

## DOCUMENT RESUME

ED 248 026

PS 014 511

AUTHOR Fosburg, Linda B.; And Others  
 TITLE The Effects of Head Start Health Services: Report of the Head Start Health Evaluation. Volume I and II.  
 INSTITUTION Abt Associates, Inc., Cambridge, Mass.  
 SPONS AGENCY Administration for Children, Youth, and Families (DHHS), Washington, D.C.  
 REPORT NO AAI-84-13; HHS-105-77-1042  
 PUB DATE 15 Mar 84  
 NOTE 1,406p.; For the executive summary, see PS 014 512.  
 PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF11/PC57 Plus Postage.  
 DESCRIPTORS Child Development; Comparative Analysis; \*Health Needs; \*Health Programs; Health Services; \*Low Income Groups; \*Medical Evaluation; Nutrition; Pediatrics; Physical Characteristics; \*Preschool Children; Preschool Education; Pretests Posttests; Program Descriptions; Program Effectiveness; Program Evaluation; Research Design; Research Methodology; Rural Urban Differences; Statistics

IDENTIFIERS Mandatory Programs; \*Project Head Start

## ABSTRACT

In 1977, a longitudinal study was initiated to assess the effectiveness of health services provided by Head Start. The study provided for 10 domains: pediatric health examinations, health history recordings, dental evaluation, anthropometric assessment, diet and nutrition assessment, and hematology evaluations, as well as for developmental, speech, vision, and hearing evaluations. This report in two volumes presents evaluation findings and technical information related to the study. Volume I, chapter one provides an executive summary including a description of the evaluation project highlights of findings for major evaluation questions, and a detailed summary of findings for each of 10 health services mandated by Head Start performance standards. Chapter two continues with additional detailed descriptions of the Head Start health services. Remaining chapters discuss findings in each of the 10 health domains. Specifically, chapters three through eleven begin with definitions of the health measures and provide background information on their use in collecting data on preschool children. Subsequent sections describe approaches taken in the analysis of the health data, and the final sections present evaluation findings. The appendix to Volume I includes a description of the evaluation methodology and a reference guide to the report and its findings. Volume II contains (1) general appendices listing Head Start performance standards and giving information for interpreting tables of regression results and (2) technical appendices focusing on implementation of the evaluation design; statistics and methodology; description of the Head Start programs, sites, and samples of children; and other relevant materials. (RH)

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AAI No. 84-13

THE EFFECTS OF  
HEAD START HEALTH SERVICES:

REPORT  
OF THE  
HEAD START HEALTH EVALUATION

VOLUME I

March 15, 1984

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HHS-105-77-1042

Prepared for:

The Administration for Children, Youth and Families  
Office of Human Development Services  
Department of Health and Human Services  
Washington, DC 20201

ED248026

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## FOREWORD

Head Start, a comprehensive program for children from low-income families, has mandated ensuring the physical well-being of children as one of means of ultimately maximizing children's learning experiences in school. Thus Head Start, since its inception in 1965, has provided a wide range of preventive and remedial health services, including periodic assessments of children's health status, prompt attention to factors which threaten to impair their growth, immunizations against infectious diseases, dental examinations and treatment, nutritional and mental health services, and health and nutrition education for parents and children. Some of these health services are provided directly by Head Start--for example, many programs conduct medical and dental examinations while most follow-up health services are provided through referrals to and coordination with other community agencies and health care professionals.

Although national assessments indicated that the overall health status of low-income children improved during the first decade of Head Start operations, they also indicated that many low-income children who were eligible for Head Start services remained at an elevated risk for health problems and required continuing health services. By 1975, the considerable experience Head Start had gained in addressing child health problems made it possible to further improve the program's health component by providing clearcut, standardized guidance to operating agencies about the precise health services to be performed. The Head Start Performance Standards (U. S. Department of Health, Education, and



Welfare, 1975) are detailed regulations for operating all components of the Head Start program, including the health services component.

The Head Start approach to improving the health status of the children and families it served was necessarily extensive, and designed to deliver the needed health services to children under a variety of local circumstances. As set forth in the Head Start Performance Standards, each Head Start agency was responsible for planning and carrying out an effective health services program for all enrolled children and their families. The Performance Standards mandated several general objectives:

- provision of comprehensive health services including medical, dental, mental health, and nutritional services to children;
- promotion of preventive health services; and
- inclusion of the child's parent in health care process through provision of necessary skills and insights to link family to ongoing health care system.

While Head Start has abundantly demonstrated its effectiveness in enhancing the cognitive and social skills of preschoolers, little has been known about the impacts of the Head Start's health component, that is, Head Start's medical, dental and nutritional services. Therefore, in 1977 the Administration for Children, Youth and Families, U.S. Department of Health and Human Services initiated a longitudinal study of the Head Start health services to assess the effectiveness of the health services being provided.

The evaluation employed a longitudinal experimental design, involving random assignment of children to a Head Start and a

non-Head Start group and was conducted in four sites. This report presents the findings of the evaluation of the Head Start health services.

### Organization of This Report

Chapter One is the Executive Summary. Part I presents an overview of the background of the evaluation. Part II highlights the findings for the major evaluation questions. Part III presents a detailed summary of findings for each of ten health services mandated by the Head Start Performance Standards. A summary of the details of the design of the Head Start Health Evaluation, samples of children recruited, the health measures used, descriptions of the sites, and Head Start programs evaluated, and the statistical methods employed are described in Appendix 1A. Appendix 1B provides a cross reference between the findings presented in Chapter One and the remainder of the report. Appendix 1C lists the major contributors to the success of this six-year evaluation. Appendices 1A through 1C are included in Volume I of the report.

Chapter Two continues with a more detailed description of the Head Start health services. Whereas the preceding discussion briefly reflects the health resources available in the local communities, information available as part of site selection, Chapter Two explores Head Start's response to local conditions. It is only in the context of the interplay of health needs, and the health services provided, that the reader can understand the detailed findings of the impact of the Head Start health program on the Head Start participants.

Two Appendix Notes and three technical Appendices provide detailed information regarding certain technical aspects of the evaluation:

- Appendix Note 2-1: Head Start Performance Standards;

- Appendix Note 2-2: Information for Interpreting Tables of Regression Results;
- Technical Appendix 2A: Implementation of the Evaluation Design;
- Technical Appendix 2B: Statistics and Methodology;
- Technical Appendix 2C: Descriptions of the Head Start Program Sites and Samples of Children.

These technical appendices and the appendices to the subsequent chapters are located in Volume II of the Report.

The remaining chapters of this report discuss the findings of the Head Start Health Evaluation in each of the health domains. Chapters Three through Eleven have a standard organization. They begin with definitions of the health indicators (measures) used, and provide background information on their use for collecting data on preschool children. The next section, analysis, describes the approaches taken in the analysis of the health data. The final section presents the findings of the evaluation.

Chapter Three reports the results of the pediatric health examination and child's health history. This evaluation consisted of a review of the health history and a medical examination of the child by a pediatrician. The pediatrician classified any significant present or past medical problems and determined their level of urgency or need for treatment. The types of medical problems and their frequencies are reported within each site.

Chapter Four reports the results of the dental evaluation. This assessment consisted of an examination by a pedodontist to determine the presence and extent of dental caries or occlusion problems. An assessment was also made of the amount of dental plaque and gingival inflammation. The frequencies and types of dental health deficiencies are reported within each site.

Chapter Five reports the results of the anthropometric assessment. The child's height, weight, and triceps skinfold thickness were determined and converted into age-and-sex-adjusted percentiles. The average and median percentiles are reported for each site.

Chapter Six reports the results of the diet and nutrition assessment. This assessment consisted of a 24-hour dietary recall and a three-month food frequency interview given to the mother or guardian of the child. Information on family dietary habits and food practices was also obtained. The 24-hour totals were converted into the percentage of the Recommended Dietary Allowance (RDAA) or other appropriate standards. Mean and median levels are reported for each site.

Chapter Seven reports the results of the hematology evaluation. A sample of blood obtained from each child by venipuncture was assayed for indicators of iron status, vitamin, and cholesterol levels. The indicators are compared to appropriate standards, and the frequencies of deficiencies are reported for each site.

Chapter Eight reports the results of the developmental evaluation. This consisted of the child's performance on the Motor Scale of the McCarthy Scales of Children's Abilities and the mother's report of the child's aggressive and/or withdrawn behavior. The child's refusals to attempt the McCarthy tasks were also scored. Mean scores on each scale are reported for each site.

Chapter Nine reports the results of the speech evaluation. This assessment determined speech and language problems for each child in the dominant language (either English or Spanish). The results are compared with age-adjusted norms, and the frequencies of speech and language deficiencies are reported for each site.

Chapter Ten reports the results of the vision evaluation. The vision assessment consisted of a series of vision tests to determine the presence of organic vision deficiencies or deficient visual skills development. The frequency of each type of vision deficiency is reported in each site.

Chapter Eleven reports the results of the hearing evaluation. The hearing assessment consisted of a determination of

hearing threshold levels at four frequencies and a tympanometric evaluation of the tympanic membrane. The hearing thresholds were compared with norms for each frequency, and the percentage of children below the norm is reported in each site.

Linda B. Fosburg, Ph.D.  
Project Director  
March 1984

# CHAPTER ONE

## EXECUTIVE SUMMARY PART I

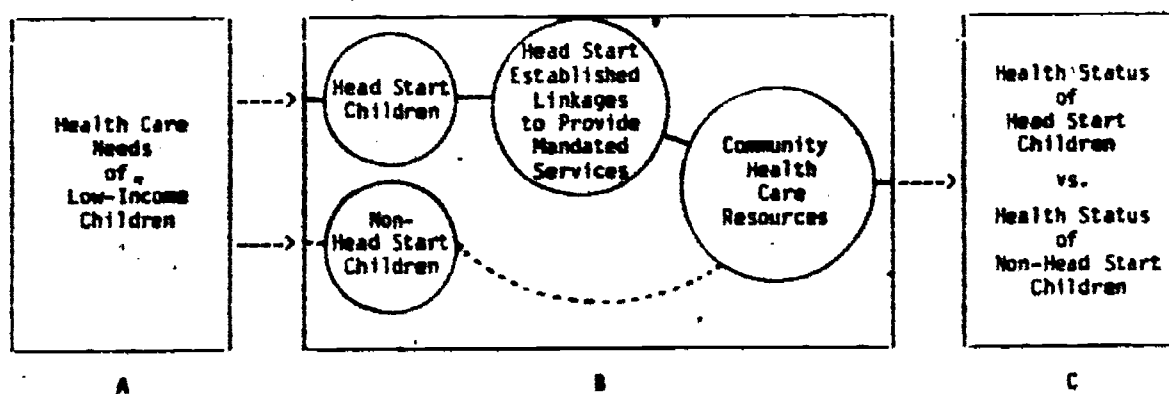
### BACKGROUND OF THE HEAD START HEALTH EVALUATION

#### Purposes of the Head Start Health Evaluation

The major focus of the evaluation was to examine Head Start health services delivery system, how it responds to the health care needs of low-income children, and to what extent it produces improvements in the health status of the children served by the Head Start program. Exhibit 1-1 provides a schematic diagram which illustrates the major features of this system.

#### Exhibit 1-1

Head Start Health Services Delivery System:  
The Linkage between the Health Care Needs  
and Health Status of Children  
through Utilization of  
Community Health Care Resources



Block A represents the health care needs of low-income children (and their families) who are eligible for participation in the Head Start program. Block B represents the community with the

Head Start health services delivery system as a linkage between the Head Start children (with their health needs) and the community health care resources. Block B also depicts the naturally occurring linkages between other low-income children (the non-Head Start children and their families) with community health care resources. Block C represents the impacts of the Head Start health services on health status of participating children and their families, compared to the health status of the non-Head Start children.

The Head Start Health Evaluation examines the Head Start health delivery system and addresses the following questions:

- What is the health status of the children prior to their entry in Head Start?
- What medical, dental and nutritional health services do Head Start children receive through Head Start?
- How do medical, dental and nutritional services received by Head Start children compare to those received by non-Head Start children?
- What are the impacts of Head Start health services on the health status of Head Start children?

By addressing these questions, the Head Start Health Evaluation makes several contributions. It provides confirmation of the previous research on the health status of low-income children and their health needs. The evaluation examines the Head Start program's health services, defined by the Head Start Performance Standards, as implemented in a variety of community contexts confronting Head Start programs. It also determines the extent of services similarly situated low-income children received in the absence of Head Start in the same communities and ascertains whether the implementation of the Head Start health services system ame-

liorated the health problems of participating children by providing screening, diagnosis, and follow-up treatment. Finally, the evaluation examines whether Head Start health services system had other desirable impacts such as promoting preventive care, linking children and their families with the community's health care systems, and contributing to the optimal development of the child.

The remainder of this chapter summarizes Head Start health services as mandated by the Performance Standards, provides a brief description of the experimental design of the evaluation, and introduces the communities and Head Start programs which participated in the Head Start Health Evaluation.

#### Head Start Health Services

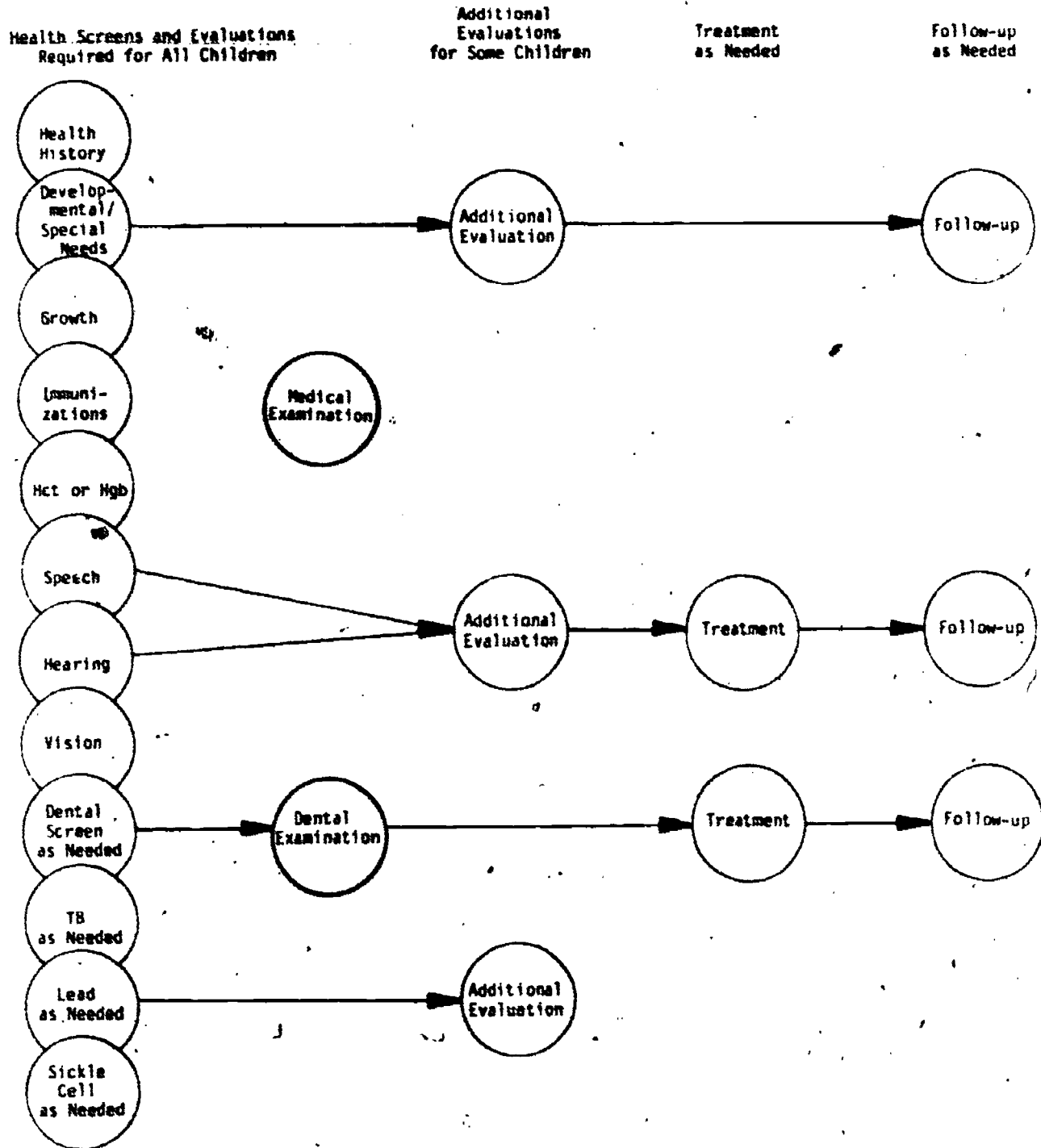
Since its inception in 1965, Head Start has provided over 8.6 million low-income children with a comprehensive program of services. During the year 1980-1981, when the children involved in this evaluation were enrolled, 1,262 Head Start programs served a total enrollment of 387,300 children. Approximately one-third of the programs were located in each of the following types of communities: urban, rural, and a combination of urban and rural. The children served by these programs were mostly between the ages of three and five; only three percent of the children were younger or older.

The Head Start Performance Standards for the delivery of services mandate that each of the children enrolled in the program receive a full battery of health screens and examinations. Treatment and other follow-up are provided on an as-needed basis only. The services mandated and the processes for delivery of the health services are illustrated in Exhibit 1-2. According to the Program Information Records (PIR's) submitted to the Department of Health and Human Services, in 1980-1981, 85 percent of the enrolled chil-



Exhibit 1-2

Head Start Health Services:  
The Process Mandated by the Performance Standards



dren received medical screening and 92 percent of those needing treatment received it; 78 percent of the children received dental examinations and 87 percent of those needing dental treatment received treatment; and 80 percent of the children completed all of their required immunizations.

To accomplish their mission in the delivery of health services, Head Start developed a staged system for the delivery of health services to participating children which, while addressing all of the mandated health services covered by the Performance Standards, recognizes that many negative health conditions affect only a small minority of the children in Head Start. The system can be summarized as follows: Head Start children are screened for all of the health conditions covered by the Performance Standards; these screens are regarded as preliminary indicators of health problems and those children with negative indications in any health area are referred to the appropriate medical or dental professional for further diagnostic work-up; only those children determined to be in need of treatment are referred for treatment to the appropriate service provider.

In addition to specifying the mandated health services the Performance Standards make recommendations about the type and level of personnel needed to perform the initial health screenings. To contain the costs of delivering services to children, the Performance Standards recommend that some of the screening activities can be performed by para-professional workers. These activities include the medical, dental and developmental health history (collection of medical records, immunization records, and teacher observations), growth assessment, and immunization status assessment. The Performance Standards are less specific about the personnel for the vision and hearing screens and indicate that these screens can be performed by a person trained to administer them to children. The "physical

examination" implies a physician's or nurse practitioner's judgment (the physician need not be a pediatrician). The dental examinations require a dentist or dental hygienist (under the supervision of a dentist): In sum, many levels of personnel, from para-professional to professional, may be required to conduct the initial health screens and examinations.

Exhibit 1-2 also illustrates one hypothetical example of the process followed in the delivery of health services to one Head Start child. First, a Head Start staff member obtains the child's health history and then the child receives all of the mandated health screens. Next, the child receives the required medical and dental examinations. In this example, the developmental screen yields suspicious results which require further diagnostic examination by a physician, who recommends no immediate treatment but specifies that additional follow-up will be required. The suspected hearing and speech problems are further evaluated by a speech pathologist who determines that while hearing is, in fact, normal, speech therapy and follow-up will be required. The dental examination finds large numbers of cavities which require two additional visits for restoration and follow-up. Finally, the suspicious lead value is followed by a more precise lead test which proves to be negative, requiring no further action. Thus for this child, the ten mandated health screens and examinations were followed by eight additional health services.

#### Experimental Design of the Evaluation

The Head Start Health Evaluation was designed to focus on the health status of Head Start children within the context of previous findings and to establish the linkages between the health status of Head Start participants and their participation in Head Start. The general design was to select a sample of Head Start

programs (to collect extensive data on program operations) and, within each program, to administer a coordinated battery of health measures to a scientific sample of participants.

The Head Start programs were selected with regard to those program characteristics that would presumptively be related to program performance: Previous research suggested health services for low-income families were likely to be strongly related to such variables as the urban or rural location of the families; the nature of the local health care system (for example, availability of free or subsidized health care); and the region of the country. Consequently these characteristics were applied to the selection of programs to evaluate.

Four Head Start programs, dispersed across four regions of the country, were selected. Half of the sites were predominately urban and the others were rural. (Although some areas in the "urban" sites were rural, the Head Start programs served children from urban locations in the county.) The counties were identified by the U. S. Public Health Service as "underserved" areas in terms of medical and dental services. The strength of the local health care system and the availability of free or subsidized health care for low-income children varied greatly and was an important factor in the delivery and impact of health services on the health status of the children. These issues are highlighted in the descriptions of the Head Start programs included in Appendix I.

Within each of four sites, 200 to 300 children who were eligible to enter Head Start in the fall of 1980 were recruited for the evaluation. These children were divided into groups based on age and sex then randomly assigned to a Head Start experimental or non-Head Start comparison group. A pretest evaluation of the health status of half of each group of children was administered in the spring of 1980, prior to the Head Start group's entry into the

program. The posttest of the evaluation, conducted one year later, evaluated the health status of all children in both groups after the Head Start group had nearly completed one year in the program.

Many children recruited for the pretest dropped out of the evaluation. Hence, prior to the posttest, additional children were recruited. The Head Start recruits were first year Head Start participants and the non-Head Start recruits were other similar-aged, low-income children. The major consequence is the distinction between (1) the impacts of Head Start determined by evaluation of the children who received both the pretest and the posttest (longitudinal impacts) and (2) the impacts of Head Start determined by evaluation of all of the children who received the posttest evaluation (cross-sectional impacts or impacts on the total posttest sample). Appendix I provides additional details on the design of the evaluation, the samples of children recruited and the health measures administered.

#### Summary of Remaining Chapters

Chapter Two highlights the answers to each of the four research questions regarding the health status of the children prior to Head Start entry, the health services received by the Head Start children, a comparison of health received by the Head Start and the non-Head Start children, and the impacts of health services on the health status of the children. Chapter Three provides more detailed findings of the evaluation results for each of the ten areas of health services mandated by the Performance Standards: pediatric health, health history, dental, anthropometric, nutrition, biochemical, developmental, speech and language, vision, and hearing.

EXECUTIVE SUMMARY  
PART II

HIGHLIGHTS OF FINDINGS FOR MAJOR QUESTIONS

What Is the Health Status of the Children  
Prior to Their Entry into Head Start?

Many of the children present a number of health problems which are remediable and require the attention of health care professionals. The following findings are drawn from the pretest of the evaluation. All of the children evaluated were eligible for enrollment into Head Start.

Accidents

Serious accidents were reported to have occurred to 35 percent of the children, including burns (5%) and swallowing poisonous substances (9%).

Perinatal Health

Eleven percent of the children had low or high birth weight, 14 percent had gestation periods of less than 38 weeks or more than 42 weeks and 34 percent had health problems at birth. Some 31 percent of the mothers did not have a prenatal health visit in their first trimester, 34 percent had health problems during their pregnancy and 35 percent had large body weight changes during pregnancy (either increases or decreases.) Twenty percent of the mothers were under 18, as opposed to the national average of six percent.

Pediatric Health

The pediatric examination determined that 53 percent of children eligible to enter Head Start were found to have at least

one pediatric problem; 9 percent had middle ear infections; 8 percent had allergies; 7 percent of the children over 4 years of age suffered from enuresis; 6 percent had asthma; 5 percent had skin problems; 3 percent had psychosocial problems; and 2 percent had urinary infections.

### Dental

On the average, a child entering Head Start had 4.6 cavities (decayed surfaces), 0.6 fillings and 0.08 missing teeth. One out of four children urgently needed dental care.

### Nutrition

Children entering Head Start had adequate diets for protein, vitamins A, B<sub>12</sub>, C, thiamin, and riboflavin. In general, calcium and iron intakes were marginal, however. In some locations magnesium, phosphorus, niacin and vitamin B<sub>6</sub> and total caloric intake were also marginal.

### Motor Development

At pretest, 34 percent of the children entering Head Start scored below the tenth percentile for fine and gross motor skills expected of children of the same age.

### Speech and Language

Sixty-three percent of the children at pretest had indications of a speech or language problem. Nearly 90 percent of these children with articulation delays were more than one year behind.

### Vision

Sixty-one percent of the children had one or more vision deficiencies.

## Hearing

At pretest one out of three children failed the hearing test. Fourteen percent had otitis media.

## What Health Services Did the Head Start Children Receive?

Most Head Start children received at least some of the mandated health services; however there were many gaps in coverage. The following findings are drawn from the posttest of the evaluation. The sources of information on Head Start Health Services include: Head Start health records, mother's or principal caretaker's reports, and Head Start Program Information Reports.

### Medical Examinations

According to Head Start health records, over 85 percent of the children received a medical examination either immediately prior to or during their first year in Head Start. Of those children examined, 24 percent were found to have medical problems and 56 percent of those with medical problems were treated.

### Dental Examinations

For the Head Start children studied, 80 percent received dental examinations. Fifty percent of the children were found to have dental problems. Of those children found to have dental problems, 68 percent were treated.

One of the Head Start programs was unable to arrange for adequate dental services. There, ninety-four percent of the children had decayed teeth at posttest. These cavities were increasing at rate of six per year resulting in an average of 11 cavities per child. Less than 1 percent of the cavities had been filled during the program year.



### Nutrition

Head Start children received meals and snacks that provided mandated proportions of children's daily nutrient needs, accounting for up to 50 percent of children's total daily intake. This is particularly important, given the marginal vitamin and mineral intakes of some of the nutrients that were observed in the non-Head Start group. Head Start placed families in need of food assistance in touch with appropriate persons or agencies. Fifty-seven percent of Head Start families were receiving benefits at posttest that they were not receiving at pretest. Families of Head Start children served meals at home that were superior to those served by non-Head Start families in nutritional quality for several nutrients. Program health records show 45 percent of the Head Start children received nutritional assessments.

### Blood Tests

For the Head Start children studied, program records showed that 67 percent received blood tests.

### Immunizations

For the Head Start children studied, 77 percent were immunized. Thirty-four percent of the children who had been immunized prior to entering Head Start and over 49 percent of all Head Start children were immunized through Head Start during the program year.

### Development Assessment

Head Start records show 41 percent of Head Start children received developmental assessments. Of those found to have a problem, one-third received services.

### Speech and Language Examination

Thirty-one percent of Head Start children studied received a speech screen. Of those suspected to have a speech problem, 25 percent received a formal speech examination. Followup services were received by 77 percent of the children determined to be in need of speech therapy.

### Vision Screening

Fifty-three percent of the Head Start children received a vision screen. Only 31 percent of the children needing follow-up and treatment received it.

### Hearing Screen

For the Head Start children studied, 61 percent received a hearing screen. Eighty-two percent of children found to have a hearing or ear infection problem were referred for treatment.

### Parent Involvement

Approximately 85 percent of the parents visited a Head Start classroom at least once. On the average, parents visited Head Start classrooms once a week. Of all Head Start parents, 31 percent attended a meeting on food and nutrition.

### Health Records and Reports

In the Head Start sample, medical treatment received for children with medical findings was 41 percent below that reported in the Program Information Reports (PIR) (56% vs. 97%). The percentage of children with identified dental problems receiving treatment were 31 percent below those reported in the PIR (68% vs. 99%).

## How Did Health Services Received Compare between the Head Start and Non-Head-Start Children?

Head Start children were much more likely to receive preventive and remedial health services than other low-income children in their community. The following findings are drawn from the posttest of the evaluation.

### Medical Examination

Head Start children were more likely to receive a medical examination than non-Head Start children (86% vs. 68%). More Head Start children received additional preventive health services such as TB tests (67% vs. 42%) and lead tests (15% vs. 8%).

All pediatric problems found during the pretest evaluation were formally communicated to the local Head Start program and to the parent and local physician of the child. Treatment for those pediatric health problems was more likely to be received by Head Start children (46% vs. 36%) and there were likely to be fewer problems (43% vs. 66%) at posttest. Although Head Start children with a single medical problem were more likely to be treated for the problem (44% vs. 22%), Head Start children with multiple medical problems were equally likely to be treated (46% vs. 42%).

### Dental Examination

More Head Start children received dental examination (80% vs. 27%). In half of the sites, Head Start children had significantly less dental plaque. As a result of receiving more services, Head Start children were more likely to have fillings (29% vs. 11%). Head Start children were also more likely to have gone to a dentist with their families and were more likely to make such visits regularly.

### Nutrition

Head Start families served meals at home that were richer in nutrient quality than non-Head Start families; for example, in the levels of vitamins A and C. Head Start children present in the center consumed appreciably more calories and protein as well as calcium, magnesium, phosphorus, vitamin A, riboflavin, and vitamin B<sub>12</sub> than Head Start children absent from the center or non-Head Start children.

### Speech Evaluation

Many more Head Start children received a speech screen or evaluation (31% vs. 15%). The Head Start children were more likely to receive speech therapy services (77% vs. 0%).

### Vision Screen

More Head Start children were likely to receive vision screen or examination (53% vs. 10%). For Head Start children, the examinations were likely to be provided by Head Start staff.

### How Did Head Start Health Services Impact the Health Status of the Head Start Children?

Significantly, when the mandated health services were delivered to Head Start children, their health status was substantially improved. The following findings are drawn from both the pretest and the posttest of the evaluation. The sources of information on Head Start health impacts include: mother's or principal caretaker's reports, and results of both the pretest and the posttest evaluation teams' findings.

### Pediatric Evaluation

Head Start children, found to have pediatric problems at the pretest, were less likely to have the same problems remaining at

posttest than non-Head Start children (43% vs. 66%). This finding was especially significant in one medically underserved site. Without Head Start services, children were much less likely to receive treatment for known medical problems.

#### Dental Evaluation

In one site, Head Start provided dental examinations to 100 percent of the children, and treated those needing dental services; Head Start children received significantly more fillings of decayed surfaces (4.8 filled surfaces/child vs. 0.06 filled surfaces/child). Head Start children had significantly less plaque on their teeth compared to non-Head Start children in two sites; both sites had flouridated water supplies. In the other two sites with predominately unfluoridated water supplies, both Head Start and non-Head Start had higher and similar levels of plaque. The Head Start children in the latter two sites also had between 178% and 489% more cavities than the Head Start children in the site providing a high level of dental services.

#### Anthropometry

Significant differences in anthropometric measures were not found.

#### Nutrition

The nutritional intake evaluation showed the exceptionally positive impacts of Head Start's nutrition services. The Head Start children took in significantly more calories, protein and almost all of the other nutrient studied compared to the non-Head Start children. Head Start children consumed significantly more calcium, magnesium, phosphorus, riboflavin, vitamin A and vitamin B<sub>12</sub> at posttest compared to pretest. Non-Head Start children and Head

Start children who were absent from Head Start when their nutritional intake was evaluated did not show these gains in nutrient intake. Families in Head Start were more likely than non-Head Start families to begin receiving food assistance using WIC or WIC plus food stamps (57% vs. 33%).

#### Biochemical Evaluation

For blood beta-carotene levels, a measure of recent vitamin A intakes, Head Start children had higher levels than the non-Head Start children. In the total posttest sample, 14 percent of the Head Start children had low levels while 24 percent of the non-Head Start children had low levels of beta-carotene. Although there was almost no iron deficiency, Head Start children who received a hemotologic screen from the program were less likely to have abnormal hemoglobin or hematocrit levels at posttest. There were no significant differences between the Head Start and non-Head Start children in blood levels for hematocrit, hemoglobin, FEP, MCHC, TIBC, serum iron, transferrin saturation, or ferritin.

#### Developmental Evaluation

At posttest Head Start children were more likely to have no problems identified by the battery of measures used in the developmental evaluation of the children (55% vs. 45%). Longitudinal Head Start impacts on children's motor coordination and development were significant for children in one site with a full-time, five-day program. There was also evidence that Head Start had a significant impact on children who performed below the 20th percentile on the McCarthy Scale of Motor Development at pretest. By posttest, 19 percent fewer Head Start children performed below the 20th percentile compared with 4 percent fewer non-Head Start children.

### Speech and Language Evaluation

Head Start had positive impact on children with speech and language comprehension problems. Head Start children tested at both pretest and posttest were less likely to have speech and language deficiencies at posttest (38% vs. 52%). There was also evidence at posttest of Head Start's effects on children's speech and language comprehension performance which was related to Head Start's delivery of services. In one site where Head Start program staff had received special speech training, Head Start children had significantly fewer articulation and language comprehension problems.

### Vision Evaluation

Fewer Head Start children than non-Head Start children who were evaluated at both pretest and posttest had a vision deficiency at posttest. This trend, although not significant, was consistent across all sites. Otherwise there were no significant differences on the vision evaluation measures.

### Hearing Evaluation

For otitis media, the prevalence was 14 percent for the Head Start children and 12 percent for the non-Head Start children. There were no significant differences between the two groups of children on any of the other hearing evaluation measures.

EXECUTIVE SUMMARY  
PART III

DETAILED SUMMARY OF FINDINGS

Pediatric Health Evaluation and Health History

In the pediatric health evaluation a board-certified pediatrician examined each of the children. The evaluation protocol was adapted from that used by the National Center for Health Statistics in the First National Health and Nutrition Examination Survey and was designed to classify the children's health problems. In addition, each child's mother or guardian was interviewed to obtain a health history. Data from the pediatrician's examination and health history were synthesized and coded into specific health problems, such as otitis media, allergies and pica.

The prevalence of health problems (as defined in this evaluation) among low-income children at pretest was lower than found in earlier national studies of equivalent populations. Fifty-three percent of the children had health problems. The most prevalent problems were:

- allergies;
- asthma;
- dermatologic problems,
- enuresis;
- otitis media;
- pica; and
- surgical problems.

However, prevalence of problems was higher in two sites where access to medical care was difficult for this population.

In addition, the perinatal health history of the mother was analyzed. Pregnancy risk factors included:



- first prenatal visit after the first trimester of pregnancy;
- mother's report of health problems during pregnancy;
- weight loss or gain of more than 30 pounds; and
- mother's age at child's birth less than 18.

Approximately one-third of the mothers reported each of the first three maternal health indicators above. One out of five children were born to mothers who were less than 18 years of age--more than three times higher than the national average.

Head Start's involvement in the delivery of the following medical services was examined:

- medical examination just prior to or during Head Start year;
- presence of a health record on the child (including a health history); and
- documentation of immunization status.

Overall, 85 percent of the Head Start children had received a physical examination and 77 percent had a immunization record. Sixty-seven percent of the children had received a TB test. In St. Clair County, a mostly urban area with many older buildings, two out of three children were tested for lead poisoning from lead-based paint and other sources.

In the longitudinal sample, proportionately fewer Head Start than non-Head Start children who had health problems at pretest continued to have problems at posttest. The positive impacts of Head Start's health services on children were particularly evident in locations where access to services is difficult.

Although there were no differences between groups in the receipt of treatment for illness in the past year, Head Start children were more likely to have received a physical examination and other preventive health services (e.g., TB test, lead test, and immunizations) than children in the non-Head Start group.

#### Dental Evaluation

Each child received a dental examination by a pedodontist who charted carious lesions on each surface, the number of missing and filled teeth, evidence of gingival inflammation, and occlusion abnormalities. Each mother or primary caretaker was interviewed to obtain a dental history. The examinations and dental histories, coupled with a review of Head Start health records of provision of services, were used to assess the impact of the Head Start program's dental education and services.

The dental health of children in the Head Start Health Evaluation was notably poorer than that of equivalent participants in the Ten-State Nutrition Survey and the First National Health and Nutrition Examination Survey. At pretest, over half of the children had decayed surfaces, and less than 10 percent had any filled teeth. Prevalence of dental problems was highest in 2 out of 4 sites where dental services were scarce and the community water system was not fluoridated. (Fluoride is a known inhibitor of caries development.)

Eight out of ten children enrolled in Head Start received a dental examination and 82 percent of those diagnosed as having dental problems were referred for follow-up services or received treatment. There is strong evidence to suggest that some Head Start procedures for delivering dental services are more effective than others. The one site that examined all Head Start children purchased services on a contractual basis from the local health department. This health department moved a dental clinic in a mobile trailer from site to site, frequently to the parking lot of the Head

Start center. In contrast, two other sites examined about 65 percent percent of the Head Start children in the evaluation. Both of these sites had few dental examination resources available and had to make special arrangements with providers for dental examinations. Children absent from Head Start on examination day usually did not receive one.

Posttest comparisons of the dental health of Head Start and non-Head Start children indicated that systematic provision of Head Start dental services leads to substantial improvements in the dental health of the Head Start children. This is particularly true in one site where the Head Start children received significantly more fillings between pretest and posttest and had a lower prevalence of decayed and missing teeth at posttest. In general, Head Start children were more likely to brush their teeth once-a-day and maintained better hygiene practices than children in the non-Head Start group.

#### Anthropometric Evaluation

To provide another estimate of the overall well-being of the children, the data collection teams measured height, weight, arm circumference, and triceps skinfold thickness. These anthropometric measurements were compared with reference data from the National Health and Nutrition Examination Survey to obtain age- and gender-specific percentiles expressing the ranking of a child relative to a healthy national reference population of the same age and sex.

According to the pretest evaluation, median height percentiles for children were below the national reference medians. The weight percentiles more closely approximated the national average. Although the younger children in the pretest tended to be below national norms, the posttest evaluation indicated that after age four, the children's average height and weight was nearly at the

50th percentile. Except in one site with a larger proportion of Hispanic children, fewer children were below the 10th height and weight percentiles than found nationally.

In general, the growth status of the Head Start and non-Head Start groups of children was typical of most children in the United States. Given two groups of children with normal growth status, there were few indications of a Head Start impact on that status.

#### Nutrition Evaluation

The nutrition evaluation focused on the adequacy and quality of the diets consumed by Head Start and non-Head Start children. Information was collected on all foods and beverages consumed by each child in a complete 24-hour period. These data were obtained primarily from each child's mother or principal caregiver. At posttest, direct observations were used to gather information on the foods children received while attending Head Start. The total nutrient content of each child's diet was calculated. The relative quality of children's diets was further assessed through measurement of nutrient density, that is, the amount of the nutrients provided in the diet relative to the total number of calories provided. The 24-hour nutrient totals were subdivided to reflect the nutrient content and nutritional quality of foods provided to the child at home and those provided through Head Start.

The children examined at pretest presented nutritional problems similar to those noted in the Ten State Nutrition Survey and the First Health and Nutrition Examination Survey. The most problematic nutrients were iron and calcium. The average iron intake was below the recommended amount in all four sites; the average calcium intake was below standard in three sites. Total caloric intake was also marginal in two sites.

Posttest analyses examined three groups of children: Head

Start who were present at the Head Start center on the day nutrition information was collected (and had received meals and snacks provided by Head Start), Head Start children who had been absent on the day nutrition information was collected (and therefore had not received Head Start meals and snacks), and non-Head Start children. These analyses revealed that the nutrition component of the Head Start program has a significant and positive effect on the children who received the meals and snacks at the Head Start centers. Positive effects were evident in all four sites; the smallest effects were noted in Maricopa County, where the Head Start nutrition program served fewer meal and snacks than were served in other programs. As a group, the Head Start children who had received the Head Start meals and snacks, had virtually no problems of inadequate or marginal nutrient intake. In contrast, non-Head Start children and the Head Start children who had not received the meals and snacks from Head Start had many more nutrient intake problems. Most profound among these were marginal intakes of both calcium and iron.

Significant Head Start effects were also noted among the children examined at both pretest and posttest. Across all sites, children who had received meals and snacks from Head Start showed pretest to posttest improvement in average intakes of calcium, magnesium, phosphorus, vitamin A, riboflavin and vitamin B<sub>12</sub>. Non-Head Start children and Head Start children who had not received meals at Head Start, on the other hand, showed no significant improvement in average nutrient intake from pretest to posttest. Additionally, the proportion of individual children who received less than 100 percent of the recommended intake for any nutrient was substantially decreased (from pretest to posttest) in the group of children who were present at Head Start. These improvements were far less prevalent in the non-Head Start and Head Start-absent groups.

There is strong evidence that the goals and objectives of the Head Start nutrition service program are being successfully achieved. Meals and snacks are nutritionally adequate, balanced and provide 40 to 50 percent of the children's daily nutrient intakes. In contrast, non-Head Start children and Head Start children not attending a center are at risk of consuming an inadequate or marginal diet. The meal service component of the Head Start nutrition program served meals and snacks that successfully provided the mandated proportions of children's average daily nutrient needs (one-third of the RDA for part-day programs; one-half to two-thirds of the RDA for full-day programs).

Significant differences between Head Start and non-Head Start families in the pattern of participation in food assistance programs from pretest to posttest suggest that Head Start may play an important role as facilitator, by putting families in need of food assistance benefits in touch with appropriate persons or agencies. Reported parent education meetings focusing on food and nutrition reached 31 percent of the parents. Nonetheless, the nutritional quality of diets provided to Head Start children at home was superior to that of non-Head Start children in concentration of vitamins A and C and cholesterol and to a lesser extent, the amount of fat and carbohydrate consumed.

#### Biochemical Evaluation

A blood sample was drawn from 816 children between the ages of 1.8 and 6.6 years. Biochemical analyses focused on an extensive assessment of iron status (including determination of hemoglobin, free erythrocyte protoporphyrin, total iron binding capacity, serum iron, transferrin saturation, and serum ferritin concentrations); an evaluation of vitamin A and vitamin C status; and a determination of serum cholesterol levels.

Compared with findings of the Preschool Nutrition Survey, conducted a decade ago, prevalence at pretest of abnormal hematocrit, serum iron, and transferrin saturation levels were similar. However, a much smaller percentage of the children in this study had abnormal hemoglobin, TIBC, or vitamin A levels. And a much higher proportion of black and Hispanic children in the Head Start Health Evaluation had unacceptably high cholesterol values than was found in the Preschool Nutrition Survey.

At posttest, there was evidence of Head Start impacts on the children from several perspectives. Sixty-seven percent of the Head Start children received a hematologic screening (hematocrit and/or hemoglobin reading) conducted by the program. This is particularly important since there is little evidence that children receive these screens through any source other than Head Start. Second, significantly fewer children screened by Head Start had abnormal hematocrit level or hemoglobin concentrations at posttest (7% vs. 18%). The children with abnormal values at posttest were also more likely to be receiving Food Stamps and/or WIC program benefits, suggesting these programs were well-targeted to children in need. Another significant Head Start impact and reflective of the more nutritional dietary intakes of the Head Start children were the children's serum beta carotene levels. This biochemical measure is an indicator of recent intake of Vitamin A. Iron status and serum cholesterol levels of the two groups were not significantly different.

#### Developmental Evaluation

The developmental assessment of the Head Start Health Evaluation examined four aspects of the children's development: the children's performance on the Motor Scale of the McCarthy Scales of Children's Abilities; the child's willingness to cooperate with the developmental tester; the parent's report of whether the child

behaved in ways which are associated with being overly withdrawn; and the parent's report of whether the child behaved in ways which are associated with being overly aggressive. In addition, data were abstracted from Head Start health records about developmental services (screens, problems identified, and referrals for or treatment of problems) provided to Head Start children.

Pretest results show that 66 percent of the children had some evidence of a development problem on one or more of the four indices. Forty-one percent of the Head Start children were screened for developmental problems. Only one-third of the children who were found to have problems received treatment for those problems.

Head Start has a significant impact on children's motor coordination and development, especially for those children who perform below average on the McCarthy Motor Scale. The impact of Head Start on the children's motor coordination and development was strongest in the site which had the most intensive program, a full-time, five day program. Significant effects were not found in the other sites which have part-day and/or part-week programs. Although Head Start children showed a trend of fewer developmental problems than non-Head Start children, these differences were statistically significant only in one site.

#### Speech and Language Evaluation

This evaluation included a speech and language comprehension component to identify children with deficiencies in these areas and to determine whether participation in Head Start is associated with remediation of such problems. The speech and language evaluation consisted of the four language comprehensive scales from the Assessment of Children's Language Comprehension (ACLC), the Denver Articulation Screening Examination (DASE), the sentence repetition subtest of the Fluharty Preschool Speech and Language Screening Test, and



selected items from the Physician's Developmental Quick-Screen for Speech Disorders (PDQ). These tests were administered to all children by a speech pathologist from the local area. Information about speech services was obtained from Head Start programs and from interviews with parents.

At pretest sixty-three percent of the children failed to achieve expected levels of speech and language comprehension. Articulation delays appeared to be more severe than language comprehension delays. Ninety percent of those with articulation problems were at least one year behind.

Head Start records indicate that 31 percent of Head Start children were screened for speech and language problems. Children whose mothers suspected problems or who had medical insurance were more likely to be screened.

There was little evidence of an overall Head Start effect on children's speech and language comprehension. Head Start children in one site where Head Start operates a full-time, five-day program, scored significantly higher in language comprehension, and Head Start children in another site, where Head Start staff had received special speech training, had significantly higher articulation scores and fewer speech problems.

#### Vision Evaluation

The vision evaluation was administered by an optometrist using the modified clinical technique. It consisted of a battery of tests that measured visual acuity, stereopsis, ocularmotility, binocularity, color discrimination, strabismus, convergence, and the need for lens correction.

Prevalence of vision deficiencies at pretest were 4 percent for visual acuity and 9 percent for strabismus. From among the evaluation's extensive range of vision measures, 61 percent of the children at pretest failed one or more of the measures.

Head Start children were much more likely to have ever been screened for vision deficiencies than children in the non-Head Start group. Head Start children received significantly more vision examinations, usually through the Head Start program. Although such examinations could lead to earlier detection and more effective treatment of vision problems than if first examinations occur later in life, there was no indication that Head Start children had fewer vision problems than children not in Head Start. There also was little indication that Head Start provides more vision services to children or that the program has an impact on Head Start families' use of vision services.

#### Hearing Evaluation

The hearing evaluation consisted of two parts: testing for hearing threshold levels at each of several frequencies and tympanometric testing for middle-ear impedance. The examination was conducted by audiologists.

Approximately 11 percent of the children at posttest had hearing problems or chronic ear infections (serous or recurrent otitis media). A much higher prevalence rate was found at pretest but the pretest data may simply indicate that the children examined were too young for an accurate hearing evaluation.

Two-thirds of the Head Start children received a hearing screen. Head Start referred 82 percent of children diagnosed to have deficiencies for treatment. There were no differences in the hearing status of Head Start and non-Head Start children at posttest that could be attributed to program intervention.

## CHAPTER TWO

### HEAD START HEALTH SERVICES: PROCESS AND EXPECTED OUTCOMES.

The major focus of this evaluation has been the impact of the Head Start health component on the health status of Head Start children. However, it has been necessary, in order to interpret the observed impacts, to account for differences both in Head Start children's health needs from one program to another, and in the health services provided. For example, an absence of impacts could result either from the absence of need, or the absence, or perhaps ineffectiveness, of the available services. Thus, it was necessary, for the purposes of the evaluation, to measure the incoming health status of the Head Start children, the proffered services and the resulting changes in health status.

Exhibit 1-1 illustrated in a simplified schematic diagram the major points at issue in the Head Start Health Evaluation. Chapter Two focuses on Block B, the Head Start health delivery system. It discusses the objectives of the Head Start Performance Standards in the health domain and the processes mandated by those standards for the delivery of health services. Because of the important variation in the level of available health services, it examines the community context in which each Head Start program delivers health services in order to determine how this affects service delivery. Next it compares the level of each type of service delivered to the established standards. To set these service levels in context, regional and national data are used for comparison. Where possible explanations are offered for the differences in kinds of services available as well as the level of quality of these services. In essence, this chapter provides a framework for understanding the evaluation's findings. Subsequent chapters will examine, for each health domain, the need for services, Block A, and the impact of those services on participants, Block C.

#### Head Start Performance Standards

The Head Start Performance Standards for the delivery of health services to children provide direction to the programs regarding the acceptable

processes for accomplishing their mission in the delivery of health services. Mandated services were listed in Table 1A-5 (with additional detail in Appendix Note 2-1).

### Health Service Delivery System

Head Start has developed a staged system for the delivery of health services to ameliorate the health problems of participating children which, while addressing all of the mandated health services covered by the Performance Standards, recognizes that many negative health conditions affect only a small minority of the children in Head Start. Briefly the system can be summarized as follows: Head Start children are screened for all of the health conditions covered by the Performance Standards; these screens are regarded as preliminary indicators of health problems and those children with negative indications in any domain are referred to the appropriate medical or dental professional for further diagnostic workup; only those children determined to be in need of treatment are referred for treatment to the appropriate service provider.

According to the Performance Standards, all of the children entering the program must receive all of their health screens and examinations within 90 days of entry into the program. Thereafter, screens are updated on a predetermined schedule. Some of the health services are performed annually (e.g., an updated developmental and health history and dental examination with prophylaxis), some at the beginning and end of each operating period (e.g., growth assessment), some periodically, usually every two years (e.g., vision and hearing testing and a medical examination), and others are performed only once (e.g., hemoglobin or hematocrit determination). Since children enter Head Start throughout the program year, an ongoing health services program is needed in order to provide screens and examinations within the 90 day limit.

The Performance Standards also make recommendations about the type and level of personnel needed to perform these initial health screening activities. In an effort to contain the costs of delivering services to children, the Performance Standards recommend that some of the screening activities can be performed by para-professional workers. These activities include the medical, dental and developmental health history (collection of

medical records, immunization records, and teacher observations), growth assessment, and immunization status assessment. The Performance Standards are less specific about the personnel for the vision and hearing screens and indicate that these screens can be performed by a person trained to administer them to children. Consequently, the personnel administering these screens can vary among programs from Head Start staff to skilled health professionals.

There is no specific guidance in the Performance Standards on the nature of the personnel required to perform medical examinations except that a "physical examination" implies a physician's or nurse practitioner's judgment (the physician need not be a pediatrician). The dental examinations require a dentist or dental hygienist (under the supervision of a dentist). In sum, depending upon the health domain, there are many levels of personnel, from para-professional to professional, required to conduct the initial health screens and examinations. This latitude in the Performance Standards, particularly for vision, hearing, speech, and development, leads to considerable variation in practice among the Head Start programs.

Where practice varies between programs, screening criteria must also be presumed to vary. Recall that the objective of the screens is to flag those children in need of further evaluation by a health professional. According to the Performance Standards only children flagged by the screening activities are to be referred for a further, in-depth diagnostic evaluation. The criteria used in the screening process thus have important ramifications; if they are set inappropriately high or low, the result will be under- or over-referral. Under-referral will mean that children in need of specific diagnostic evaluation, and perhaps treatment, will not receive that appraisal or treatment. Over-referral will increase costs because more children than necessary will be referred for professional diagnostic evaluations. While it is unrealistic to assume that precise criteria can be set or maintained, considerable additional attention to this problem is merited because the entire structure of health service delivery is critically dependent on the choices made at this stage.

For illustration consider the process that was illustrated in Exhibit 1-2. If it is assumed that professional and paraprofessional judgments in this case were uniformly "correct" then this child has received optimum health care. However, small changes in screening practice could have lead to

substantial changes in treatment. If the screening levels for the developmental tests were set higher, the child might never have been referred for additional evaluation, and thus not have received the appropriate follow-up. If the screening level for vision was set somewhat lower the child might unnecessarily have been referred for a costly examination by an optometrist or ophthalmologist.

#### Implications for Program Accountability

The Performance Standards allow local screening criteria to be set by local Head Start Health Services Advisory Committees. These committees, composed of local health professionals, are often the service providers used by Head Start. They reflect local health practices, and, based on the review of this evaluation, clearly demonstrate that clinical practice in the area of preventive health care is in no way monolithic. For example, while a given dental condition in a four-year-old child might, in one site, lead to an extraction, in another the tooth might be filled, while still another site would do nothing (and wait for secondary dentition). Similar variability exists in medical practice for vision, developmental, and other special needs areas (practice in the other health domains is more homogeneous).

Whereas this "local option" is undoubtedly necessary, and follows standard practice of reliance on "clinical judgment", it does complicate the national management of the health component (and the evaluation of this component). It means that national program managers must be careful to recognize that the screening rates and referrals reported in Head Start's Program Information Record (PIR) do not necessarily convey the same information from site to site. Further scrutiny of local health records is necessary in order to determine local practice.

Until recently, another management evaluation tool was available, the Comprehensive Management Reviews (CMR's) to provide this fine-grained information. Using the Head Start Performance Standards as the criteria for performance appraisal, the CMR's were conducted periodically on each program by an outside team of specialists. This team reviewed each area covered by the Performance Standards. Data from this review supplemented data from the Program Information Record (PIR). Thus, the PIR's basic information such as enrollment, number of children receiving health services, and number of

children diagnosed to have handicapping conditions was augmented by much more in-depth data. However, the CMR's have recently been dropped, leaving the PIR as the main indicator of program performance. Unfortunately, as will be illustrated later in the chapter, the PIR does not seem to be providing all the information necessary to assess accurately the degree to which the programs are providing Head Start children with the mandated health services.

To summarize the preceding discussion, the limited specificity of the Performance Standards has the following implications:

- The qualifications of personnel used to perform health screens and health services can vary from program to program;
- Some children may not receive all mandated health screens, especially speech and developmental; and
- The exact criteria for "flags" of specific health problems can vary from program to program and result in variation in what is considered "a problem" and how such a problem is treated.

Hence, delivery of the mandated health services varies considerably from program to program because of differences in the interpretation of the objectives of the Performance Standards and differences in the processes used to meet these objectives. Furthermore, these important differences are often not reflected in the PIR.

#### Community Context for Health Services Delivery

Since Head Start mediates the delivery of most health services rather than directly delivering such care, Head Start health coordinators are constrained by local conditions and practices. Head Start's health service delivery in a given site is highly dependent upon the demographic and health service characteristics of the program's catchment area as well as upon certain characteristics of the local Head Start program. The sites selected for the Head Start Health Evaluation varied on a number of important characteristics which have implications for the level of effort required to deliver health services to Head Start children, and for the results of those efforts. The relevant site characteristics are summarized in this chapter and described in more detail in Technical Appendix 2C: Descriptions of the Head Start Program Sites and Samples of Children.

Some recurring elements are worthy of mention at the outset. Programs serving populations largely eligible to receive Aid to Families with Dependent Children (AFDC) are often more likely to be able to finance health care services through cooperation with the Medicaid program (though this is not true in Arizona, where there was no Medicaid program at that time of the evaluation), thus placing less of a burden on Head Start resources. On the other hand, certain Head Start program characteristics, such as high attrition among participating children, are likely to be related to higher costs and poorer service delivery, since those who enter late, after the program year has begun, are more difficult to schedule for routine health screening. Scheduling problems also abound in those programs which provide fewer contact hours per week, and thus have less access to the children.

The Head Start Health Evaluation sites have made numerous unique arrangements, in the light of local conditions, to use the local health care system to facilitate the delivery of Head Start's mandated health services. The following descriptions provide a summary of some of the distinguishing features of health care at these study sites.

#### Greene and Humphreys Counties

Under perhaps the most challenging conditions observed in this evaluation, the Head Start program has assumed almost the entire responsibility for the delivery of health services to children in this site. Both of these counties are very rural and have few locally available health services. To deliver the mandated services, given the local paucity of such services, the Head Start program must annually develop its own health services delivery system using central office staff, and professionals from Jackson, Mississippi, to perform the medical and dental screens and examinations of Head Start children.

Most of the health screens performed in these sites were done by paraprofessional Head Start staff trained to perform the specific screens. Occasionally, Head Start trains local staff, but more frequently trained Head Start staff members circulate among all thirteen counties served by this grantee. For example, the central office used the services of a dental assistant to screen children for dental services. In addition, Head Start had to hire physicians and a nurse practitioner from Jackson to perform medical examinations.



Since children attend Head Start five days per week, scheduling screens and examinations is fairly easy. Too, the turnover of children in the program is low, so once health screening has been completed for a program year, it does not have to be repeated for new children.

The costs of health service delivery were born by Head Start. Very little use was made of Medicaid reimbursements during the evaluation year because of lack of coordination with the Welfare Department. Although considerable effort was made to involve Head Start parents when their child needed referral or treatment, it required considerable staff time to provide case management to ensure that the parents made and kept necessary appointments. Head Start's excellent relationships with local health care providers, however, meant that when families missed appointments, the providers called on Head Start to remind the parents of the importance of obtaining needed health services. Without such cooperation an already burdensome system might well have proved too unwieldy.

Several changes have occurred since the evaluation. Improved cooperation with the Welfare Department now means that more children receive health services reimbursed by Medicaid. Head Start has also compensated for the lack of a local optometrist by enlisting the cooperation of a highly qualified optometrist to conduct vision screens of Head Start children in Humphreys County. Thus, as is typical of many local Head Start programs, the local health coordinators must make adjustments in the program from year to year.

#### St. Clair County

The responsibility for delivery of health services in this site was shared between the Head Start program and the children's parents. Health services in St. Clair County, and particularly in East St. Louis, are readily available. Consequently, Head Start can rely on local health providers for many of the required services. In particular, services were so widely available that the St. Clair County Head Start program could require parents to provide evidence of a medical examination as part of the child's application to Head Start. (Recently, the admissions policy was modified to require evidence of a dental examination as well).

Most of the medical examinations of the children were performed by pediatricians in private practice or in primary care clinics. Other mandated screens and examinations were conducted after the Head Start health coordinator had reviewed the children's health examination records and determined what additional health screens and services were required. A summer clinic was scheduled at one of the local health clinics to complete some of the missing screens, e.g., lead poisoning, hemoglobins and dental examinations. Additional health screens were completed during the program year, some by trained Head Start staff, and the remainder by health professionals in nearby facilities.

Scheduling health services is complicated in this program because some children attend Head Start for two days per week while others attend for four days. This scheduling problem, coupled with high turnover among Head Start children, make screening and service provision more difficult to administer, thus engendering a heavy management burden for the Head Start program staff. The high rate of turnover, in particular, meant that although additional screening and examinations were often required during the program year, scheduling was difficult and screens were often left undone.

The costs of delivering health services to the Head Start children in this site are relatively low because most health services are Medicaid reimbursable or are paid for in-kind. Head Start encourages parents to follow-up for necessary services, and occasionally provides transportation or makes appointments.

Several changes in procedures have occurred since the evaluation. As mentioned above, parents are now responsible for dental as well as medical examinations prior to application to Head Start. The program has begun a summer clinic which is designed to provide all additional required screens during the same appointment. (This procedure was modeled on the one used in the Head Start Health Evaluation. More than one site found this an efficient and effective approach to delivering these services.)

#### Maricopa County

The Maricopa County Head Start program delegates the responsibility for delivery of health services to Head Start children to the Maricopa County Health Department, through a formal arrangement which operates like a health

maintenance organization (HMO). The health department has a well-organized and extensive delivery system in place in the county and provides the Head Start children with all of the needed medical and dental screens, examinations, and services (or makes arrangements with other community agencies for these services) at a fixed cost per child (\$165).

Most of the medical and dental screens and examinations are provided by a combination of professional and para-professional health department staff. For most health screens and services, children are transported to the nearest primary care clinic. Dental examinations and services are provided through a mobile dental trailer. Scheduling services is particularly easy since most children attend Head Start four days per week and the dental trailer is parked on the Head Start lot. Parents are invited to be present during the dental examination. This provides an opportunity to teach them appropriate dental hygiene practices for themselves and their children.

Because of this HMO-like arrangement, the management burden for Head Start was very low; even scheduling and delivering services was the responsibility of a health department nurse. Thus, whereas at most sites Head Start maintains the health records, in Maricopa County the health records of the children were kept at the health department and the Health Department assumed the responsibility for delivery of those services. Head Start monitored that delivery through means of an independent medical auditor who reviewed health records for the program.

Though Arizona has no Medicaid program, the health department managed and administered program was an effective and cost-containing option. The costs of health services were fixed at \$165 per child for all services including treatment.

Some notable changes have occurred in the program since the evaluation. Since the county now provides transportation to Head Start children, it is possible to recruit children from poorer families who formerly were not eligible for Head Start because their families had no means of transporting them. Further, the health department now provides nutrition assessments of the children. However, service costs continue to rise--currently they are at \$254 per child.

## Mingo County

The Mingo County Head Start program assumes responsibility for delivery of all medical and dental screens and examinations to Head Start children. Since this county is very rural, and only some of the required services are available, Head Start must make special arrangements for other services from Charleston, West Virginia. In addition, continual flux in the local availability of health services forces the Head Start health coordinator to make frequent changes in health care arrangements.

Most of the medical examinations provided during the evaluation were conducted by a local physician. A State-supported dental clinic conducted dental examinations and provided treatment. The remainder of the required services and health screens were provided by a variety of other health professionals and para-professionals.

Given the paucity of services, Head Start's management burden was high. In addition, management problems were exacerbated by the untimely loss of the health coordinator during the evaluation year which, coupled with other Head Start staffing changes, lead to a fragmented health service delivery effort. A Comprehensive Management Review (CMR) of this program, conducted just prior to the posttest data collection, showed that the program was out-of-compliance with the Head Start Performance Standards on 87 items, many of them pertaining to the delivery of health services. (CMR's of the other programs were much more positive.) The delivery of health services to Head Start children in this site was the most chaotic in the evaluation.

Costs of health service delivery were shared by Head Start, parents, Medicaid, and the state (grants for dental examinations). Head Start paid for medical examinations, but if any treatment or follow-up was needed, it became the responsibility of the parent.

Several changes have occurred since the evaluation. A new and experienced Head Start director has been appointed and many management changes have been undertaken. Furthermore, the program now has a health services trailer in which to conduct medical examinations and other health screens. This greatly simplifies the enormous management problems that previously plagued the health component.

## Health Service Delivery

The delivery of the full range of mandated health services to Head Start children from screening through diagnosis and treatment, hinges on the effectiveness of the Head Start program's health care management. If the child is not screened, then the child never even enters the health service delivery system. Moreover, failure at any subsequent stage of the health service delivery system will diminish the overall impact of the services. Thus, the extent to which Head Start's health service delivery system attains the desired impact depends, to a large extent, on the detailed process by which each Head Start program manages and implements its health service delivery system.

The four Head Start programs examined in the evaluation have implemented different approaches to the delivery of the mandated health services. These different systems provide some insights into the relationship between system management and structure, and the ultimate success of the system. Each program's approach depended in large part upon the available health care facilities in the local communities, and the ingenuity of the Head Start staff. A comparative summary of these four systems follows. The specific details of these systems are described in Exhibit 2-1. (This exhibit is intended also as a reference for use with the following chapters.)

### Managing Health Screens

Health screens can be managed in several ways. First, the Head Start program can require that the parent provide evidence of a health screen as part of the Head Start application. This is done in St. Clair County (for physical examinations) and results in high completion rates. Second, the Head Start program can itself make arrangements to provide screens and examinations in a single location at a single time. This strategy, used in Maricopa County for medical screens, also had a relatively high completion rate. A third option is for Head Start to administer a system which delivers different health screens sequentially, on different days, frequently at different locations. This last strategy was used by both Greene and Humphreys Counties and Mingo County for most health screens.

Exhibit 2-1

Description of Head Start Health Service Delivery

| Head Start Health Services                    | Greene & Humphreys Counties   | St. Clair County   | Maricopa County   | Mingo County  |
|---|---|--|---|---|
| <u>Physical Examination</u>                   |   |  |   |   |
| Process for delivery                          | Head Start contracted with pediatricians and nurse practitioners from health clinics in Jackson to examine children in Head Start centers.  | Head Start required parents to submit results of child's physical examination (conducted by private practitioners or primary care clinics) with Head Start application; otherwise Head Start made arrangements with health clinic. | Head Start contracts with Maricopa County Health Department which manages examinations of children at the Primary Care Clinics. | Head Start transported children to private physicians's office for examination.   |
| Cost of the examination                       | \$12/child (no cost for a few known EPSDT-eligible children who were examined at Health Department).  | No cost-EPSDT reimbursable or in-kind.   | \$165 per child (for medical and dental services), plus \$4500 for medical audit of contract.                                   | \$8 per child (not EPSDT reimbursable).   |
| Process if treatment required                 | Head Start notifies parents and encourages parent to follow-up. Head Start provides transportation and assistance with making appointments. Health care providers call Head Start when appointments missed. | Head Start helped parents with follow-up treatments.   | Health Department notifies parents and coordinates delivery of needed services.   | Physician reported to Head Start. Head Start notified parents and encouraged follow-up. Head Start occasionally provided transportation.                                    |
| Average cost of treatments paid by Head Start | \$50-60   | No EPSDT reimbursable or in-kind.  | Included in above cost.   | Parent's responsibility or EPSDT reimbursable.  |
| Changes since 1980-81                         | Head Start receives list of EPSDT-eligible children; EPSDT reimburses contracted examinations of those children.  | No changes mentioned.  | Contracted costs per child have increased to \$201 in 1981-82 and \$254 in 1982-83.   | Head Start transports children to a health care trailer located at one of the Head Start centers. All children are EPSDT-eligible and examinations are reimbursed by EPSDT. |

Exhibit 2-1 (Continued)

Description of Head Start Health Service Delivery

| Head Start Health Services    | Greene & Humphreys Counties   | St. Clair County  | Maricopa County   | Mingo County   |
|-------------------------------|---|---|---|--|
| <u>Dental Examination</u>     |   |   |   |  |
| Process for delivery          | Dental assistants, from central office, examined Head Start children in centers and prioritized need for services. Head Start transported children to a local dentist for examinations (in Humphreys County and in a county neighboring Greene County); there was no prophylaxis or fluoride application. | Head Start conducted, during the summer, a health clinic for all entering children. Services included screening, prophylaxis, and fluoride application. | Head Start contracts with the Maricopa County Health Department. Dental hygienist screens children at entry to determine priority for treatment. Head Start transports children most in need to dental trailer. Otherwise dental trailer makes rounds of Head Start centers annually. | Head Start transports children to State-supported dental clinics for examination and prophylaxis by dentists.                        |
| Cost                          | --  | EPSDT reimbursable, otherwise \$21 per child.   | Included in contract (\$165 per child).   | No cost to Head Start.   |
| Process if treatment required | Dentists submit treatment plan to Head Start with estimated costs (up to \$800 per child). Costs are negotiated and treatments given if the budget will permit the expenditures.  | Head Start transports children to dentists office.  | Treatments given in dental trailer.   | If child were complaining or had toothache, Head Start paid to have tooth pulled. Otherwise, parent was informed of needed services. |
| Average cost of treatments    | \$250 per child.  | Varies considerably and sometimes provided in-kind.   | Included in above cost.   | Parent's responsibility.   |
| Changes since 1980-81         | No changes mentioned.   | Head Start requires evidence of a dental examination as part of the Head Start application, usually EPSDT reimbursable.                                 | No change, except cost.   | Dental examinations are no longer State supported and currently cost \$30 per child, and not Medicaid reimbursable.                  |

Exhibit 2-1 (Continued)

Description of Head Start Health Service Delivery

| Head Start Health Services  | Greene & Humphreys Counties   | St. Clair County  | Maricopa County   | Mingo County  |
|---|---|---|---|---|
| <p><u>Vision Screening</u></p> <p>Process for delivery</p> <p>Cost (professional evaluation)</p> <p>Process if treatment required</p> <p>Average costs of treatments</p> <p>Changes since 1980-81</p> | <p>Head Start central office trains Head Start staff to perform screens in Head Start centers. Head Start refers children needing further evaluation to professionals (locally in Humphreys County and in a county neighboring Greene County).</p> <p>\$30 per child.</p> <p>Parent informed; Head Start uses own resources, if necessary.</p> <p>\$115 for glasses.</p> <p>Head Start contracts with an optometrist to perform vision screens on all children (in Humphreys County).</p> | <p>Head Start staff perform screens in Head Start centers. Head Start refers children needing further evaluation to East Side Health District.</p> <p>No cost.</p> <p>Parents informed; Head Start makes arrangements with ophthalmologist.</p> <p>—</p> <p>Head Start conducts all screens in summer using a multi-disciplinary professional team.</p> | <p>Health Department nurses conduct screens in Head Start classrooms.</p> <p>Included in contract (\$165 per child).</p> <p>Referred to Crippled Children's.</p> <p>No cost to Head Start.</p> <p>No change, except cost.</p> | <p>Head Start staff - conducted vision screens of children at Head Start centers.</p> <p>No cost.</p> <p>Lion's Club provides assistance if child needs glasses.</p> <p>No cost to Head Start.</p> <p>No changes mentioned.</p> |



Exhibit 2-1 (Continued)

Description of Head Start Health Service Delivery

| Head Start Health Services     | Greene & Humphreys Counties   | St. Clair County   | Maricopa County  | Mingo County   |
|--------------------------------|---|--|--|--|
| <u>Hearing Screening</u>       |   |  |  |  |
| Process for delivery           | Head Start central office trains Head Start staff to perform screens in Head Start centers. Head Start refers children needing further evaluation to professionals (locally in Humphreys County and in a county neighboring Greene County). | Head Start staff perform screens in Head Start centers. Head Start refer children needing further evaluation to East Side Health District. | Health Department nurses conduct screens in Head Start classrooms.               | Crippled Children's personnel conducted hearing screens.   |
| Cost (professional evaluation) | \$50.   | No cost.   | Included in contract (\$165 per child).  | No cost to Head Start.                                     |
| Process if treatment required  | Parent informed; Head Start uses own resources, if necessary.   | Parents informed; Head Start makes arrangements with E.N.T. specialist.  | Follow-ups conducted in classroom by specialist referred by Crippled Children's. | Crippled Children's provided follow-up services as needed. |
| Average costs of treatment     | \$200 for hearing aid   | ---  | No cost to Head Start.   | No cost to Head Start.                                     |
| Changes since 1980-81          | No changes mentioned.   | Head Start conducts all screens in summer using a multi-disciplinary professional team.  | No change, except cost.  | Hearing evaluations now cost \$25 per child.               |

Exhibit 2-1 (Continued)

Description of Head Start Health Service Delivery

| Head Start Health Services     | Greene & Humphreys Counties  | St. Clair County  | Maricopa County   | Mingo County  |
|--------------------------------|--|---|---|---|
| <u>Speech Screening</u>        |  |   |   |   |
| Process for delivery           | Head Start trains own staff to perform screen. Head Start refers children needing further evaluation to professionals (outside both counties). | St. Louis University staff screen children.   | If requested by parent or teacher, Handicapped Services Department screened children. | If requested by parents or teacher, Head Start referred child to speech pathologist (from Charleston) for evaluation. |
| Cost (professional evaluation) | \$30-35.   | ---   | No cost to Head Start.  | No cost to Head Start.  |
| Process if treatment required  | Parent informed; Head Start uses own resources if necessary.   | Parent informed; University staff provide treatment in Head Start center unless child requires individual work (conducted at University). | Parent informed.  | Parent informed; speech pathologist prepared manual and trained classroom staff to work daily with children in need.  |
| Average costs of treatment     | \$5 per session for 20 to 25 sessions.   | ---   | No cost to Head Start.  | Staff time.   |
| Changes since 1980-81          | No changes mentioned.  | Head Start conducts all screens in summer using a multidisciplinary professional team.  | No changes mentioned.   | Speech evaluations now cost \$25 per child.   |

Exhibit 2-1 (Continued)

Description of Head Start Health Service Delivery

| Head Start Health Services     | Greene & Humphreys Counties   | St. Clair County  | Maricopa County  | Mingo County   |
|--------------------------------|---|---|--|--|
| <u>Developmental Screening</u> |   |   |  |  |
| Process for delivery           | Head Start teachers perform. Head Start refers children needing further evaluation to mental health professionals (outside both counties) | East St. Louis School District 189 administered screens to all children   | Head Start teachers conduct non-standard assessment and referred some children for further assessment  | Head Start teachers performed developmental assessment of child's progress three times per year.   |
| Cost (professional evaluation) | \$125 per day   | No cost   | ---  | Staff time   |
| Process if treatment required  | Head Start contracts 3 to 4 per month in each county for professional services to aid children in need                                    | ---   | Professional assessment leads to Individualized Education Program (IEP); professional trained Head Start staff or student intern to help child with useful exercises | Head Start refers children to Special Children's group (in Charleston) which provides services.  |
| Average costs of treatment     | \$125 per day   | ---   | ---  | No cost to Head Start  |
| Changes since 1980-81          | No changes mentioned  | Head Start conducts all screens in summer using a multi-disciplinary team | No changes mentioned   | Head Start central office staff (rather than teachers) recruit. All children now EPSDT eligible and over 10 percent have serious handicapping conditions. <del>Over</del> staff have been trained to manage these children's problems. |

Exhibit 2-1 (Continued)

Description of Head Start Health Service Delivery

| Head Start Health Services  | Greene & Humphreys Counties  | St. Clair County  | Maricopa County   | Mingo County   |
|---|--|---|---|--|
| <p><u>Nutrition Screening</u></p> <p>Process for delivery</p> <p>Cost</p> <p>Process if treatment required</p> <p>Average costs of treatment</p> <p>Changes since 1980-81</p> | <p>Head Start staff perform in Head Start centers.</p> <p>Staff time</p> | <p>Nutrition consultants visited each Head Start center 2 to 3 times during the year, screened a few children and provided nutrition education to parents.</p> <p>Head Start conducts all screens, including nutrition, in summer using multi-disciplinary team</p> | <p>Head Start staff nutritionist performed nutrition assessments.</p> <p>Staff time</p> <p>Health department staff perform nutrition assessment</p> | <p>Head Start does not have a nutritionist. The County Extension Home Economist provides some nutrition guidance to the centers on menus.</p> <p>No cost to Head Start</p> |

## Exhibit 2-1 (Continued)

## Description of Head Start Health Service Delivery

| Head Start Health Services | Greene & Humphreys Counties   | St. Clair County  | Maricopa County   | Mingo County  |
|----------------------------|---|---|---|---|
| <u>Health education</u>    |   |   |   |   |
| Process for delivery       | Head Start scheduled regular meetings with parents. Attendance was poor. Head Start sends monthly news-letter | Head Start conducts meetings on nutrition (4-6 seminars) mental health (group therapy) and lead poisoning. Attendance poor. | Head Start conducted seminars for parents on nutrition, childhood diseases, what to expect from Health Department's medical and dental examinations. Approximately 1/3 of the parents participated regularly in programs or as classroom volunteers. Health Department also offered crisis intervention, planned parenthood, drug and alcohol abuse programs. | Head Start conducted few meetings for parents. Attendance was very poor.  |
| Changes since 1980-81      | Parent participation is improved. Emphasis on parent involvement is higher.                                   |   | No changes mentioned.   | Head Start has conducted a needs assessment of what parents want and will incorporate results into their program. |

While, in practice, all of these strategies can work, they require varying amounts of management skill and resources to succeed in providing the mandated health screens. The first strategy requires the least program management support, but only works under conditions where parents can obtain health services with little assistance. It is also a strategy which can be very effective for programs with high turnover. Since, using this approach, programs need not themselves maintain ongoing health services, the many new enrollees may be screened as they enter throughout the program year without cost to the program.

The third strategy is the most difficult. There are numerous opportunities for gaps in service delivery. Children are likely to miss one screen or another. Only careful management, of the kind practiced in Greene and Humphreys Counties, can keep track of needed services. Because of the added management burden this last approach can be very costly (for example for scheduling and bringing outside health professionals into the community). While some improvement in management efficiency can be gained by more tightly scheduling health screens, the lack of local health facilities will invariably make providing rural health care both more difficult and more expensive.

### Service Priorities

Another issue strongly related to whether or not particular screens are conducted in a site is the local priority given to the particular health screen by the Head Start staff. Although the Performance Standards mandate delivery of all health screens and examinations shown in Exhibit 1-2, compliance varies with the local priorities. In many cases these priorities are based on the reporting requirements of the PIR.

To the extent a particular health service is given high priority by the local staff, it appears more likely that the service will be delivered. Services reported on specifically in the PIR (medical examinations\*, dental examinations and immunizations) receive the most attention and attain the highest completion rates. For example, because the rate of immunization

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\*The distinction between medical screens and medical examinations as reported in the PIR is explained in the next section.

tends to be low among low-income children, immunizations have been made a high priority health goal for Head Start. Consequently, Head Start programs, in all sites (except Mingo County) placed a high priority on this service and substantially improved the rates of immunizations among the children they served. Compliance with the Performance Standards for other services, such as vision and developmental screens, is much lower. Since these particular screens need not even be singled out for reporting in the PIR, they are given a lower priority by some Head Start programs. Thus, given a multitude of competing demands, some screens are given short shrift.

#### Responsibility for Follow-up

The extent to which the Head Start program takes responsibility for case management and delivery of treatments to children has, in large measure, important implications for whether or not prescribed treatments are delivered. As is seen in Greene and Humphreys Counties, it is possible with community support, to integrate parents into this phase of the health care delivery system and, with careful monitoring, provide the necessary support to parents so that needed treatments are obtained. However, in programs such as Mingo County where Head Start does not take adequate responsibility for follow-up, the system can break down and, often as not, a child can go without needed care. To be effective, Head Start must not abdicate, even to parents, its responsibility for monitoring the delivery of services.

#### Flux in Availability of Services

The degree to which the Head Start program interacts with a stable health care system in a community also has important implications for the amount of Head Start management support required to operate the mandated health care delivery system. In a location like Maricopa County which has a stable and well-managed health care delivery system, the Head Start program need only negotiate price for services for the Head Start children. In all the other programs, the annual need to identify service providers and renegotiate the cost for their services is a time-consuming process over which Head Start has little control. Some programs, like Greene and Humphreys Counties and Mingo County, put considerable effort each year into the

configuration of the health care delivery system. Since their community's systems are often in flux, it is not easy to predict from year to year what will work and what will not. In such sites, a strong training and assistance program for Head Start's health care coordinators is essential if the coordinator is to master the complex health care issues with which she will typically be confronted.

#### Payment Mechanisms

According to Head Start regulations, Head Start program funds for health services for children are to be used for direct payments to providers only in the last resort. Such an approach means that time must be spent to identify workable alternatives. In some cases, staff time consumed in identifying alternatives may be more costly than if the Head Start program had purchased the services directly. In Maricopa County, for example, where there was no Medicaid and no other payment alternative was feasible, the Head Start program paid a fixed amount per child to get the job done. It appears that the vast majority of the children not only received all of the required screens but are more likely than in other sites to receive the necessary treatments, all this with minimum management support on Head Start's part.

On the other hand, in some sites, making arrangements for payments through Medicaid for some children and directly paying for others requires an enormous amount of staff time, a cost which has to be considered in computing the total cost of health care services. In some of these instances it might have been more cost-effective to pay directly for services.

#### Placement of Health Care Facilities

Provision of health care services is highly constrained in some locations by the lack of convenient facilities. It often becomes necessary to transport children to obtain needed services. The necessity of improving access was evident in these programs. The closer the facility was to the children, the greater the likelihood that the children would receive services.

All programs attempted to solve this problem. In Greene and Humphreys Counties the Head Start centers were used for many of the health



screens, thus bringing health screens to the children. Maricopa County utilized the health departments' primary care clinics for most health screens and a mobile dental trailer (parked at the Head Start center) for the dental screens and treatments. For the services it provided directly, St. Clair County used one local health clinic for some services and the Head Start centers for others. Mingo County transported children out to physicians offices for medical and dental examinations and conducted other screens at the Head Start centers.

#### Health Services Delivered by Head Start

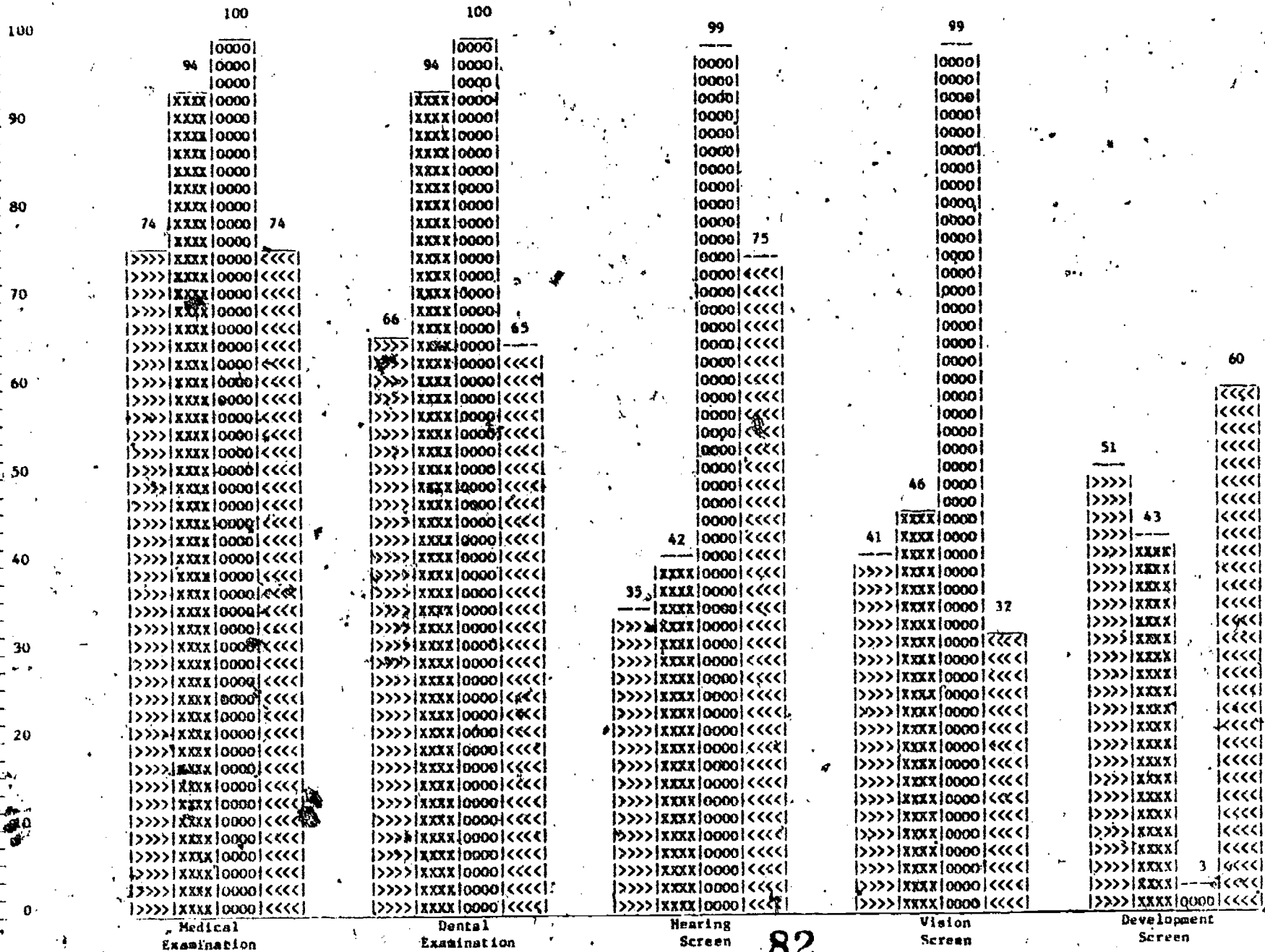
The Head Start Performance Standards mandate delivery of certain medical and dental screens to all children. Since Head Start keeps records of these screens and examinations in health records for each of the children, it is possible by examining these records to determine whether all of the mandated screens and examinations were delivered.

Exhibit 2-2 shows the percentage of Head Start children in the Head Start Health Evaluation who had received each of the mandated health screens. Examination of their health records revealed that only one Head Start program (Maricopa County) succeeded in providing all of the Head Start children (included in the evaluation) with most of the health services mandated in the Performance Standards. However, all four of the Head Start programs were relatively successful in providing the children with medical and dental examinations (between 65 and 100 percent of the children in each site were examined). All of the children (except 20 in Mingo County with no health records at all) had a health history in their health record. In all sites but Mingo County Head Start was also very successful in providing immunizations (to between 85 and 99 percent of the children). However, the screening rates for the remaining health services were frequently lower than 50 percent of the children. Speech and developmental screens were provided least frequently.

The pattern of service delivery, shown here is for children who entered the program in the fall and who have now participated in Head Start for at least eight months (health records reviewed in May 1981). It is indicative of each program's success in screening children and indicates that (with the exception of speech and developmental screens) all programs attempted to deliver all of the screens to the children at least once.

## Exhibit 2-2

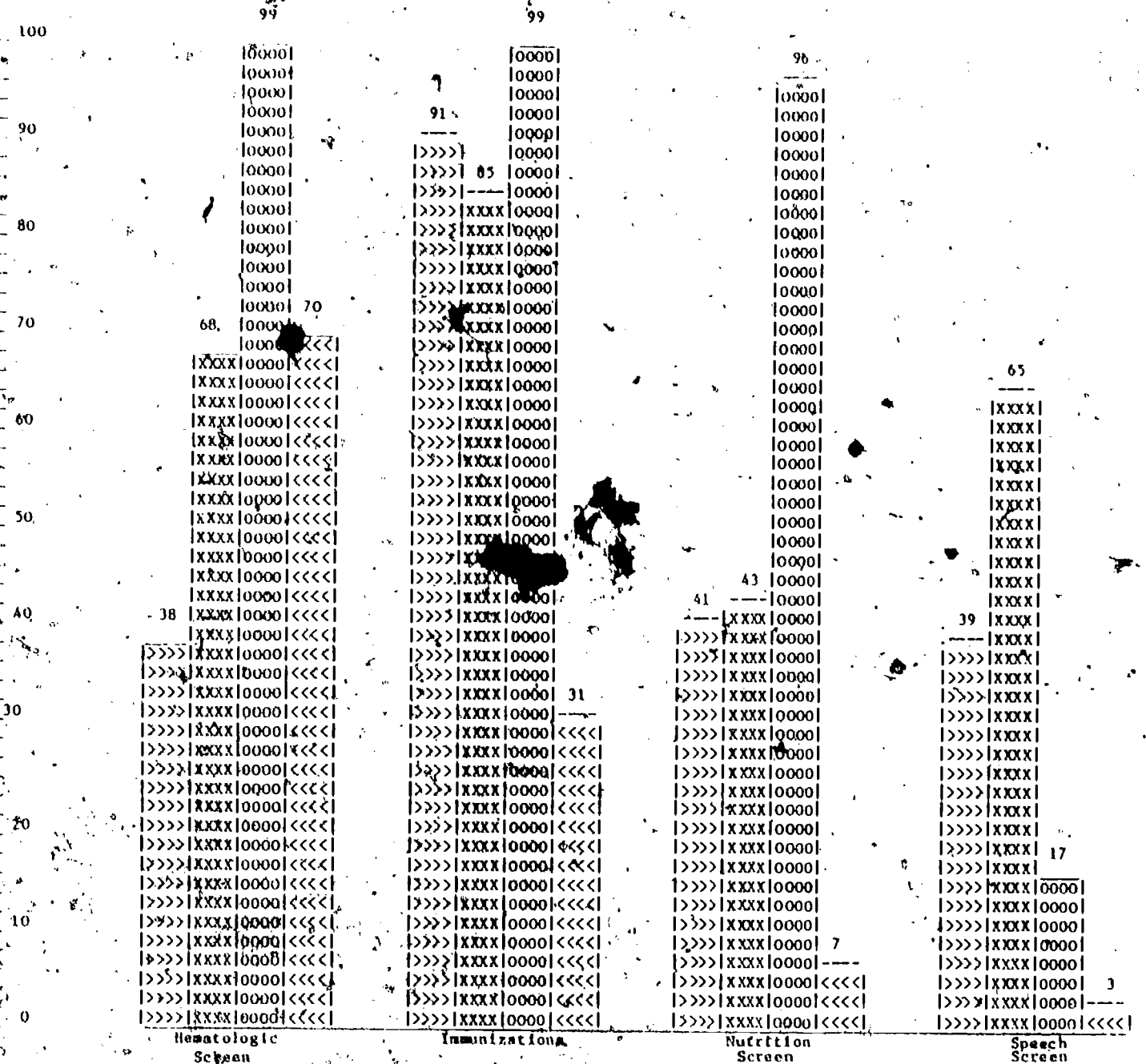
Percent of Head Start Children Receiving Health Examinations and Screens Mandated by the Performance Standards  
as Shown in Head Start Health Records



>> Greene and Humphreys Counties  
 XX St. Clair County  
 OO Macon County  
 << Mingo County

# Exhibit 2-2 (Continued)

Percent of Head Start Children Receiving Health Examinations and Screens Mandated by the Performance Standards  
as Shown in Head Start Health Records



>> Greene and Humphreys Counties  
 XX St. Clair County  
 QQ Maricopa County

## Comparisons with Health Services Delivered by Other Head Start Programs

It is reasonable to wonder whether the health services delivered by programs studied in the Head Start Health Evaluation are "typical" of those of other Head Start programs. Comparisons are possible using two other estimates of health service delivery:

- the local Program Information Record (PIR), a Head Start form submitted annually to the regional and national Head Start Office for Program Management. This form collects various descriptors of each Head Start program, including the number of children actually served and the proportion receiving various health services;
- the U.S. Department of Health and Human Services regional averages for health services delivered, an aggregate of the local PIRs for each region. National averages, across all regions, are also available.

On the basis of the 1980-81 PIR information, the Head Start Health Evaluation sites provide health services to enrolled children at a rate typical of national estimates. Exhibit 2-3 presents comparisons between the levels of health services provided to Head Start children within each of the four sites and aggregated across all four sites. Across all sites, the four programs report providing medical screens to 81 percent of their entire enrollment, and the national average for medical screens in 1980-81 was 85 percent. There is some variability within sites, but with the exception of Greene and Humphreys Counties, the local PIR and regional estimates are quite similar, supporting the notion that the provision of medical screens in each of these sites is typical of Head Start performance elsewhere in the region (according to Head Start records).

Similarly, the four site average and the national average on percent of children with medical findings (22% vs. 25%) and percent receiving treatment for medical problems (97% vs. 92%) are also very comparable. For particular sites, however, there are some differences between the site PIR and the regional averages. St. Clair County reports fewer medical findings and somewhat less treatment of medical problems than is reflected in the average levels reported from its region (Region 7). The other sites, however, report more medical problems and more treatment than their regional averages.

Exhibit 2-3

Comparisons of Head Start Health Services Delivered According to the Local PIR<sup>a</sup>, and Regional (National) Averages

|                                      | Greene & Humphreys Counties |                  | St. Clair County |                  | Maricopa County |                  | Mingo County     |                  | All Sites         |                  |
|--------------------------------------|-----------------------------|------------------|------------------|------------------|-----------------|------------------|------------------|------------------|-------------------|------------------|
|                                      | PIR                         | Regional Average | PIR              | Regional Average | PIR             | Regional Average | PIR              | Regional Average | PIR               | National Average |
| Total Enrollment                     | 620                         |                  | 899              |                  | 458             |                  | 345              |                  | 2322              |                  |
| Percent Receiving Medical Screens    | n 365/620<br>% 58.9         | 88.9             | 814/899<br>90.5  | 84.4             | 400/458<br>87.3 | 81.5             | 310/345<br>89.9  | 83.7             | 1889/2322<br>81.4 | 84.5             |
| Percent with Medical Findings        | n 104/365<br>% 28.5         | 23.6             | 47/814<br>5.8    | 22.6             | 162/400<br>40.5 | 20.7             | 110/310<br>35.5  | 28.1             | 423/1889<br>22.4  | 24.9             |
| Percent Receiving Medical Treatment  | n 104/104<br>% 100.0        | 93.8             | 35/47<br>74.5    | 88.2             | 161/162<br>99.4 | 92.8             | 110/110<br>100.0 | 90.8             | 410/423<br>96.9   | 91.8             |
| Percent Receiving Dental Examination | n 97/620<br>% 15.6          | 75.2             | 780/899<br>86.8  | 79.7             | 415/458<br>90.6 | 74.8             | 300/345<br>87.0  | 79.8             | 1592/2322<br>68.6 | 78.0             |
| Percent with Dental Findings         | n 97/97<br>% 100.0          | 56.7             | 67/780<br>8.6    | 34.2             | 272/415<br>65.5 | 45.1             | 156/300<br>52.0  | 38.7             | 592/1592<br>37.2  | 42.3             |
| Percent Receiving Dental Treatment   | n 97/97<br>% 100.0          | 90.2             | 67/67<br>100.0   | 83.3             | 264/272<br>97.1 | 90.7             | 156/156<br>100.0 | 85.4             | 584/592<br>98.6   | 87.4             |
| Percent Receiving Immunizations      | n 590/620<br>% 95.2         | 86.1             | 741/899<br>82.4  | 76.9             | 355/458<br>77.5 | 77.4             | 229/345<br>66.4  | 76.9             | 1915/2322<br>82.5 | 79.7             |

<sup>a</sup> Base is total actual local enrollment reported in Program Information Record in all programs except for Friends of Children. The latter pertains to Greene and Humphreys Counties only.

<sup>b</sup> Base is total grantees in region.

The estimates of children receiving dental examinations, presented in the bottom half of Exhibit 2-3, reveal a similar pattern of Head Start health services. The major divergency is in the local PIR for Greene and Humphreys Counties. This shows that only 16 percent of the children in that site received a dental examination, compared to the regional average of 75 percent. Because Greene County had no dentist for most of the 1980-81 program year (but has obtained one since), this local impact on delivery of dental services is plausible. The four site averages are also similar to the national averages for percent of children with dental findings (37% vs. 42%) and those receiving dental services (99% vs. 87%). Once again, St. Clair County reports a substantially smaller proportion of children with dental findings than regional estimates (9% vs. 34%), but all sites report a slightly higher proportion of children receiving dental treatment.

The four sites in the Head Start Health Evaluation report rates of immunizations for their children which are very similar to their regional averages and, on average, to the national estimate (83% vs. 80%). Mingo County reports the lowest immunization rate, and is the only site whose immunization rate falls below its regional average (66% vs. 77%).

The PIR also reports information on the utilization of Medicaid as a financing mechanism for Head Start's delivery of health services, including medical and dental screens and treatments. On the average, as shown in Appendix Table 2-1, the proportion of Head Start children with Medicaid coverage across the four sites is only slightly below the national average of 47 percent. There is great variation, however, from none in Maricopa County to 76 percent in St. Clair County. Only in Greene and Humphreys is the proportion of Medicaid eligible children similar to regional averages.

#### Evaluation Review of Service Delivery Data

Comparisons of the health records of the Head Start children in the evaluation with the local PIR reports are shown in Exhibit 2-4 and Table 2-2. Although the evaluation children are only a subset of the enrollment of any grantee, comparisons between their receipt of health services and those reported in the PIR provide validation of the PIR information. What emerges suggests that there may be some problems in the PIR reports.

Exhibit 2-4.

Comparisons of Head Start Health Services Delivered According to the Local PIR<sup>a</sup>, the Abstract of Local Health Records of the Evaluation of Children<sup>b</sup>, and Regional (National) Estimates

|                                       | Greene & Humphreys Counties |                  | St. Clair County |                  | Maricopa County |                  | Mingo County     |                  | All Sites         |                  |
|---------------------------------------|-----------------------------|------------------|------------------|------------------|-----------------|------------------|------------------|------------------|-------------------|------------------|
|                                       | PIR                         | Abstract Records | PIR              | Abstract Records | PIR             | Abstract Record  | PIR              | Abstract Records | PIR               | Abstract Records |
| Total Enrollment                      | 620                         | 127              | 899              | 108              | 458             | 102              | 345              | 112              | 2322              | 449              |
| Percent Receiving Medical Screens     | n 365/620<br>Z 58.9         | 94/127<br>74.0   | 814/899<br>90.5  | 102/108<br>94.4  | 400/458<br>87.3 | 102/102<br>100.0 | 310/345<br>89.9  | 83/112<br>74.1   | 1889/2322<br>81.4 | 381/449<br>84.9  |
| Percent with Medical Findings         | n 104/365<br>Z 28.5         | 45/94<br>47.9    | 47/814<br>5.8    | 2/102<br>2.0     | 162/400<br>40.5 | 33/102<br>32.4   | 110/310<br>35.5  | 13/83<br>15.7    | 423/1889<br>22.4  | 93/381<br>24.4   |
| Percent Receiving Medical Treatment   | n 104/104<br>Z 100.0        | 25/45<br>55.6    | 35/47<br>74.5    | 0/2<br>0.0       | 161/162<br>99.4 | 18/33<br>54.5    | 110/110<br>100.0 | 9/13<br>69.2     | 410/423<br>96.9   | 52/93<br>55.9    |
| Percent Receiving Dental Examinations | n 97/620<br>Z 15.6          | 84/127<br>66.1   | 780/899<br>86.8  | 102/108<br>94.4  | 415/458<br>90.6 | 102/102<br>100.0 | 300/345<br>87.0  | 73/112<br>65.2   | 1592/2322<br>68.6 | 361/449<br>80.4  |
| Percent with Dental Findings          | n 97/97<br>Z 100.0          | 22/84<br>26.2    | 67/780<br>8.6    | 46/102<br>45.1   | 272/415<br>65.5 | 93/102<br>91.2   | 156/300<br>52.0  | 19/73<br>26.0    | 592/1592<br>37.2  | 180/361<br>49.9  |
| Percent Receiving Dental Treatment    | n 97/97<br>Z 100.0          | 13/22<br>59.1    | 67/67<br>100.0   | 26/46<br>56.5    | 264/272<br>97.1 | 69/93<br>74.2    | 156/156<br>100.0 | 15/19<br>78.9    | 584/592<br>98.6   | 123/180<br>68.3  |
| Percent Receiving Immunizations       | n 590/620<br>Z 95.2         | 116/127<br>91.3  | 741/899<br>82.4  | 92/108<br>85.2   | 355/458<br>77.5 | 101/102<br>99.0  | 229/345<br>66.4  | 35/112<br>31.3   | 1915/2322<br>82.5 | 344/449<br>76.6  |

<sup>a</sup>Base is total actual local enrollment reported in Program Information Record except for Greene and Humphreys Counties which is the disaggregated numbers specific to those counties.

<sup>b</sup>Base is total Head Start group included in evaluation and percentage reflects medical examinations, only.

<sup>c</sup>Base is total grantees in region.

The Head Start Health Evaluation's review of children's health records as shown in Exhibit 2-4 indicates that 85 percent received Head Start medical screens, exactly the national average (see Exhibit 2-2), but four percent more than reported in the PIR for these sites. A number of explanations could account for this small difference. However, the data does not seem to support the contention that the Head Start programs paid any "extra attention" to the children included in the evaluation. A more likely explanation for this difference is that, whereas the evaluation's estimates of service delivery are based on the evaluation children who were in the Head Start program from the beginning of the program year in September through May (when the health record review was conducted), local PIR estimates include anyone who ever participated in the program in that year, including dropouts. Thus, the evaluation's estimates, reported here, provide an indicator of the performance of Head Start in delivering medical screens to children who remain in the program throughout the year.

The same argument is true also for dental examinations with one major exception. In Greene and Humphreys Counties, it appears that practically the only children who received dental examinations were those included in the evaluation. (It also is difficult to understand the reported percentages for dental findings and treatments based on our reviews of the children's records.)

Comparisons of the rates of medical screens with rates of medical examinations reported in the children's health records and those shown in Exhibit 2-4 raises other questions. The estimates shown for percent receiving medical screens, as reported in the PIR, are supposed to be the percentage of children "who have completed medical screening, including all appropriate tests and physical examinations." These screens and examinations include health history, growth assessment, hemoglobin or hematocrit determination, hearing test, vision test, physical examination and other screens recommended by the local Health Services Advisory Committee. It appears, however, that the percentages reported in the PIR for medical screens are comparable only to the proportion of children receiving medical examinations. Although the medical examinations conceivably contain portions of the other required screens, this is not the intention of the PIR instructions, nor does this reporting practice reflect the contents of the children's health records for receipt of the other screens.



Exhibit 2-4 also compares the percent of children with medical and dental findings and treatments received according to the PIR versus the health records of the children included in the evaluation. There are strikingly few similarities between the PIR reports of medical or dental findings and treatments and the estimates based on abstracting the health records of the children in the evaluation. With the exception of Greene and Humphreys Counties, all sites reported more medical findings and much more medical treatment. Differences were also striking on dental findings and treatment. PIR reports of the proportions of children receiving treatments for medical or dental problems were 97 to 100 percent except in one instance (75% received medical treatment in St. Clair County); the evaluation's estimates ranged from 0 to 69 percent; and the average difference in estimates was 40 percent.

For both the medical and the dental reports, differences between the local PIR reports and the review of the local health records for the children in the evaluation strongly suggest that programs may have juggled the numbers reported in the PIR. Although two sites made extensive use of clinics in the delivery of services, this does not account for the discrepancies between their PIR reports and our estimates based on a sample of the same source for their PIR report, the Head Start health records.

The PIR reports on the use of Medicaid in paying for health services are similar to those reported previously in the program descriptions and those available from evaluation data (see Appendix Table 2-2). Neither Greene and Humphreys Counties nor Maricopa County reports use of Medicaid. St. Clair County, however, makes almost exclusive use of Medicaid for medical and dental services, and Mingo County makes high use of Medicaid for dental but not medical services.

#### Service Delivery Patterns

As shown in Exhibit 2-2, the overall rates of service delivery, according to the Head Start health records, range from 85 percent for medical examinations, 80 percent for dental examinations, and 77 percent for immunizations to 31 percent for speech screens, 40 percent for developmental screens and 45 percent for nutritional assessments. Given these rates, the evaluation focused on whether all children were equally likely to receive

services or whether some particular characteristics of the children or their families might influence their receipt of services. For example, were children most in need or with most problems more likely to receive services through Head Start? The following discussion addresses these and other issues related to service delivery and briefly reflects on the anticipated consequences of these patterns of service delivery on the overall health impacts of the program.

#### Children in Most Need

Various groups of children (who because of low per capita income, low mother's education or age, lack of medical insurance or Medicaid, lack of benefits from WIC or Food Stamps, and difficulty of access to medical services) were considered at risk in terms of demographic characteristics. The evaluation examined the possibility that Head Start was targeting these children for services. The results, discussed in more detail in Technical Appendix 2C, indicate that Head Start children in Maricopa County receive services regardless of special need. No special group of children were more or less likely to receive services. Children without medical insurance or Medicaid were more likely to receive vision and hearing screens (in Greene and Humphreys Counties and St. Clair County) but less likely to receive dental treatments (in St. Clair County). Children in Mingo County who were not receiving Food Stamps or WIC were less likely to receive hearing and hematology screens. Hence, overall, it does not appear that Head Start made health screening and delivery decisions based on whether or not the child was a member of the above special groups.

#### Children with One or More Health Problems

Another way to examine the impact of Head Start on the children "most in need" is to look at those with the most health problems in various health domains (e.g., speech, hearing, and hematology) according to the Head Start health records, to determine whether children with multiple problems were more likely than children with single problems to be treated. According to that information, only in St. Clair County were children with multiple problems significantly more likely to receive treatment for those problems

than if they had a single problem. (There was a similar but not significant trend in Mingo County.) Technical Appendix 2C provides additional information on this issue.

#### Children with Medical Problems at Pretest

During the pretest in Spring 1980, 114 children (who returned for the posttest) were found to have one or more specific medical problems. During the posttest, the physician reexamined the child for evidence of these (and other) problems and asked the parent whether the child had received treatment for the problems found at pretest. Head Start children were twice as likely as non-Head Start children to have received treatment for a single problem (44% vs. 22%). However, both groups of children received treatment for multiple medical problems at the same rate (46% vs. 42%). Chapter Three (and Table 3-17) presents additional discussion of this issue.

#### Children with Health Problems at Posttest

The Head Start children who had health problems in a particular domain at posttest were also examined to determine whether Head Start had screened them at a higher rate than children with no problems. As shown in Technical Appendix 2C, children in Maricopa County with language problems were more likely to be screened. A similar trend (though not statistically significant) occurred for children with language problems in Mingo County and overall for children with vision problems. Hence, it appeared that children with chronic vision and language problems were more likely to be screened by Head Start.

#### General Issues of Health Services Delivery

From the preceding chapter it is apparent that Head Start programs can operate under several very different models of health care delivery. Further, it appears that several issues confront the Head Start programs in their efforts to deliver the services mandated by the Head Start Performance Standards to all Head Start children. Based on our experience with each of the four programs and their frank discussions about successes and

difficulties in delivering the mandated health services, the following issues are critical to have an effective program for health services delivery.

Head Start must manage the delivery of health services. Numerous configurations of health care delivery can be effective and efficient, but they all must share certain characteristics. To be efficient the system must be stable from year to year. To be effective the system must supplement those health care services available in the community with those remaining services which Head Start must procure to meet its mandates. If either the efficiency or the effectiveness of health services delivery system is "at risk" through constant flux or lack of funding for health services, then the roles of the Head Start program director and health services coordinator are crucial.

When one considers that the Performance Standards mandate a minimum of ten medical and dental screens and examinations for each child, just providing these services (and keeping accurate records) is an enormous task. Following-up on all suspected problems and providing the recommended course of treatment is yet another major undertaking.

Without an effective local health care system, Head Start must train and supervise their own staff to provide these services. If there is high turnover among the Head Start staff performing screens, additional training must occur. If the health providers in the community change the amount, quality, or costs of service, then Head Start must renegotiate procurement of those services. If Medicaid or other forms of public support for health services are not available in the community (or if health care providers will not accept these forms of third-party payment), then Head Start must either negotiate a means for providing the services in-kind, rely on parents to take responsibility, or substantially increase Head Start costs. Stable and resourceful management of the system is thus an essential feature of any successful Head Start health component.

In those instances where a health service delivery system, extant in the community, can provide health care to low-income children at a reasonable cost, Head Start can delegate a large portion of the responsibility for the health component to that community system, that is, providing there are adequate management, coordination, and oversight safeguards. However, there must always be a clear understanding that Head Start must take the final responsibility for the stability and delivery of services.

Parents must be involved. Since ultimately the parent is responsible for the health care of the child, it generally is deemed essential to involve parents in the delivery of the mandated health services. However, since the parent's comprehension of the need for particular health services and the means of obtaining such services is often low, Head Start must often invest considerable time in integrating parents into the process, and providing one or both parents with essential information. Based on this evaluation team's experience with providing parents and local health care providers with a detailed report of the health problem findings resulting from the pretest evaluation, and chronicling the follow-up (as well as assuming Head Start's role in the cases of the non-Head Start children with serious health problems requiring urgent attention), it is abundantly evident that parents are concerned about their children, but their knowledge and skills to access needed health services is limited. Involving parents is not equivalent to directing parents to access health services by themselves. To be effective mediators of health services for their child, parents must learn more about child health, how to care for their child's health (what they can do and who else can help), and how to obtain health care services in their community. Without this learning process, few parents can be expected to interact effectively with the health care delivery system.

Additional Head Start health care costs are modest. The additional costs of delivering all the mandated Head Start health services are modest. There are choices. Two types of costs are incurred for health service delivery--costs of managing the system and costs of providing services to children. Both are inescapable and, within a fixed budget, trade-offs are made, one against the other. To date, the Head Start strategy has been to be the health provider of last resort--an efficient strategy for keeping the direct payments to health care providers as low as possible. However, one can question how efficient this approach is when this lack substantially increases the management costs to Head Start in those instances where it is difficult to arrange for services.

Thus, where there are sufficient local health services and a public health service system in the community, Head Start serves in a coordinating function and relies heavily on the strength and stability of the community's health service resources to provide necessary services. In this instance, Head Start management costs are generally low. Costs for services will also

be low if third party or in-kind payments can be arranged, as is often the case. Where such arrangements are not possible Head Start costs increase. These increases can be managed, however.

One alternative some Head Start programs use to control health expenditures is to place more responsibility for the delivery of health care on the parents. However, this strategy does not appear to work either effectively or efficiently. In essence, such a strategy forces Head Start to manage an extraordinarily diffuse system composed of Head Start parents. Head Start can not effectively manage all those parents, nor can it count on effectively communicating all of the information required for parents to take full responsibility. Thus, many children go without needed health care.

Another more efficient alternative in those communities where health care system does not adequately serve all low-income families is for Head Start to expend more of its own resources to install and maintain its own health service delivery system. Such a system can effectively provide health services to Head Start children, for example, given a strong health coordinator and the good will of the local health service providers. In such a system, health service costs can be negotiated and although this may require considerable management resources given the complexity of the problem, the cost benefits can be realized. Thus, it should be recognized that programs which are confronted with such difficult situations may fare poorly, given the magnitude of their responsibilities. This does not mean that they are necessarily poor programs but that, given the complexities of running a health care system, and the extensiveness of the health mandates contained in the Performance Standards, modest additional health care expenditures coupled with strong management support and training will often be required to pull a program through and achieve an effective health care delivery system for Head Start children.

## CHAPTER THREE

### PEDIATRIC HEALTH EVALUATION AND HEALTH HISTORY

#### Pediatric Health Indicators

Although children in the United States today enjoy better health than children 10 years ago, major problems remain among children being raised in families with very little income, especially those low-income families with only one parent. "Children in inner-city slums, in the hills of Appalachia, or in the families of migrant workers may be in extreme poverty and ill health. Special surveys . . . document the health conditions and special needs of these children" (U.S. Department of Health and Human Services, 1981, Vol. 3, p. 41).

As a comprehensive developmental program, Head Start was concerned from the outset that poor health was likely to be a problem for the low-income children served by the program. From the perspective that low-income children were likely to have more health problems than middle class children and were also likely to have more difficulties obtaining necessary health services for prevention and remediation, the Head Start programs included a health service component. As early as the first year of the program in the summer of 1965, the health service program was viewed as one of the "substantial successes" of Head Start. Funds were available to perform medical examinations and preventive services, but not treatment. North (1979) described the experience in 1965 as follows:

No Head Start funds had been budgeted for such treatment, and few programs were able to put together the resources to ensure that problems discovered through Head Start were actually treated. In this, Head Start was the victim not only of its own unrealistic expectation that treatment resources would generally be available for children with identified problems, but also of a long and dreary tradition of school health programs and well-baby clinics. Such programs, fearing to encroach on the private practice of medicine, had "referred" children found to need treatment to physicians or clinics, usually by simply asking the parent to obtain such care from whatever source the parent thought most appropriate. Responsibility ended with such referral, and this concept of limited responsibility

persisted in many Head Start programs. Despite Head Start's later attempts to banish this tradition, it was still evident a decade later in the Early and Periodic Screening, Diagnostic, and Treatment Program under Medicaid (pp. 232-233).

By 1975, the health service component of the Head Start program, was still considered a "substantial success." Although more funds were now available for Head Start health services, serious questions still remained:

- Who was to pay for the services?
- Who was responsible for follow-up?
- What was the parents' responsibility?
- To what extent could Head Start rely on other community health programs?
- What constituted compliance?

By 1975, detailed regulations in the form of the Head Start Performance Standards were issued covering all areas of Head Start policy, including health. Because the health component was now believed to be fully implemented, the Administration for Children, Youth and Families also began planning an evaluation of that component. The purposes of that evaluation were to determine whether the Performance Standards were being implemented as intended and whether their implementation led to the desired impacts.

One portion of the evaluation of the health component, the pediatric health assessment is discussed in this chapter. Other portions of the health component evaluations are discussed in succeeding chapters. The purposes of the Pediatric Health Evaluation were three-fold: to document the general health status of the children from low-income families, to document the health services provided by Head Start, and to examine the impact of Head Start's health services component on the health of children, as it is delivered currently. Using samples of Head Start and non-Head Start children at the posttest, the Head Start Health Evaluation examined the changes in the health status of the children during their enrollment in Head Start and assessed which changes could be attributed to Head Start.

The information was collected through a combination of examinations by a board-certified pediatrician, health history interviews with the parents



or guardians, and abstracts of the Head Start health records of the Head Start children. The manner of identifying health problems during the evaluation was therefore similar to that which occurs in a well-child examination. That is, the health status of the children was likely to be "healthy" and the problems which could be reported were likely to be predominantly chronic (from mild to moderate severity) with few acute problems (because the parents would not bring in the children for the evaluation if they were "sick".)

The pediatric evaluation was administered by one of a team of board-certified pediatricians from Boston City Hospital and the Department of Pediatrics of the Boston University School of Medicine. The protocol for the pediatrician's examination was adapted from that used by the National Center for Health Statistics in the First National Health and Nutrition Examination Survey.

The health history form was adapted from items on the patient-intake form used at Children's Hospital Medical Center, Boston, Massachusetts and from other surveys of child health. The health history included inquiries concerning the mother's pregnancy history; her health-related attitudes; and the child's birth, hospitalizations, medications, diseases, health-related habits (e.g., pica--craving for unnatural food), and serious accidents. Although some items are important for this evaluation, per se, much of the health history was intended to provide the examining physician with sufficient information to assess the health status of a child adequately. The health history was obtained through an interview administered to each child's mother or guardian by a non-health professional who had been trained by a physician. This interview was conducted by members of the evaluation team before the pediatric examination. The examining physician reviewed this health history before conducting the pediatric examination. Exhibit 3-1 summarizes the health history measures that were used.

After reviewing the health history and examining the child, the pediatrician summarized the collective findings in terms of health problems. For example, given a record indicating an abnormal tympanogram, a history of ear infections, a scarred ear drum, and abnormal drum mobility and color, the examining pediatrician might indicate a health problem of recurrent otitis media on a summary problem sheet. Self-limiting diseases, such as a cold, were not considered problems by this health evaluation. In addition, conditions which could be more precisely defined by data from other portions

Exhibit 3-1

Health History Measures Reported from Parent Interview

|                                    |  |
|------------------------------------|--|
| General Estimate of Child's Health | Parental assessment of child's health as excellent, very good, good, fair, or poor.  |
| Serious Accidents                  | Number of occurrences of accidents resulting in a broken bone, a burn bad enough to require medical treatment, a cut requiring stitches, consumption of medicine or poison, being knocked-out, and/or going to an emergency room.                                      |
| Pica                               | Frequency of consumption of seven types of non-food items (clay, laundry starch, paint or plaster, dirt or mud, newspapers or comic books, large quantities of ice, crayons).  |
| Health Problems at Birth           | Incidence of problems requiring special treatment or extended hospitalization (such as low birth weight, jaundice, blueness, respiratory problems, convulsions, or infections).  |
| Congenital Problems                | Incidence of conditions at birth involving specific organ systems--heart, eyes, ears, mouth or throat, stomach or intestines, kidney or urinary system, muscles, joints or bones, brain or nervous system.   |
| Chronic Conditions                 | Incidence of the following selected chronic conditions--diabetes, sickle cell anemia, congenital heart conditions, vision trouble, polio/paralysis, emotional problems, mental retardation, or tuberculosis.   |
| Infections and Other               | Incidence of specific illnesses, frequency of occurrence, and the time since the most recent occurrence of pneumonia, convulsions, meningitis, arthritis, anemia, urinary or kidney infections, ear infections, asthma, diarrhea, vomiting, and fainting or blackouts. |

of the evaluation were not included in the pediatric examination's list of health problems (e.g., anemia, growth stunting, obesity, dental caries, and hearing and vision deficiencies). The examining pediatrician graded each problem according to severity, chronicity, and urgency of treatment needs.

After data collection, each summary health problem sheet was reviewed by a single pediatrician to ensure consistency. Problems were classified to

facilitate analysis. Problem classifications included a distinction between infectious and noninfectious problems, and between organic and psychosocial problems. A designation of "possible problem" was used for findings which might or might not be considered as problems, depending upon other specific information or findings not available at the time of the examination (e.g., pica or enuresis). In addition, problems were classified according to the affected system and the specific condition (e.g., dermatologic--eczema; neurologic--ptosis).

Posttest data were collected about the utilization of health services to determine their impact on the health status of the children. Two data sources were used: the Head Start health records and the parent's report. Health Start health records on each child were abstracted to obtain information about the provision of health services (e.g., medical examinations or speech evaluation). However, these records did not specify the content of the health services to the extent that might be found in a medical chart.

After the pretest, each child's local physician had received a complete summary of the evaluation's findings at pretest. (Head Start children's evaluation summaries were also shared with the local Head Start program.) During the posttest evaluation, the examining pediatrician interviewed mothers of children who had pediatric problems identified at pretest to ascertain whether treatment had been received since pretest, whether the treatment had been provided through Head Start, and whether the problem was still present at posttest. Since self-limiting health problems were not included in this list from pretest, many of the problems could be expected to be still present, but it was deemed important to assess if they were now medically managed.

The overall goal of the health history and pediatric examination was to answer the following questions:

- What is the prevalence of pediatric health problems in Head Start-eligible children?
- What health services does Head Start provide to children?
- Do children receive services through sources other than Head Start?
- What is the impact of the Head Start health service on the children's health status?

## Analysis of Pediatric Health Indicators

Most of the analyses for these data are simple tabulations of frequencies for items by site. All are unweighted for the few fluctuations in sample characteristics, because although there may be differences between the Head Start and non-Head Start children, in a particular sample in one site, these differences usually disappear when samples are combined, e.g., the cross-sectional posttest children in Samples A, B, and C. Statistical comparisons for these tabulations used conventional chi-squared tests of independence. In the case of health problems, the frequencies may be interpreted as prevalence rates.

Continuous variables were summarized by calculating means and standard deviations, and comparisons between groups were statistically tested using one-way analysis of variance and the resulting F-ratio statistic. Statistical significance between means was calculated using t-tests. Throughout, a statistical probability of a chance occurrence less than 0.05 was considered statistically significant.

It is important to note that some longitudinal analyses exclude a group of children examined at pretest who were diagnosed as having health problems requiring immediate medical care and subsequently were referred for follow-up services (and, if in the non-Head Start group, aided in getting that care). One hundred and three children with urgent medical problems were in the pretest sample (27%). Twenty-seven of these children were in need only of dental services. This group was not excluded from analyses reported here. The remaining 76 children had one or more health problem (often including dental needs) for which they were referred. They are excluded from some of the analyses.

At posttest, similar referrals were made for urgent medical and dental problems. Because treatment occurred after posttest data collection this group of children is included in all analyses. Table 3-1 in the Appendix identifies each of the children who were referred at pretest and describes the health problem(s) they were referred for. Similar data are provided about posttest children in Table 3-2.

## Summary of Findings

### Prevalence of Pediatric Problems

The prevalence of selected health problems identified in the pediatric evaluation at pretest is presented in Exhibit 3-2. These problems were selected because of their importance in terms of child health and because they appear to be more common than others in this sample of children. They included: serous otitis media, allergies, asthma, chronic illness,\* enuresis (in children four years or older), recurrent otitis media, dermatologic problems,\* surgical problems,\* neurological problems (including seizures and febrile seizures),\* psychosocial problems,\* congenital cardiac problems,\* urinary infections, acute otitis media, and congenital abnormalities.

Across the four sites, sixty percent of the children did not have any of the health problems noted above and could be considered "healthy." Prevalence of problems was highest in Greene and Humphreys Counties (47% of the children) and Maricopa County (45%) and lowest in Mingo County and St. Clair Counties where only one out of three children were diagnosed as having health problems. The most common problems that were found were serous otitis media, allergies and asthma.

The epidemiology of pediatric problems is not well known in many instances as shown in Exhibit 3-3; for some pediatric health problems estimates (in some cases a range) of prevalence have been published; these provide a context for the prevalences determined from the Head Start Health Evaluation.

In all cases, this evaluation's estimates of prevalence were below published prevalences for most problems. This may be due to a number of factors. For example, the lower prevalence of recurrent otitis media (5 versus 33%) is probably due to differences in methodology; Teele et al. based their estimates on review of long-term medical records of children in pediatric care; Head Start evaluation estimates are based on mother's report. The very low estimates from the Head Start Health Evaluation are probably underestimates of the actual prevalences and suggest that a mother may not

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\*Definitions of these problems are presented in Exhibit 3-2.

Exhibit 3-2

Prevalences of Selected Problems from the Pediatric Examination at Pretest

| Selected Pediatric Problems      | Pretested Children (Samples A and D) in: |                           |                         |                      |                    |
|----------------------------------|--|---------------------------|-------------------------|----------------------|--------------------|
|                                  | Greene & Humphreys Counties<br>n=95      | St. Clair County<br>n=113 | Maricopa County<br>n=95 | Mingo County<br>n=73 | All Sites<br>n=376 |
| Serous Otitis Media              | n 10<br>Z 10.5                           | 5<br>4.4                  | 11<br>11.6              | 8<br>11.0            | 34<br>9.0          |
| Allergies                        | n 17<br>Z 17.9                           | 7<br>6.2                  | 5<br>5.3                | 0<br>0.0             | 29<br>7.7          |
| Asthma                           | n 5<br>Z 5.3                             | 9<br>8.0                  | 5<br>5.3                | 3<br>4.1             | 22<br>5.9          |
| All Chronic Illness <sup>a</sup> | n 8<br>Z 8.4                             | 7<br>6.2                  | 6<br>6.3                | 1<br>1.4             | 22<br>5.9          |
| Enuresis (4+ years old)          | n 2/ 11<br>Z 18.2                        | 1/ 40<br>0.7              | 4/ 56<br>7.1            | 1/ 11<br>9.1         | 8/118<br>6.8       |
| Recurrent Otitis Media           | n 3<br>Z 3.2                             | 10<br>8.8                 | 2<br>2.1                | 4<br>5.5             | 19<br>5.1          |
| Dermatologic <sup>b</sup>        | n 0<br>Z 0.0                             | 6<br>5.3                  | 11<br>11.6              | 1<br>1.4             | 18<br>4.8          |
| Surgical Problems <sup>c</sup>   | n 7<br>Z 7.4                             | 2<br>1.8                  | 2<br>2.1                | 2<br>2.7             | 13<br>3.5          |
| Neurologic <sup>d</sup>          | n 4<br>Z 4.2                             | 5<br>4.4                  | 2<br>2.1                | 0<br>0.0             | 11<br>2.9          |
| Seizures                         | n 3<br>Z 3.2                             | 5<br>4.4                  | 1<br>1.1                | 0<br>0.0             | 9<br>2.4           |
| Febrile Seizures                 | n 1<br>Z 1.1                             | 0<br>0.0                  | 0<br>0.0                | 0<br>0.0             | 1<br>0.0           |
| Psychosocial <sup>e</sup>        | n 2<br>Z 2.1                             | 6<br>5.3                  | 4<br>4.2                | 0<br>0.0             | 12<br>3.2          |
| Congenital Cardiac <sup>f</sup>  | n 3<br>Z 3.2                             | 1<br>0.1                  | 4<br>4.2                | 1<br>1.4             | 9<br>2.4           |
| Urinary Infections               | n 3<br>Z 3.2                             | 0<br>0.0                  | 0<br>0.0                | 4<br>5.5             | 7<br>1.9           |
| Acute Otitis Media               | n 2<br>Z 2.1                             | 0<br>0.0                  | 2<br>2.1                | 1<br>1.4             | 5<br>1.3           |
| Congenital Anomalies             | n 1<br>Z 1.1                             | 0<br>0.0                  | 0<br>0.0                | 0<br>0.0             | 1<br>0.0           |
| No Problem (above)               | n 50<br>Z 52.6                           | 75<br>66.4                | 52<br>54.7              | 49<br>67.1           | 226<br>60.1        |

<sup>a</sup>All chronic illnesses: congenital cardiac, urogenital anomaly, hypospadias, seizures, neurological problems secondary to head trauma, febrile seizures, and sickle cell anemia.

<sup>b</sup>Dermatologic problems: eczema, seborrhea, nits, alopecia areata, impetigo, dry skin, and fungal infection.

<sup>c</sup>Surgical problems: inguinal hernias, undescended testes, umbilical hernias, and femoral hernias.

<sup>d</sup>Neurologic problems: seizures, febrile seizures, and neurologic problems secondary to head trauma.

<sup>e</sup>Psychosocial problems: breath holding, self-induced vomiting, hyperactivity, depressed mother, and undifferentiated psychosocial problems.

<sup>f</sup>Congenital cardiac problems: mostly murmurs, thought to be non-functional.

Exhibit 3-3

Estimated Prevalences of Pediatric Health Problems

| Pediatric Health Problem | Estimated Prevalence with Source |                                       |
|--------------------------|----------------------------------|---------------------------------------|
| Recurrent Otitis Media   | 33%                              | Teele, Klein, Rosner, 1980            |
| Enuresis                 | 10-20%                           | Leventhal, 1975                       |
| Allergies                | 10-15%                           | Hoekelman, 1978                       |
|                          | 13.9%                            | Harvard School of Public Health, 1981 |
| Seizures                 | 7%                               | Hoekelman, 1978                       |
| Febrile seizures         | 2.5%                             | Hoekelman, 1978                       |
| Asthma                   | 3-4%                             | Haggerty, Roghmann, and Pless, 1975   |
|                          | 5.4%                             | Harvard School of Public Health, 1981 |
| Congenital cardiac       | 0.8%                             | Vaughn and McKay, 1978                |
|                          | 1.3%                             | Harvard School of Public Health, 1981 |

know whether her child has had a history of ear infections because the child did not receive medical care during such an episode or the mother was not informed of the event. Another factor which may contribute to differences is that some published estimates are based on wider age ranges than those of the evaluation children, thereby describing health of children at ages when more problems might be expected. Among the three possibilities (methodology, lack of maternal medical knowledge, and ages reported) the second factor appears to be a major contributor to the differences between the Head Start Health Evaluation estimates and those of other studies.

According to classifications into which these problems were coded by a single pediatrician after the data collection, it is evident that problems are predominantly chronic, noninfectious, and of mild to moderate severity. Table 3-3 displays this information for pretest prevalences. These results are not surprising, because this evaluation focused on non-handicapped children.

The number of pediatric problems per child ranges from none to six at pretest as shown in Exhibit 3-4. Forty-seven percent of the children were found to have no health problems identified by the pediatric health evaluation. About one-third of the children had one problem and 14 percent had two. Boys tended to have more problems than girls in two sites (see Table 3-4 in the Appendix).

The child's health history at three periods (prenatal, perinatal, and childhood) was reviewed. According to the mother's reports, the health of approximately half the children was reported to be excellent or very good, as shown in Exhibit 3-5. The most common response by mothers in all sites was "good" or "very good;" whereas 10.8 percent reported their children's health to be "fair" or "poor." Such ratings were far more common in Mingo County than in the other three sites. Ratings of mothers were compared with assessments of the examining pediatricians showed high agreement as Tables 3-5 through 3-9 in the Appendix illustrate.

Exhibit 3-6 illustrates that an average of 31 percent of the mothers of children in the pretest sample delayed receiving prenatal care until after the first trimester. This is slightly higher than the national percentage of 26 who delay (National Center for Health Statistics, 1979). Furthermore 34 percent reported having health problems during pregnancy\* and 35 percent gained more than 30 pounds or lost weight during pregnancy. There was some site variation in the prevalence of problems during pregnancy. Such problems seem to have been far more common in Mingo County than in the other three sites; mothers in Greene and Humphreys Counties, on the other hand, reported the lowest incidence.

Table 3-10 in the Appendix shows that 20 percent of the children were born to mothers who were less than 18 years of age, a situation which is considered to be a health risk to the child. The national average is 6 percent. Hence the proportion of teenaged mothers in the evaluation is more than three times higher than the national average.

Responses to items characterizing the perinatal health of the examined children are presented in Exhibit 3-7. The items distinguish children

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\*These include fever, infection, high blood pressure, seizures, convulsions, vaginal bleeding, sugar in urine, diabetes, edema (less swelling, etc.), nerves/depression, and others.



Exhibit 3-4

Number of Health Problems at Pretest

| Number of Problems |        | Pretested Children<br>n=375 |
|--------------------|--------|-----------------------------|
| 0                  | n<br>% | 177<br>47.2                 |
| 1                  | n<br>% | 128<br>34.1                 |
| 2                  | n<br>% | 52<br>13.9                  |
| 3                  | n<br>% | 11<br>2.9                   |
| 4                  | n<br>% | 6<br>1.6                    |
| 5                  | n<br>% | 0<br>0.0                    |
| 6                  | n<br>% | 1<br>0.3                    |

Exhibit 3-5

Mother's Report of State of Child's Health for Pretested Children

| State of Child's Health | Pretested Children (Samples A & D) in: |                                     |                           |                         |                      |                    |
|-------------------------|--|-------------------------------------|---------------------------|-------------------------|----------------------|--------------------|
|                         |  | Greene & Humphreys Counties<br>n=95 | St. Clair County<br>n=109 | Maricopa County<br>n=94 | Mingo County<br>n=73 | All Sites<br>n=371 |
| Excellent               | n                                      | 23                                  | 17                        | 16                      | 12                   | 68                 |
|                         | %                                      | 24.2                                | 15.6                      | 17.0                    | 16.4                 | 18.3               |
| Very Good               | n                                      | 26                                  | 41                        | 34                      | 22                   | 123                |
|                         | %                                      | 27.4                                | 37.6                      | 36.2                    | 30.1                 | 33.2               |
| Good                    | n                                      | 36                                  | 41                        | 37                      | 26                   | 140                |
|                         | %                                      | 37.9                                | 37.6                      | 39.4                    | 35.6                 | 37.7               |
| Fair                    | n                                      | 9                                   | 10                        | 5                       | 12                   | 36                 |
|                         | %                                      | 9.5                                 | 9.2                       | 5.3                     | 16.4                 | 9.7                |
| Poor                    | n                                      | 1                                   | 0                         | 2                       | 1                    | 4                  |
|                         | %                                      | 1.1                                 | 0.0                       | 2.1                     | 1.4                  | 1.1                |

Exhibit 3-6

Problems Reported During Pregnancy of Pretested Children

| Maternal Health Indicators During Pregnancy               | Pretested Children (Samples A & D) in: |                        |                      |                    |                     |
|---|--|------------------------|----------------------|--------------------|---------------------|
|   | Greene & Humphreys Counties n=95       | St. Clair County n=113 | Maricopa County n=95 | Mingo County n=73  | All Sites n=376     |
| First prenatal visit more than three months               | n 20/ 84<br>% 23.8                     | n 28/107<br>% 26.2     | n 32/ 93<br>% 34.4   | n 29/ 69<br>% 42.0 | n 109/353<br>% 30.9 |
| Health problems during pregnancy (other than weight gain) | n 25/ 88<br>% 28.4                     | n 38/107<br>% 35.5     | n 30/ 92<br>% 32.6   | n 29/ 70<br>% 41.4 | n 122/357<br>% 34.2 |
| Pregnancy weight loss or gain of more than 30 lbs.        | n 13/ 62<br>% 21.0                     | n 28/100<br>% 28.0     | n 36/ 79<br>% 45.6   | n 30/ 64<br>% 46.9 | n 107/305<br>% 35.1 |

Exhibit 3-7

Children with Perinatal Problems at Pretest

| Perinatal Health Problems                                  | Pretested Children (Samples A & D) in: |                        |                      |                    |                     |
|--|--|------------------------|----------------------|--------------------|---------------------|
|  | Greene & Humphreys Counties n=95       | St. Clair County n=113 | Maricopa County n=95 | Mingo County n=73  | All Sites n=376     |
| Gestation less than 38 weeks or greater than 42 weeks      | n 5/ 89<br>% 5.6                       | n 22/109<br>% 20.2     | n 16/ 91<br>% 17.6   | n 6/ 71<br>% 8.5   | n 49/360<br>% 13.6  |
| Birthweight less than 5.5 pounds or greater than 10 pounds | n 7/ 80<br>% 7.9                       | n 7/108<br>% 15.7      | n 11/ 92<br>% 12.0   | n 3/ 68<br>% 4.4   | n 38/357<br>% 10.6  |
| Hospital stay at birth longer than mother's                | n 2/ 91<br>% 2.2                       | n 14/107<br>% 13.1     | n 14/ 93<br>% 15.1   | n 7/ 71<br>% 9.9   | n 37/362<br>% 10.2  |
| Health problems at birth                                   | n 25/ 88<br>% 28.4                     | n 38/107<br>% 35.5     | n 30/ 92<br>% 32.6   | n 29/ 70<br>% 41.4 | n 122/357<br>% 34.2 |
| Congenital problems  | n 11/ 93<br>% 11.8                     | n 18/108<br>% 16.7     | n 12/ 92<br>% 13.0   | n 16/ 72<br>% 22.2 | n 57/365<br>% 15.6  |

who were at risk at birth (gestational age, birth weight) and children who experienced health-related problems in the neonatal period (hospital stay, health problems, congenital problems). Based on these data, the children in Greene and Humphreys Counties, according to mother's reports, generally were healthier perinatally than children in the other sites. Moreover, few of the children participating in the evaluation appear to be "at risk" from perinatal factors.

Exhibit 3-8 presents the percentage of children reported to have had serious accidents, according to type of accident. Unlike national statistics on children's accidents based on emergency room records, no attempt was made to collect information on the cause of the accident (e.g., of a poisoning incident.) Across the four sites one out of three children had been involved in any type of accident. Lacerations and swallowing of poison were the most common types of accidents being highest in Maricopa County and lowest in Greene and Humphreys Counties (both in terms of the proportion of children who had had accidents and the average number of accidents per child).

#### Health Services Provided through Head Start

The Head Start Performance Standards and the amendment of January 4, 1980, "Interpretation of Health Performance Standards as related to Periodic Provision of Medical Screening Services," are fairly specific about what Head Start requires in the medical services or health component, including their periodicity. The services are shown in Exhibit 3-9.

To document services obtained by Head Start children, three items from the Head Start health abstracts were utilized: (1) having a physical exam before or during the Head Start year, (2) having a health record, and (3) having documentation of a child's prior immunization status.\*

\*The immunization data, as abstracted, could not be used to determine whether the child had completed all immunizations. Consequently for that variable it had to be assumed that, if there was any immunization information, this requirement was satisfied. It is likely that such a definition overestimates the number of children for whom complete immunization records were in the possession of Head Start.

Exhibit 3-8

Percentage of Head Start-Eligible Children Reported to Have Had Serious Accidents

| Type of Accident                   | Pretested Children (Samples A & B) in: |                           |                         |                      |                    |
|------------------------------------|--|---------------------------|-------------------------|----------------------|--------------------|
|                                    | Greene & Humphreys Counties<br>n=95    | St. Clair County<br>n=110 | Maricopa County<br>n=95 | Mingo County<br>n=73 | All Sites<br>n=376 |
| Any                                | 22.1                                   | 36.4                      | 43.2                    | 39.7                 | 35.1               |
| Broken Bone                        | 1.1                                    | 3.5                       | 3.2                     | 2.7                  | 2.7                |
| Burn                               | 3.2                                    | 6.2                       | 4.2                     | 5.5                  | 4.8                |
| Laceration                         | 8.4                                    | 12.4                      | 22.1                    | 9.6                  | 13.3               |
| Swallow poison                     | 7.4                                    | 6.2                       | 10.5                    | 11.0                 | 8.5                |
| Loss of consciousness              | 2.1                                    | 2.7                       | 5.3                     | 1.4                  | 2.9                |
| Other                              | 5.3                                    | 15.9                      | 22.1                    | 17.8                 | 15.2               |
| Mean Number of Accidents Per Child | 0.3                                    | 0.6                       | 0.9                     | 0.6                  | 0.6                |
| Standard Deviation                 | 0.6                                    | 0.9                       | 1.7                     | 0.9                  | —                  |

Exhibit 3-9

Medical Services Required by Head Start

| Required Medical Services  | When Required                          |
|--|--|
| Health History, including copy of immunization record  | Beginning of operating period.         |
| Physical examination/assessment  | Every two years beginning age 3        |
| Immunization against seven diseases  | By end of operating period as required |
| Tuberculin testing   | As required                            |
| Additional screening for other health factors e.g. lead poisoning, parasites, sickle cell anemia | As required                            |
| Growth assessment  | Beginning and end of operating period  |
| Hemoglobin or hematocrit   | During first year                      |
| Hearing test   | Every two years beginning age three    |
| Vision testing for visual acuity and strabismus  | Every two years beginning at age three |

Exhibit 3-10 presents the percentages of Head Start children examined at posttest who had received the desired health services. Overall, there was moderate compliance with the Head Start performance standards. Eighty-five percent of the children had received a physical exam before or after entering Head Start and 77 percent of the children had received immunizations.

There was considerable site variation in receipt of these services. Maricopa County arranged for physical examination for all Head Start children.

Exhibit 3-10

Health Services Delivered to Head Start Children during the Year In Program

| Health Services                      | Posttested Children (Samples A, B, C) in: |                    |                   |                             |                    |
|--------------------------------------|---|--------------------|-------------------|-----------------------------|--------------------|
|                                      | Greene & Humphreys<br>n=127               | St. Clair<br>n=108 | Maricopa<br>n=102 | Mingo<br>n=112              | All Sites<br>n=449 |
| Information Present in:              |   |                    |                   |                             |                    |
| Information Present in Health Record | n 127<br>% 100                            | n 108<br>% 100     | n 102<br>% 100    | n 85 <sup>a</sup><br>% 75.9 | n 422<br>% 94.0    |
| Physical Exam After Entry            | n 94<br>% 74.0                            | n 4<br>% 3.7       | n 97<br>% 95.1    | n 82<br>% 96.5              | n 277<br>% 65.6    |
| Before or After Entry                | n 94<br>% 74.0                            | n 102<br>% 94.4    | n 102<br>% 100    | n 83<br>% 74.1              | n 381<br>% 84.9    |
| Previous Immunization <sup>b</sup>   | n 116<br>% 91.3                           | n 92<br>% 85.2     | n 101<br>% 99.0   | n 35<br>% 31.3              | n 344<br>% 76.6    |

<sup>a</sup> Only 85 Head Start children had a health record on file.

<sup>b</sup> This variable indicates some documentation of immunization status, completion of all immunizations during the year in Head Start.

and the majority had an immunization record. In terms of the proportion of children who had received physical exams, Greene and Humphreys Counties and Mingo County scored lowest.

These site variations reflect local Head Start policies regarding delivery of health services. According to the reports of the Head Start directors and the health coordinators, the delivery of medical screens and services is conducted differently in each of the four sites. Exhibit 3-11 summarizes some of the characteristics of the methods each Head Start program uses to conduct medical screens and referrals for treatment according to whether the child is Medicaid-eligible. One of the Head Start grantees relies heavily on Medicaid assistance in delivery of medical screening and treatment. In St. Clair County the children go to private pediatric practices or primary care clinics (frequently located in their public housing projects).

The other sites pay directly for most of the screens and examinations. There is no Medicaid in Maricopa County (and therefore no EPSDT) and all health services are purchased by contract with the Health Department. Maricopa County's record of service delivery to the children is outstanding (100% received medical examinations and 99 percent had immunization records). In Mingo County, although some children are Medicaid-eligible (EPSDT-eligible) none of the physicians will accept the level of reimbursement offered. Consequently, Head Start pays directly for the screens and examinations. Any findings from these, however, are simply called to the parent's attention. Unless the child is EPSDT-eligible or the parent pays directly for the necessary treatment, no treatment is provided. This is the only site with nearly 25 percent of the health records missing and with immunization records on only 31 percent of the children.

Another major policy difference among sites is that, with the exception of St. Clair County, all medical screens are performed after entry into Head Start. In that site a physical examination is required with the Head Start application and all medical screens are paid for by other means, usually EPSDT.\*

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\*Referred to locally as IDPA (Illinois Department of Public Assistance).

Exhibit 3-11

Characteristics of the Head Start's Delivery of Medical Examinations and Services in Each of the Sites

| Characteristic and EPSDT Eligibility         | Greene & Humphreys Counties          | St. Clair County     | Maricopa County        | Mingo County            |
|--|--------------------------------------|----------------------|------------------------|-------------------------|
| Time of the screen                           | before mid December                  | prior to entry       | as soon as possible    | as soon as possible     |
| Non-EPSDT children                           |                                      |                      |                        |                         |
| Who performs screen                          | Pediatrician Nurse Pract.            |                      | Pediatrician           | Pediatrician            |
| Where performed                              | Head Start                           |                      | Health Dept.           | Private Off.            |
| Cost per child                               | \$12                                 | (parent pays)        | \$165 <sup>a</sup>     | \$8.                    |
| EPSDT children                               |                                      |                      |                        |                         |
| Who performs screen                          | Nurse Pract.                         | Pediatrician         |                        |                         |
| Where performed                              | Health Dept.                         | Private Off.         |                        |                         |
| No Cost to Head Start                        |                                      |                      |                        |                         |
| If finding, method of referral and follow-up | Head Start helps parent to follow-up | Head Start follow-up | Health Dept. follow-up | Head Start tells parent |
| Average cost for treatment                   | \$150                                | All EPSDT            | Included in cost above | Head Start does not pay |

<sup>a</sup> Contract with Health Department is similar to an HMO arrangement. This cost per child covers all medical, dental, vision and hearing screening and treatment.

Head Start children receive other preventive health services beside screening tests. Exhibit 3-12 presents frequencies of Head Start children at posttest who have received tuberculosis testing, immunizations in the past year, and blood tests for lead toxicity. The Head Start Performance Standards state that certain specific tests may be indicated in areas or in groups of children at particular sites. The preventive screens for lead and tuberculosis fall into this category. The data show that a significant number of children in each site is at risk for tuberculosis due to exposure to someone known to have this disease. Nationwide, in this age range, reported cases of tuberculosis have an incidence from 0.5 to 0.9 percent (CDC, 1980). In three sites, over 75 percent of the children were tested for tuberculosis; in Greene and Humphreys Counties only 18 percent of the children had received a TB test. St. Clair County is the only site in which appreciable testing for lead toxicity was conducted. This is consistent with the fact that children in older urban environments are most at risk for lead poisoning, resulting from the prevalence of lead paint in dwellings and high levels of lead-containing automobile exhaust fumes.

Based on findings at pretest, a total of 34 Head Start children (2 in Greene and Humphreys Counties and 2 in St. Clair County) were referred for lead tests. Because these referrals may be viewed as an intervention, the referred children were excluded and the proportions of children tested were recalculated. Adjusted proportions are presented in the bottom row of Exhibit 3-12.

Over half of the children received immunizations during the Head Start year. Forty-nine percent of this group of children had received the immunization through Head Start. This practice was most common in Head Start programs in Maricopa and Mingo Counties.

As noted in Exhibit 3-9, Head Start is mandated to arrange for a number of other screens for enrolled children: growth assessments, hemoglobin or hematocrit, vision and hearing. These screens are addressed in separate chapters of this report (Chapter Five: Anthropometry; Chapter Seven: Hematology; Chapter Ten: Vision; Chapter Eleven: Hearing).

In addition to health screening and preventive services, Head Start provides help to families to obtain medical treatment for problems in some situations. As shown in Exhibit 3-13, over half of the children had received



Exhibit 3-12

Preventive Services Received by Head Start Children

| Preventive Services                          | Posttested Children (Samples A, B and C) in: |                           |                          |                       |                     |
|--|--|---------------------------|--------------------------|-----------------------|---------------------|
|  | Greene & Humphreys Counties<br>n=127         | St. Clair County<br>n=108 | Maricopa County<br>n=106 | Mingo County<br>n=119 | All Sites<br>n=460  |
| TB exposure                                  | n 3/127<br>% 2.4                             | n 6/108<br>% 5.6          | n 14/105<br>% 13.3       | n 3/118<br>% 2.5      | n 26/458<br>% 5.7   |
| TB test                                      | n 18/101<br>% 17.8                           | n 81/97<br>% 83.5         | n 75/96<br>% 78.1        | n 94/106<br>% 88.7    | n 268/400<br>% 67.0 |
| Immunization in past year                    | n 63/123<br>% 51.2                           | n 75/107<br>% 70.1        | n 68/103<br>% 66.0       | n 51/117<br>% 43.6    | n 257/450<br>% 57.1 |
| Immunization through Head Start              | n 22/63<br>% 34.9                            | n 12/72<br>% 16.7         | n 50/67<br>% 74.6        | n 40/50<br>% 80.0     | n 124/252<br>% 49.2 |
| Lead Test                                    | n 3/123<br>% 2.4                             | n 61/101<br>% 60.4        | n 0<br>% 0.0             | n 0<br>% 0.0          | n 64/440<br>% 14.5  |
| Excluding referrals at pretest for lead test | n 1/120<br>% 0.9                             | n 59/96<br>% 61.5         | n 0<br>% 0.0             | n 0<br>% 0.0          | n 60/432<br>% 13.9  |

a Percentages based on those reporting having received immunizations in the previous year.

treatment for illness since they entered Head Start. Only one out of five children, however, had received treatment through Head Start. This was more common in Mingo County than in the other three sites, according to mother's reports.

Health Services Provided Through Other Sources

A wide range of resources are available to serve the medical needs of low-income children. Since Head Start in most cases does not do medical

Exhibit 3-13

Treatment for Illness in the Past Year  
Received by Head Start Children

| Treatment Service  | Posttested Children (Samples A, B, C) in: |                           |                          |                          |                          |
|--------------------|---|---------------------------|--------------------------|--------------------------|--------------------------|
|                    | Greene & Humphreys Counties<br>n=126      | St. Clair County<br>n=100 | Maricopa County<br>n=101 | Mingo County<br>n=110    | All Sites<br>n=437       |
| Received Treatment | n<br>66<br>%<br>52.4                      | n<br>54<br>%<br>54.0      | n<br>57<br>%<br>56.4     | n<br>70<br>%<br>63.6     | n<br>247<br>%<br>56.5    |
| Through Head Start | n<br>7/ 51<br>%<br>13.5                   | n<br>1/ 51<br>%<br>2.0    | n<br>4/ 47<br>%<br>8.5   | n<br>32/ 67<br>%<br>47.8 | n<br>44/217<br>%<br>20.3 |

screens or provide medical treatment directly but rather refers to private physicians or health care organizations, the same resources are used by Head Start and non-Head Start children.

We investigated what sources were used by low-income families to meet their health needs. All but 10 percent of the mothers could identify where they usually receive medical care. There was some variation among sites, ranging from 15 percent of the mothers in Maricopa County not having a usual source of medical care to only one percent in St. Clair County.

As is shown in Tables 3-11 through 3-13 in the Appendix, the majority of the children received checkups either from a pediatrician (43%) or a general practitioner (43%). There was some variation from site to site, with the majority of children in St. Clair and Mingo Counties receiving medical services from a pediatrician; in the other two sites it was more typical for children to be examined or treated by a general practitioner. With regard to immunizations, the pattern is somewhat different with more children receiving shots from either a nurse/nurse practitioner (34%) or a pediatrician (34%). Only in Maricopa do most children receive immunizations from a general practitioner.

In addition, data were collected about the location of the medical services. Site variations again were evident. Medical care is provided most commonly in a private physician's office in St. Clair and Greene and Hum-

phreys Counties. Use of community clinics for checkups, treatment and immunizations is most common in Maricopa County. Families in Mingo County, on the other hand, used hospital clinics more often than other locations for checkups and treatment. Immunizations in two sites most often were provided to the majority of children by the Health Department. The most common sources of medical care are summarized in Exhibit 3-14.

### Impacts of Head Start's Health Services on Children

Longitudinal Analyses. The longitudinal sample allows us to assess change in the problems within the constraints of sample size. The prevalence of pediatric problems at pretest was low as discussed earlier (see Exhibit 3-2). None of the changes in prevalence of problems from pretest to posttest are significantly different from zero, and changes did not differ significantly between the Head Start and non-Head Start group of children. These findings are not surprising for several reasons. First, most of the pediatric problems identified are chronic in nature, so that little change can be expected over time. Second, the prevalences of these problems and their observed changes are small relative to the number of children in the sample, so that it is difficult to detect any true change. Finally, because of the low observed prevalences, few changes in prevalence and the relatively small sample sizes, even small observer errors in diagnosis may obscure "true" changes.

Next, we examined whether differences existed between the Head Start and non-Head Start groups in the proportion of children diagnosed as having problems both at pretest and posttest. Two sets of analyses were undertaken -- one excluding children referred for medical care at pretest; the other including all children regardless of pretest referrals. These two sets of analyses produced almost identical results, as shown in Table 3-14 in the Appendix. Across the four sites, the proportion of children with health problems at both pre- and posttest was significantly lower (by 23%) for the Head Start group, suggesting a positive Head Start impact when the sample includes the children referred for treatment by evaluation's physician(s).\*

\*Table 3-15 provides more detailed information about the specific health problems children were diagnosed to have at pretest and the absence or presence of these problems at posttest for Head Start and non-Head Start children by site. This table cannot be used to count children, however.

Most Common Uses of Health Care Sources of Low-Income Families

|                             | Greene & Humprheys Counties | St. Clair County      | Maricopa County  | Mingo County             | All Sites                                |
|-----------------------------|-----------------------------|-----------------------|------------------|--------------------------|--|
| <b>Medical Providers</b>    |                             |                       |                  |                          |  |
| Checkups                    | GP                          | Pediatrician          | GP               | Pediatrician             | Pediatrician/GP                          |
| Treatment                   | GP                          | Pediatrician          | GP               | Pediatrician             | GP                                       |
| Immunizations               | Nurse/Nurse practitioner    | Pediatrician          | GP               | Nurse/Nurse practitioner | Nurse/Nurse practitioner or Pediatrician |
| <b>Location of Services</b> |                             |                       |                  |                          |  |
| Checkups                    | Private Doctor Office       | Private Doctor Office | Community Clinic | Hospital Clinic          | Private Doctor Office                    |
| Treatment                   | Private Doctor Office       | Private Doctor Office | Community Clinic | Hospital Clinic          | Private Doctor Office                    |
| Immunizations               | Health Department           | Private Doctor Office | Community Clinic | Health Department        | Health Department                        |

Otherwise, the Head Start program in Green and Humphreys Counties showed a significant impact on the health problems found at pretest, irrespective of a referral by the evaluation's pediatrician. On closer examination of group differences in each of the sites, Head Start shows a lower prevalence of continuing problems at both time points in Maricopa County as well. This trend is reflected across all sites, as Exhibit 3-15 illustrates.

The group difference in Greene and Humphreys Counties is primarily due to Head Start's use of health resources in this site. Despite moderate compliance with performance standards (as noted earlier) after the evaluation provided each program with a complete summary of the pretest findings on each child, this program responded. As Exhibit 3-16 suggests, Head Start intervention in this site was instrumental in getting children treated for health problems that were identified by the examining physician at pretest. A significantly greater proportion of the Head Start than non-Head Start children had received treatment for problems.\* A similar trend was evident in Maricopa and Mingo Counties, but the group differences were not statistically significant. What this appears to indicate is that children in these two sites received treatment for medical problems whether or not they are enrolled in Head Start. This was not the case in Greene and Humphreys Counties where only a very small proportion of the non-Head Start children received follow-up care. Only in St. Clair County did children in the non-Head Start group fare better than Head Start children, although the group difference was not statistically significant.

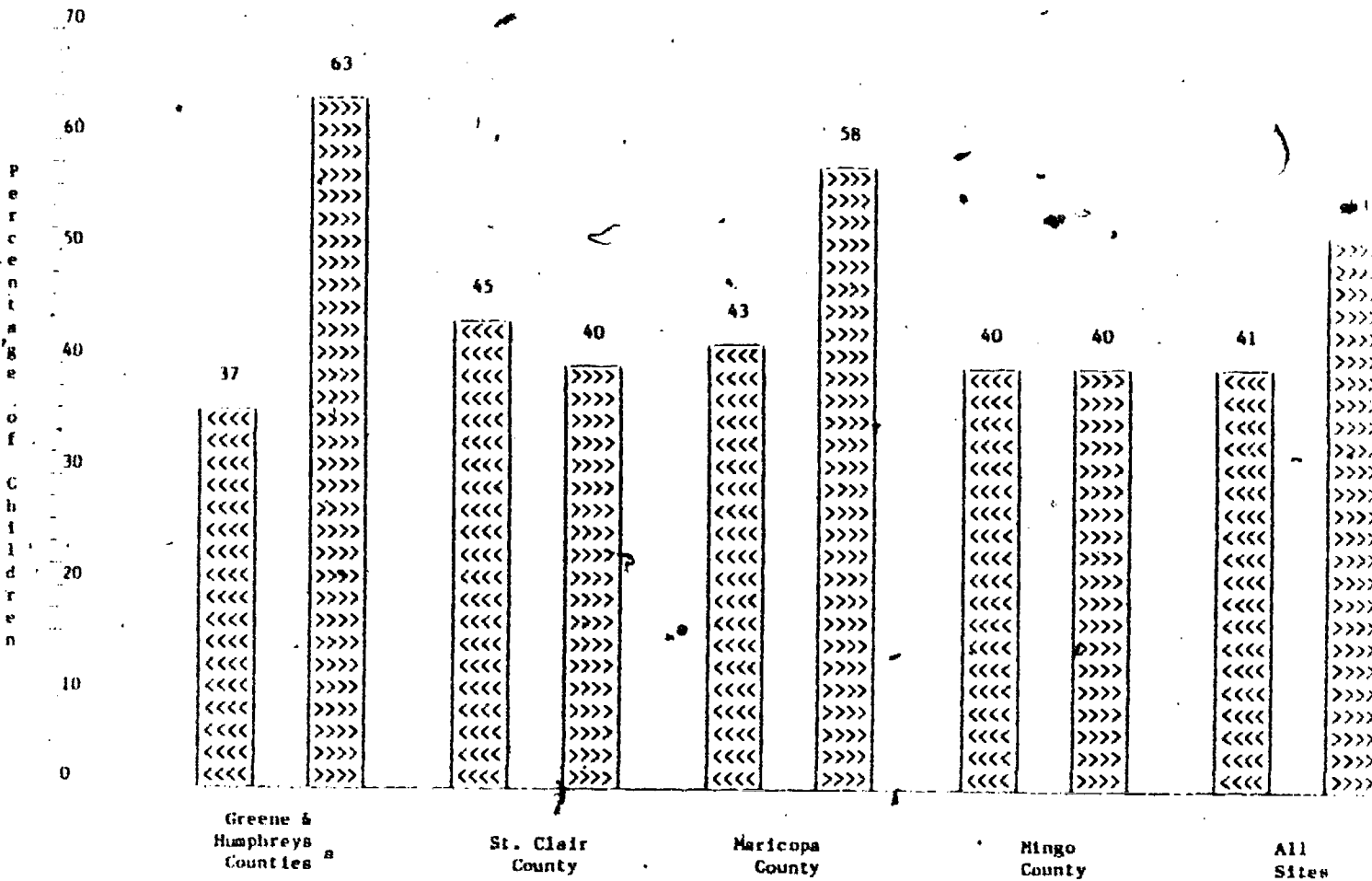
We further examined whether children with multiple problems were more likely to have received treatment than those with only a single problem. Results (presented in Table 3-17 in the Appendix) suggest that this is not the case, at least for the Head Start children (approximately 44% in both the single and multiple problem group received treatment). The situation was different for the non-Head Start children who were more likely to have been treated if they had multiple problems (42%) than children with a single health problem (22%). The trend was not consistent across all four sites, however.

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\*Analyses were done on all children, as well as on the group that was not referred for medical services by the examining physician at pretest. These two analyses produced identical results, as shown in Table 3-16.

### Exhibit 3-15

Children with Problems at Both Pretest and Posttest  
for Head Start and Non-Head Start Children in the Longitudinal Sample



Key to Symbols:

Head Start

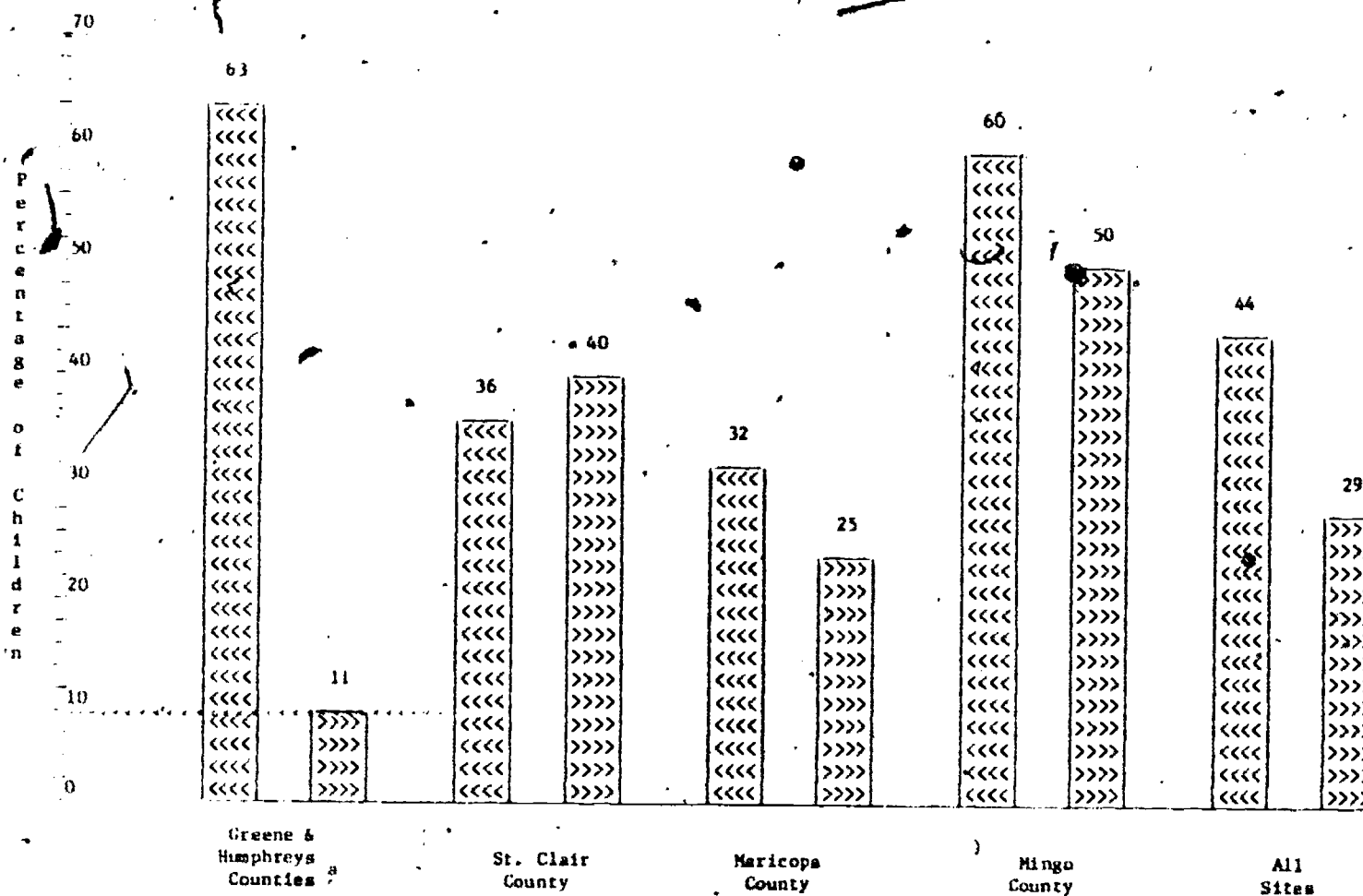
Non-Head Start

118

<sup>a</sup> Difference between Head Start and non-Head Start groups is statistically significant  $p < .05$ .

### Exhibit 3-16

Children with Problems at Both Pretest Who Received Treatment for At Least One Problem Prior to Posttest for Head Start and Non-Head Start Children in the Longitudinal Sample



Key to Symbols:

<<<< Head Start

>>>> Non-Head Start

<sup>a</sup> Difference between Head Start and non-Head Start groups is statistically significant  $p < .05$ .

Mothers of Head Start children were asked whether treatment had been obtained through Head Start. Data were collected on only 25 of the treated children. It is unclear whether the large amount of missing data for this item reflects uncertainty on the part of mothers, or oversight on the part of the recording pediatrician. While the exact nature of Head Start involvement is unknown for these cases, it is the mothers' perception that was recorded. The percentage of Head Start children treated for a pretest pediatric problem for whom it was indicated there was Head Start involvement in these treatments ranged from zero (n=4) in St. Clair County to 80 percent (n=10) in Greene and Humphreys Counties. Across all the sites the average is 48 percent (n=25), including 25 percent in Maricopa County (n=8) and 67 percent in Mingo County (n=3). Head Start involvement was reported for all sites except St. Clair County.

There also appear to be group differences in the proportion of children who received a physical exam in the previous year. Across all sites, 85 percent of the Head Start children compared to 71 percent of the non-Head Start children had received a checkup. The group difference was largest in Mingo County where physical examinations had been done on 81 percent of the Head Start and only 59 percent of the non-Head Start children.

Finally, we examined whether Head Start had been instrumental in informing families about Medicaid and assisting them in the enrollment process. There was practically no change in Medicaid coverage from pretest to posttest in either the Head Start or non-Head Start group. As shown in Exhibit 3-17, Medicaid use is low (or in the case of Maricopa County, non-existent) for both groups in all sites except St. Clair County. This finding is surprising because most families appear to meet Medicaid eligibility requirements in terms of income (as illustrated in Table 3-18 in the Appendix). There was, in fact, a slight decrease in Medicaid coverage from pretest to posttest, which may be due to recent cutbacks in social programs. Only Greene and Humphreys Counties showed an increase in the proportion of families with Medicaid coverage, but only for the Head Start group, suggesting the presence of a possible Head Start effect. (The group difference was not statistically significant, however, probably due to small sample sizes.) It is clear that Head Start effectiveness could be improved in this regard.

Cross-sectional Analyses. A series of analyses were conducted using the cross-sectional sample of children (Samples A, B, and C). Important



Exhibit 3-17

Medicaid Coverage of Head Start and Non-Head-Start Families by Site<sup>a</sup>

| Groups of Families         | Pretest (Sample A) Children in: |                  |                 |               |                |
|----------------------------|---------------------------------|------------------|-----------------|---------------|----------------|
|                            | Greene & Humphreys Counties     | St. Clair County | Maricopa County | Mingo County  | All Sites      |
| Head Start at Pretest      | n<br>17/ 43<br>%<br>39.5        | 22/ 25<br>88.0   | 0/ 39<br>0.0    | 8/ 18<br>44.4 | 47/125<br>37.6 |
| Head Start at Posttest     | n<br>24/ 43<br>%<br>55.8        | 15/ 25<br>60.0   | 0/ 40<br>0.0    | 6/ 18<br>33.3 | 45/126<br>35.7 |
| Non-Head Start at Pretest  | n<br>14/ 31<br>%<br>45.2        | 14/ 17<br>82.4   | 0/ 16<br>0.0    | 6/ 18<br>33.3 | 34/ 82<br>41.5 |
| Non-Head Start at Posttest | n<br>13/ 31<br>%<br>41.9        | 13/ 17<br>76.5   | 0/16<br>0.0     | 4/ 17<br>23.5 | 30/ 81<br>37.0 |

<sup>a</sup> Group differences are not statistically significant.

health characteristics of the Head Start and non-Head Start groups in the cross-sectional sample are presented in Tables 3-19 through 3-27 in the Appendix. No significant differences in prevalence rates were found between the pretest and posttest sample, suggesting that our estimates are realistic for low-income children in the four study sites. Similar analyses comparing the posttest sample groups (Head Start and non-Head Start) in terms of prenatal and perinatal problems and incidence of accidents and hospitalizations showed no significant group differences in any of the sites.

Finally, we assessed whether there is evidence of a Head Start effect in terms of preventive health care provision. In all four sites Head Start was instrumental in getting children examined (see Exhibit 3-18). Within sites, group differences were statistically significant only in Maricopa and Mingo Counties.

Across the four sites, 86 percent of the Head Start children had received their physical exam through Head Start. There was some site varia-



Exhibit 3-18

Physical Examination Received by Children in Past Year

| Groups of Families | Posttested Children (Samples A,B,C) in: |                  |                 |                |                 |
|--------------------|---|------------------|-----------------|----------------|-----------------|
|                    | Greene & Humphreys Counties             | St. Clair County | Maricopa County | Mingo County   | All Sites       |
| Head Start         | n<br>%<br>83/100<br>75.5                | 94/105<br>89.5   | 86/103<br>83.5  | 99/114<br>86.8 | 362/422<br>85.5 |
| Non-Head Start     | n<br>%<br>61/91<br>67.0                 | 69/83<br>83.1    | 30/57<br>52.6   | 68/105<br>64.8 | 228/336<br>67.9 |
| Significance       | n<br>0.19                               | 0.20             | <.02            | <.01           | <.01            |

tion in the proportion of children being examined through Head Start, ranging from all children in Maricopa County to three out of four in Mingo County.

In terms of other preventive health services--tests for tuberculosis and lead poisoning, and immunizations--Head Start children were more likely to have received them than non-Head Start children. As Exhibit 3-19 illustrates, evidence of a statistically significant Head Start impact was found across all four sites on all three measures. (Note, however, that lead testing occurred in only two sites--Greene and Humphreys Counties and St. Clair County.) Within-site analyses showed up some significant group differences--particularly in Mingo County (where Head Start children fared considerably better than non-Head Start children with regard to receipt of TB tests and immunizations) and St. Clair County (on all three preventive health services). No statistically significant group differences were found in Greene and Humphreys Counties and only one Head Start effect (TB test) was evident in Maricopa County.

A positive Head Start effect could not be demonstrated in terms of treatment for illness (See Exhibit 3-20). This may indicate that although Head Start children are more likely to receive physical examinations and other preventive health services, they are no more likely to need and accept medical care for illness. Parents of both the Head Start and non-Head Start children are equally likely to find medical help for a sick child.

Exhibit 3-19

Other Preventive Health Services Received by Children in Previous Year<sup>a</sup>

| Preventive Services                          | Posttested Children (Sample A, B, C) in: |                |                  |                  |                 |                  |                |                   |                 |                    |
|--|--|----------------|------------------|------------------|-----------------|------------------|----------------|-------------------|-----------------|--------------------|
|  | Greene & Humphreys Counties              |                | St. Clair County |                  | Maricopa County |                  | Mingo County   |                   | All Sites       |                    |
|  | HS<br>(n=127)                            | NHS<br>(n=101) | HS<br>(n=108)    | NHS<br>(n=86)    | HS<br>(n=106)   | NHS<br>(n=61)    | HS<br>(n=119)  | NHS<br>(n=109)    | HS<br>(n=460)   | NHS<br>(n=357)     |
| TB exposure                                  | 3/127<br>2.4                             | 3/97<br>3.1    | 6/108<br>5.6     | 1/85<br>1.2      | 14/105<br>13.3  | 3/59<br>5.1      | 3/118<br>2.5   | 10/108<br>9.3*    | 26/458<br>5.7   | 17/357<br>4.9      |
| TB Test                                      | 18/101<br>17.8                           | 16/83<br>19.3  | 81/97<br>83.5    | 42/74<br>56.8*** | 75/96<br>78.1   | 29/56<br>51.8*** | 94/106<br>88.7 | 45/100<br>45.0*** | 268/400<br>67.0 | 132/313<br>42.2*** |
| Any Immunizations in Past Year               | 63/123<br>51.2                           | 42/97<br>43.3  | 75/107<br>70.1   | 48/85<br>56.5*   | 68/103<br>66.0  | 31/60<br>51.7    | 51/117<br>43.6 | 25/108<br>23.1**  | 257/450<br>57.1 | 146/350<br>41.7*** |
| Lead Test                                    | 3/123<br>2.4                             | 1/97<br>1.0    | 61/101<br>60.4   | 27/73<br>37.0**  | 0               | 0                | 0              | 0                 | 64/440<br>14.5  | 28/337<br>8.3**    |
| Excluding referrals at pretest for lead test | 1/120<br>0.9                             | 1/97<br>1.0    | 59/96<br>61.5    | 24/68<br>35.3*** | 0               | 0                | 0              | 0                 | 60/432<br>13.9  | 25/332<br>7.5**    |

<sup>a</sup>Significance indicated as:

- \* p < .05
- \*\* p < .01
- \*\*\* p < .001

Exhibit 3-20

Treatment for Illness Received in the Past Year<sup>a</sup>

| Groups of Families | Posttested Children (Sample A, B, C) in: |                    |                    |                    |                     |
|--------------------|--|--------------------|--------------------|--------------------|---------------------|
|                    | Greene & Humphreys Counties              | St. Clair County   | Maricopa County    | Mingo County       | All Sites           |
| Head Start         | n 66/126<br>% 52.4                       | n 54/100<br>% 54.0 | n 57/101<br>% 56.4 | n 70/110<br>% 63.6 | n 247/437<br>% 56.5 |
| Non-Head Start     | n 54/ 97<br>% 55.7                       | n 44/ 81<br>% 54.3 | n 30/ 59<br>% 50.8 | n 72/ 97<br>% 74.2 | n 200/334<br>% 59.9 |

<sup>a</sup> None of the group differences are statistically significant.

Finally, we examined whether Head Start's health services were more effective for special groups of children. The results of these analyses are shown in Appendix Tables 3-28 through 3-37. In general, there were few differences among children who did or did not receive needed services. Children of mothers with less than 12 years of education and those with no Medicaid were less likely to have findings reported on the basis of the health screen. This last result may suggest underreporting of findings if the child is not eligible for EPSDT.

Conclusions

The results indicate that the children in both the Head Start and non-Head Start groups are three times as likely to be born to a teenage mother as children in the general population. Despite these beginnings, a substantial proportion of the children are considered "healthy." Of the children not deemed to be in good health, many have chronic, non-infectious problems of mild to moderate severity.

There is considerable variation in the Head Start service delivery policies within sites. One made effective use of Medicaid, another, the local health department. Two others were forced to purchase screening services directly for all children and had limited funds available for

treatments. Head Start had a positive effect with regard to provision of preventive health services. This is especially true in the improved rates of immunizations.

Although there is a significant Head Start effect in only one site on the delivery of treatment for specific problems which were identified at pretest by the examining physician, it does appear that in all sites but one Head Start made a positive effort to treat problems. This is evident in two of the four sites, where a smaller percentage of Head Start children retained a problem found at pretest. Head Start intervention was particularly important in sites where access to medical services is limited for low-income children.

Data suggest that the presence of Medicaid or a contract for services from a health department is an essential element in the delivery of medical services from screening and examinations through treatment. It is therefore unclear why more emphasis is not being placed by Head Start on increasing the proportions of children who receive EPSDT services--one of potential mechanism for increasing services to children. Head Start effectiveness in this regard could be enhanced substantially.

## CHAPTER FOUR

### DENTAL EVALUATION

#### Dental Health Indicators

The prevalence of caries has declined considerably in the past 10 years among American children. In a recent survey of 40,000 children, 95 percent of all five-year olds were caries-free. Community fluoridation of water, alternative fluoridation regimes, and pit and fissure sealants appear to be three contributing factors to the improvements in the dental health of children (Brunelle, 1982). Dental health remains a major public health issue within the adult population. If low-income children do not have access to fluoridation and do not receive proper care of their teeth, they will face serious dental health problems later in life. According to the results of the First National Health and Nutrition Examination Survey, 10 percent of adults aged 18 to 44 had lost all of their teeth from one or both jaws and 4 percent had no remaining teeth. This survey also found evidence of decay in teeth of children under five years of age. On average, 16 percent of children aged one to five needed dental treatment for decay and had one decayed or filled primary tooth. However, most of the primary teeth remained unfilled (U.S. Department of Health and Human Services, 1981a).

Although no evidence indicates that low-income children are more at risk for dental decay than high-income children, there is evidence that family income may be related to whether children receive fillings. Dental health is a product of the child's overall health, nutrition, and health care context. Treatment and preventive dental services are components of the health care system that vary in their availability and accessibility to the Head Start-eligible population. For example, some communities provide fluoridation of water as a service to all residents: This is clearly beneficial in reducing caries development. Dental hygiene practices for very young children are those of the child's family and its social context. The family determines the acceptability of thumb sucking and the age at which it is discouraged. Similarly, nutrition and feeding habits within the family have ramifications for dental health. Both the consumption of sweet, sugared

foods and the practice of permitting a child to fall asleep with a bottle of sweet or carbohydrate liquid may result in serious dental problems.

The dental evaluation was designed to determine the impact of Head Start dental services on children, and to assess whether Head Start children exhibit better dental health than non-Head Start children. Dental health indicators observable in the evaluation are:

- Cleanliness and health of the children's teeth;
- Overall incidence of treatment needs; and
- Identified treatment needs that have been met.

The dental evaluation consisted of a direct examination performed by a pedodontist trained at Boston's Children's Hospital and a dental history interview administered to the child's mother or guardian. During the dental examination, the pedodontist charted carious lesions and fillings on each surface and recorded evidence of gingival inflammation and occlusion abnormalities.

The analysis of the dental evaluation aimed to answer four major research questions:

- What is the prevalence of decay and restorations, hygiene and occlusion measures, and needs for treatment of dental problems among the Head Start and non-Head Start children?
- What dental screening and treatment services has Head Start provided to Head Start children?
- Do children receive dental services through sources other than Head Start?
- What is the impact on Head Start children of dental services, in terms of the dental health status and receipt of services compared with non-Head Start children?

The dental health indicators used in the analyses are defined in Exhibits 4-1 and 4-2. They include both prevalence measures and incidence measures. Prevalence measures are indicators of dental events at particular times. With two time points, the pretest and posttest, a set of incidence measures can be created. These capture the development of caries and receipt of fillings in the year between pretest and posttest examinations; measurement of incidence is thus confined to the sample of children participating in both examinations (Sample A). Incidence measures are of interest because

## Exhibit 4-1

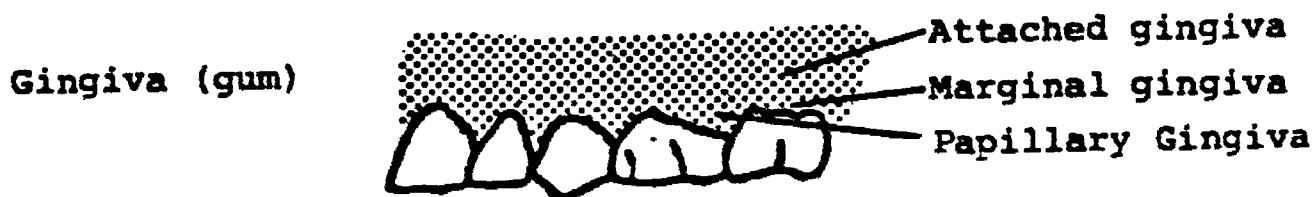
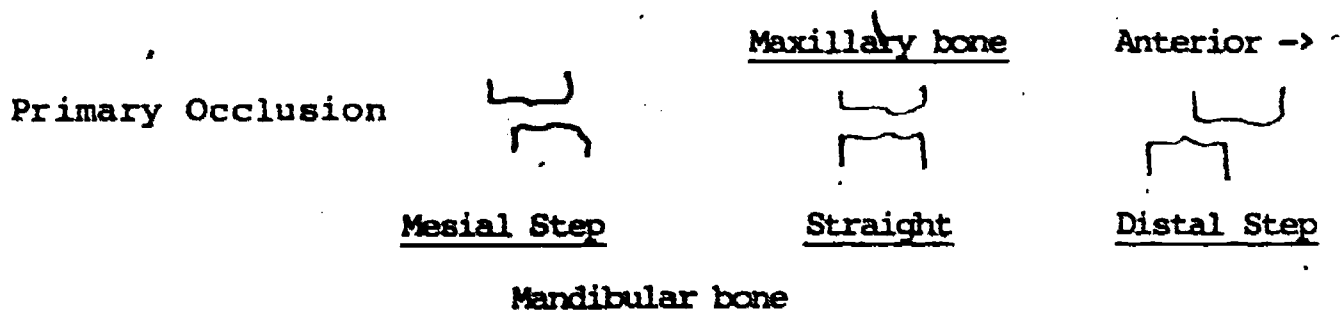
### Definitions of Variables Used in Dental Evaluation

| <u>Surface Variables</u>               | <u>Definition</u>  |
|--|--|
|  | The five sides of a tooth above the gum line, the buccal surface is toward the cheek, the lingual toward the tongue, the mesial toward the chin and distal toward the jaw. The occlusal is the biting surface.   |
|  | <u>Variable Construction.</u> The variables summarizing affected surfaces were constructed by counting the number of surfaces observed to be carious, filled, or missing among the 120 surfaces a child may have in 24 teeth. Counts of total numbers are termed the prevalence variables. Comparably, surfaces are enumerated to set change status flags for the incidence variables. Percent equivalents of these measures have been created by dividing these counts by the total number of surfaces observed. However, in the case of percent measures of missing surfaces, the denominator equals the number of surfaces observed <u>plus</u> the number which are missing. |
| <u>Prevalence Variables</u>            | Counts of total numbers of decayed, filled or missing surfaces are termed the prevalence variables.  |
| Decayed surfaces                       | Surfaces with unrestored carious lesions (may also have restorations).   |
| Filled surfaces                        | Surfaces with restored carious lesions (may also have unrestored lesions).   |
| Missing surfaces                       | Surfaces on a tooth which is missing, presumably as a result of a trauma or extraction.  |
|  | Note that of the 98 children in the pretest and posttest samples with missing teeth, 14 had a tooth possibly missing due to natural processes. This possibility has been identified by a consulting clinician familiar with the normative patterns of exfoliation and eruption. However, the tooth was scored by examining pedodontist as missing, and the possibility of extraction or trauma cannot be ruled out.  |
| Decayed and Filled Teeth               | The sum of decayed and filled teeth. In general, lower <u>df</u> is a sign of better dental health (fewer decayed and/or filled teeth) than a higher <u>df</u> .   |
| <u>Incidence Variables</u>             | The difference between the numbers of decayed, filled or missing surfaces at pretest and at posttest is the incidence variable.  |
| Incidence of decay                     | Unrestored caries observed at posttest in surfaces which were sound or restored at the pretest.  |
| Incidence of fillings                  | Restorations observed at posttest in surfaces which were sound or decayed at the pretest.  |
| Incidence of missing surfaces          | Surfaces of teeth which were observed to be missing at posttest but were present at pretest.   |
| <u>Occlusion Variables</u>             |  |
| Classification of profile              | An appraisal of the conformation of the profile from the bridge of the nose to the jawbone. Scored as straight (orthognathic), convex (retrognathic), or concave (prognathic).   |
| Primary occlusion <sup>a</sup>         | The relationship of the upper and lower primary molars, assessed at the second first degree molars, and scored according to whether the back (distal) surface of the lower molar is forward or mesial in relation to the upper molar, or is behind or distal to the back (distal) surface of the upper molar.  |
| <u>Occlusion Variables (continued)</u> | <u>Definition</u>  |
| Overbite                               | Percent of the lower incisor covered by the upper when the teeth are closed naturally.   |
| Openbite                               | When the teeth are closed naturally, open bite is present if the upper incisors are above the lower incisors.  |
| Overjet                                | The horizontal distance between the incisors (i.e., the extent to which the teeth are protrusive or retrusive in the horizontal plane).  |
| Crossbite                              | Relationship of the posterior teeth; observed when an upper molar is oriented toward the lingual (tongue) or buccal (cheek) side of the lower teeth, rather than in the normal cusp to fossa relationship.   |
| <u>Gingival Inflammation</u>           | Inflammation of the papillary, marginal and attached gingiva of each tooth.  |
|  | Careful evaluation of the data collected in the posttest suggests that in two of the sites, the scoring of inflammation was not sufficiently reliable to permit further analysis.  |
| <u>Oral Hygiene Index<sup>a</sup></u>  | Average of the plaque scores obtained for the buccal and lingual surfaces of a sample of six teeth. Plaque was scored from 0 (indicating no plaque) to 3 (indicating plaque extending to the middle third of the tooth).   |
| <u>Treatment Needs</u>                 | Urgent or routine needs for treatment based on clinical evaluation of, oral hygiene—presence of debris and calculus, decayed teeth, gingival inflammation and unacceptable occlusion.  |

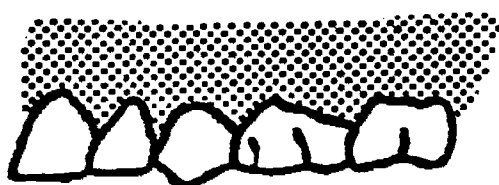
<sup>a</sup>See Exhibit 4-2 for drawings that elucidate dental terminology used in this chapter.



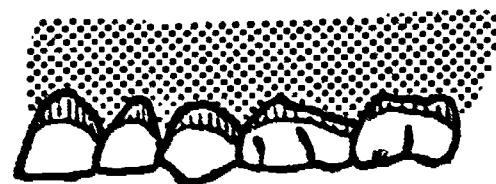
Exhibit 4-2  
Dental Terminology



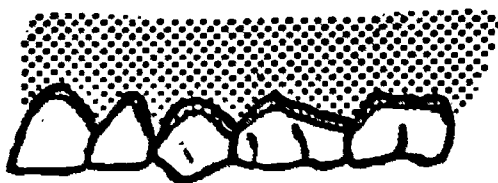
Oral Hygiene Index Scoring System<sup>a</sup>



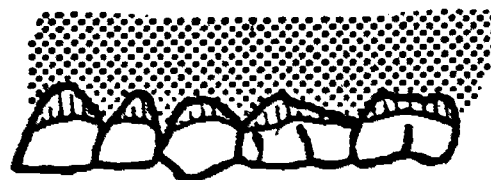
0-no plaque



2-plaque to the gingival third

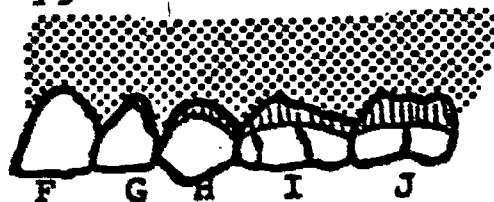


1-plaque limited to the gingival line



3-plaque to the middle third of tooth

Oral Hygiene Score Calculation



F=0      H=2      J=3  
G=1      I=3  
 $(F+G+H+I+J)/5=1.8$

<sup>a</sup> Oral hygiene scores were obtained in this manner on a sample of six teeth. One half the upper arch was used in this example to illustrate the calculation.

Head Start dental education and treatment services may be hypothesized to lower the incidence of decay and may increase the frequency with which carious teeth are restored.

### Analysis of Dental Data

The dental evaluation employed variables requiring the use of different analytic and statistical procedures. The major measures were of two kinds: (1) the oral hygiene index and (2) measures of surfaces, in which each surface was scored as carious, restored or missing, including number of decayed surfaces and number of filled surfaces.

The oral hygiene index is a continuous measure of average plaque, ranging from 0--indicating no plaque--to 3--extensive plaque. Its distribution appeared similar to a normal distribution; the mean and standard deviation have been included as descriptors, and normal statistics have been used to assess group differences.

By contrast, the measures derived from scoring surfaces (or teeth) represent counts of events, such as caries development or receipt of fillings. As discussed in Technical Appendix 2B, the distributions of these variables are well approximated by compound Poisson distributions.\* An

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\*Much previous dental research examining the process of decay has employed a t-test, which incorporates the assumption that the data follow a normal distribution (or do not depart too seriously from normality). Many physical measures (such as height and weight) tend to take values that are most frequently near some central value and are distributed symmetrically about that value, so that a normal distribution can serve as a reasonable model. However, the processes of decay, receipt of fillings, and loss of teeth do not produce data that resemble a normal distribution. Instead, the data more nearly resemble counts of rare events. The most frequent value, zero (no decay, no fillings, or no missing teeth), often dominates the other values; but the data usually include a considerable number of moderate and large values, producing distributions that are strongly skewed to the right. Models based on the Poisson distribution are often appropriate for such data. The patterns observed in this study's dental data suggest that the observations do not constitute a homogeneous sample. That is, because of factors like hygiene practices or receipt of fluoride, children do not develop caries at the same rate. Thus, the underlying mechanism may be more satisfactorily described as a mixture of Poisson distributions. In this situation it would be inappropriate to apply a t-test, primarily because the sample variance on which it is based would not be a satisfactory estimate of the population variance. Fortunately, a theoretical property of the Poisson distribution makes it possible still to work with the total or the mean of the data and to apply a different form of approximation based on the normal distribution. The result, as discussed in more detail in Technical Appendix 2B, is the z-statistic.

important property of Poisson distributions is that a sum of Poisson variables also follows a (suitable) Poisson distribution. Given this assumption, the test of the difference between Head Start (HS) and non-Head Start (NHS) takes the form:

$$z = \frac{\bar{x}_{HS} - \bar{x}_{NHS}}{\sqrt{\frac{n_{HS} x_{HS} + n_{NHS} x_{NHS}}{n_{HS} + n_{NHS}} \left[ \frac{1}{n_{HS}} + \frac{1}{n_{NHS}} \right]}}$$

The null hypothesis states that prevalences in the two groups are equal. The alternative hypothesis implies a one-tailed test and values of  $z$  greater than +1.645 (when Head Start is expected to have larger values) or less than -1.645 (when Head Start is expected to have smaller values) are significant at  $p < .05$ . The direction of these expectations is clear for decay and fillings; the prevalence of decay is hypothesized to be lower, and the prevalence of fillings to be higher for Head Start than for non-Head Start children. The direction is less clear for missing surfaces and for the sum of decayed, missing, or filled surfaces (dmf). (See Appendix Note 4-1.) Missing surfaces, as described above, are primarily teeth extracted by a dentist because of caries damage. Typically, preschool children do not have missing teeth. Because the primary teeth are exfoliating, exfoliation is frequently selected as a third measure of dental health for children this age. However, because of the extensive decay observed among these children, and the comparatively greater prevalence of extractions, the choice of the measure "missing surfaces" seems appropriate in these analyses. Thus, the measure reflects both exposure to treatment and a preceding serious dental health problem. Similarly, dmf surfaces include both untreated (cariou) and treated surfaces. Because this variable seems to provide a measure of overall need and/or use of dental services, a lower prevalence of dmf surfaces is hypothesized for the Head Start group.

The sample for analyses of the posttest prevalence measures, with their underlying Poisson distribution, is the randomly assigned children (Samples A and B). The null hypothesis of equal prevalence makes it important to confine these analyses to this sample. When the non-randomly-assigned children are included, the assumption of equal likelihood of outcomes may be questionable.

Prevalences on these variables differ dramatically across sites, as does the extent of fluoridation in county water supplies. Consequently, the dental analyses have been performed at the site level. In Greene and Humphreys Counties, with one exception, fluoride has not been present in the water. In Leakesville, from which approximately 13 percent of the children were drawn, water supplies began to be fluoridated at the beginning of the study year. In St. Clair County, the water supply is fluoridated in all communities except Lebanon. In Mingo County, water is fluoridated in two of the larger towns, Williamson and Matewan, but not in the rural areas. In Maricopa County, most of the residents use fluoridated water. Water is naturally fluoridated in two Maricopa County communities: Gila Bend and Tempe. Because of the profound differences in level of fluoridation, known to be related to caries development, and the concomitant differences in prevalence of decayed surfaces, most analyses have been performed within rather than across sites.

It must be noted that the evaluation team, during the pretest of the Head Start Health Evaluation, identified some children who were urgently in need of dental intervention--so urgently in need that the risk to the children of delaying referrals vastly exceeded the risk to the evaluation design. In many instances, the referrals for treatment were facilitated by the evaluation assistants in each site, resulting in decreases in the numbers of decayed surfaces and likewise increases in the numbers of filled and missing surfaces. These children's dmfs are easily identified outliers in Sample A. Consequently, in the analysis of the posttest data, where referral constitutes an intervention by the evaluation team, the affected children have been removed from the analysis. In each case, their presence or absence in the analyses is noted. In Table 4-1 these children's values at pre-test and posttest are displayed for number of decayed, filled and missing surfaces.

The dental evaluation also included a number of categorical measures, pertaining to the pedodontist's assessment of the child's need for treatment, the receipt of screening and treatment services through Head Start, and the mother's report of the child's dental history and care of teeth. Contingency table analyses were used to investigate differences in groups on the categorical variables.

## Findings of the Dental Evaluation

### Prevalence of Problems

In order to determine the prevalence of dental problems among low-income children, dental examination data collected at the pretest were examined. The dental health of these children was notably poor. Across the four sites, 59 percent of the children had decayed surfaces. As noted in Exhibit 4-3, prevalence of tooth decay was highest in Greene and Humphreys Counties both in terms of the proportion of children with decayed teeth (80 percent) and the average number of decayed surfaces (7.1) per child. Prevalence was lowest in St. Clair County, where 48 percent of the children had tooth decay and the number of decayed surfaces averaged 2.3. Prevalence of missing teeth, on the other hand, was low in all sites. Only a small proportion of the children had filled surfaces (8 percent across the four sites). Treatment of tooth decay was more common in Maricopa County than in the other three sites.

Exhibit 4-4 provides information about the profile and primary occlusion of children participating in the pretest evaluation. Crossbite was a more serious problem in Greene and Humphreys Counties and St. Clair County than in the other two sites. In 15 percent of the children, across the four sites, fractured teeth were found to be present.

The prevalence of oral hygiene problems among the pretested children is shown in Exhibit 4-5. Greene and Humphreys Counties and Mingo County evidence the most serious problems with plaque.

Urgent dental treatment needs of the children at pretest are displayed in Exhibit 4-6. Across the four sites, approximately one-fourth of the children were diagnosed as having urgent dental treatment needs. Site variation was evident, however. Greene and Humphreys Counties were on the high end of the scale, with one out of three children having urgent dental treatment needs particularly for problems of unacceptable tooth decay and occlusion. Twenty-seven percent of children in Mingo County had urgent dental needs but the profile of dental health problems was somewhat different from that in Greene and Humphreys Counties--the proportion of Mingo County children with serious tooth decay was 5 percent higher than in Greene and Humphreys Counties. Urgent treatment needs for oral hygiene problems and inflammation of the gums were common in Mingo County but almost non-existent

**Prevalence of Affected Surfaces at Pretest: Number and Percent  
of Affected Children and Average Number of Affected Surfaces**

| Prevalence Variables                      | Pretested Children (Samples A and D) in: |                           |                         |                      |                    |
|---|--|---------------------------|-------------------------|----------------------|--------------------|
|   | Greene & Humphreys Counties<br>n=91      | St. Clair County<br>n=109 | Maricopa County<br>n=94 | Mingo County<br>n=73 | All Sites<br>n=367 |
| <b>Decayed Surfaces</b>                   |  |                           |                         |                      |                    |
| Number of Affected Children               | 73                                       | 52                        | 55                      | 37                   | 217                |
| Percent of Affected Children              | 80                                       | 48                        | 59                      | 51                   | 59                 |
| Average Number of Affected Surfaces/Child | 7.09                                     | 2.32                      | 4.06                    | 5.47                 | 4.57               |
| <b>Filled Surfaces</b>                    |  |                           |                         |                      |                    |
| Number of Affected Children               | 6  | 1                         | 14                      | 7                    | 28                 |
| Percent of Affected Children              | 7  | 1                         | 15                      | 10                   | 8                  |
| Average Number of Affected Surfaces/Child | .29                                      | .07                       | 1.77                    | .14                  | .57                |
| <b>Missing Surfaces</b>                   |  |                           |                         |                      |                    |
| Number of Affected Children               | 3  | 5                         | 6                       | 2                    | 16                 |
| Percent of Affected Children              | 3  | 5                         | 6                       | 3                    | 4                  |
| Average Number of Affected Surfaces/Child | .33                                      | .27                       | .59                     | .34                  | .38                |
| <b>Average dmf</b>                        | 7.68                                     | 2.67                      | 6.41                    | 5.95                 | 5.52               |

Exhibit 4-4

Profile, Primary Occlusion, and Occlusion Measures at Pretest

|                                   |   | Pretested Children (Samples A and D) in: |                  |                 |              |           |     |
|-----------------------------------|---|--|------------------|-----------------|--------------|-----------|-----|
|                                   |   | Greene & Humphreys Counties              | St. Clair County | Maricopa County | Mingo County | All Sites |     |
| <b>Profile</b>                    |   |  |                  |                 |              |           |     |
|                                   | N | 89                                       | 109              | 93              | 73           | 364       |     |
| Straight                          | X | 99                                       | 95               | 100             | 51           | 88        |     |
| Convex                            | X | 0  | 3                | -               | 44           | 10        |     |
| Concave                           | X | 1  | 2                | -               | 6            | 2         |     |
| <b>Right Primary Occlusion</b>    |   |  |                  |                 |              |           |     |
|                                   | N | 91                                       | 110              | 94              | 71           | 366       |     |
| Flat                              | X | 3  | 47               | 43              | 42           | 34        |     |
| Distal Step                       | X | 2  | 5                | 5               | 7            | 5         |     |
| Mesial Step                       | X | 95                                       | 48               | 52              | 51           | 61        |     |
| <b>Left Primary Occlusion</b>     |   |  |                  |                 |              |           |     |
|                                   | N | 91                                       | 110              | 94              | 71           | 366       |     |
| Flat                              | X | 3  | 44               | 45              | 38           | 33        |     |
| Distal Step                       | X | 2  | 2                | 4               | 3            | 3         |     |
| Mesial Step                       | X | 95                                       | 55               | 51              | 59           | 65        |     |
| <b>Degree of Overbite</b>         |   | N  | 89               | 108             | 86           | 70        | 353 |
| Openbite                          |   |  | 8                | 10              | 6            | 7         | 8   |
| 0-5%                              | X |  | 12               | 19              | 14           | 16        | 16  |
| 5-25%                             | X |  | 40               | 12              | 24           | 11        | 22  |
| 25-50%                            | X |  | 25               | 30              | 30           | 30        | 29  |
| 50-75%                            | X |  | 8                | 17              | 9            | 17        | 13  |
| 75-100%                           | X |  | 7                | 13              | 16           | 9         | 13  |
| <b>Size of Overjet</b>            |   | N  | 87               | 106             | 90           | 65        | 348 |
| -2-0mm                            | X |  | 7                | 6               | 4            | 0         | 5   |
| 0-1mm                             | X |  | 17               | 14              | 23           | 9         | 16  |
| 1-2mm                             | X |  | 28               | 36              | 29           | 28        | 30  |
| 3mm                               | X |  | 28               | 26              | 20           | 32        | 26  |
| 4mm                               | X |  | 12               | 9               | 13           | 5         | 10  |
| 5mm or more                       | X |  | 9                | 9               | 10           | 26        | 13  |
| <b>Crossbite</b>                  |   | N  | 87               | 109             | 94           | 71        | 361 |
|                                   | X |  | 23               | 16              | 5            | 9         | 13  |
| <b>Presence of Fracture Teeth</b> |   | N  | 83               | 108             | 94           | 71        | 356 |
|                                   | X |  | 19               | 13              | 10           | 18        | 15  |

Exhibit 4-5

Average Oral Hygiene Index for Children  
in Pretest

| Oral Hygiene Index | Pretested Children (Samples A and D) in: |                        |                       |                       |           |
|--------------------|--|------------------------|-----------------------|-----------------------|-----------|
|                    | Greene & Humphreys Counties n=91         | St. Clair County n=109 | Maricopa County n=94  | Mingo County n=73     | All Sites |
| N                  | 91                                       | 109                    | 94                    | 73                    | 367       |
| Mean               | 1.94                                     | 1.21                   | 1.20                  | 1.60                  | 1.42      |
| Standard Deviation | .56                                      | .34                    | .33                   | .69                   | —         |
| Range              | Min. .38<br>Max. 3.00                    | Min. .00<br>Max. 1.83  | Min. .58<br>Max. 1.92 | Min. .00<br>Max. 3.00 | —         |

Range = 0 (no plaque) to 3 (extensive plaque).

Exhibit 4-6

Urgent Dental Treatment Needs of Children  
in Pretest

| Urgent Dental Treatment Needs | Pretested Children (Sample A and D) in: |                        |                      |                   |                 |
|-------------------------------|---|------------------------|----------------------|-------------------|-----------------|
|                               | Greene & Humphreys Counties n=91        | St. Clair County n=113 | Maricopa County n=95 | Mingo County n=73 | All Sites n=376 |
| Any                           | n 30<br>% 32                            | n 25<br>% 22           | n 13<br>% 14         | n 20<br>% 27      | n 88<br>% 23    |
| Oral Hygiene                  | n 21<br>% 2                             | n 1<br>% 1             | n 0                  | n 15<br>% 21      | n 18<br>% 1     |
| Decay                         | n 16<br>% 17                            | n 14<br>% 12           | n 11<br>% 12         | n 16<br>% 22      | n 67<br>% 18    |
| Inflammation                  | n 9<br>% 1                              | n 2<br>% 2             | n 0                  | n 11<br>% 15      | n 22<br>% 6     |
| Unacceptable Occlusion        | n 17<br>% 18                            | n 2<br>% 2             | n 1<br>% 1           | n 5<br>% 7        | n 25<br>% 7     |



in the other three sites. Of the four sites, Maricopa County had the lowest proportion of children with urgent dental treatment needs. Tables 4-2 through 4-7 compare the prevalence of dental health problems of children assigned to Head Start and non-Head Start groups at pretest.

Exhibit 4-7 compares the dental health of children participating in the Head Start Health Evaluation with participants in both the Ten-State Nutrition Survey and the First National Health and Nutrition Examination Survey. The comparison was the measure df (average number of decayed and filled teeth) as an indicator of good or poor dental health. Values of df are shown by race (white, black, and Hispanic).

At pretest, the df of the children in the Head Start Health Evaluation was comparable to the df of children in low-income ratio states of the Ten-State Nutrition Survey, but significantly higher than that of children in the First National Health and Nutrition Examination Survey or high-income ratio states (of the Ten-State Nutrition Survey). The comparison of greatest interest is that between children at posttest and children in the other two surveys. The comparison indicates that the dental health of evaluated children declines significantly with age. The df of both Head Start and non-Head Start children at posttest significantly exceeds that of children in the low-income ratio states of the Ten-State Nutrition Survey. Thus, children in the Head Start Health Evaluation (who come from medically underserved areas) have poorer dental health (as measured by df) than their counterparts of a decade ago in the Ten-State Nutrition and First National Health and Nutrition Examination Surveys.

#### Dental Services Provided by Head Start and Other Sources

The Head Start Performance Standards state that the dental health services component shall include "obtaining or arranging for basic dental care services" as follows:

- Dental examination;
- Services required for the relief of pain or infection;
- Restoration of decayed primary and permanent teeth;
- Pulp therapy for primary and permanent teeth as necessary;
- Extraction of non-restorable teeth;

Exhibit 4-7

Average Number of Decayed and Filled Teeth<sup>a</sup> in Children Two through Five Years of Age in Head Start Health Evaluation<sup>b</sup>, the Ten State Nutrition Survey, and the First National Health and Nutrition Examination Survey

|          | Head Start Health Evaluation  |                          |                | First National Health and Nutrition Examination Survey | Ten-State Nutrition Survey |                                       | Comparison of Posttest Data with Ten State Low-Income Ratio States |                                  |
|----------|-------------------------------|--------------------------|----------------|--|----------------------------|---------------------------------------|--|----------------------------------|
|          | At Pretest                    | At posttest <sup>c</sup> |                |  | Low-Income Ratio States    | High-Income Ratio States <sup>c</sup> | Head Start <sup>d</sup><br>z                                       | non-Head Start <sup>d</sup><br>z |
|          | Head Start and Non-Head Start | Head Start               | Non-Head Start |  |                            |                                       |  |                                  |
| White    | 3.01<br>n=98                  | 4.28<br>n=40             | 4.90<br>n=42   | 0.9<br>n=2478  | 3.47<br>n=412              | 1.83<br>n=1291                        | 2.60*  | 4.65*                            |
| Black    | 3.0<br>n=195                  | 5.01<br>n=105            | 4.20<br>n=80   | 0.9<br>n=438   | 2.17<br>n=1288             | 1.48<br>n=476                         | 18.14*   | 11.64*                           |
| Hispanic | 3.45<br>n=71                  | 4.19<br>n=43             | 4.07<br>n=14   | —  | 3.01<br>n=221              | 2.02<br>n=435                         | 3.96*  | 2.20*                            |

<sup>a</sup>Head Start Health Evaluation df includes permanent teeth where present; permanent teeth are excluded in Ten State measure.

<sup>b</sup>Posttest cross-sectional sample of children randomly assigned and not referred for emergency care.

<sup>c</sup>Low-income ratio states are those whose median poverty income ratio (PIR) is below the overall median for participating states. The low-income states were South Carolina, Louisiana, Texas, Kentucky, and W. Virginia. The high-income states included Michigan, California, Washington, Massachusetts, New York State and New York City. The poverty income ratio is a measure of family income which takes into account family size, gender of the family head, and place of residence.

<sup>d</sup>Values of z beyond ± are significant at  $p < .05$  as shown by (\*).

- Dental prophylaxis and instruction in self-care oral hygiene procedures; and
- Application of topical fluoride in communities which lack adequate fluoride levels in the public water supply

A review of the children's Head Start health records furnished information about the frequency with which the Head Start programs provided dental services, as well as the kinds and frequency of follow-up services. As shown in Exhibit 4-8, 80 percent of the children across the four sites were examined, ranging from 65 percent in Mingo County to 100 percent in Maricopa County. Of examined children, 47 percent were reported to have dental needs (including prophylaxis). Considerable site variation again was evident, the percentage of examined children with reported dental needs ranged from 26 percent in Greene and Humphreys Counties and in Mingo County to 91 percent in Maricopa County. With respect to caries, fillings were reported to be necessary for eight percent of the examined children in Greene and Humphreys Counties, and extractions were necessary for three percent of those examined.\* In Mingo County and Maricopa County, fillings were needed by proportionately more children; this finding was recorded for 41 and 66 percent, respectively, of those examined. Of the Head Start children receiving a dental examination, treatment was provided for 43 percent. Only in Mingo County do Head Start health records show that more children than those with findings were treated. After adjustment for this peculiarity, 82 percent of the children found by Head Start to have dental needs were referred for treatment.

There is no evidence that Head Start provides dental services to "special" groups of children. As shown in Tables 4-8 through 4-10, there do not appear to be any differences between the rates of dental screens, dental findings, or dental treatments for special groups of children such as those with incomes less than \$1295 or teenaged mothers. Moreover, as discussed in Chapter Two, there were also no differences in the rates of dental problems

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\*The evaluation results showed the number of decayed surfaces was higher in Greene and Humphreys than in other sites and that the vast majority of water supplies in those counties are not fluoridated. Because the Head Start health records simply summarize information from a dental chart completed by a local practitioner and reflect local standards of practice regarding filling of primary teeth (which are frequently not filled), it is difficult to relate the low level of need reported to Head Start to that observed in Head Start Health Evaluation examinations.

Exhibit 4-8

Dental Services Provided by Head Start to Head Start Children as a Result of the Dental Evaluation (Samples A, B, C)

| Head Start Dental Services        | Posttested Head Start Children (Samples A,B,C) in: |                        |                        |                                     |                   |
|-----------------------------------|--|------------------------|------------------------|-------------------------------------|-------------------|
|                                   | Greene & Humphreys Counties n=127                  | St. Clair County n=108 | Maricopa County n=102  | Mingo County n=112                  | All Sites n=449   |
| Child Received Dental Examination | n 84<br>% 66                                       | n 102<br>% 94          | n 102<br>% 100         | n 73<br>% 65                        | n 361<br>% 80     |
| Results:                          |  |                        |                        |                                     |                   |
| Any Dental Needs                  | n 22/84<br>% 26                                    | n 37/102<br>% 64       | n 93/102<br>% 91       | n 19/73<br>% 26                     | n 171/361<br>% 47 |
| Fillings Needed                   | n 7<br>% 8<br>range (2-18)                         | n 8<br>% 14<br>(1-10)  | n 67<br>% 66<br>(1-13) | n 19 <sup>a</sup><br>% 41<br>(1-11) | n 101<br>% 28     |
| Extractions Needed                | n 3<br>% 4   | n 1<br>% 2             | n 3<br>% 3             | n --<br>% --                        | n 7<br>% --       |
| Gingiva                           | n 4<br>% 5   | n --<br>% --           | n 75<br>% 74           | n 1<br>% 1                          | n 80<br>% 22      |
| Bone Condition                    | n 4<br>% 5   | n --<br>% --           | n --<br>% --           | n --<br>% --                        | n 4<br>% --       |
| Oral Hygiene                      | n 2<br>% 2   | n --<br>% --           | n 43<br>% 42           | n --<br>% --                        | n 45<br>% 40      |
| Other Condition                   | n 2<br>% 2   | n 37<br>% 64           | n 27<br>% 29           | n --<br>% --                        | n 66<br>% 47      |
| Treatment/Examined                | n 19<br>% 23                                       | n 33<br>% 32           | n 69<br>% 68           | n 36<br>% 49                        | n 157<br>% 43     |
| Treatment/Findings                | n 19<br>% 86                                       | n 33<br>% 89           | n 69<br>% 74           | n 19 <sup>a</sup><br>% 100          | n 140<br>% 82     |

<sup>a</sup> Adjusted to reduce number of children treated to the number with dental needs.

detected by the Head Start Health Evaluation for the children Head Start examined and the children they did not examine. Approximately one-third of both groups were found to have dental problems in the posttest evaluation.

There was agreement between the findings of the Head Start Health Evaluation dental examination and those reported in the Head Start health records in the majority of cases. However, in one out of four cases, no findings were reported based on the Head Start dental examination while pedodontists of the Head Start Health Evaluation found dental health needs. Such discrepancies were most common in Mingo County where 47 percent of the children who had been examined and reported to have no findings in the Head Start Health records were deemed to be in need of dental care by the evaluation team. What this finding suggests is a need for Head Start to examine the quality of dental examinations provided to enrolled children and to bring about improvements where needed. Where dental services are donated to the program, however, it may not be possible to change the outcome of the dental examinations.

Since local Head Start programs examined only a part of the Head Start group, it is important to look closely at the children Head Start did not examine. Do parents depend upon Head Start to provide a dental checkup and thus do not take the child to the dentist themselves while the child is enrolled? Such a substitution effect would be evident in these data if, among the Head Start children not receiving examinations, fewer parents report recent dental visits than parents whose children were examined. As shown in Exhibit 4-9, no difference is apparent in the proportion of parents of examined and non-examined Head Start children reporting recent dental visits. Moreover, in all four sites, the proportion of Head Start children who have been to a dentist is substantially higher than that of the non-Head Start groups.

Finally, we examined whether children from families with prior Head Start experience had better dental health than children from families entering Head Start for the first time. Pretest measures were used to answer this question. As illustrated in Tables 4-11 through 4-14, there appears to be evidence of such a trend. It suggests that Head Start participation may lead to improvements in the dental health of younger children in the family.

Exhibit 4-9

Children Whose Mothers Report They Have Been to the  
Dentist in the Previous Year by Those Examined  
and Not Examined by Head Start

| Examined/<br>Not<br>Examined/by<br>Head Start | Posttested Children (Samples A, B, C) in: |              |                     |             |                    |             |                 |              |              |              |
|---|---|--------------|---------------------|-------------|--------------------|-------------|-----------------|--------------|--------------|--------------|
|   | Greene &<br>Humphreys<br>Counties         |              | St. Clair<br>County |             | Maricopa<br>County |             | Mingo<br>County |              | All<br>Sites |              |
|   | HS<br>n=27                                | NHS<br>n=101 | HS<br>n=108         | NHS<br>n=86 | HS<br>n=102        | NHS<br>n=61 | HS<br>n=118     | NHS<br>n=109 | HS<br>n=447  | NHS<br>n=387 |
| Examined by<br>Head Start                     | n<br>81                                   | n<br>0       | n<br>56             | n<br>0      | n<br>101           | n<br>0      | n<br>69         | n<br>0       | n<br>307     | n<br>0       |
|   | %<br>32                                   | %<br>0       | %<br>75             | %<br>0      | %<br>90            | %<br>0      | %<br>71         | %<br>0       | %<br>68      | %<br>0       |
| Not Examined<br>by Head Start                 | n<br>39                                   | n<br>99      | n<br>49             | n<br>84     | n<br>0             | n<br>58     | n<br>12         | n<br>108     | n<br>100     | n<br>349     |
|   | %<br>31                                   | %<br>22      | %<br>71             | %<br>33     | %<br>0             | %<br>38     | %<br>67         | %<br>20      | %<br>56      | %<br>127     |

## Impact of Head Start on Children's Dental Health

Longitudinal Analysis. The longitudinal sample (A) was examined in order to measure changes in dental health between Head and non-Head Start children during the study year as evidenced by recent decay (present at posttest and not at pretest), fillings received since the pretest, and missing surfaces of teeth lost as a result of extraction or trauma since the pretest examination. Exhibit 4-10 shows the results of these analyses. (Children whose dental problems were so severe that they were immediately referred for treatment at the pretest were not included, because the intervention might dilute Head Start effects.) In all sites, except in Maricopa County, the incidence of decay was higher for the Head Start than the non-Head Start group; none of the group differences, however, were statistically significant.\* In all sites, except St. Clair County, where incidence of fillings was evident, the Head Start group scored higher than the non-Head Start group. Only in Maricopa County was the group difference large and statistically significant. There were no significant differences in the incidence of missing surfaces.

The dental health of children in the longitudinal sample (A) is shown in Exhibit 4-11. (Note that no adjustments for pretest scores were made in these analyses.) Head Start's impacts on the dental health of children in Maricopa County show evidence on decayed, filled, and missing surfaces. Head Start children in St. Clair County also have few decayed surfaces. Though not statistically significant (because of the hypothesized direction of the one-tailed test) one cannot ignore the higher prevalence of decayed surfaces among the Head Start children in Greene and Humphreys Counties. (Were a two-tailed test applied, the non-Head Start children have significantly fewer cavities and the incidence findings in Exhibit 4-10 add further credence to this concern.)

\*It should be noted that differences between the Head Start and non-Head Start groups, including all children in Sample A, initially were statistically significant. To determine whether this unexpected finding was the consequence of outliers, the calculations were repeated excluding one child with the highest dmf score. Excluding this child, it turned out that the Head Start group was not significantly higher than the non-Head Start group with respect to mean incidence of decay.

Exhibit 4-10

Incidence of Decayed, Filled, and Missing Surface for Head Start and Non-Head Start Children at Posttest and Not Referred for Treatment by the Pretest Evaluation

| Incidence Variables                             | Longitudinal Children (Sample A) |             |                  |             |                 |             |              |             |
|---|----------------------------------|-------------|------------------|-------------|-----------------|-------------|--------------|-------------|
|   | Greene & Humphreys Counties      |             | St. Clair County |             | Maricopa County |             | Mingo County |             |
|   | HS<br>n=37                       | NHS<br>n=24 | HS<br>n=25       | NHS<br>n=17 | HS<br>n=40      | NHS<br>n=16 | HS<br>n=15   | NHS<br>n=16 |
| Incidence of Decay<br>$\bar{x}_A$<br>z          | 5.86<br>2.02                     | 4.59        | 2.92<br>.62      | 2.59        | 1.13<br>-1.50   | 1.63        | 2.80<br>.62  | 2.44        |
| Incidence of Fillings<br>$\bar{x}$<br>z         | .08<br>.52                       | .05         | .00              | .00         | 4.80<br>8.63*   | .06         | .40<br>.74   | .25         |
| Incidence of Missing Surfaces<br>$\bar{x}$<br>z | .14<br>-1.52                     | .68         | .21<br>-.89      | .59         | .38<br>-.57     | .63         | .00          | .00         |

\*Values of z beyond +1.645 are significant at  $p < .05$ , shown as \*.



Exhibit 4-11

Prevalence of Decayed, Filled, and Missing Surfaces for Head Start  
and Non-Head Start Children at Posttest  
and Not Referred for Treatment by the Pretest Evaluation

| Prevalence Variables | Longitudinal Children (Sample A) in: |               |                  |                |                 |                |              |              |      |
|----------------------|--------------------------------------|---------------|------------------|----------------|-----------------|----------------|--------------|--------------|------|
|                      | Greene & Humphreys Counties          |               | St. Clair County |                | Maricopa County |                | Mingo County |              |      |
|                      | HS<br>n=37                           | NHS<br>n=24   | HS<br>n=25       | NHS<br>n=17    | HS<br>n=40      | NHS<br>n=16    | HS<br>n=15   | NHS<br>n=16  |      |
| Decayed Surfaces     | $\bar{x}$<br>z <sup>a</sup>          | 11.0<br>3.12  | 8.42             | 3.48<br>-2.21* | 4.88            | 2.25<br>-5.75* | 5.25         | 4.00<br>1.19 | 3.19 |
| Filled Surfaces      | $\bar{x}$<br>z                       | .08<br>-.96   | .17              | .00            | .00             | 5.73<br>2.45*  | .06          | .40<br>.73   | .25  |
| Missing Surfaces     | $\bar{x}$<br>z                       | .14<br>-1.46  | .63              | .40<br>-.39    | .59             | .38<br>-2.90*  | 2.19         | .00          | .00  |
| <u>Dmf</u>           | $\bar{x}$<br>z                       | 11.22<br>2.28 | 9.17             | 3.88<br>-2.00* | 5.47            | 8.28<br>-3.05* | 11.50        | 4.40<br>1.35 | 3.44 |

Values of z beyond  $\pm 1.645$  are significant at  $p < .05$ , shown as \*.

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Using dmf as a summative measure of dental health experience, it is evident that Head Start children in both St. Clair County and Maricopa County have significantly better dental health than the non-Head Start children. In contrast, Head Start children in Greene and Humphreys Counties tend to have poorer dental health than non-Head Start children, mostly accounted for by the high rate of decayed surfaces. Even if the calculations are repeated (as they were for the incidence variables excluding the one child with the highest dmf score) the prevalence of decayed surfaces of the Head Start group in this site remained higher than of the non-Head Start group.

Crosssectional Analyses. Crosssectional analyses on different samples were performed to determine prevalence of decayed surfaces, filled surfaces, and missing surfaces (to assess Head Start impacts) as well as the total dmf score at posttest (to assess the cumulative dental health of Head Start children compared to children in the non-Head Start group).

The dental health at posttest of the combination of Sample A (children who had received a pretest) and Sample B (children who had not received a pretest) also was assessed. Where relevant, the augmentation sample C (not randomly assigned) was also examined. These analyses on somewhat larger samples of children reveal similar trends to those found in the longitudinal sample and provide evidence of Head Start effectiveness in Greene and Humphreys Counties and St. Clair County in some analyses.

Exhibit 4-12 shows, the percentages of children with at least one decayed, filled, or missing surface. The relatively poor dental health of these low-income children is evident when the non-Head Start children are considered. In each site at least half the children have at least one carious surface, and in Greene & Humphreys Counties, 94 percent have. In three sites, few children have had teeth filled (3 to 19 percent); only in Maricopa County have as many as 24 percent of the 17 non-Head Start children had a surface filled. Six to eleven percent of the children in three sites have at least one missing tooth; in Maricopa County one out of four non-Head Start children have one or more missing teeth. Even among the Head Start children, three to eight percent of the children have missing teeth, and many children have no fillings. Standards of practice at the local level with regard to filling primary teeth may explain why some fraction of the observed caries have not been filled. Moreover, where the Head Start referral mechanism depends on the family for implementation, parents may not follow through consistently in obtaining treatment. Still, the

Exhibit 4-12

Prevalence of Affected Surfaces for Head Start and Non-Head Start Children at Posttest

| Prevalence Variables | Children in Samples A and B and Not Referred for Treatment by the Pretest Evaluation |             |                  |             |                 |             |              |             |             |              |
|----------------------|--|-------------|------------------|-------------|-----------------|-------------|--------------|-------------|-------------|--------------|
|                      | Greene & Humphreys Counties  |             | St. Clair County |             | Maricopa County |             | Mingo County |             | All Sites   |              |
|                      | HS<br>n=71   | NHS<br>n=46 | HS<br>n=37       | NHS<br>n=46 | HS<br>n=50      | NHS<br>n=17 | HS<br>n=32   | NHS<br>n=30 | HS<br>n=190 | NHS<br>n=139 |
| Decayed Surfaces     | n<br>67  | n<br>43     | n<br>22          | n<br>30     | n<br>25         | n<br>10     | n<br>18      | n<br>22     | n<br>132    | n<br>105     |
|                      | %<br>94  | %<br>94     | %<br>60          | %<br>65     | %<br>50         | %<br>59     | %<br>56      | %<br>73     | %<br>69     | %<br>76      |
| Filled Surfaces      | n<br>5   | n<br>3      | n<br>1           | n<br>2      | n<br>31         | n<br>4      | n<br>6       | n<br>1      | n<br>43     | n<br>10      |
|                      | %<br>7   | %<br>7      | %<br>3           | %<br>4      | %<br>62         | %<br>24*    | %<br>19      | %<br>3      | %<br>23     | %<br>7       |
| Missing Surfaces     | n<br>4   | n<br>3      | n<br>3           | n<br>5      | n<br>3          | n<br>4      | n<br>1       | n<br>2      | n<br>11     | n<br>14      |
|                      | %<br>6   | %<br>7      | %<br>8           | %<br>11     | %<br>6          | %<br>24*    | %<br>3       | %<br>7      | %<br>6      | %<br>10      |

\*Chi-squared is significant at  $p < .05$ .

prevalence of teeth presumed lost because of extraction or trauma is serious and appears to exceed that typically found in preschool populations.

A significant positive Head Start effect was found only in Maricopa County where a higher proportion of the Head Start children compared to the non-Head Start group had one or more filled teeth. (A similar positive trend was evident in Mingo County, although the group difference was not statistically significant.) In all sites, fewer Head Start than non-Head Start children had one or more missing teeth. Only in Maricopa County was the group difference statistically significant.

The number of decayed, missing, and filled surfaces at posttest in the same groups of children is shown in Exhibit 4-13. (Because it was not possible to collect radiological evidence of caries, the data represent conservative estimates of the extent of decay.) Comparisons of Head Start and non-Head Start children reveal a number of group differences. In Greene and Humphreys Counties and in Maricopa County, Head Start children have a significantly lower average number of decayed surfaces. In these sites, as well as in Mingo County, Head Start children have, on average, significantly more fillings than do the non-Head Start children. In Maricopa County, the Head Start group has a significantly lower average number of dmf surfaces. Similarly, in Exhibit 4-14 it is evident that in Maricopa and Mingo Counties Head Start children are more likely to have had teeth filled. These findings suggest that the provision of Head Start screening and treatment services has led to substantial improvement in certain components of dental health for Head Start participants in these sites.

The oral hygiene index also showed that Head Start children had significantly lower average index scores (no plaque = 0) than did non-Head Start children in two sites. As shown in Exhibit 4-15, St. Clair and Maricopa County Head Start children had, on average, index scores close to 1.45, while the non-Head Start children had comparatively higher scores exceeding 1.50. Classification of the profile and the primary occlusion are shown in Exhibit 4-16. Because these variables reflect basic physical measurements and are not considered especially sensitive to dental intervention, statistical comparisons of Head Start and non-Head Start groups have not been performed.

Exhibit 4-16 also shows the distribution across sites of three other occlusion measures--overbite, overjet, and crossbite--as well as the presence

Exhibit 4-13

Average Numbers of Affected Surfaces for Head Start and Non-Head Start Children Not Referred by the Pretest Evaluation

| Prevalence Variables  | Posttested Children in Samples A & B: |             |                  |             |                 |             |              |             |
|-----------------------|---------------------------------------|-------------|------------------|-------------|-----------------|-------------|--------------|-------------|
|                       | Greene & Humphreys Counties           |             | St. Clair County |             | Maricopa County |             | Mingo County |             |
|                       | HS<br>n=71                            | NHS<br>n=46 | HS<br>n=37       | NHS<br>n=46 | HS<br>n=50      | NHS<br>n=17 | HS<br>n=32   | NHS<br>n=30 |
| Decayed Sur-<br>faces | $\bar{x}$<br>11.59                    | 13.04       | 3.59             | 4.15        | 2.10            | 4.94        | 4.53         | 4.40        |
|                       | $z$<br>-2.20*                         |             | -1.28            |             | -6.03*          |             | .24          |             |
| Filled Sur-<br>faces  | $\bar{x}$<br>1.58                     | .11         | .14              | .20         | 6.78            | 3.82        | .44          | .13         |
|                       | $z$<br>7.76*                          |             | -.67             |             | 4.29*           |             | 2.22*        |             |
| Missing Sur-<br>faces | $\bar{x}$<br>.56                      | .54         | .41              | .65         | .30             | 2.06        | .31          | .50         |
|                       | $z$<br>.64                            |             | -.68             |             | -3.24*          |             | -.52         |             |
| <u>Dnf</u>            | $\bar{x}$<br>13.72                    | 13.67       | 4.11             | 5.00        | 9.12            | 10.82       | 5.28         | 5.03        |
|                       | $z$<br>.07                            |             | -1.55            |             | -1.71*          |             | .38          |             |

<sup>a</sup>Values of  $z$  beyond  $\pm 1.645$  are significant at  $p < .05$ , shown as \*.

Exhibit 4-14

Prevalence of Fillings at Posttest of Head Start and Non-Head Start Children<sup>a</sup>

| Prevalence of Fillings | Posttested Children (Samples A, B, C) Excluding Referred Children and Children with No History of Caries in: |             |                  |             |                 |             |              |             |
|------------------------|--|-------------|------------------|-------------|-----------------|-------------|--------------|-------------|
|                        | Greene & Humphreys Counties  |             | St. Clair County |             | Maricopa County |             | Mingo County |             |
|                        | HS<br>n=117  | NHS<br>n=86 | HS<br>n=67       | NHS<br>n=50 | HS<br>n=78      | NHS<br>n=35 | HS<br>n=84   | NHS<br>n=78 |
| Has Fillings           | n<br>14  | 6           | 6                | 3           | 60              | 11          | 21           | 7           |
|                        | $z$<br>12  | 7           | 9                | 6           | 77*             | 31          | 25*          | 9           |

<sup>a</sup>Chi squared test is significant at  $p < .05$  shown as \*.

Exhibit 4-15

Average Oral Hygiene Index for Head Start  
and Non-Head Start Children

| Oral Hygiene Index <sup>a</sup> | Posttested Children (Samples A, B C) in: |      |                  |       |                 |       |              |      |      |
|---------------------------------|--|------|------------------|-------|-----------------|-------|--------------|------|------|
|                                 | Greene & Humphreys Counties              |      | St. Clair County |       | Maricopa County |       | Mingo County |      |      |
|                                 | HS                                       | NHS  | HS               | NHS   | HS              | NHS   | HS           | NHS  |      |
| n                               | 127                                      | 101  | 104              | 84    | 104             | 60    | 119          | 107  |      |
| Mean <sup>b</sup>               | 1.84                                     | 1.85 | 1.43             | 1.52* | 1.44            | 1.61* | 1.70         | 1.72 |      |
| Standard Deviation              | .54                                      | .56  | .23              | .28   | .44             | .35   | .41          | .41  |      |
| Range                           | Min.                                     | .17  | .50              | 1.00  | .90             | .25   | .88          | .75  | .83  |
|                                 | Max.                                     | 3.00 | 3.00             | 2.08  | 2.50            | 2.50  | 2.42         | 2.60 | 2.80 |

<sup>a</sup>Range = 0 (no plaque) to 3 (extensive plaque).

<sup>b</sup>Non-Head Start significantly higher than Head Start at  $p \leq .05$ , shown as \*.

of fractured teeth, and the degree to which the tooth has been fractured.\* The occlusion measures represent physical relationships in the skeletal system of bones and teeth. Direct intervention to correct these relationships involves orthodontics and is not typically begun before adolescence, when the permanent occlusion has long been in place. The extent of overbite, overjet, and crossbite are only moderately sensitive to receipt of professional services and to dental health education. For example, restoration of cavities may result in some decrease in the amount of overbite. Overjet and crossbite may be related to oral habits like use of a pacifier and

\*No differences were observed between randomly assigned and non-randomly assigned children on overbite, overjet, crossbite, presence and degree of fractured teeth. Consequently, these data are combined across waves of recruitment.

Exhibit 4-16

Classifications of the Profile and Primary Occlusion for Head Start and Non-Head Start Children

|  | Posttested Children (Samples A, B, C) |     |                  |     |                 |     |              |     |     |
|--|---------------------------------------|-----|------------------|-----|-----------------|-----|--------------|-----|-----|
|  | Greene & Humphreys Counties           |     | St. Clair County |     | Maricopa County |     | Mingo County |     |     |
|  | HS                                    | NHS | HS               | NHS | HS              | NHS | HS           | NHS |     |
| <b>Profile</b>                             |                                       |     |                  |     |                 |     |              |     |     |
|  | N                                     | 127 | 101              | 105 | 84              | 105 | 60           | 119 | 108 |
| Straight                                   | X                                     | 85  | 79               | 28  | 26              | 50  | 58           | 22  | 31  |
| Convex                                     | X                                     | 7   | 17               | 72  | 74              | 51  | 40           | 69  | 69  |
| Concave                                    | X                                     | 8   | 4                | -   | -               | -   | 2            | 9   | 1   |
| <b>Right Primary Occlusion<sup>b</sup></b> |                                       |     |                  |     |                 |     |              |     |     |
|  | N                                     | 124 | 98               | 107 | 84              | 106 | 60           | 114 | 106 |
| Flat                                       | X                                     | 9   | 9                | 26  | 29              | 32  | 40           | 29  | 35  |
| Distal Step                                | X                                     | 2   | 3                | 1   | 4               | 9   | 5            | 8   | 7   |
| Mesial Step                                | X                                     | 89  | 88               | 73  | 68              | 59  | 55           | 63  | 59  |
| <b>Left Primary Occlusion<sup>c</sup></b>  |                                       |     |                  |     |                 |     |              |     |     |
|  | N                                     | 122 | 98               | 107 | 84              | 106 | 59           | 112 | 107 |
| Flat                                       | X                                     | 7   | 8                | 26  | 20              | 30  | 42           | 33  | 34  |
| Distal Step                                | X                                     | 4   | 2                | 2   | 4               | 12  | 5            | 5   | 9   |
| Mesial Step                                | X                                     | 89  | 90               | 72  | 76              | 58  | 53           | 63  | 57  |
| <b>Degree of Overbite</b>                  | N                                     | 120 | 96               | 101 | 81              | 93  | 57           | 113 | 107 |
| Openbite                                   | X                                     | 8   | 14               | 8   | 7               | 10  | 4            | 1   | 4   |
| 0-5%                                       | X                                     | 14  | 24               | 18  | 16              | 19  | 14           | 9   | 8   |
| 5-25%                                      | X                                     | 14  | 24               | 18  | 16              | 19  | 14           | 9   | 8   |
| 25-50%                                     | X                                     | 26  | 23               | 29  | 30              | 30  | 16           | 25  | 23  |
| 50-75%                                     | X                                     | 18  | 18               | 12  | 25              | 8   | 18           | 21  | 28  |
| 75-100%                                    | X                                     | 11  | 5                | 6   | 4               | 8   | 14           | 34  | 27  |
| <b>Size of Overjet</b>                     | N                                     | 120 | 96               | 101 | 82              | 93  | 52           | 112 | 103 |
| -2-0mm                                     | X                                     | 7   | 3                | 10  | 7               | 12  | 10           | 4   | 5*  |
| 0-1mm                                      | X                                     | 8   | 8                | 23  | 22              | 32  | 15           | 11  | 3   |
| 1-2mm                                      | X                                     | 32  | 27               | 27  | 35              | 17  | 31           | 20  | 21  |
| 3mm  | X                                     | 31  | 34               | 28  | 21              | 22  | 29           | 46  | 33  |
| 4mm  | X                                     | 18  | 19               | 6   | 6               | 9   | 10           | 8   | 18  |
| 5mm or more                                | X                                     | 6   | 8                | 7   | 9               | 9   | 6            | 13  | 20  |
| <b>Crossbite</b>                           | N                                     | 127 | 100              | 107 | 84              | 106 | 60           | 119 | 109 |
|  | X                                     | 20  | 10*              | 16  | 12              | 6   | 7            | 9   | 5   |
| <b>Presence of Fractured Teeth</b>         | N                                     | 127 | 100              | 107 | 83              | 105 | 60           | 118 | 109 |
|  | X                                     | 14  | 18               | 59  | 66              | 11  | 17           | 30  | 27  |
| <b>Degree of Fracture</b>                  | N                                     | 127 | 100              | 106 | 84              | 106 | 60           | 119 | 109 |
| No fracture                                | X                                     | 86  | 82               | 42  | 35*             | 89  | 83           | 70  | 73  |
| Enamel fractured                           | X                                     | 13  | 16               | 58  | 57              | 8   | 8            | 21  | 14  |
| Enamel & Dentin fractured                  | X                                     | 2   | 2                | 1   | 8               | 4   | 8            | 9   | 13  |

<sup>a</sup> Chi-squared test is significant at  $p < .05$ , shown as \*.

<sup>b</sup> Five children have right permanent occlusion--the permanent teeth had erupted and were observed in scoring the occlusion.

<sup>c</sup> Seven children had left permanent occlusion.

thumb-sucking. Thus, parent education about the consequences of these habits may modify and moderate, to some degree, crossbite and the extent of overjet. Comparisons of the Head Start and non-Head Start children do not reveal differences on overbite. However, in Mingo County, the size of the overjet is greater for non-Head Start children. Prevalences of crossbite similar among Head Start and non-Head Start children in three sites; however, in Greene and Humphreys Counties, crossbite is observed in 20 percent of the Head Start children compared to 10 percent of the non-Head Start children. When fractured teeth are considered, no differences are evident between Head Start and non-Head Start children. In St. Clair County, however, the degree of fracture differs between groups. Among the non-Head Start children, 8 percent have a tooth fractured in both the enamel and dentin (a more severe fracture), while only one percent of the Head Start children do.

The need for urgent treatment of dental health conditions was a clinical judgment of the examining dentist; that is, the pedodontists were asked to identify children whom they would immediately treat if they had seen them in their own practice. Results of this part of the dental examination are shown in Exhibit 4-17. With respect to oral hygiene, only in St. Clair County did the Head Start children differ significantly from the non-Head Start children; in that site three percent of the Head Start group, compared to 11 percent of the non-Head Start group, needed treatment for removal of debris and plaque and instruction about hygiene practices. Head Start and non-Head Start children did not differ in their needs for treatment of decay, nor in the frequency with which unacceptable occlusion was observed. However, again in St. Clair County, the groups differed in their need for treatment of gum inflammation. Twelve percent of the children in the non-Head Start group were judged to need this treatment while only 3 percent of the Head Start group did.

Care of teeth both at home and through professional services was included in the medical history; distributions obtained on these variables are shown in Exhibit 4-18. On one key indicator of care of teeth--whether the child has been to the dentist--the randomly assigned children (Samples A and B) differ significantly from those who were not randomly assigned (Sample C) as shown in Tables 4-15 through 4-18. Relatively few of the non-randomly assigned comparison children have seen a dentist. In Greene and Humphreys Counties and in Mingo County, only approximately 15 percent have been to a



Exhibit 4-17

Urgent Dental Treatment Needs of Head Start and Non-Head Start Children at Posttest<sup>a</sup>

| Urgent Dental Treatment Needs | Posttested Children (Samples A, B, C) |     |                  |     |                 |     |              |     |     |
|-------------------------------|---------------------------------------|-----|------------------|-----|-----------------|-----|--------------|-----|-----|
|                               | Greene & Humphreys Counties           |     | St. Clair County |     | Maricopa County |     | Mingo County |     |     |
|                               | HS                                    | NHS | HS               | NHS | HS              | NHS | HS           | NHS |     |
| Any                           | n                                     | 127 | 101              | 108 | 85              | 106 | 60           | 117 | 107 |
|                               | %                                     | 28  | 23               | 16  | 22              | 9   | 15           | 27  | 29  |
| Oral Hygiene                  | n                                     | 127 | 101              | 108 | 85              | 106 | 60           | 117 | 107 |
|                               | %                                     | 2   | 4                | 3   | 11*             | -   | -            | 3   | 0   |
| Decay                         | n                                     | 126 | 101              | 108 | 85              | 106 | 60           | 117 | 107 |
|                               | %                                     | 7   | 10               | 9   | 13              | 8   | 15           | 22  | 23  |
| Inflammation                  | n                                     | 127 | 101              | 108 | 85*             | 106 | 59           | 117 | 107 |
|                               | %                                     | 6   | 4                | 3   | 12              | -   | -            | 12  | 8   |
| Unacceptable Occlusion        | n                                     | 126 | 97               | 103 | 83              | 106 | 58           | 116 | 107 |
|                               | %                                     | 21  | 13               | 8   | 10              | -   | -            | 8   | 5   |

<sup>a</sup> Chi-squared test significant at  $p \leq .05$  shown as \*.

dentist, in the remaining sites no more than 35 percent have. Because of these differences, the data shown in Exhibit 4-18 are presented separately for the respective samples of children. Results of chi-square tests are included for analyses comparing Samples A and B versus Sample C, and Head Start versus non-Head Start (with all samples combined). There are no significant differences between the Head Start and non-Head Start groups on whether the family visits the dentist regularly or has dental insurance. However, in each site, Head Start children are more likely to have ever visited a dentist than non-Head Start children. Except in Greene and Humphreys Counties, Head Start children are more likely to have seen a dentist

Exhibit 4-18

Dental History and Care of Teeth According to Mother's Report for Head Start and Non-Head Start Children in the Randomly Assigned Samples (A and B) and the Non-Randomly Assigned Sample (C)

| Dental History and Care of Teeth | Greene & Humphreys Counties |                       |            |                        | St. Clair County |                       |            |                       |
|----------------------------------|-----------------------------|-----------------------|------------|------------------------|------------------|-----------------------|------------|-----------------------|
|                                  | Samples A&B                 |                       | Sample C   |                        | Samples A&B      |                       | Sample C   |                       |
|                                  | HS<br>n=76                  | NHS<br>n=52           | HS<br>n=50 | NHS<br>n=48            | HS<br>n=37       | NHS<br>n=45           | HS<br>n=71 | NHS<br>n=39           |
| Brush Teeth at Least Once a Day  | N<br>62<br>82               | 38<br>73              | 44<br>88   | 32<br>67 <sup>a</sup>  | 29<br>78         | 33<br>73              | 61<br>86   | 33<br>85              |
| Ever Been to Dentist             | N<br>31<br>41               | 17<br>33              | 18<br>35   | 7<br>15 <sup>a,b</sup> | 31<br>84         | 20<br>44 <sup>a</sup> | 60<br>85   | 14<br>36 <sup>a</sup> |
| Been to the Dentist in Past Year | N<br>27<br>36               | 15<br>29              | 14<br>27   | 7<br>15 <sup>b</sup>   | 25<br>69         | 17<br>38 <sup>a</sup> | 53<br>75   | 11<br>28 <sup>a</sup> |
| Has Dental Insurance             | N<br>46<br>60               | 21<br>40 <sup>a</sup> | 16<br>32   | 20<br>42 <sup>b</sup>  | 21<br>57         | 32<br>70              | 55<br>78   | 23<br>59 <sup>a</sup> |
|                                  | HS<br>n=61                  | NHS<br>n=40           | HS<br>n=40 | NHS<br>n=40            | HS<br>n=31       | NHS<br>n=37           | HS<br>n=64 | NHS<br>n=36           |
| Family Visits Dentist Regularly  | N<br>36<br>59               | 22<br>55              | 22<br>55   | 25<br>63 <sup>b</sup>  | 19<br>61         | 27<br>73 <sup>a</sup> | 49<br>77   | 19<br>53 <sup>a</sup> |

<sup>a</sup> Chi-squared test significant at  $p \leq .05$  for Head Start/Non-Head Start comparison within Samples A & B, or Sample C.

<sup>b</sup> Chi-squared test significant at  $p \leq .05$  for comparison of Samples A and B versus Sample C.

Exhibit 4-18 (continued)

Dental History and Care of Teeth According to Mother's Report for Head Start and Non-Head Start Children in the Randomly Assigned Samples (A and B) and the Non-Randomly Assigned Sample (C)

| Dental History and Care of Teeth   | Maricopa County |             |            |             | Mingo County |             |            |             |
|------------------------------------|-----------------|-------------|------------|-------------|--------------|-------------|------------|-------------|
|                                    | Samples A&B     |             | Sample C   |             | Samples A&B  |             | Sample C   |             |
|                                    | HS<br>n=50      | NHS<br>n=16 | HS<br>n=56 | NHS<br>n=43 | HS<br>n=35   | NHS<br>n=32 | HS<br>n=83 | NHS<br>n=77 |
| Brush Teeth at Least Once a Day    | N<br>44         | 13          | 51         | 29          | 24           | 21          | 54         | 44          |
|                                    | Z<br>88         | 81          | 91         | a 67        | 69           | 66          | 65         | 57          |
| Ever Been to Dentist               | N<br>47         | 12          | 50         | 15          | 29           | 12          | 56         | 12          |
|                                    | Z<br>94         | a 75        | 89         | a,b 35      | 83           | a 38        | 67         | a,b 16      |
| Been to the Dentist in Past Year   | N<br>46         | 11          | 49         | 12          | 29           | 10          | 54         | 12          |
|                                    | Z<br>92         | a 67        | 87         | a,b 28      | 83           | a 32        | 65         | a,b 16      |
| Has Dental Insurance               | N<br>7          | 1           | 10         | 10          | 15           | 10          | 25         | 20          |
|                                    | Z<br>14         | 6           | 18         | 18          | 43           | 31          | 30         | 26          |
|                                    | HS<br>n=44      | NHS<br>n=15 | HS<br>n=53 | NHS<br>n=39 | HS<br>n=29   | NHS<br>n=28 | HS<br>n=68 | NHS<br>n=69 |
| Family Visits to Dentist Regularly | N<br>13         | 4           | 26         | 13          | 13           | 2           | 22         | 29          |
|                                    | Z<br>30         | 27          | 49         | b 33        | 45           | a 7         | 32         | a 42        |

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<sup>a</sup> Chi-squared test significant at  $p \leq .05$  for Head Start/Non-Head Start comparison within Samples A & B, or Sample C.

<sup>b</sup> Chi-squared test significant at  $p \leq .05$  for comparison of Samples A and B versus Sample C.A

dentist, in the remaining sites no more than 35 percent have. Because of these differences, the data shown in Exhibit 4-18 are presented separately for the respective samples of children. Results of chi-square tests are included for analyses comparing Samples A and B versus Sample C, and Head Start versus non-Head Start (with all samples combined). There are no significant differences between the Head Start and non-Head Start groups on whether the family visits the dentist regularly or has dental insurance. However, in each site, Head Start children are more likely to have ever visited a dentist than non-Head Start children. Except in Greene and Humphreys Counties, Head Start children are more likely to have seen a dentist in the past year than are non-Head Start children. Further, in Greene and Humphreys and Maricopa Counties, Head Start participants are more likely than the comparison group to brush their teeth at least once a day.

The Head Start randomly assigned sample (Samples A and B) were also compared with the Head Start non-randomly assigned sample (Sample C) on the prevalence measures. In this analysis, the children referred as a result of the pretest examination have been included for two reasons. First, since the analysis is confined to the Head Start sample, all children have experienced some intervention by Head Start with respect to dental health. Second, children in the Head Start-recruited group (Sample C) did not participate in the pretest and, thus, could not have been referred. Consequently, to exclude referred children is to exclude potentially extreme members of one group without the ability to exclude comparable members of the other group. As shown in Exhibit 4-19, in many of these comparisons, the randomly assigned Head Start children differ from the non-randomly assigned group. With respect to the decay, the mean of the randomly assigned Head Start children in Mingo County significantly exceeds that of the group recruited by Head Start. In Maricopa County, the mean number of fillings is higher for the non-randomly-assigned group. In Greene and Humphreys County and in Mingo County, the non-randomly assigned children have more missing surfaces, on average. Finally, in Greene and Humphreys Counties the randomly assigned children have a lower mean dmf, while in Maricopa County, this group has a higher mean dmf than the group recruited by Head Start.

Exhibit 4-19

Comparison of Randomly Assigned and Non-Randomly Assigned Children  
in Head Start (Referred Children Included)

| Prevalence Variables | Greene & Humphreys Counties |                          | St. Clair County      |                       | Maricopa County       |                  | Mingo County          |                  |
|----------------------|-----------------------------|--------------------------|-----------------------|-----------------------|-----------------------|------------------|-----------------------|------------------|
|                      | Samples A & B<br>n=76       | Sample C<br>n=50         | Samples A & B<br>n=37 | Sample C<br>n=71      | Samples A & B<br>n=50 | Sample C<br>n=56 | Samples A & B<br>n=35 | Sample C<br>n=83 |
| Decayed Surfaces     | mean<br>z                   | 12.34<br>13.24<br>-1.39  | 3.59<br>3.36<br>.63   | 2.10<br>1.68<br>1.58  | 7.97<br>6.68<br>2.42* |                  |                       |                  |
| Filled Surfaces      | mean<br>z                   | 2.00<br>2.44<br>-1.64    | .14<br>.23<br>-1.04   | 6.78<br>5.61<br>2.43* | .74<br>1.08<br>-1.71  |                  |                       |                  |
| Missing Surfaces     | mean<br>z                   | .84<br>2.40<br>3.18*     | .41<br>.64<br>-.70    | .30<br>.54<br>-.83    | .71<br>2.02<br>-2.27* |                  |                       |                  |
| Dmf                  | mean<br>z                   | 14.95<br>17.86<br>-3.42* | 4.11<br>4.14<br>-.06  | 9.12<br>7.82<br>2.10* | 9.43<br>9.77<br>-.42  |                  |                       |                  |

\*In a two tailed test, values of z beyond  $\pm 1.96$  are significant at  $p < .05$  and show as \*.

## Conclusion

The results of the Head Start Health Evaluation support the conclusion that the Head Start's program of dental health services leads to improved dental health status of the Head Start children. A significantly higher proportion of Head Start children than non-Head Start children in all sites have visited a dentist. Moreover, Head Start children, in at least two sites, have lower incidence of decay and a higher number of fillings. Likewise in two sites oral hygiene scores seem to indicate that a higher proportion of the Head Start children have received prophylactic care, and Head Start children are more likely to brush their teeth once a day and maintain better hygiene practices than children in the non-Head Start group.

Furthermore, findings suggest that Head Start participation may lead to improvements in the dental health of younger children in the family. Children from families with prior Head Start experience appear to have better dental health status even before entry into Head Start.

However, the extent of the impacts of Head Start's services depends considerably on other factors such as fluoridation in the community water system, the procedures Head Start adopts to deliver services, the availability of dentists to serve those in the community (including the children), and the knowledge and attitudes of parents with regard to the dental health of their children. For example, fluoride, a known inhibitor of caries development, was absent in the water systems in Greene and Humphreys Counties and Mingo County. In both of these locations, the prevalence of dental caries was substantially higher than in St. Clair County and Maricopa County, where most of the children drink fluoridated water. Hence, children in the non-fluoridated areas enter Head Start with a substantial number of decayed teeth, thereby presenting the program with many more dental health needs than in other sites. Furthermore, even with intervention, the children who enter the program with a high prevalence of caries tend to continue to have a high incidence of caries after Head Start intervention.\*

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\*Comparison of the average number of decayed, filled and missing surfaces in fluoridated and non-fluoridated areas is given in Table 4-19.

The procedures Head Start adopts to examine and treat children to meet their dental health needs are also important factors in the dental health status of the children. Where Head Start places a considerable amount of responsibility on the parents to meet the dental health needs of their children, the needs are not well met. Procedures such as requiring the parents to arrange for a dental examination for their children prior to entry into Head Start (as in St. Clair County) or to assume the responsibility for following through on a course of dental treatment after the child has been examined by Head Start (as in Greene and Humphreys Counties and Mingo County) do not tend to lead to completion of a desirable course of treatment for the children. By contrast, a procedure such as that implemented in Maricopa County (a fluoridated area), where the program purchases examination, prophylaxis, and treatment as needed, on a contractual basis (at a fixed cost per child), it is evident that the dental health status of the Head Start children is much better than that seen in any other community in the Head Start Health Evaluation.

Other factors such as the number of dentists available and accessible by the population of the community or county also have an impact on dental health. Both of the very rural sites, Greene and Humphreys Counties and Mingo County, are excellent examples of the difficulties which either Head Start or parents have in procuring dental services for children. The lack of sufficient dental health professionals to serve a community also may have implications for the family's attitudes toward dental health. If the parents are not accustomed to adequate dental health care, they may not know the importance of, and seek services to improve, the dental health status of their children. These findings strongly suggest that in certain communities systematic provision of Head Start dental services to low-income preschool children leads to substantially improved dental health.

## CHAPTER FIVE

### ANTHROPOMETRIC EVALUATION

#### Anthropometric Indicators

Measurements of body dimensions (anthropometry) can be made reliably (Roche, 1978) and generally accepted protocols allow comparability with other studies. Good reference data from the National Center for Health Statistics allow determination of growth status within age and gender categories, relative to national populations.

Measures of overall body size, such as height and weight, generally reflect the total cumulative nutriture (height) or short-term nutriture (weight) of the child (Himes, 1980). It should be noted that a few days of serious illness can alter weight considerably. A gross measure such as weight, however, does not reveal the composition of the body. For example, one cannot determine whether an overweight child is heavy because of excess fat or because of unusual muscularity. The thickness of the subcutaneous fat therefore serves to identify degrees of fatness or leanness. Fat thickness, measured by triceps skinfold thickness, provides a better criterion for determining obesity than body weight alone or a combination of height and weight (Himes, 1980).

Anthropometric data were taken for each child by members of the examination teams who had been specially trained to follow recommended protocols. The protocols closely follow those used to collect the data on which the growth charts for the National Center for Health Statistics were based (Hamill et al., 1979). The measurements, the equipment, and the protocol used for each are presented in Exhibit 5-1. The details of the measurement techniques generally correspond to those described by Roche (1978). Two derived anthropometric indicators were used: weight for height and estimated muscle circumference.

Because height and weight measure only single aspects of a child, it is customary to combine them to gain more information concerning the child's body proportions and build. For statistical and theoretical reasons, the weight-height relationship is best expressed as a regression of weight on,



height. This can be achieved by using regression-type reference data like those from the National Center for Health Statistics. The resulting measure, "weight for height," describes the child's weight status relative to other children of the same height. This measure is particularly sensitive to acute nutritional insult to the child and is determined irrespective of age in preadolescent children.

Estimated muscle circumference estimates the muscularity of the arm, by using the measured arm circumference and the measured triceps skinfold thickness. The definition treats the arm as a cylinder and the estimated muscle circumference (EMC) is computed according to the formula:

Exhibit 5-1

Anthropometric Measures, Equipment Used and Protocol for Measurement

| <u>Measure</u>                 | <u>Equipment</u>         | <u>Protocol</u>  |
|--------------------------------|--------------------------|--|
| Height                         | Portable stadiometer     | Child's height measured to the nearest millimeter without shoes.   |
| Weight                         | Health-Co balance scale  | Child's weight measured to the nearest half pound; shoes and extra clothing removed.                                     |
| Arm Circumference              | Ross "Ensure" Insertapes | Child's arm circumference measured on left upper arm to the nearest millimeter.  |
| Triceps Skinfold Thickness     | Lange Caliper            | Thickness of child's subcutaneous fat, measured at left triceps to nearest 0.5 millimeter (average of two measurements). |
| Weight for Height              | (none)                   | Child's weight status relative to other children of the same height.   |
| Estimated Muscle-Circumference | (Derived Measure)        | Calculated from arm circumference and triceps skinfold:<br>$EMC = AC - \pi TSKF.$  |

$$EMC = AC - \pi TSKF,$$

where AC = arm circumference and TSKF = triceps skinfold. Estimated muscle circumference has also been used as a measure of the lean body mass, in an effort to separate the lean and fat portions of body composition (Frisancho, 1974).

Interrelationships among the anthropometric measures were investigated using the pretest data (see Exhibit 5-2). For these analyses, correlation coefficients were calculated within each six-month age group and

Exhibit 5-2

Average Age-Specific Correlation Coefficients<sup>a</sup>  
Among Anthropometric Measures

|                                | Weight | Weight for Height | Arm Circumference | Estimated Muscle Circumference | Triceps Skinfold |
|--------------------------------|--------|-------------------|-------------------|--------------------------------|------------------|
| Height                         | .78    | .31               | .36               | .39                            | .12 <sup>b</sup> |
| Weight                         |        | .83               | .68               | .64                            | .43              |
| Weight for Height <sup>b</sup> |        |                   | .72               | .63                            | .56              |
| Arm Circumference              |        |                   |                   | .89                            | .70              |
| Estimated Muscle Circumference |        |                   |                   |                                | .29              |

<sup>a</sup> Average correlations derived by combining age-specific coefficients using the z-transformation. Fewer significant chi-squared statistics indicating heterogeneity of age-specific correlations were observed than would be expected by chance ( $p < .05$ ).

<sup>b</sup> Only correlation coefficient in this Exhibit not significantly different from zero ( $p < .05$ ).

averaged across age groups using the z-transformation.\* The resulting average correlation coefficients represent associations independent of age (without assuming age linearity) and are better estimates of the true associations than the coefficient for any single age group. Virtually all the variables were significantly correlated (triceps skinfold and height were the only exception). The degree of association also indicated considerable separate variation. Because the variables can be measured reliably, deviations of the correlations from unity provide additional information. For example, triceps skinfold thickness and weight correlate 0.43, suggesting that subcutaneous fat and weight are measuring rather different characteristics. Not surprisingly, height and weight were highly correlated (0.78), as were weight and weight for height (0.83), and arm circumference and estimated muscle circumference (0.89). Subcutaneous fat thickness over the triceps was moderately related to other soft-tissue measures, but fatness in this sample was not significantly related to height.

#### Analysis of Anthropometric Measures

Initially, the analyses compared the anthropometric measures of the children to standard reference percentiles, which are available for males and females separately at half-year intervals of age. Using this approach to compare Head Start and non-Head Start children in each site, however, encounters many small samples, so that results would tend to be unreliable. Thus, for most analyses in this report, the anthropometric measures were expressed as gender-and-age-specific percentiles, so that the data could readily be aggregated, especially across gender. For height, weight, and weight for height a computer program furnished by the Centers for Disease Control (CDC) was used to calculate exact percentiles relative to the National Center for

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\*If  $r$  is a sample correlation coefficient, the z-transformation yields

$$z = 1/2[\log_e(1 + r) - \log_e(1 - r)];$$

whose distribution is almost normal with variance  $1/(n-3)$ , where  $n$  is the sample size. To combine values of  $z$  from samples of varying size, one forms the weighted average with weights  $n_i - 3$ , where  $n_i$  is the size of sample  $i$ . For further discussion, see Snedecor and Cochran (1967, Section 7.7).

Health Statistics reference data.\* For triceps skinfold, arm circumference, and estimated muscle circumference percentiles derived from the U.S. Health and Nutrition Examination Survey by Frisancho (1981) were smoothed for these analyses (see Technical Appendix 2B).

The percentiles, calculated within groups defined by gender, were pooled for analyses across age and gender groups after determining that no systematic differences attributable to age or gender of the child were present. This pooling greatly facilitated analyses because of the very small sample sizes within groups defined by the combination of age, gender, and site.

The National Center for Health Statistics percentiles have been recommended for use with children from all ethnic groups although they were derived from a sample of black and white children. Within the age group considered, there is little evidence of differences between ethnic populations that could not be attributed to socio-economic or other environmental factors (Habicht et al., 1974). Because there was no evidence of a systematic ethnic difference in the Head Start Health Evaluation data, they were also pooled across ethnic groups.

The analyses for the anthropometry data primarily examined distribution statistics for the anthropometric indicators relative to the reference data along with means and medians. Correlation coefficients were Pearson product-moment coefficients, and statistical significance was tested as significant difference from zero. Estimated rates of growth were calculated by linear regression.

The effect of Head Start on children's anthropometric status was investigated using multiple regression techniques. Regression models first adjusted for background covariates and site differences and then introduced an indicator variable for the Head Start treatment effect. Initial analyses considered a variety of covariates including: child's age, child's gender, child's race, per capita income, mother's education, family employment status, and mother's height. Only the following were found to be significant for more than one dependent variable across and within sites:

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\*Normalized data based on Hammill et al., 1979.

- child's age;
- child's gender;
- child's race;
- mother's height; and
- pretest value (longitudinal) analyses).

Mother's height, however, was available for fewer than half of the children; therefore two regression models were developed. The first model included only child's age, child's gender, and child's race (n=772), whereas the second included child's age, child's gender, child's race, and mother's height (n=376). Effects-coded variables were used to adjust for site differences (see Technical Appendix 2B). The dependent variables for both regression models were the z-scores of height, weight, weight for height, triceps skinfold thickness, arm circumference, and estimated muscle circumference. Specifically, the age-and-gender-specific means and standard deviations from the reference data were used to transform each child's measured values to a common scale.

In addition, a regression model for children in the longitudinal sample included the same covariates and site variables and posttest dependent measures (as the cross-sectional analyses), but also included pretest measurements as covariates. This model was used to examine the impact of Head Start on changes in children's growth from pretest to posttest.

### Summary of Anthropometry Findings

#### Prevalences of Growth Problems

Summary statistics for percentiles of height, weight, and weight for height with ages and sexes combined were prepared by site for children at pretest (see Exhibit 5-3). The height percentiles of the children in Maricopa County and Mingo County were below the national reference data, suggesting a possible deficient nutritional or health status. In Greene and Humphreys Counties, children were average; children in Maricopa County were the shortest.

Exhibit 5-3

Anthropometric Percentiles at Pretest Relative to  
National Center for Health Statistics Charts

| Anthropometric Measures | Pretested (Samples A and D) Children in: |                          |                        |                     |                   |      |
|-------------------------|--|--------------------------|------------------------|---------------------|-------------------|------|
|                         | Greene & Humphreys Counties (n=95)       | St. Clair County (n=113) | Maricopa County (n=95) | Mingo County (n=73) | All Sites (n=376) |      |
| Height                  | n  | 84                       | 104                    | 91                  | 66                | 345  |
| Mean Percentile         |  | 50.7                     | 44.0                   | 39.0                | 45.3              | 44.5 |
| St. Deviation           |  | 24.2                     | 27.0                   | 22.3                | 26.1              | 25.2 |
| Median Percentile       |  | 56.2                     | 41.9                   | 36.5                | 44.0              | 43.8 |
| Weight                  | n  | 85                       | 104                    | 89                  | 66                | 344  |
| Mean Percentile         |  | 52.4                     | 48.2                   | 48.6                | 52.1              | 50.1 |
| St. Deviation           |  | 23.5                     | 25.3                   | 24.9                | 27.6              | 25.1 |
| Median Percentile       |  | 56.4                     | 49.8                   | 45.2                | 54.2              | 50.1 |
| Weight for Height       | n  | 84                       | 103                    | 88                  | 65                | 340  |
| Mean Percentile         |  | 56.3                     | 56.0                   | 58.9                | 59.0              | 57.4 |
| St. Deviation           |  | 20.4                     | 20.3                   | 21.2                | 24.1              | 21.3 |
| Median Percentile       |  | 59.0                     | 58.5                   | 58.5                | 61.5              | 59.4 |

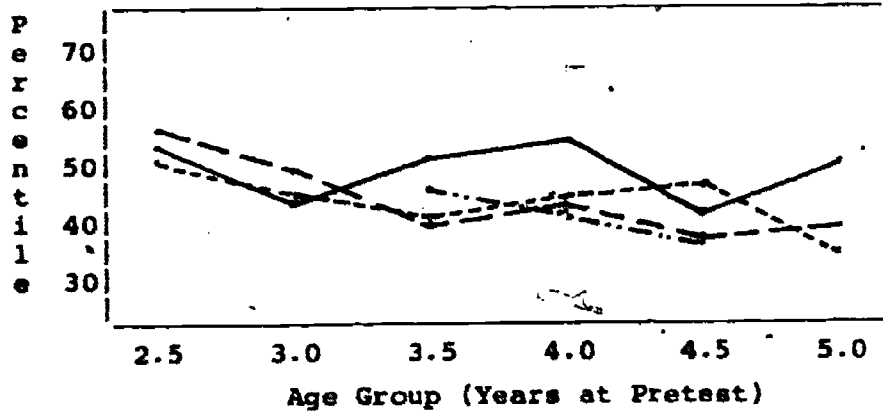
At pretest, mean and median weight percentiles approximated the national median (50th percentile) in all sites. This pattern of height and weight status resulted in slightly elevated weight for height\* in all sites.

Percentiles for height, weight, and weight for height at pretest were calculated by age group (6-month intervals) in each site. Results are graphically displayed in Exhibit 5-4. The pretest data suggest that as children grow older, both height and weight percentiles (relative to the national median) decrease slightly—that is, older children are further behind the national median than younger ones.

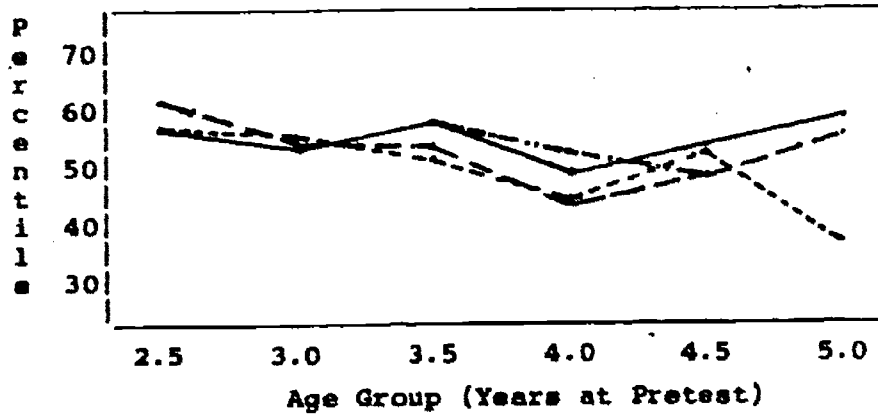
\*Although the children tended to be short they were slightly heavier than children of the same height in the national sample.

Exhibit 5-4

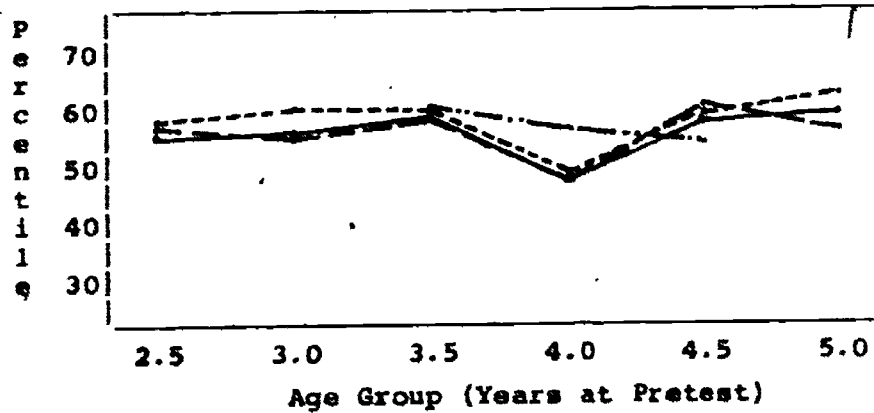
Growth Percentiles for Children  
by Age Group at Pretest



Height Percentiles



Weight Percentiles



Weight for Height Percentiles

|                                  |       |
|----------------------------------|-------|
| Greene and<br>Humphreys Counties | _____ |
| St. Clair County                 | _____ |
| Maricopa County                  | _____ |
| Mingo County                     | _____ |

We investigated the apparent slowdown in growth at pretest in the longitudinal sample; results are discussed in the impact section below.

### Head Start Services Provided

One focus of the Head Start Health Evaluation has been to document services provided to children in each of the health domains, both through Head Start and through other sources. There are two services that are related to children's growth: nutrition services and physical examinations that monitor height and weight. The provision of nutrition services is discussed in Chapter Six, and the provision of physical examinations is presented in Chapter Three. Therefore, to avoid repetition, sections on Services Provided through Head Start, Services Provided through Other Sources, and Services Provided to Special Groups are not included in this chapter.

### Impact of Head Start on Children's Growth

Longitudinal Analyses. The possibility that a decrease in growth that was observed for pretest children is due to a peculiarity of the pretest data is supported if one considers only the longitudinal sample of children. Graphs were prepared for these children (sample A) at pretest (Exhibit 5-5) and at posttest (Exhibit 5-6). Two facts are apparent. First, the longitudinal children at pretest do not display the downward trend in growth percentiles with age, which was observed for pretest children on average.\* Second, the graphs are remarkably similar from pretest to posttest, indicating that children's growth patterns did not change very much over the intervening year.

Graphs also were prepared to illustrate changes in growth rates (z-scores), relative to national population estimates (see Exhibit 5-7). These figures indicate that at all age levels children in the longitudinal sample were growing somewhat more slowly than the average child in the United States, but there is no indication that their rate of growth, compared to

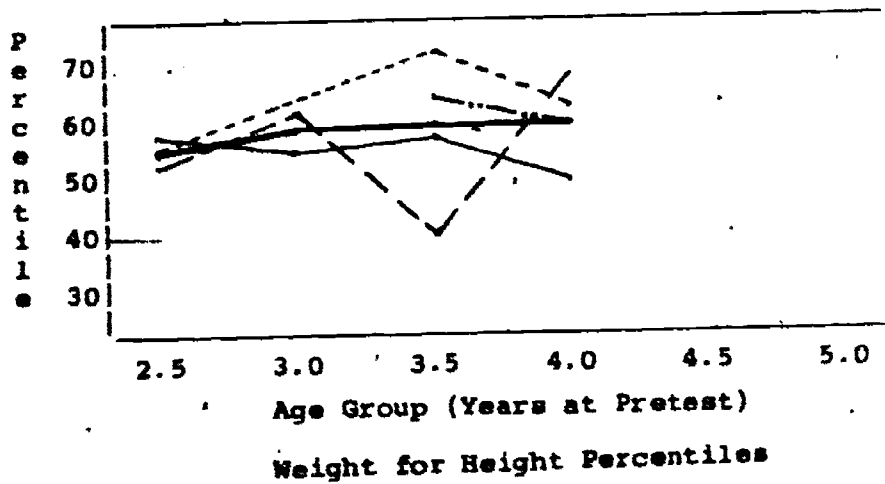
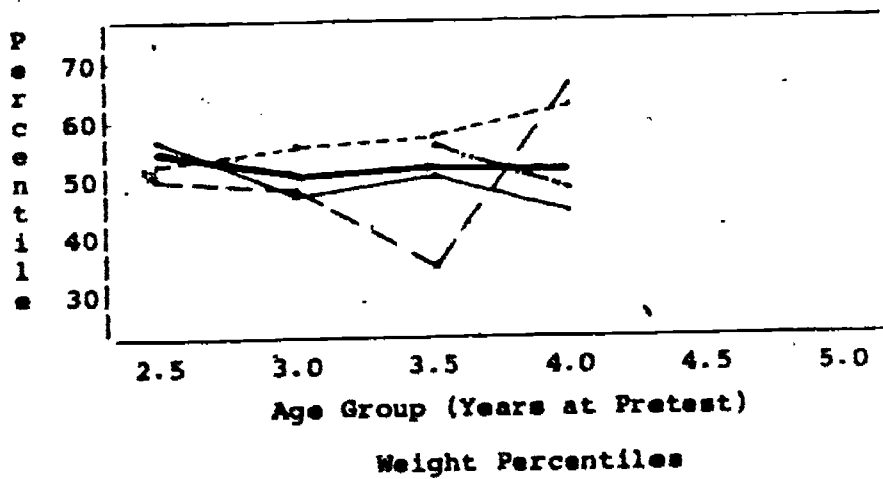
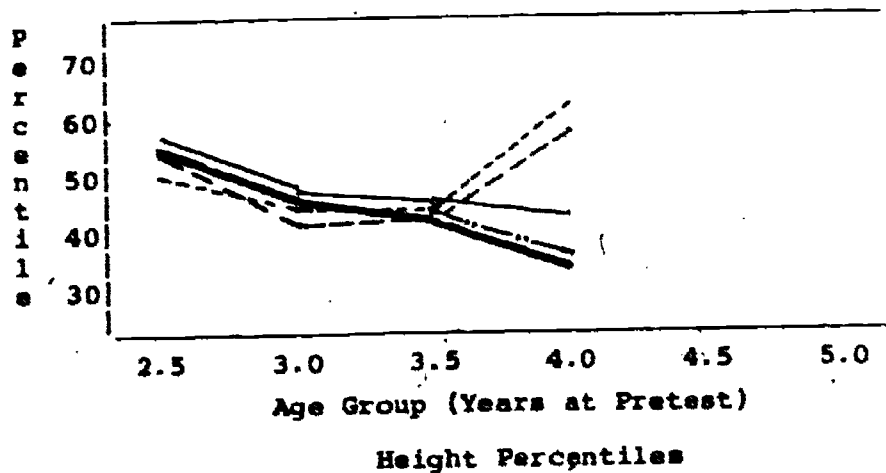
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\*This may be due to attrition which occurred from pretest to posttest, with children at a relatively lower socioeconomic status leaving the longitudinal sample.



Exhibit 5-5

Growth Percentiles for Longitudinal Children  
by Age Group at Pretest

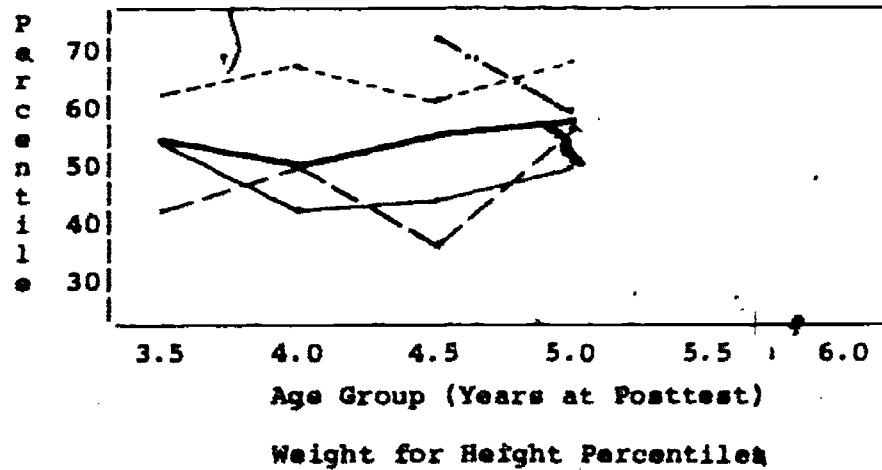
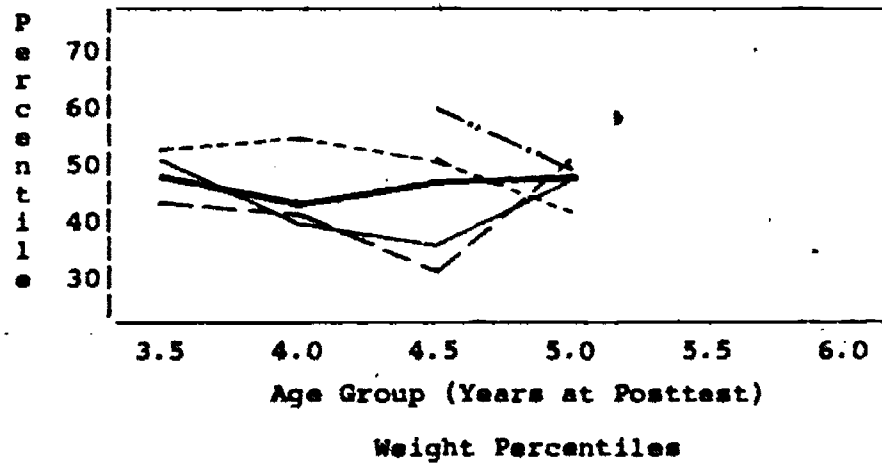
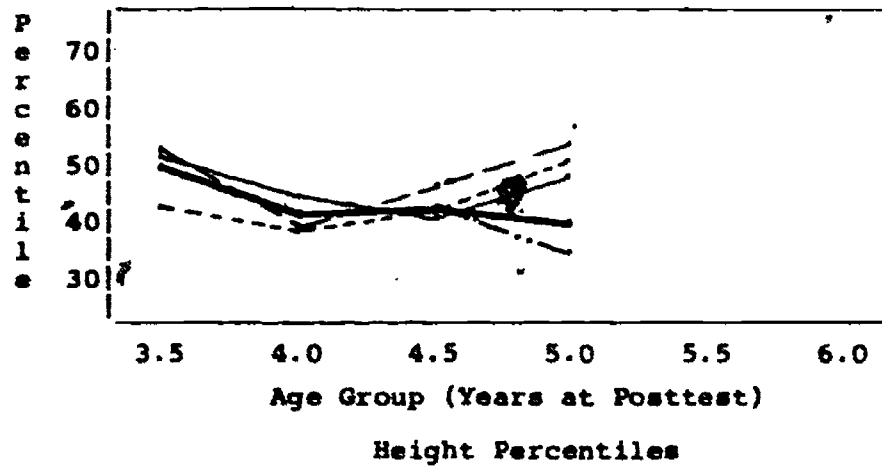


|                               |       |
|-------------------------------|-------|
| Greene and Humphreys Counties | _____ |
| St. Clair County              | _____ |
| Maricopa County               | _____ |
| Mingo County                  | _____ |
| All Sites                     | _____ |



Exhibit 5-6

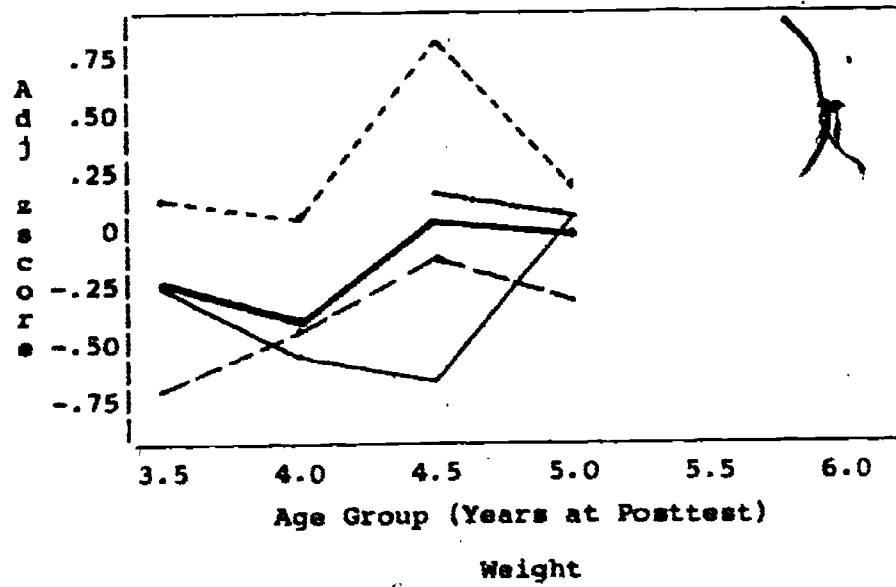
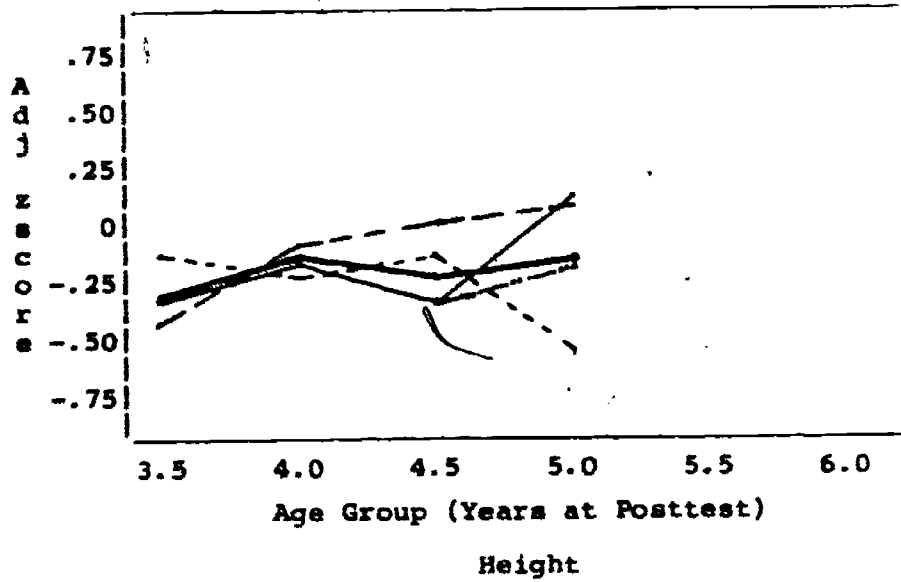
Growth Percentiles for Longitudinal Children by Age Group at Posttest



|                               |       |
|-------------------------------|-------|
| Greene and Rumphreys Counties | _____ |
| St. Clair County              | _____ |
| Maricopa County               | _____ |
| Mingo County                  | _____ |
| All Sites                     | _____ |

Exhibit 5-7

Rate of Growth for Children in Longitudinal Sample  
(Adjusted for Gender-Specific  
National Standardized Data)<sup>a</sup>



<sup>a</sup>  $z_{post} - z_{pre}$  \* expected correlation of pre-post score for age group

|                                  |         |
|----------------------------------|---------|
| Greene and<br>Humphreys Counties | _____   |
| St. Clair County                 | _____   |
| Maricopa County                  | .....   |
| Mingo County                     | -.-.-.- |
| All Sites                        | _____   |

to the expected rate of growth for children of the same gender, is slowing as they get older. In fact, the rate of weight gain is at the expected level for children who are over 4 years of age.

The effect that Head Start may have on children's anthropometric status was assessed through regression models both within and across sites. The results of these analyses are summarized in Exhibit 5-8 and Table 5-1 in the Appendix. Across sites, there was no significant ( $p < .05$ ) Head Start effect for any outcome measure. Within sites, however, there are several significant effects, often in opposite directions. This divergence of results and a lack of findings across sites suggests that, across all ages, Head Start does not have a consistent impact on children's growth.

Exhibit 5-8

Head Start Impacts on Anthropometric Status  
Summary of Regression Results

|  | Longitudinal (Sample A) Children in: |  |                 |  |           |
|--|--------------------------------------|--|-----------------|--|-----------|
|  | Greene & Humphreys Counties          | St. Clair County   | Maricopa County | Mingo County   | All Sites |
| Posttest z-score controlling for pretest z-score (n=171) |                                      | HS > taller children, smaller triceps skinfold (p < .05) |                 | HS > smaller arm circumference, smaller estimated muscle circumference (p < .01) |           |

Cross-Sectional Analyses. Exhibit 5-9 provides summary statistics for percentiles of height, weight, and weight for height with ages and sexes combined for children in the cross-sectional sample. The profile of anthropometric status of this group of children is somewhat different than that of the pretest sample (see Exhibit 5-3). In St. Clair County was there a marked increase in height percentiles from pretest (41.9 median) to posttest (49.5 median). In Greene and Humphreys Counties mean and median weight percentiles

did not approximate the national median (50th percentile) in the cross-sectional sample; this was not the case in the pretest sample. Finally, children in Greene and Humphreys Counties and St. Clair County were slightly below the national reference norms for appropriate weight for their height.

Exhibit 5-9.

Anthropometric Percentiles at Posttest Relative to  
National Center for Health Statistics Charts  
by Site

| Anthropometric Measures | Posttested Children (Samples A, B, C) in: |                          |                         |                      |                   |
|-------------------------|---|--------------------------|-------------------------|----------------------|-------------------|
|                         | Greene & Humphreys Counties (n=228)       | St. Clair County (n=194) | Maricopa County (n=167) | Mingo County (n=228) | All Sites (n=817) |
| Height n                | 224                                       | 187                      | 162                     | 224                  | 797               |
| Mean Percentile         | 50.3                                      | 51.1                     | 37.5                    | 45.9                 | 46.7              |
| St. Deviation           | 25.1                                      | 24.0                     | 25.8                    | 23.3                 | 25.0              |
| Median Percentile       | 50.3                                      | 49.5                     | 36.8                    | 43.4                 | 46.4              |
| Weight n                | 224                                       | 187                      | 167                     | 225                  | 803               |
| Mean Percentile         | 44.9                                      | 48.2                     | 51.9                    | 53.9                 | 49.6              |
| St. Deviation           | 27.3                                      | 24.8                     | 26.5                    | 25.1                 | 26.1              |
| Median Percentile       | 42.6                                      | 45.8                     | 52.0                    | 54.0                 | 49.3              |
| Weight for Height n     | 224                                       | 186                      | 162                     | 223                  | 795               |
| Mean Percentile         | 45.0                                      | 49.3                     | 62.7                    | 61.4                 | 54.2              |
| St. Deviation           | 25.8                                      | 22.6                     | 27.0                    | 22.9                 | 25.7              |
| Median Percentile       | 44.0                                      | 46.4                     | 64.2                    | 61.6                 | 55.6              |

Growth charts by age group and for children from families with per capita incomes of less than \$1,295 are presented in Tables 5-2 and 5-3 in the Appendix. The results suggest that younger children from low-income families tend to be slightly behind national norms, but that, beginning around age four, children from such families are near the national norm.

This statement is further supported by the number of children who are below the 10th national percentile for height, weight, triceps skinfold

thickness, arm circumference, and/or estimated muscle circumference (see Exhibit 5-10).<sup>\*</sup> Only in Maricopa County, where slightly more children than expected were below the 10th percentile for height as well as arm circumference and estimated muscle circumference, is there some evidence that there may be a greater frequency than expected of children with a growth delay. In St. Clair County, where more children were below the 10th percentile than expected for arm circumference and estimated muscle circumference, fewer than expected were below the 10th percentile for height--a finding that suggests systematic group differences in physique or measurement error, but is not consistent with a finding of growth delay.

Some group differences were evident between the Head Start and the non-Head Start group. Prevalence of height below the 10th percentile in Maricopa County was significantly higher for the Head Start than non-Head Start group and weight for height over the 85th percentile. In Mingo County, non-Head Start children were more likely to have triceps skinfold thickness over the 85th percentile than Head Start children, indicating that these children are heavier than expected from the reference data.

One straightforward indication of the children's growth status at posttest comes from plotting age- and gender-specific means of height and weight against the standard growth curves for these two variables. Preliminary examination revealed no differences among sites that approached significance, so the plots in Exhibits 5-11 through 5-14 reflect the combined data from the four sites. The number of observations underlying each point varies from 1 to 70, with the small sample sizes in the first three age intervals and the last age interval; from 3.5 to 5.5 years, however, each point is based on at least 24 observations. Overall, the four plots show both Head Start children and non-Head Start children close to the 50th percentile; the only points below the 25th percentile or above the 75th percentile come from rather small samples.

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<sup>\*</sup>Table 5-4 in the Appendix presents distribution statistics according to age- and sex-specific z-scores by group and by site.

## Exhibit 5-10

### Prevalence of Growth Problems Posttest Sample

| Growth Problems                                      |        | Posttested (Samples A,B,C) Children in: |                |                |               |                |                |                |                 |                |                 |
|--|--------|---|----------------|----------------|---------------|----------------|----------------|----------------|-----------------|----------------|-----------------|
|  |        | Greene & Humphreys                      |                | St. Clair      |               | Maricopa       |                | Mingo          |                 | All Sites      |                 |
|  |        | HS<br>n=127                             | NHS<br>n=101   | HS<br>n=108    | NHS<br>n=86   | HS<br>n=106    | NHS<br>n=61    | HS<br>n=119    | NHS<br>n=109    | HS<br>n=460    | NHS<br>n=357    |
| Height Below 10th Percentile                         | n<br>Z | 5/123<br>4.1                            | 5/101<br>5.0   | 4/105<br>3.8   | 7/82<br>8.5   | 29/101<br>28.7 | 1/61<br>1.6*** | 9/118<br>7.6   | 5/106<br>4.7    | 47/447<br>10.5 | 18/350<br>5.1** |
| Weight Below 10th Percentile                         | n<br>Z | 8/123<br>6.5                            | 12/101<br>11.9 | 5/105<br>4.8   | 8/82<br>9.8   | 5/106<br>4.7   | 2/61<br>3.3    | 4/119<br>3.4   | 4/106<br>3.8    | 22/453<br>4.9  | 26/350<br>7.4   |
| Weight for Height Below 10th Percentile              | n<br>Z | 11/123<br>8.9                           | 11/101<br>10.9 | 2/104<br>1.9   | 2/82<br>2.4   | 2/101<br>2.0   | 2/61<br>3.3    | 4/118<br>3.4   | 2/105<br>1.9    | 19/446<br>4.3  | 17/349<br>4.9   |
| Triceps Skinfold Thickness Below 10th Percentile     | n<br>Z | 4/118<br>3.4                            | 3/91<br>3.3    | 6/106<br>5.7   | 5/82<br>6.1   | 2/106<br>1.9   | 0/61           | 5/117<br>4.3   | 5/105<br>4.8    | 17/447<br>3.8  | 13/339<br>3.8   |
| Arm Circumference Below 10th Percentile              | n<br>Z | 6/120<br>5.0                            | 7/97<br>7.2    | 14/106<br>13.2 | 16/80<br>20.0 | 16/106<br>15.1 | 5/60<br>8.3    | 7/118<br>5.9   | 3/104<br>2.9    | 43/450<br>9.6  | 31/341<br>9.1   |
| Estimated Muscle Circumference Below 10th Percentile | n<br>Z | 10/118<br>8.4                           | 7/91<br>7.7    | 13/106<br>12.3 | 13/80<br>16.3 | 32/106<br>30.1 | 11/60<br>18.3  | 4/117<br>3.4   | 0/104           | 59/445<br>13.2 | 31/335<br>9.3   |
| Weight for Height Over 85th Percentile               | n<br>Z | 11/123<br>8.9                           | 5/101<br>5.0   | 9/104<br>8.7   | 2/82<br>2.4   | 34/101<br>33.7 | 9/61<br>14.8** | 13/118<br>11.0 | 19/105<br>18.1  | 67/446<br>15.0 | 35/349<br>10.0* |
| Triceps Skinfold Thickness Over 85th Percentile      | n<br>Z | 28/118<br>23.7                          | 22/91<br>24.2  | 17/106<br>16.0 | 10/82<br>12.2 | 26/106<br>24.5 | 19/61<br>31.1  | 9/117<br>7.7   | 21/105<br>20.0* | 80/447<br>17.9 | 72/339<br>21.2  |

\*p < .05  
\*\*p < .01  
\*\*\*p < .001

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Exhibit 5-11

Height of Head Start and non-Head Start Boys  
Compared to Standard Percentile Growth Curves,  
All Four Sites Combined

(H = Head Start, N = non-Head Start)

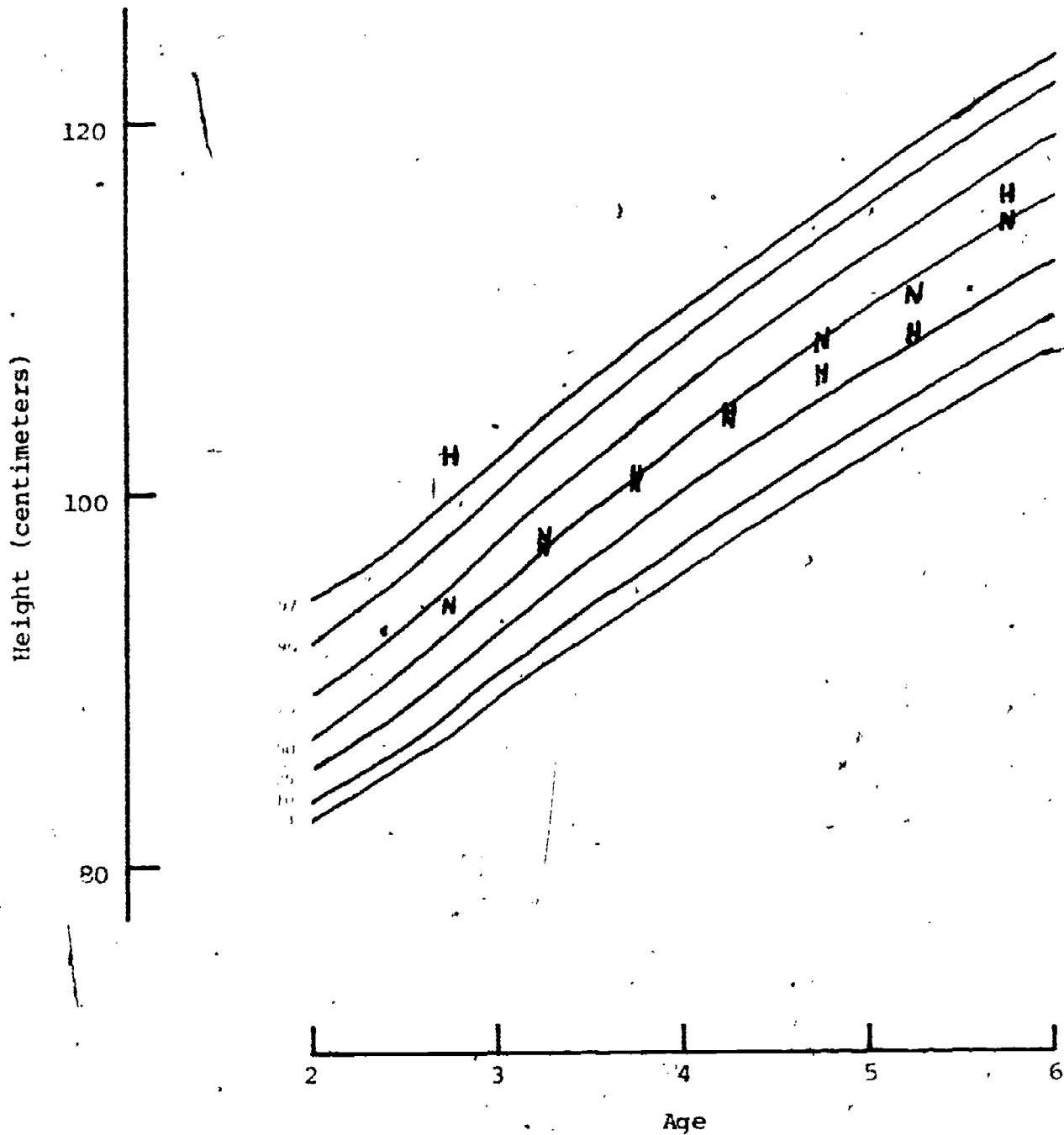




Exhibit 5-12

Weight of Head Start and non-Head Start Boys  
Compared to Standard Percentile Growth Curves,  
All Four Sites Combined

(H = Head Start, N = non-Head Start)

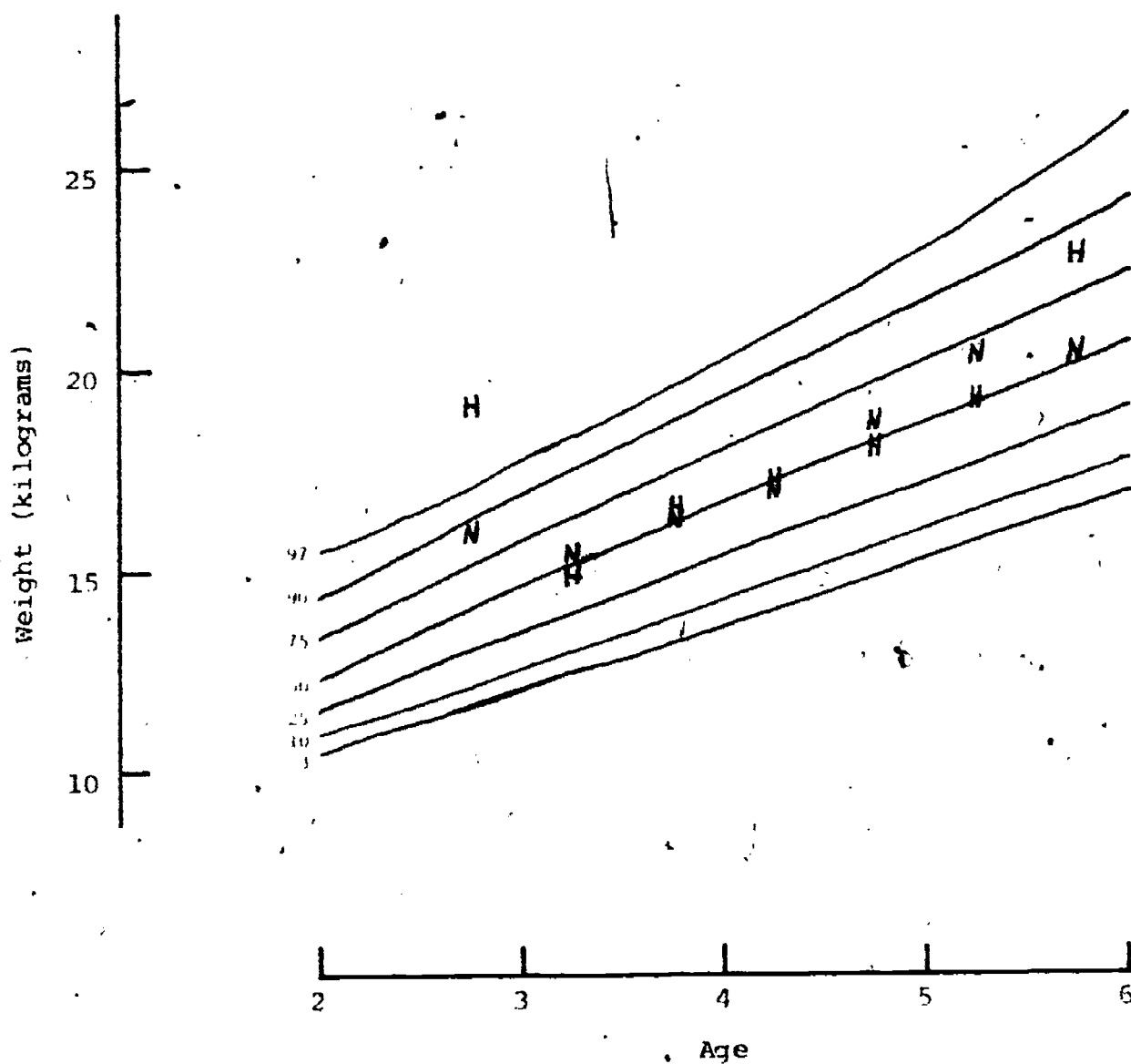


Exhibit 5-13

Height of Head Start and non-Head Start Girls  
Compared to Standard Percentile Growth Curves,  
All Four Sites Combined

(H = Head Start, N = non-Head Start)

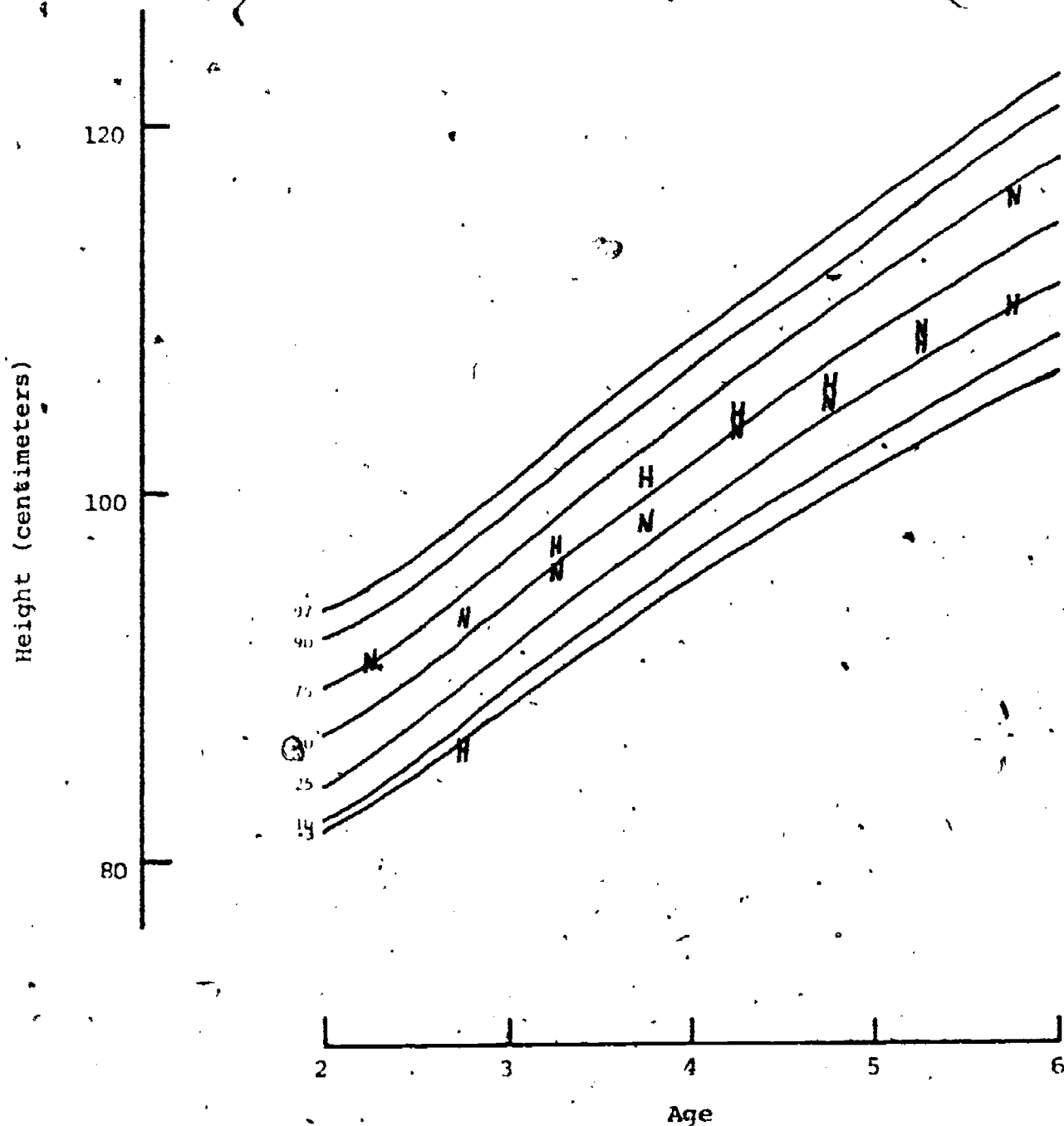
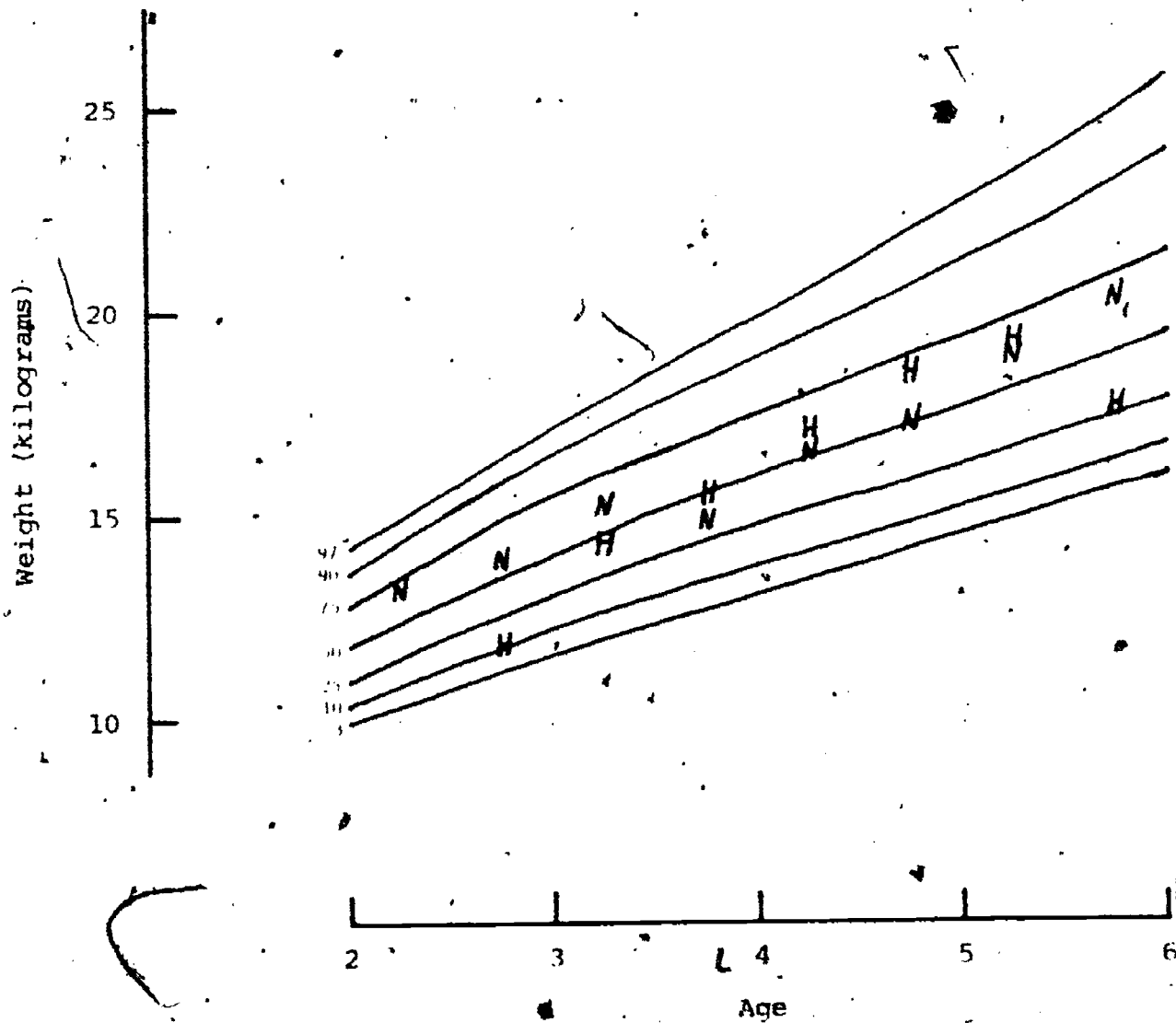


Exhibit 5-14

Weight of Head Start and non-Head Start Girls  
Compared to Standard Percentile Growth Curves,  
All Four Sites Combined

(H = Head Start, N = non-Head Start)



Results of regression analyses on the cross-sectional sample are summarized in Exhibit 5-15 and Tables 5-5 and 5-6 in the Appendix. As was the case in the longitudinal sample, there is no significant Head Start effect on any measure and the significant effects that were found within site were not consistent in direction.

### Conclusions

The anthropometric analyses indicate that the growth status of study children, in general, is typical of most children in the United States. Except in Maricopa County fewer children are below the 10th percentile for height and weight than are found nationally. However, the rate of growth (height, weight) observed for children in the longitudinal sample is slightly below the national average. There also is evidence that, except in Mingo County, study children tend to be relatively heavy rather than muscular. Younger pretest children in the study tended to be behind national norms, but analyses of the posttest data indicated that after age four, children's average height and weight approach the 50th national percentile.

Although Head Start is significantly associated with one or more of the anthropometric measures in all sites, there is little consistency in direction and, therefore, few overall significant effects. The Head Start effects are stronger for children over four years of age.

Exhibit 5-15

Head Start Impacts on Anthropometric Status  
 Summary of Regression Results

| Regression Analyses  | Posttested Children (Samples A, B, C) in:              |                                 |  |  |           |
|--|--|---------------------------------|--|--|-----------|
|  | Greene & Humphreys Counties                            | St. Clair County                | Maricopa County  | Mingo County   | All Sites |
| Cross-sectional<br>Sample: z-scores<br>(n=770)   |  |                                 | HS -> shorter children, greater weight for height (p < .01)              | HS -> taller children, less weight for height, smaller arm circumference (p < .05) |           |
| Cross-sectional<br>Sample: z-scores<br>for children under 4 years (n=224)                  | HS -> greater estimated muscle circumference (p < .05) |                                 |  |  |           |
| Cross-sectional<br>sample: z-scores<br>for children 4 years and older (n=546) <sup>1</sup> |  | HS -> taller children (p < .05) | HS -> shorter children, greater weight for height (p < .01) <sup>a</sup> |  |           |

<sup>a</sup>Note: This is same sample as total cross-sectional sample since all children in Maricopa County are 4+ years old.

## CHAPTER SIX

### NUTRITION EVALUATION

#### Nutrition Indicators

The principal data collection methodology employed in the nutrition evaluation was the 24-hour recall, which obtained information on each child's food consumption during the previous 24 hours. A second observation-based data collection technique was used to obtain data on foods consumed by Head Start children during the hours they attended Head Start centers. Both of these methodologies are described in detail in the following pages.

Dietary intake data were used in calculating the total nutrient content of diets consumed by both Head Start and non-Head Start children. Nutrient intake data for Head Start children were calculated in both aggregated (24-hour totals) and disaggregated (nutrient contribution of meals consumed at Head Start separated from meals consumed at home) forms. Computation of these nutrient intake indicators and construction of related variables are fully described below.

#### Data Collection Methodologies

Twenty-Four-Hour Recall. A 24-hour recall yielded information on each child's food consumption during the previous 24 hours. Detailed data on all foods and beverages consumed by the child on the previous day were obtained from the child's mother or principal caregiver. When either mother or child was absent from the home for a period of time on the day of recall, so that mothers were unable to provide complete food consumption data, the appropriate person(s) (e.g., babysitter, grandparent, older sibling) was contacted for information on foods consumed by the child during the time period in question. Both telephone contacts and return-by-mail food-record forms were used in gathering these data.

A total of 25 data collectors were utilized in collecting dietary intake data over the course of the study. All data collectors had previous experience in basic nutrition interviewing techniques. Eighty percent were registered dietitians (R.D.) or R.D.-eligible, and all but six of the

interviewers were masters-level nutritionists or nutrition students. Data collectors completed a four-day training session in which they were trained in collecting dietary intake information "second-hand" from mothers and other caregivers. A standardized interview protocol was adapted from that used in the First and Second National Health and Nutrition Examination Surveys (NHANES I and NHANES II). Graduated food models (also adapted from NHANES) were used with the 24-hour recall to help estimate quantities (portion sizes) of foods consumed. Following the NHANES protocol, interviews were conducted Tuesday through Saturday only (reported intake for Monday through Friday only), thereby excluding weekend food consumption data, which are more likely to be atypical.

Head Start Meal Observation. Because Head Start children were expected to be in Head Start classes on the day of recall, an observation methodology was used to obtain data on foods consumed by children during the hours they attended Head Start. The same group of trained nutrition interviewers collected detailed descriptions of all foods served, and then estimated amounts of foods consumed by each study child. Because these data would ultimately be combined with 24-hour recall data, the observation methodology was designed to be as similar to the 24-hour recall as possible. However, two major deviations in protocol were unavoidable:

- during Head Start meal observations, observers were able to record all foods as they were eaten. For the 24-hour recall, on the other hand, mothers were required to recall all foods eaten by their children on the previous day.
- food models were used in estimating portion sizes of non-standard food items reported in 24-hour recalls.\* Use of these models in the Head Start classroom setting was not practical since each observer was responsible for observing two to six children at each meal. Observers therefore estimated the portion of food consumed by

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\*Non-standard food items are foods that are not pre-portioned in any way (e.g., glasses of milk, servings of vegetables, pieces of meat). Standard food items are those that come in standard sizes and therefore do not require measurement with food models (e.g., brand name cookies and crackers, slices of sandwich bread, half-pint cartons of milk). Standard food items were recorded in the same fashion in both recalls and observations.

each child based on the average portion of that food as served. Average portion sizes of foods as served were determined by weighing and measuring sample portions of food in the kitchen. (Observers were trained in a standardized manner for both the weighing and measuring and observation tasks.)

These variations in protocol present particular problems in interpretation of the data because the observation methodology was utilized only for meals and snacks served in Head Start centers. Findings must therefore be considered in light of this mixed methodology and the possibility that any differences noted between Head Start and non-Head Start groups may be an artifact of the observation methodology. Analyses addressing this issue have yielded promising results and are discussed in Appendix Note 6-1. Based on these exploratory analyses we are confident that positive Head Start findings presented in this chapter are not artifacts of the mixed methodology used in collecting Head Start children's dietary intake data.

#### Construction of Nutrition Variables

The total nutrient content of foods consumed by each child during the previous 24-hour period was calculated using the USDA Nationwide Food Consumption Survey (NFCS) nutrient data base and other standard USDA references on nutrient composition.\* In addition to total energy intake (calories), protein, carbohydrate, fat, and cholesterol, the intake of seven vitamins and four minerals were also evaluated. These nutrients are listed in Exhibit 6-1.

In order to accurately describe the nutrition services provided by Head Start and the impact of these services on the nutrient intake of participating children, it was necessary to differentiate between nutrients received from foods provided by Head Start and those received from foods consumed at home. Therefore, the total nutrient content of foods consumed in each setting was calculated separately. These values were then summed to provide accurate 24-hour totals for Head Start children. The percentage

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\*Cholesterol data were obtained from USDA Nutrient Data Base for Standard Reference, Release 1.



Exhibit 6-1

Nutrients Examined in Nutrition Evaluation

Calories  
Protein (gm)  
Fat (gm)  
Carbohydrate (gm)  
Calcium (mg)  
Iron (mg)  
Magnesium (mg)  
Phosphorus (mg)  
Vitamin A (I.U.)<sup>a</sup>  
Thiamin (mg)  
Riboflavin (mg)  
Niacin (mg)<sup>b</sup>  
Vitamin B<sub>6</sub> (mg)<sup>c</sup>  
Vitamin B<sub>12</sub> (mcg)<sup>c</sup>  
Vitamin C (mg)  
Cholesterol (mg)<sup>d</sup>

<sup>a</sup>Total Vitamin A value.

<sup>b</sup>Preformed niacin.

<sup>c</sup>Food composition data for these nutrients are somewhat less complete and reliable--results should be interpreted with caution.

<sup>d</sup>Not included in USDA-NFCS nutrient composition data base. Data obtained from USDA Nutrient Data Base for Standard Reference, Release 1.

of each child's total daily intake that was provided by Head Start meals and snacks was also computed.

Total nutrient intake variables were used in computing three other major classes of nutrition variables:

- percentage of daily nutrient intake standard provided;
- nutrient density (nutrient per 1000 calories); and
- nutrient sources of food energy (proportion of calories from protein, fat, and carbohydrate).

These variables and the steps involved in their construction are outlined below. Exhibit 6-2 summarizes the major variable categories utilized in the nutrition analyses.

Percentage of Daily Nutrient Intake Standard Provided. Nutrient intake standards used in the nutrition evaluation were in large part based on the 1980 Recommended Dietary Allowances (RDAs). The RDAs are recommended levels of intake for population groups; and thus are appropriate benchmarks to use in identifying groups who may be at risk of consuming marginal or inadequate amounts of essential nutrients. The temptation to identify adequate or inadequate individual nutrient intakes should be avoided, however. The practice of evaluating nutrient intake data in this manner, though somewhat commonplace, is an invalid use of the standards and frequently overestimates the prevalence of truly deficient intakes (Hegsted, 1975). (For a more detailed discussion of this issue, refer to Appendix Note 6-2.)

The standards used in the nutrition evaluation are listed in Appendix Note 6-3. Standards are included for children two to three years of age and four to six years of age.\* Standards for calories and protein were adjusted for body weight, because individual requirements are closely related to total body size. Similarly, standards for thiamin, riboflavin and niacin were adjusted for total caloric intake because each of these nutrients is intimately involved in energy metabolism, and requirements are therefore approximately proportional to caloric intake. Adjustments were based on those used in the NHANES surveys and the Ten State Nutrition Survey and

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\*RDAs for these age groups do not differentiate males and females. Therefore, the same set of standards was used for both sexes.

Exhibit.6-2

Variable Categories Used in Nutrition Evaluation

| 24-Hour (Total Intake)  | Variable Categories  |  |
|---|--|--|
|   | Head Start Meals and Snacks  | Diet Consumed at Home  |
| Total nutrient intake   | Nutrient intake from Head Start meals and snacks                                   | Nutrient intake from diet consumed at home                                   |
|   | Percent of total daily intake provided by Head Start meals and snacks              | Percent of total daily intake provided by diet consumed at home              |
| Percent of daily nutrient intake standards provided by total diet | Percent of daily nutrient intake standards provided by Head Start meals and snacks | Percent of daily nutrient intake standards provided by diet consumed at home |
| Nutrient density of total diet                                    | Nutrient density of Head Start meals and snacks                                    | Nutrient density of diet consumed at home                                    |
| Nutrient sources of food energy in the total diet                 | Nutrient sources of food energy from Head Start meals and snacks                   | Nutrient sources of food energy in diet consumed at home                     |

closely approximate the 1980 RDA standards. The reference standard for cholesterol is the one most commonly used in evaluation of dietary intake (Hegsted, 1982; Pipes, 1982) because no RDA for cholesterol has been established. Although the role of cholesterol in the diet is still controversial, particularly for young children, this reference standard is generally used for adults and children over two years of age (Pipes, 1977; Pipes 1982).

The percentage of the age-appropriate standard provided in each child's total 24-hour intake was calculated for each nutrient. Similarly, the percentage of each standard provided by Head Start meals and snacks and meals and snacks consumed at home were computed.

Nutrient Density. Many of today's major public health nutrition concerns are essentially the converse of earlier nutrition concerns, in that contemporary nutrition problems are often the result of excesses in the diet rather than deficiencies (Dwyer, 1981; Hegsted, 1982). Excess consumption of calories, fat and refined carbohydrates and their potential role in the major chronic diseases affecting the U.S. population have been the target of many public- and private-sector nutrition education efforts (Dwyer, 1981; Hegsted, 1982; U.S. Department of Agriculture and U.S. Department of Health and Human Services, 1980). Food habits developed in early childhood may form the foundation for food habits throughout life. Thus, excess consumption of foods high in calories, fat or refined carbohydrates (sugar) during childhood may be the first link in a lifelong chain of poor eating habits, weight problems and other health problems (Dwyer, 1981; Pipes, 1982).

Diets lower than average in nutrient density may be indicative of such problematic consumption patterns. Nutrient density, or the relationship between calories and nutrients provided by the diet, reflects the general quality of the diet (Sorenson and Hansen, 1975). By examining this relationship in conjunction with the percentage of the recommended intake received for each nutrient, one gains insight into possible causes for differences in total nutrient intake among groups.

Nutrient density assesses the amount of a given nutrient received per calorie consumed. Nutrient densities are most commonly expressed as nutrient intake per 1000 calories:

$$\frac{\text{total nutrient intake}}{\text{total caloric intake}} \times 1000.$$

Nutrient densities were computed for total 24-hour intake, Head Start meals and snacks, and at-home diets. Data were compared to the nutrient density profile for the standard RDA-reference diet; these reference nutrient density values are presented in Appendix Note 6-3.

Nutrient Sources of Food Energy. Food energy (calories) in the diets of preschool children comes from three major sources--protein, fat, and carbohydrate. An assessment of the proportion of calories provided by each of these major nutrients provides further insight into diet quality, particularly in the case of fat and carbohydrate intake, since excess consumption of fat and refined carbohydrates (sugar) generally results in poorly balanced diets and may be related to development of chronic diseases later in life (Hegsted, 1982; U.S. Department of Health and Human Services, 1980). The percent contribution of each of the major energy-yielding nutrients was computed for total caloric intake as well as for calories provided by Head Start meals and snacks and those consumed at home.

### Analysis of Nutrition Indicators

#### Preliminary Examination of Data

Preceding analysis, visual and numerical examination of the data (primarily one variable at a time, using the techniques discussed in Appendix 2B) ensured that anomalous distributions and data values would not go undetected. When a visual display of the data indicated the possibility of anomalous or outlying values, the basic numerical criterion described in Appendix 2B was used to further evaluate the data and decide whether to treat an individual observation as an outlier. The general preference (in applying judgment to possible outliers) was to retain data for analysis whenever possible. Thus, a clear break in the sample that distinguished one or more possibly anomalous values generally resulted in their being treated as outliers and excluded from any analysis involving means or tests of mean differences.

Vitamins A and B<sub>12</sub>, as total intake values and as percentages of the nutrient intake standards, had substantially skewed distributions and required transformation to the logarithmic scale. For ease in interpretation

and comparison to other data sets all tables included in this report display both the untransformed and log values for vitamins A and B<sub>12</sub>. Final decisions about outliers for vitamin A and vitamin B<sub>12</sub> were made after transformation to the logarithmic scale since, depending on the shape of the sample, a transformation can change the status of an observation from outlying to non-outlying or vice versa.

#### Handling of Unsatisfactory Data

Collection of dietary intake data, particularly data obtained from mothers about their children, inevitably results in a certain number of incomplete, unreliable, or unsatisfactory records. Since it is extremely important that all food consumption data be complete and accurate, these cases must be carefully identified and excluded from group analyses. Sixty-two such cases (out of the total 810 cases) were excluded from these analyses, for three major reasons:

- the mother or principal caregiver was away from the child for extended periods of time and was thus unable to provide complete information on the previous day's intake;
- the reported intake was identified by the mother or principal caregiver to be highly atypical due to illness, family circumstances, or other causes;
- data were judged unsatisfactory by data collector or field supervisor because of poor respondent reliability (e.g., respondent was reticent or nonresponsive, respondent was not a person who usually cares for the child, or respondent did not comprehend the purpose of the interview).

#### Head Start Subgroups

As previously mentioned, Head Start children were expected to be attending Head Start classes on the day to be reflected in the 24-hour recall. The appointment for each child's health assessment was therefore scheduled so that each Head Start child would be observed on the day before his/her appointment. The combination of Head Start meal observation and 24-hour recall interview information would then provide complete data on

the previous 24-hour period. This plan worked quite well in the majority of cases; however, normal attendance fluctuations and appointment changes resulted in three separate subgroups of Head Start children:

- 27 children for whom no Head Start meal observation data were obtained. This problem occurred most frequently when mothers rearranged their pre-scheduled appointments and brought the child for his/her health assessment a day early or a day late;
- 54 children who were absent from Head Start on the day of scheduled observation, but kept their scheduled appointment for the health assessment.\* Hence, the intake reported for the previous 24-hour period for these Head Start children did not include Head Start meals or snacks;
- 68 children who were present in Head Start on the scheduled observation day, but did not come for their health assessment until a later date. The 24-hour recall obtained at this time covered a time period when the child had not attended Head Start, either because he/she was absent or did not normally attend Head Start every day of the week.\*\*

Two different approaches were taken in handling these special subgroups of children. First, for the 27 cases where Head Start meal observations were not completed, nutrient data were imputed. Data from observations of children attending the same Head Start center were used to determine imputed values. A value was imputed only if there were at least five other observations available in the appropriate Head Start center. Since mean values for particular nutrients can be strongly influenced by valid but high intakes, the median value was used in imputing data. Imputing nutrient intake data for missing Head Start meal observations was felt to be a valid and reliable procedure since complete and accurate data on foods served,

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Children who had been ill on the day of recall have been excluded from the analyses (see preceding section on handling of unsatisfactory data). The numbers reported here include only those children whose absence was not related to an illness or other incident that might have affected their usual food consumption at home.

\*\*The Head Start meal observations for these 68 children, though valid, were not included in further analysis since they were not compatible with their 24-hour recalls.

as well as typical consumption behaviors, were available from observations of other children in the same center.

The two groups of children who were not present in Head Start on the day of recall presented a more difficult problem. Since the 24-hour recall data obtained for these children was complete but did not include any meals or snacks provided by Head Start, their nutrient intake data reflected a food consumption pattern that was potentially quite different from that of the rest of the Head Start children.\* For this reason, the two subgroups of children who were not present in Head Start on the day of recall have been kept separate from the main Head Start group for all nutrition-related analyses. This distinction is reasonable since the main Head Start nutrition "treatment" was provision of food (and nutrients) through Head Start meals and snacks--meals and snacks that were not consumed by the absent children in the 24-hour period on which their nutrient intake data was based. Although these subgroups of children were not a part of the original study design, they provide an opportunity for several analyses that may shed light on important practical problems. For example, examination of the nutrient intake of these children gives a partial indication of what Head Start parents feed their children in the absence of Head Start. Thus, these children form an "accidental" comparison group whose differences from the regular Head Start group may help fill out our picture of Head Start's contribution to the nutrient content and nutritional quality of participating children's diets.

Analysis of nutrient intake data and appropriate background variables revealed no significant differences between the two groups of absent children. The two subgroups were therefore combined for all subsequent analyses and are identified as the Head Start-absent group. Exhibit 6-3 summarizes the subgroups of Head Start children used in the nutrition analyses.

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\*It is important to reiterate that these subgroups did not include children who had been ill on the day of recall. Only those children whose absence was not related to an incident that may have affected food consumption at home were retained in the analyses. For many children, this "absence" was a routine one, since many children did not attend Head Start every day of the week, even if they were enrolled in a five-day program.



Exhibit 6-3

Groups of Children Included in Nutrition Analyses

| Group              | Nutrition Data Sources              | Greene & Humphreys Counties | St. Clair County | Maricopa County | Mingo County | All Sites |
|--------------------|-------------------------------------|-----------------------------|------------------|-----------------|--------------|-----------|
| Head Start-Present | Recall and Observation              | 107                         | 66               | 54              | 58           | 285       |
|                    | Recall and Imputed Observation      | 3                           | 6                | 4               | 14           | 27        |
| Head Start-Absent  | Recall and Incompatible Observation | 6                           | 24               | 28              | 10           | 68        |
|                    | Recall only                         | 4                           | 8                | 13              | 29           | 54        |
| Non-Head Start     | Recall only                         | 90                          | 68               | 52              | 104          | 314       |
| Total              |                                     | 210                         | 172              | 151             | 215          | 748       |

The prevalence of nutrition problems in the pretest sample established baseline nutrition profiles for children in each site prior to Head Start intervention. Unadjusted group means for each nutrient were compared to the reference nutrient intake standards (see Appendix Note 6-3) to assess the prevalence of potentially inadequate nutrient intakes.\* Groups with the greatest potential risk of deficient nutrient intakes were identified as those whose mean intake for any nutrient fell below 100 percent of the recommended intake. Since the potential risk for individuals within a group increases as the mean intake falls further below the recommendation, the extent to which the mean intake fell below 100 percent of the daily recommendation was also examined. Findings were then compared to reference data for comparable groups of children.

To determine Head Start impacts, unadjusted data were examined first, to detect major differences among groups. Impacts were further validated through use of multiple regression analysis, as described in Appendix 2B in which other potentially influential factors were taken into account. In particular, the fact that children in the Head Start group tended to be older than children in the non-Head Start group (see Chapter Two) warranted some attention. If older children consistently consumed more food than younger children (not an unrealistic expectation), any Head Start effect detected in the unadjusted comparisons could conceivably be an artifact of the age differences between groups. Similarly, variations in income (family's employment status served as a proxy for income in these analyses) or access to food assistance benefits might also influence the validity of unadjusted findings.

The regression model for the nutrition analyses was developed by carefully examining the effect of several potential covariates. Total (24-hour) nutrient intake variables were used as the principal dependent

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\*As previously discussed, obvious outlying or anomalous nutrient intake values were excluded from analyses involving means or tests of mean differences. The problem of disproportionate influence of single intakes on the mean value still exists, however, because some nutrients are heavily concentrated in particular foods. Examining the mean intake in light of the full distribution of intakes within the population group may provide a more accurate picture.

variables in developing the model. Covariates included in the final analytic model for the nutrition analyses are:

- child's age;
- child's sex;
- family employment status -- (1) if any member of the child's household was employed, 0 (zero) if otherwise; and
- household participation in federal food assistance programs -- 0 (zero) = no participation; 1 = participated in Food Stamps only; 2 = participated in WIC only; 3 = participated in both Food Stamps and WIC.

Several other potential covariates, including child's weight and height\*, child's race, mother's education, family's per capita income and wave of recruitment (Samples A, B and C) were considered but were found to have no significant influence on the regression model. Only those variables found to be significantly associated with intake of at least three nutrients in either across- or within-site analyses were included.\*\*

Head Start impacts were evaluated for the longitudinal sample (Sample A) and the full cross-sectional sample (Samples A, B and C) both within and across sites. Regression analyses were conducted for all three categories of dependent nutrition measures: nutrient intake, nutrient density, and proportion of calories provided by protein, fat and carbohydrate. All regression analyses were structured so that potential Head Start effects would be measured last, after the contributions of all other factors and covariates had been considered. Therefore, the covariates and factors were entered into the regression equation in a fixed sequence: first, the covariates (child's age, child's sex, family employment status, and household participation in federal food assistance programs), and then a three-level Head Start factor (Head Start-present, Head Start-absent and non-Head Start).\*\*\* In analyses

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\*It was found that the combination of child's age and child's sex was a more significant predictor across a range of nutrient intake variables than was child's weight or height.

\*\*Detailed breakdowns of nutrient intake data for the cross-sectional sample by age, sex and wave of recruitment, are available in Tables 6-36 through 6-52.

\*\*\*See Appendix Note 6-4 for a detailed description of the coding scheme used in structuring multiple regressions to compare these three groups of children.

of the longitudinal sample (Sample A) the pretest measure for each nutrient was added to the covariate list to adjust for nutrient intake at pretest. In analyses run across all sites, the factor for site effects was entered into the equation just prior to the Head Start factor.

### Summary of Findings

#### Prevalence of Nutrition Problems at Pretest

Nutrition problems in the pretest sample (Samples A and D) were assessed on two levels:

- prevalence of potential risk for inadequate or marginal intake of particular nutrients; and
- prevalence of poorly balanced diets, as evidenced by below-average nutrient densities or proportion of calories obtained from protein, fat, and carbohydrate.

Prevalence of inadequate or marginal nutrient intakes were identified on the basis of unadjusted group means. In order to provide a more complete description of nutrition problems and to gain some insight into the variability in intakes both within and among sites, the distribution of percentage of the daily recommended intake received was also evaluated for each nutrient. Samples were partitioned into four categories; the following intervals were used:

- 0 to 33 percent of recommended intake;
- 34 to 66 percent of recommended intake;
- 67 to 99 percent of recommended intake; and
- 100 percent or more of recommended intake.

Although children receiving less than 100 percent of the daily recommendation are not necessarily consuming an inadequate diet (see Appendix Note 6-2), the risk of inadequate intakes within a population group clearly decreases as the intakes of more children approach or exceed 100 percent of the recommendation.

The prevalence of poorly balanced diets was evaluated using the nutrient density data. In keeping with the approach outlined above, both mean values and full distributions were examined for each nutrient. Nutrient densities of the RDA-reference diet were used as benchmarks. Groups with the greatest potential risk for poorly balanced diets were identified as those whose mean density for any nutrient fell below the RDA reference standard. Prevalence of nutrient density problems was further described by evaluating the percentage of children in each group who had consumed diets with nutrient densities below the RDA reference standards.

Prevalence of Potential Risk for Marginal or Inadequate Nutrient Intakes. Exhibit 6-4 illustrates the pattern of marginal nutrient intakes noted within and across sites in the pretest sample. (A more complete description of the data, including means, medians and extremes is presented in Table 6-1.) As Exhibit 6-4 illustrates, mean intakes of pretested children in all sites met or exceeded 100 percent of the daily recommendation for protein, vitamin A, thiamin, riboflavin, vitamin B<sub>12</sub> and vitamin C. The most problematic nutrients in all sites were calcium and iron. The mean intake for both of these nutrients was well below 100 percent of the recommendation in all sites with the exception of calcium intake in Mingo County. The degree of inadequacy varied across sites, with children in Greene and Humphreys Counties consuming the most inadequate diets, receiving, on the average, less than 70 percent of the recommended amount of both calcium and iron.

In general, caloric intakes were adequate, with the exception of children in Greene and Humphreys Counties and Maricopa County. This finding is especially noteworthy because the caloric standard was individually adjusted for each child's body weight, and therefore is a more accurate reflection of individual children's requirements than other nutrient intake standards may be.

Children in Maricopa County also had mean intakes below 100 percent of the recommended intake for niacin and vitamin B<sub>6</sub>. The standard for niacin was adjusted for each individual child's caloric intake and therefore, similar to the caloric standard, reflected a more accurate estimation of the children's individual needs. The seemingly deficient intake of niacin is less important, however, since it is based only on the amount of preformed niacin in the diet. The body can also obtain niacin from tryptophan, an

Exhibit 6-4

Unadjusted Mean Nutrient Intakes Below 100 Percent  
of Recommended Daily Intake for Pretested Children by Site

| Nutrient                | Pretested Children (Samples A and D) in: |                  |                 |              |           |
|-------------------------|--|------------------|-----------------|--------------|-----------|
|                         | Greene & Humphreys Counties              | St. Clair County | Maricopa County | Mingo County | All Sites |
| Calories                | +  |                  | ++              |              |           |
| Protein                 |  |                  |                 |              |           |
| Calcium                 | +++                                      | +++              | ++              |              | +++       |
| Iron                    | +++                                      | ++               | +++             | +++          | +++       |
| Magnesium               | +  |                  | ++              |              |           |
| Phosphorus              | ++                                       |                  |                 |              |           |
| Vitamin A               |  |                  |                 |              |           |
| Thiamin                 |  |                  |                 |              |           |
| Riboflavin              |  |                  |                 |              |           |
| Niacin                  |  |                  | +               |              |           |
| Vitamin B <sub>6</sub>  |  |                  | ++              |              |           |
| Vitamin B <sub>12</sub> |  |                  |                 |              |           |
| Vitamin C               |  |                  |                 |              |           |

- + 90-99% of recommended intake
- ++ 80-89% of recommended intake
- +++ 70-79% of recommended intake
- ++++ Below 70% of recommended intake

amino acid in protein foods.\* Since the mean protein intake of children in Maricopa County was more than adequate to meet their needs, it is reasonable to assume that a significant amount of tryptophan was available for conversion to niacin.

The marginal vitamin B<sub>6</sub> intake in Maricopa County should also be interpreted with caution. Nutrient composition data for vitamin B<sub>6</sub> are less complete than for other nutrients (Food and Nutrition Board, National Academy of Sciences, 1980). Some of the richest food sources of vitamin B<sub>6</sub> are meats, fish and poultry. It is interesting to note that over 60 percent of the children in Maricopa County were Hispanic and may consume a diet typical of this ethnic group and lower than average in amounts of meat, fish and poultry.\*\* It appears then that the decreased calorie, protein and vitamin B<sub>6</sub> intakes of children in this site may be interrelated and the result of a diet that focuses on alternative protein sources (grains and legumes) rather than meat, fish and poultry.

The significance of the marginal intake of magnesium noted in Greene and Humphreys Counties and Maricopa County is difficult to estimate. This mineral occurs widely in almost all foods, and although low-income populations have previously been noted to consume marginal levels of this nutrient (Hegsted, 1982), actual (clinical) deficiencies of magnesium are rare (Food and Nutrition Board, National Academy of Sciences, 1980).

The patterns of marginal nutrient intake noted for the pretest sample are similar to those of comparable groups of children evaluated in several other major nutrition and/or health surveys (see Exhibit 6-5). Corroborating the findings discussed here, calcium and iron were also the most problematic nutrients in the other surveys. Overall, prevalence and severity of marginal intakes in the pretest population were somewhat greater than would be expected from these reference data, particularly in Greene and Humphreys

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\*Proteins of animal origin contain approximately 1.4 percent tryptophan; vegetable source proteins contain approximately 1 percent tryptophan; corn products, a poor source of tryptophan contain less than 0.6 percent tryptophan. (Food and Nutrition Board, National Academy of Sciences, 1980).

\*\*As Table 6-1 indicates, children in Maricopa County consumed substantially lower amounts of protein than children in the other three sites. Nonetheless, on the average, their protein intake was more than adequate to meet their needs.

Exhibit 6-5

Unadjusted Mean Nutrient Intakes below 100 Percent of Recommended Daily Intake for Children Evaluated in the USDA Nationwide Food Consumption Survey (NFCS), First National Health and Nutrition Examination Survey (NHANES-I), and Ten State Nutrition Survey (TSNS)<sup>a</sup>

| Nutrient                | NFCS <sup>b</sup><br>n=51 | NHANES-I <sup>c</sup><br>n=627 | TSNS <sup>d</sup><br>n=278 |
|-------------------------|---------------------------|--------------------------------|----------------------------|
| Calories                | +                         |                                |                            |
| Protein                 | +                         |                                |                            |
| Calcium                 | +                         |                                | ++                         |
| Iron                    | ++                        | +++                            | ++++                       |
| Magnesium               | +                         | not available                  | not available              |
| Phosphorus              |                           | not available                  | not available              |
| Vitamin A               |                           |                                |                            |
| Thiamin                 |                           |                                |                            |
| Riboflavin              |                           |                                |                            |
| Niacin                  |                           |                                | +                          |
| Vitamin B <sub>6</sub>  | +                         | not available                  | not available              |
| Vitamin B <sub>12</sub> |                           | not available                  | not available              |
| Vitamin C               |                           |                                | +                          |

- + 90-99% of recommended intake
- ++ 80-89% of recommended intake
- +++ 70-79% of recommended intake
- ++++ Below 70% of recommended intake

Actual data from each of these surveys are presented in Table 6-2.

<sup>a</sup>Data from the Preschool Nutrition Survey (1968-1970), a seemingly obvious group for comparison, are not included here or in the appendix. Nutrient intake data from this survey included the contributions made by vitamin supplements. Dietary data for the present study and the studies summarized above do not include nutrients received from vitamin supplementation.

<sup>b</sup>Conducted 1977-1978. Data shown here include only children (aged three to five years) of families with incomes below \$6,000/year.

<sup>c</sup>Conducted 1971-1974. Data shown here include only children of low-income families. Based on weighted averages of values for two- to three-year old children and four- to six-year old children.

<sup>d</sup>Conducted 1968-1970. Data shown here include only children (aged two to three years) from low-income ratio states.



Counties and Maricopa County. Interestingly, the problem of vitamin C intake noted in the Ten-State Nutrition Survey was not replicated in the present evaluation, nor in the two other more recent surveys included in Exhibit 6-5. The Ten-State findings sparked a great deal of nutrition education and food fortification aimed at improving vitamin C intake in preschool children. The problem seems to have diminished, at least on the basis of mean intakes of vitamin C in the particular groups of preschool children evaluated here.

In summary, the prevalence of marginal nutrient intakes at pretest, as measured by mean intakes within each site, was similar to, although somewhat more severe (in degree of shortfall of mean nutrient intake), than what one would expect from appropriate reference data. Problems appeared to be most pronounced in Greene and Humphreys Counties and Maricopa County. Diets of all pretested children were marginal in calcium and iron. Intakes of phosphorus, magnesium and vitamin B<sub>6</sub> were also low in some sites. Children in Greene and Humphreys Counties and Maricopa County also consumed diets that were marginal in total calories. Mean intakes of all other nutrients exceeded 100 percent of the daily recommendations.

In order to more fully describe the baseline diets of the Head Start-eligible children evaluated at pretest, the distribution of percent of nutrient intake standard received was evaluated for each nutrient, both across and within sites, using the four intervals described previously. These data are displayed in Exhibit 6-6.

Over 90 percent of the children in all sites consumed diets providing 100 percent or more of the recommended amount of protein and thiamin. For all other nutrients, most notably calcium and iron, varying percentages of children consumed diets supplying less than 66 percent of the recommendation. Children in Greene and Humphreys Counties consumed diets supplying the least calcium, iron, phosphorus, vitamin B<sub>12</sub> and vitamin C, as evidenced by greater numbers of children in this site appearing in the lower ends of the distributions (0-66%) for these nutrients. Children in St. Clair and Mingo Counties tended to consume diets higher in most nutrients, with fewer children appearing in the lower ends of the distributions.

Although neither the data from 24-hour recalls nor the reference nutrient intake standards allow us to interpret the implications of intakes below 100 percent of the standard for any individual child, the pattern of

Exhibit 6-6

Percent of Nutrient Intake Standards  
Received for Pretested Children By Site

| Nutrients                  | Percent of Pretested Children<br>(Samples A and D) In: |                             |                            |                         |                       |
|----------------------------|--|-----------------------------|----------------------------|-------------------------|-----------------------|
|                            | Greene &<br>Humphreys<br>Counties<br>n=75              | St. Clair<br>County<br>n=94 | Maricopa<br>County<br>n=90 | Mingo<br>County<br>n=63 | All<br>Sites<br>n=322 |
| <b>Calories</b>            |  |                             |                            |                         |                       |
| 0 - 33%                    | 0  | 1                           | 1                          | 0                       | 0.50                  |
| 34 - 66%                   | 9  | 5                           | 10                         | 7                       | 7.75                  |
| 67 - 99%                   | 39   | 23                          | 42                         | 18                      | 30.50                 |
| 100%+                      | 52   | 71                          | 47                         | 75                      | 61.25                 |
| <b>Protein (mg/day)</b>    |  |                             |                            |                         |                       |
| 0 - 33%                    | 0  | 0                           | 0                          | 0                       | 0.0                   |
| 34 - 66%                   | 1  | 1                           | 2                          | 0                       | 1.0                   |
| 67 - 99%                   | 2  | 1                           | 5                          | 2                       | 2.5                   |
| 100%+                      | 97   | 98                          | 93                         | 98                      | 96.5                  |
| <b>Calcium (mg/day)</b>    |  |                             |                            |                         |                       |
| 0 - 33%                    | 13   | 9                           | 11                         | 6                       | 9.75                  |
| 34 - 66%                   | 43   | 31                          | 22                         | 21                      | 29.25                 |
| 67 - 99%                   | 27   | 30                          | 28                         | 17                      | 25.50                 |
| 100%+                      | 17   | 30                          | 39                         | 56                      | 35.50                 |
| <b>Iron (mg/day)</b>       |  |                             |                            |                         |                       |
| 0 - 33%                    | 8  | 4                           | 7                          | 5                       | 6.0                   |
| 34 - 66%                   | 39   | 30                          | 43                         | 36                      | 37.0                  |
| 67 - 99%                   | 33   | 33                          | 30                         | 30                      | 31.5                  |
| 100%+                      | 20   | 33                          | 20                         | 29                      | 25.5                  |
| <b>Magnesium (mg/day)</b>  |  |                             |                            |                         |                       |
| 0 - 33%                    | 5  | 0                           | 8                          | 0                       | 3.25                  |
| 34 - 66%                   | 18   | 17                          | 19                         | 6                       | 15.00                 |
| 67 - 99%                   | 24   | 32                          | 36                         | 27                      | 27.75                 |
| 100%+                      | 53   | 51                          | 37                         | 67                      | 52.25                 |
| <b>Phosphorus (mg/day)</b> |  |                             |                            |                         |                       |
| 0 - 33%                    | 4  | 2                           | 2                          | 0                       | 2.00                  |
| 34 - 66%                   | 20   | 13                          | 15                         | 8                       | 14.00                 |
| 67 - 99%                   | 39   | 28                          | 23                         | 21                      | 27.75                 |
| 100%+                      | 37   | 57                          | 60                         | 71                      | 56.25                 |

Continued

Exhibit 6-6 (continued)

| Nutrients                               | Percent of Pretested Children<br>(Samples A and D) In: |                             |                            |                         |                       |
|---|--|-----------------------------|----------------------------|-------------------------|-----------------------|
|   | Greene &<br>Humphreys<br>Counties<br>n=75              | St. Clair<br>County<br>n=94 | Maricopa<br>County<br>n=90 | Mingo<br>County<br>n=63 | All<br>Sites<br>n=322 |
| <b>Vitamin A (IU/day)<sup>a</sup></b>   |  |                             |                            |                         |                       |
| 0 - 33%                                 | 11   | 2                           | 8                          | 3                       | 6.00                  |
| 34 - 66%                                | 13   | 17                          | 20                         | 13                      | 15.75                 |
| 67 - 99%                                | 20   | 24                          | 18                         | 27                      | 22.25                 |
| 100%+                                   | 56   | 57                          | 54                         | 57                      | 56.00                 |
| <b>Thiamin (mg/day)</b>                 |  |                             |                            |                         |                       |
| 0 - 33%                                 | 0  | 0                           | 0                          | 0                       | 0.00                  |
| 34 - 66%                                | 0  | 0                           | 1                          | 0                       | 0.25                  |
| 67 - 99%                                | 7  | 1                           | 7                          | 0                       | 3.75                  |
| 100%+                                   | 93   | 99                          | 92                         | 100                     | 96.00                 |
| <b>Riboflavin(mg/day)</b>               |  |                             |                            |                         |                       |
| 0 - 33%                                 | 0  | 0                           | 0                          | 0                       | 0.00                  |
| 34 - 66%                                | 3  | 0                           | 0                          | 0                       | 0.75                  |
| 67 - 99%                                | 5  | 12                          | 4                          | 6                       | 6.75                  |
| 100%+                                   | 92   | 88                          | 96                         | 94                      | 92.50                 |
| <b>Niacin (mg/day)<sup>b</sup></b>      |  |                             |                            |                         |                       |
| 0 - 33%                                 | 0  | 0                           | 0                          | 2                       | 0.5                   |
| 34 - 66%                                | 3  | 1                           | 11                         | 9                       | 6.00                  |
| 67 - 99%                                | 10   | 17                          | 32                         | 33                      | 23.00                 |
| 100%+                                   | 87   | 82                          | 57                         | 56                      | 70.5                  |
| <b>Vitamin B<sub>6</sub> (mg/day)</b>   |  |                             |                            |                         |                       |
| 0 - 33%                                 | 5  | 2                           | 10                         | 2                       | 5.00                  |
| 34 - 66%                                | 15   | 14                          | 36                         | 19                      | 20.75                 |
| 67 - 99%                                | 17   | 28                          | 25                         | 25                      | 23.75                 |
| 100%+                                   | 63   | 56                          | 29                         | 54                      | 50.05                 |
| <b>Vitamin B<sub>12</sub> (mcg/day)</b> |  |                             |                            |                         |                       |
| 0 - 33%                                 | 9  | 0                           | 4                          | 0                       | 3.25                  |
| 34 - 66%                                | 16   | 13                          | 13                         | 11                      | 13.25                 |
| 67 - 99%                                | 24   | 17                          | 20                         | 11                      | 18.00                 |
| 100%+                                   | 51   | 70                          | 63                         | 78                      | 65.50                 |
| <b>Vitamin C (mg/day)</b>               |  |                             |                            |                         |                       |
| 0 - 33%                                 | 17   | 6                           | 11                         | 11                      | 47.00                 |
| 34 - 66%                                | 10   | 7                           | 18                         | 14                      | 12.25                 |
| 67 - 99%                                | 6  | 14                          | 8                          | 10                      | 9.50                  |
| 100%+                                   | 67   | 73                          | 61                         | 65                      | 66.50                 |

<sup>a</sup> Total Vitamin A value

<sup>b</sup> Milligrams of preformed niacin.

intakes is nonetheless worth noting. It is reasonable to assume that any positive impact from Head Start nutrition services would effect the distribution of percentage of recommended nutrient intakes received in participating groups of children. This hypothesis has been examined in this evaluation; results are discussed in a subsequent section of this chapter focusing on impacts of Head Start nutrition services.

Prevalence of Diets Low in Nutrient Density. Diets of pretested children in all sites were low in nutrient density for calcium, iron and vitamin B<sub>6</sub> as Exhibit 6-7 illustrates. Diets of all children, except those in Greene and Humphreys Counties, were also high in cholesterol density.

The prevalence of diets marginal in nutrient density parallels the prevalence of diets marginal in nutrient intake, in as much as calcium and iron are again the most limiting nutrients. The problem of diets low in iron density is, in fact, not a surprising finding when one considers that the iron density of the average American diet is approximately 6-7 mg per 1000 calories (Williams, Henneman and Fox, 1977; Hegsted, 1982). In order for a child in this age group to achieve the amount of iron required in the RDA standards without exceeding the recommended caloric intake, he or she must consume a diet that supplies approximately 9.6 mg of iron per 1000 calories. Consequently, it is frequently observed that iron nutriture is a major problem for many segments of the population, particularly young children, girls and women between menarche and menopause, and the elderly (Dallman, Stimes and Stekel, 1980; Cook and Finch, 1979). It is quite likely that pretested children who did receive 100 percent of the recommended intake for iron did so because of the large amounts of food they ate, rather than by consuming a higher quality diet, e.g., a diet higher in nutrient density for iron.

Similarly, the fact that diets of children in all sites were low in vitamin B<sub>6</sub> density while mean intakes for this nutrient exceeded 100 percent of the recommended intake in all sites, except Maricopa County, suggests that much of the vitamin B<sub>6</sub> consumed by children was also due to large amounts of food, particularly meat, fish and poultry (recall that the best sources of Vitamin B<sub>6</sub> are animal-source foods), rather than diets superior in nutrient density for vitamin B<sub>6</sub>. The concomitant excess in cholesterol density noted in all sites, except Greene and Humphreys Counties, also suggests a pattern of large intakes of meat.

Exhibit 6-7

Unadjusted Mean Nutrient Densities Below RDA Reference Standard for Pretested Children By Site

| Nutrient                | Pretested Children (Samples A and D) In: |                  |                 |              |           |
|-------------------------|--|------------------|-----------------|--------------|-----------|
|                         | Greene & Humphreys Counties              | St. Clair County | Maricopa County | Mingo County | All Sites |
| Protein                 |  |                  |                 |              |           |
| Calcium                 | +  | +                | +               | +            | +         |
| Iron                    | +  | +                | +               | +            | +         |
| Magnesium               |  |                  |                 |              |           |
| Phosphorus              |  |                  |                 |              |           |
| Vitamin A               |  |                  |                 |              |           |
| Thiamin                 |  |                  |                 |              |           |
| Riboflavin              |  |                  |                 |              |           |
| Niacin                  |  |                  |                 |              |           |
| Vitamin B <sub>6</sub>  | +  | +                | +               | +            | +         |
| Vitamin B <sub>12</sub> |  |                  |                 |              |           |
| Vitamin C               |  |                  |                 |              |           |
| Cholesterol             |  | +                | +               | +            | +         |

+ = group mean below nutrient density standard of RDA reference diet  
 + = group mean above recommended intake

Exhibit 6-8 illustrates the percentage of children in each site who consumed diets with nutrient densities below the RDA reference standards. (See Table 6-3 for a more complete description of the data.) Iron density is again the most problematic, with 90 percent of children across all sites consuming diets low in iron density. Vitamin B<sub>6</sub> and calcium densities were also problematic in all sites.

Children in Greene and Humphreys Counties and St. Clair County consumed diets considerably less concentrated in calcium, phosphorous, vitamin A, riboflavin and vitamin B<sub>12</sub>. Since all of these nutrients are present in concentrated amounts in milk and other dairy products, these findings suggest that children in Greene and Humphreys and St. Clair Counties may consume smaller amounts of milk and other dairy products than children in the other two sites.

#### Nutrition Services Provided Through Head Start

From its inception in 1965, the Head Start nutrition program has been an ambitious undertaking. In its first printed guidelines, Head Start went on record with explicit goals for the nutrition program that far exceeded those of previous feeding and nutrition programs in either preschools or primary schools. The Head Start nutrition program was built around the following principles (Zigler and Valentine, 1979):

- to build strong bodies, to grow and develop properly, children need the right food;
- a child who is fed when he or she is hungry feels well cared for and secure;
- a well-nourished child has a better chance to learn;
- Head Start can help each child establish good food habits which may help lay the foundation for good health throughout life;
- food and feeding affect many parts of a child's life: the child's body grows stronger and better able to work and play; while the mind learns about new foods, the different ways foods are served, and about making meal time a pleasant experience;

Exhibit 6-8

Prevalence of Diets Low in Nutrient Density<sup>a</sup>  
for Pretested Head Start Children by Site

| Pretested Children (Samples A and D) in: |                                     |                          |                         |                      |                    |
|--|-------------------------------------|--------------------------|-------------------------|----------------------|--------------------|
| Nutrient                                 | Greene & Humphreys Counties<br>n=75 | St. Clair County<br>n=94 | Maricopa County<br>n=90 | Mingo County<br>n=63 | All Sites<br>n=322 |
| Protein                                  |                                     |                          |                         |                      |                    |
| Number                                   | 0                                   | 1                        | 0                       | 0                    | 1                  |
| Percent                                  | 0.00                                | 1.0                      | 0.0                     | 0.0                  | 0.00               |
| Calcium                                  |                                     |                          |                         |                      |                    |
| Number                                   | 60                                  | 74                       | 49                      | 34                   | 217                |
| Percent                                  | 80.00                               | 79.0                     | 54.0                    | 54.0                 | 67.00              |
| Iron                                     |                                     |                          |                         |                      |                    |
| Number                                   | 66                                  | 85                       | 84                      | 56                   | 291                |
| Percent                                  | 87.50                               | 91.0                     | 93.0                    | 89.0                 | 90.00              |
| Magnesium                                |                                     |                          |                         |                      |                    |
| Number                                   | 40                                  | 54                       | 46                      | 27                   | 167                |
| Percent                                  | 52.75                               | 57.0                     | 51.0                    | 43.0                 | 52.00              |
| Phosphorus                               |                                     |                          |                         |                      |                    |
| Number                                   | 38                                  | 38                       | 23                      | 13                   | 112                |
| Percent                                  | 50.50                               | 41.0                     | 26.0                    | 21.0                 | 35.00              |
| Vitamin A                                |                                     |                          |                         |                      |                    |
| Number                                   | 37                                  | 48                       | 30                      | 25                   | 140                |
| Percent                                  | 49.00                               | 51.0                     | 33.0                    | 40.0                 | 43.50              |
| Thiamin                                  |                                     |                          |                         |                      |                    |
| Number                                   | 11                                  | 24                       | 37                      | 18                   | 90                 |
| Percent                                  | 14.25                               | 26.0                     | 41.0                    | 29.0                 | 28.00              |
| Riboflavin                               |                                     |                          |                         |                      |                    |
| Number                                   | 9                                   | 15                       | 10                      | 5                    | 39                 |
| Percent                                  | 12.00                               | 16.0                     | 11.0                    | 8.0                  | 12.00              |
| Niacin                                   |                                     |                          |                         |                      |                    |
| Number                                   | 9                                   | 13                       | 40                      | 28                   | 90                 |
| Percent                                  | 12.00                               | 14.0                     | 44.0                    | 44.0                 | 28.00              |
| Vitamin B <sub>6</sub>                   |                                     |                          |                         |                      |                    |
| Number                                   | 51                                  | 69                       | 64                      | 40                   | 224                |
| Percent                                  | 68.25                               | 73.0                     | 71.0                    | 63.0                 | 69.50              |
| Vitamin B <sub>12</sub>                  |                                     |                          |                         |                      |                    |
| Number                                   | 34                                  | 30                       | 17                      | 16                   | 97                 |
| Percent                                  | 45.00                               | 32.0                     | 19.0                    | 25.0                 | 30.25              |
| Vitamin C                                |                                     |                          |                         |                      |                    |
| Number                                   | 26                                  | 27                       | 36                      | 31                   | 120                |
| Percent                                  | 34.25                               | 29.0                     | 40.0                    | 49.0                 | 37.25              |

<sup>a</sup>Based on RDA-reference diet (see Appendix Note 6-3)

- by involving parents in the nutrition program of the center parents will learn which foods and amounts are best for children. They will also learn that family meals may follow the same pattern as those served at the center; and
- a child who learns to like a variety of foods at the center may influence the kind of foods served at home.

Thus, Head Start's nutrition program seeks to increase the likelihood that participating children will consume a well-balanced and nutritious diet, both now and in the future, through two important activities: provision of nutritious meals and snacks, and education about food and nutrition for both children and parents.

The Head Start performance standards outline five major objectives for the nutrition program. These objectives are designed to:

- provide food which will help meet the child's daily nutritional needs, recognizing individual differences and cultural patterns, and thereby promote sound physical, social, and emotional growth and development;
- provide an environment for nutritional services which will support and promote the use of the feeding situation as an opportunity for learning;
- help staff, child and family to understand the relationship of nutrition to health, factors which influence food practices, a variety of ways to provide for nutritional needs, and to apply this knowledge in the development of sound food habits even after leaving the Head Start program;
- demonstrate the interrelationships of nutrition to other activities of the Head Start program and its contribution to the overall child development goals; and
- involve all staff, parents and other community agencies as appropriate in meeting the child's nutritional needs so that nutritional care provided by Head Start complements and supplements that of the home and community.

(Head Start Program Performance Standards, U.S. Department of Health Education and Welfare, 1975).

Specific performance standards and guidelines designed to assist Head Start programs in meeting these objectives are listed below. The list is not all-inclusive because in some cases, sufficient data on program operations were not collected to allow evaluation of program compliance with particular.



stated objectives. The Head Start Health Evaluation focused on services provided to participating children and their families rather than on more global program philosophies and educational goals. The standards for Head Start nutrition services evaluated in this report include:

- identify nutritional needs and problems of Head Start children and their families, using:
  - nutrition assessment data (height, weight, hemoglobin/hematocrit);
  - information about family eating habits, special dietary needs and feeding problems;
  - information about major community nutrition problems;
- assist in meeting nutritional needs of the children by ensuring that:
  - every child in a part-day program will receive a quantity of food in meals (preferably hot) and snacks which will provide at least one-third of daily nutritional needs;
  - every child in a full-day program will receive snack(s), lunch, and other meals as appropriate which will provide one-half to two-thirds of daily nutritional needs, depending on the length of the program;
  - all children in morning programs who have not received breakfast at the time they arrive at the Head Start program will be served a nourishing breakfast;
  - the kinds of food served will conform to the minimum standard meal patterns (see Exhibit 6-11, below);
  - the quantities of food served will conform to recommended amounts (see Exhibit 6-11, below);
- set forth an organized nutrition education program for staff, parents and children which shall ensure that:
  - families receive education in the selection and preparation of foods to meet family needs, guidance in home and money management, and help in consumer education so that they can fulfill their major role and responsibility for the nutritional health of the family.

(Head Start Program Performance Standards, U.S. Department of Health Education and Welfare, 1975).

These performance standards cover three main types of nutrition and nutrition-related services:

- identification of children or families with specific nutritional problems and in need of special intervention;
- provision of meals and snacks to Head Start children; and
- provision of nutrition education to Head Start parents.

Identification of Nutritional Needs. The nutrition assessment, as defined in the performance standards, screens for children who are anemic (based on hemoglobin or hematocrit levels), underweight, or overweight (based on accepted growth standards). Inasmuch as hematologic and anthropometric status have been the subjects of separate analyses in the Head Start Health Evaluation, the provision of these screens has been discussed in the appropriate chapters (Chapter Seven--Biochemical Evaluation, Chapter Five--Anthropometric Evaluation).

Interviews with program staff revealed that in most sites the remainder of the nutritional needs information (data on family eating habits, special needs, etc.) were collected by program staff or Head Start center staff at the time of enrollment. Systems for identification and follow-up of individual children or families with nutrition problems were found to be vaguely defined and varied greatly from site to site. For the most part, children with suspected nutrition problems were identified by teachers, social service aides, or other center staff. Only Maricopa County had a full-time nutrition consultant available for handling such referrals. In other sites, referrals were made to physicians, WIC clinics or other available local nutrition counseling services. Records of such transactions were not routinely kept in the child's health records; it was therefore not possible to assess the extent to which such referrals were made. It seems apparent, though, through informal observations and interviews with program staff, that actual assessment or follow-up on any food habit or food intake data collected during the enrollment interview was infrequent in all sites, with the possible exception of Maricopa County, where the services of a full-time nutrition consultant were available.

Identification of families who were eligible for, but were not receiving, federal food assistance benefits (Food Stamps or WIC) was reported to be a high priority in the assessment of nutritional needs of the family in all sites. According to Head Start staff, a concerted effort was made to assist such families in acquiring appropriate food assistance benefits. A subsequent section in this chapter will discuss analyses that addressed the question of whether Head Start participation had a positive effect on families' receipt of food assistance benefits.

Provision of Meals and Snacks to Head Start Children With the exception of the Head Start program in Greene and Humphreys Counties, all programs included in this evaluation were part-day programs which serve children from 3 to 6 hours each day.\* As such, they are required to serve children one main meal (lunch or breakfast) and one snack, which should theoretically supply 33 percent of the child's daily nutrient needs.\*\* The full-day program in Greene and Humphreys Counties is required to serve lunch or supper, plus breakfast or two well-planned snacks, with the aim of supplying one-half to two-thirds of the child's daily nutrient needs (see Exhibit 6-9).

The number and types of meals served in all programs were in compliance with the USDA Child Care Food Program (CCFP) guidelines (see Exhibit 6-10). CCFP provides funds for provision of meals and snacks to children in eligible day-care settings. A study of the Child Care Food Program conducted by Abt Associates found that child care centers participating in the CCFP were more likely to serve breakfast than those not participating in the program (Fox and Glantz, 1981). Virtually 100 percent of all center-based Head Start programs (excludes home-based Head Start programs) participate in the Child Care Food Program.\*\*\*

Meal component guidelines and quantity requirements for the CCFP are listed in Exhibit 6-11.

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\*Verbal communication--Margaret Phillips, Head Start Program Nutritionist, U. S. Department of Health and Human Services, July 1982.

\*\*The age-appropriate average RDA values are the guidelines generally used. (Head Start Performance Standards, U. S. Department of Health, Education and Welfare, 1975).

\*\*\*Verbal communication--Margaret Phillips, Head Start Program Nutritionist, U. S. Department of Health and Human Services, July 1982.

Exhibit 6-9

Head Start Performance Standards for Meal Service In Full- and Part-Day Programs

| Head Start Performance Standard                           | Type of Program   |  |
|---|---|--|
|   | Full-Day  | Part-Day   |
| Hours of operation  | More than 6 hours per day   | 3 to 6 hours per day                                     |
| Meals to be served  | (A) Lunch or Supper<br><br><u>plus</u><br>(B) Breakfast or 2 snacks | (A) Lunch or Breakfast<br><br><u>plus</u><br>(B) 1 snack |
| Proportion of child's daily nutrient needs to be supplied | 50% - 66%   | 33%  |

Meals and snacks served in Head Start centers during the process of data collection were evaluated for their compliance with these meal component guidelines; data are summarized in Exhibit 6-12. (No formal assessment of compliance with quantity requirements was carried out in this evaluation.) In general, meals observed in the Head Start centers were in compliance with CCFP and/or Head Start meal component guidelines. There was some evidence that the different guidelines for snacks may be confusing to program personnel, since any snack found to be noncompliant with CCFP regulations was at the same time found to be in compliance with the less demanding meal component requirements outlined in the Head Start performance standards. The performance standards encourage programs to comply with USDA guidelines, but the inconsistency between Head Start and USDA recommendations may act to encourage programs in the opposite direction, since the Head Start guidelines

Head Start Nutrition Program Characteristics by Site

| Program Characteristics | Greene & Humphreys Counties                                    | St. Clair County  | Maricopa <sup>a</sup> County   | Mingo County   |
|-------------------------|--|---|--|--|
| Type of Program         | Full-Day   | Part-Day  | Part-Day   | Part-Day   |
| Hours of Operation      | 7:30 - 2:00  | 9:00 - 2:00   | (1) 8:00 - 11:45<br>(2) 9:00 - 1:00<br>(3) 12:00 - 3:45<br>(4) 11:00 - 3:00  | 8:30 - 2:30  |
| Total Hours Per Day     | 6 1/2  | 5   | Approx. 4  | 6  |
| Meals Served            | Breakfast<br>Lunch<br>Afternoon Snack                          | Breakfast<br>Lunch<br>Afternoon Snack   | (1) Breakfast and Lunch<br>(2) Morning Snack and Lunch<br>(3) Lunch and Afternoon Snack<br>(4) Lunch and Afternoon Snack | Breakfast<br>Lunch<br>Afternoon Snack                          |
| Type of Meal Service    | Family Style   | Family Style  | 45% Family Style <sup>b</sup><br>55% Cafeteria Style   | Family Style   |
| Food Service System     | Centralized cycle menu; food prepared in each center's kitchen | Centralized cycle menu; food purchased from vendor and delivered to each center | No centralized menu; center either receives food from school kitchen or children eat in school cafeteria                 | Centralized cycle menu; food prepared in each center's kitchen |

<sup>a</sup>All programs in Maricopa County are part-day programs, but hours of operation and associated meal patterns varied from center to center. All centers followed one of the four configurations identified above.

<sup>b</sup>Most Head Start centers in Maricopa County were located in elementary schools. Some programs received food from the cafeteria and served it to children in the Head Start classrooms. In other centers, children went to the school cafeteria for lunch or breakfast. (Snacks were usually served in the classroom in all centers.)

Exhibit 6-11

Child Care Food Program  
Requirements for Meals and Snacks Served in Head Start Centers

| CCFP Requirements <sup>a</sup>          |                               |
|---|-------------------------------|
| <u>Breakfast</u>                        |                               |
| Milk                                    | 3/4 cup                       |
| Cereal                                  | 1/3 cup                       |
| Bread                                   | or<br>1/2 slice               |
| Juice or Fruit                          | 1/2 cup                       |
| <u>Snack</u>                            |                               |
| At least 2 of the following, including: |                               |
| Milk                                    | 1/2 cup                       |
| Fruit/Juice/<br>Vegetable               | 1/2 cup                       |
| plus                                    |                               |
| Bread                                   | 1/2 slice                     |
| Cereal                                  | or<br>1/3 cup                 |
| <u>Lunch</u>                            |                               |
| Milk                                    | 3/4 cup                       |
| Protein-rich food <sup>b</sup>          | 1 1/2 oz<br>(or equiv)        |
| Vegetables and/or fruit                 | 1/2 cup<br>(at least 2 kinds) |
| Bread                                   | 1/2 slice                     |

<sup>a</sup>U. S. Department of Agriculture, "A Planning Guide For Food Service in Child Care Centers", 1976.

<sup>b</sup>Meat, fish, poultry, eggs, cheese or legumes.

Exhibit 6-12

Compliance with Meal Component Requirements  
in Meals and Snacks Observed in Head Start Centers by Site

|                              | Greene & Humphreys Counties<br>n=9  | St. Clair County<br>n=8                                 | Maricopa County<br>n=9                                  | Mingo County<br>n=8                 | All Sites<br>n=34 |
|------------------------------|-------------------------------------|---|---|-------------------------------------|-------------------|
| <b>Breakfast</b>             |                                     |   |   |                                     |                   |
| ● number observed            | 9                                   | 8   | 5   | 8                                   | 30                |
| ● percent compliant          | 100                                 | 100   | 80  | 87.5                                | 94.1              |
| ● reasons for non-compliance | ---                                 | ---   | no milk served  | no milk served                      | ---               |
| <b>Morning Snack</b>         |                                     |   |   |                                     |                   |
| ● number observed            | NA                                  | NA  | 3   | NA                                  | 3                 |
| ● percent compliant          |                                     |   | 100   |                                     | 100               |
| ● reasons for non-compliance |                                     |   | ---   |                                     | ---               |
| <b>Lunch</b>                 |                                     |   |   |                                     |                   |
| ● number observed            | 9                                   | 8   | 9   | 8                                   | 34                |
| ● percent compliant          | 66                                  | 62.5  | 78  | 100                                 | 76.5              |
| ● reasons for non-compliance | only one vegetable/fruit served     | only one vegetable served (n=2)<br>no milk served (n=1) | only one vegetable served (n=1)<br>no milk served (n=1) | ---                                 | ---               |
| <b>Afternoon Snack</b>       |                                     |   |   |                                     |                   |
| ● number observed            | 9                                   | 8   | 3   | 8                                   | 28                |
| ● percent compliant          | 89                                  | 50  | 100   | 87.5                                | 78.6              |
| ● reasons for non-compliance | no bread or bread substitute served | no bread or bread substitute served                     | ---   | no bread or bread substitute served | ---               |

<sup>a</sup> Snacks as served were not compliant with USDA Child Care Food Program regulations, but were in compliance with Head Start performance standards (see Exhibit 6-11). Head Start performance standards require only one food group for snacks, whereas CCFP regulations require two, one of which must be bread or an acceptable bread substitute.

encourage programs in the opposite direction, since the Head Start guidelines are less stringent. Other than this confusion about appropriate meal components for snacks, the only problems detected involved two centers where milk was not served with the breakfast meal, two centers where milk was not served with lunch, and six centers where only one vegetable or fruit selection was offered at lunch.

These deviations from program guidelines, although certainly important to note, did little to affect the average nutrient contribution of the total Head Start meal service in each site. The mean nutrient contribution from Head Start meals in all sites successfully met the performance standard goals\* for calories and all nutrients, with only two exceptions: the mean iron intake of children in Greene and Humphreys Counties provided only 43 percent of the recommended intake and the mean vitamin B<sub>6</sub> intake in Maricopa County provided approximately 29 percent of the recommendation (see Table 6-4). These shortcomings are not surprising, given the previous discussions on the problems associated with iron consumption in this population group, and the pattern of vitamin B<sub>6</sub> intake in the Maricopa County site. Across all sites, Head Start programs (including part-day programs) provided over 50 percent of the recommended amount of all nutrients with the exceptions of iron (42%), niacin (47%) and vitamin B<sub>6</sub> (47%) (see Table 6-5).

Head Start programs are successfully meeting their goals in providing significant proportions of children's daily nutrient needs. In addition, as Exhibit 6-13 indicates, programs are making substantial contributions to children's total daily nutrient intake. In general, Head Start programs are providing 40 to 50 percent of the total amount of nutrients children receive each day (see Tables 6-6 and 6-7). It is interesting to note that the mean percentage of total daily intake provided by Head Start meals and snacks in Greene and Humphreys Counties is consistently higher than that in the other three sites for almost every nutrient. The differences between Greene and Humphreys Counties and St. Clair and Mingo Counties are of particular interest, since the Head Start meal service programs in each of these sites

\*33 percent of children's daily nutrient needs for the part-day programs in St. Clair County, Maricopa County and Mingo County; 50 to 66 percent for the full-day programs in Greene and Humphreys Counties.



Exhibit 6-13

Mean Percent of Total Daily Intake Provided by Meals  
and Snacks Served in Head Start Centers by Site

|                               | Greene &<br>Humphreys<br>Counties<br>n=110 | St. Clair<br>County<br>n=72 | Maricopa<br>County<br>n=58 | Mingo<br>County<br>n=72 | All<br>Sites<br>n=312 |
|-------------------------------|--|-----------------------------|----------------------------|-------------------------|-----------------------|
| Calories                      | 47.1                                       | 38.8                        | 39.6                       | 44.6                    | 43.2                  |
| Protein (gm)                  | 51.8                                       | 40.2                        | 42.6                       | 45.4                    | 45.9                  |
| Fat (gm)                      | 50.1                                       | 37.3                        | 45.6                       | 44.4                    | 45.0                  |
| Carbohydrate (gm)             | 44.6                                       | 39.6                        | 34.1                       | 44.6                    | 41.5                  |
| Calcium (mg)                  | 66.7                                       | 46.7                        | 49.2                       | 56.7                    | 56.6                  |
| Iron (mg)                     | 47.9                                       | 39.2                        | 37.5                       | 41.9                    | 42.6                  |
| Magnesium (mg)                | 54.3                                       | 45.4                        | 42.3                       | 49.2                    | 48.9                  |
| Phosphorus (mg)               | 58.4                                       | 43.1                        | 43.5                       | 48.8                    | 49.9                  |
| Vitamin A (I.U.) <sup>b</sup> | 64.0                                       | 50.0                        | 42.0                       | 48.0                    | 53.0                  |
| Thiamin (mg)                  | 47.5                                       | 36.2                        | 40.1                       | 47.6                    | 43.5                  |
| Riboflavin (mg)               | 61.8                                       | 43.3                        | 44.4                       | 51.1                    | 51.7                  |
| Niacin (mg) <sup>c</sup>      | 43.4                                       | 34.8                        | 34.5                       | 37.3                    | 38.3                  |
| Vitamin B <sub>6</sub> (mg)   | 47.8                                       | 37.8                        | 36.1                       | 43.5                    | 42.3                  |
| Vitamin B <sub>12</sub> (mcg) | 64.0                                       | 43.3                        | 45.3                       | 50.8                    | 52.3                  |
| Vitamin C (mg)                | 45.2                                       | 44.9                        | 39.2                       | 46.3                    | 44.2                  |
| Cholesterol (mg)              | 59.2                                       | 45.2                        | 46.0                       | 42.9                    | 49.6                  |

<sup>a</sup>Detailed data are presented in Appendix Tables 6A-5 and 6A-7.

<sup>b</sup>Total Vitamin A value.

<sup>c</sup>Milligrams of preformed niacin.

is identical (e.g., breakfast, lunch, afternoon snack). As the data in Tables 6-6 and 6-7 illustrate, differences between Greene and Humphreys Counties and St. Clair County stem largely from an increased nutrient content of meals and snacks provided by the Head Start program in Greene and Humphreys Counties. Differences noted for Mingo County, however (differences were not as large or as consistent as differences for St. Clair County), are apparently due to lower overall intakes of children in Greene and Humphreys Counties. That is, children in Greene and Humphreys Counties consumes less food at home that did children in Mingo County; the overall influence of Head Start meals and snacks on children's total nutrient intake was therefore greater in Greene and Humphreys Counties.

A similar trend is apparent in Maricopa County. As Exhibit 6-13 indicates, the proportion of total daily intake provided by Head Start meals and snacks in Maricopa County is often similar to or greater than that provided in St. Clair and Mingo Counties, even though the total nutrient content of Head Start meals and snacks provided by the Maricopa County program was often substantially lower than the other two sites, since Maricopa County Head Start serves only one meal and one snack to participating children (see Exhibit 6-10 and Table 6-4).

These findings suggest that the relative importance of Head Start meals to each child's total daily intake varied from site to site and depended upon the amount of food that the child received at home. It is worth noting that a program serving children less than four hours per day (Maricopa County) can have the same relative impact on total daily intake as programs serving children five or six hours per day (Greene and Humphreys, St. Clair and Mingo Counties).

In summary, both the Head Start program philosophy and nutrition performance standards currently work hand-in-hand with the Child Care Food Program in providing Head Start children with well-balanced and nutritious meals and snacks. Meals and snacks provided by Head Start successfully provided the mandated proportions of children's daily nutrient needs, in all but a few instances. Head Start meals and snacks generally provided 40-50 percent of children's total daily intake, and thus had a significant and important impact on their overall diets. The magnitude of this impact varied from site to site and was greatest in those sites where parents appear to serve less food to their children at home (Greene and Humphreys and Maricopa Counties).

Provision of Nutrition Education to Head Start Parents. The Head

Start Performance Standards suggest both formal and informal approaches to the provision of nutrition education. Formal parent education classes are suggested, as well as informal discussions between parents and teaching staff, involvement of parents in food service and menu-planning or other nutrition-related activities. Sufficient data on program operations were not collected to allow assessment of educational opportunities on all of these levels. Data were collected, however, on mothers' (or other caregivers') involvement in parent education meetings, and parents' visits to or involvement in classroom activities. These data are summarized in the next two exhibits. Exhibit 6-14 summarizes parent participation in classroom activities and attendance at parent meetings; Exhibit 6-15 presents data on the frequency of parent participation in each of these activities.

Parent involvement in Head Start classrooms or parent meetings was fairly consistent across sites, although it was slightly higher in Maricopa County. Across all sites, 85 percent of the parents had visited their child's classroom at least once. As illustrated in Exhibit 6-15, the majority of parents who visited Head Start classrooms did so less than once a month (36%). In general, parents were more likely to visit their children's classrooms than to attend parent meetings. Seventy percent of the parents reported attendance at one or more parent meetings in the preceding six-month period. Of the group that participated in parent meetings, the most frequently reported attendance (33%) was two or three meetings during the preceding six months.

Of the parents who participated in any parent meetings, about one in three attended sessions on food and nutrition; about one-fourth participated in sessions on available community health services. In St. Clair County, attendance at such sessions was considerably higher than in the other three sites. Parent meetings addressed a wide array of topics, including general child behavior (discipline, bedwetting, etc.), general child development (how children learn and grow), and others not related to health and/or nutrition.

These data indicate that formal opportunities for parent education about food and/or nutrition, as assessed in this evaluation, were generally limited to a small proportion of the parents in each site. Informal opportunities, on the other hand, such as those which might arise during visits to

Exhibit 6-14

Parents' Involvement in Head Start Classrooms or Participation in Parent Education Meetings by Site

|  | Parents of Posttested Head Start Children<br>(Samples A, B and C) In: |                           |                          |                       |                    |
|--|---|---------------------------|--------------------------|-----------------------|--------------------|
|  | Greene & Humphreys Counties<br>n=118                                  | St. Clair County<br>n=102 | Maricopa County<br>n=106 | Mingo County<br>n=113 | All Sites<br>n=439 |
| Parents reporting involvement in or visit to Head Start classroom<br>Number<br>Percent                             | 89<br>75.4  | 84<br>82.4                | 100<br>94.3              | 101<br>89.4           | 374<br>85.2        |
| Parents reporting <sup>a</sup> attendance at one or more parent meetings<br>Number<br>Percent                      | 81<br>68.6  | 67<br>65.7                | 87<br>82.1               | 73<br>64.6            | 308<br>70.2        |
| Parents reporting <sup>b</sup> attendance at meetings focusing on food/nutrition<br>Number<br>Percent              | 21<br>25.9  | 31<br>46.3                | 24<br>27.6               | 19<br>26.0            | 95<br>30.8         |
| Parents reporting <sup>b</sup> attendance at meeting focusing on available community services<br>Number<br>Percent | 21<br>25.9  | 28<br>41.8                | 17<br>19.5               | 11<br>15.1            | 77<br>25.0         |

<sup>a</sup>Reported attendance covers six-month time period immediately preceding health assessments (November, 1980 to April, 1981).

<sup>b</sup>As percentage of parents who reported attending at least one meeting in the preceding six-month period.

Exhibit 6-15

Frequency of Parents' Involvement in Head Start Classroom Activities or Participation in Parent Education Meetings By Site

|  | Parents of<br>Head Start Children (Samples A, B and C) In: |                              |                             |                          |                       |
|--|--|------------------------------|-----------------------------|--------------------------|-----------------------|
|  | Greene &<br>Humphreys<br>Counties<br>n=118                 | St. Clair<br>County<br>n=102 | Maricopa<br>County<br>n=106 | Mingo<br>County<br>n=113 | All<br>Sites<br>n=439 |
| Frequency of involvement in or visit to Head Start classrooms<br>Number <sup>a</sup> | (87)   | (82)                         | (100)                       | (100)                    | (369)                 |
| ● less than once a month<br>Number   | 39   | 17                           | 34                          | 43                       | 133                   |
| Percent  | 44.8   | 20.7                         | 34.0                        | 43.0                     | 36.0                  |
| ● once a month<br>Number   | 26   | 16                           | 21                          | 26                       | 89                    |
| Percent  | 29.9   | 19.5                         | 21.0                        | 26.0                     | 24.1                  |
| ● once a week<br>Number  | 11   | 31                           | 31                          | 28                       | 101                   |
| Percent  | 12.6   | 37.8                         | 31.0                        | 28.0                     | 27.4                  |
| ● every day<br>Number  | 11   | 18                           | 14                          | 3                        | 46                    |
| Percent  | 12.6   | 22.0                         | 14.0                        | 3.0                      | 12.5                  |
| Number of parent meetings attended in past six months<br>Number                      | (77)   | (63)                         | (78)                        | (50)                     | (258)                 |
| ● only one<br>Number   | 9  | 7                            | 12                          | 10                       | 38                    |
| Percent  | 11.7   | 11.1                         | 15.4                        | 20.0                     | 14.7                  |
| ● 2-3 meetings<br>Number   | 25   | 18                           | 21                          | 20                       | 84                    |
| Percent  | 32.5   | 28.6                         | 26.9                        | 40.0                     | 32.6                  |
| ● 4-5 meetings<br>Number   | 19   | 13                           | 15                          | 8                        | 55                    |
| Percent  | 24.7   | 20.6                         | 18.8                        | 16.0                     | 20.4                  |
| ● 6-7 meetings<br>Number   | 10   | 13                           | 6                           | 3                        | 32                    |
| Percent  | 13.0   | 20.6                         | 7.5                         | 6.0                      | 11.8                  |
| ● 8 or more meetings<br>Number   | 14   | 12                           | 24                          | 9                        | 61                    |
| Percent  | 18.2   | 19.0                         | 32.5                        | 7.6                      | 22.6                  |

<sup>a</sup>Base numbers and percentages reported here may not match data in Exhibit 6-29 due to missing data on frequency of participation in some cases.

Head Start centers or children's classrooms, were apparently available to larger numbers of parents. In a later section of this chapter, we assess whether these formal and informal opportunities for nutrition education had an impact on parents' feeding behaviors, and consequently on either the nutrient content or nutritional quality of the diets provided to Head Start children at home.

### Nutrition Services Provided Through Other Sources

There are few sources other than Head Start that provide comparable nutrition services for preschool children. The one service that approximates Head Start most closely in terms of nutrition services is center-based day care, where meals and snacks are provided to enrolled children. Enrollment in day care was generally low (13%) but showed considerable variability across the four sites. Enrollment in day care for both Head Start and non-Head Start children was highest in Maricopa County, where one out of four children were enrolled in day care. In contrast, none of the children in Mingo County were enrolled in a day care center. (Use of day care services was similar in Head Start and non-Head Start groups, although it tended to be slightly, but not significantly, higher for the group of children not enrolled in Head Start.)\*

Other nutrition services available in the community include federal food assistance programs, e.g., Food Stamps and the Supplemental Food Program for Women, Infants and Children (WIC). We investigated whether families' participation in these food assistance programs made a difference in children's nutrient intake or the overall nutritional quality of their diets. Results of these analyses are discussed in a subsequent section of this chapter.

### Impacts of Head Start Nutrition Services

The impacts of Head Start nutrition services were evaluated for both the longitudinal sample (Sample A) and the total cross-sectional sample (Samples A, B and C), both within and across sites. In addition to impact

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\*Because utilization of day care services was low and similar for both Head Start and non-Head Start groups, we did not attempt to identify or compare impacts from day care services.

on nutrient intake and overall nutritional quality of the diet, Head Start impacts on families' patterns of participation in federal food assistance programs was evaluated. The impact of parent involvement in Head Start classroom activities and participation in parent education meetings focusing on food and nutrition was also examined in the cross-sectional sample. Results of these analyses are discussed in the following pages.

### Longitudinal Analyses

Impacts on Mean Nutrient Intake and Percent of Recommended Daily Intake Received. Multiple regression analyses of nutrient intake for all children in the longitudinal sample revealed that nutrient intake at pretest was a significant predictor of nutrient intake at posttest for almost all nutrients (see Tables 6-8 and 6-9). These results suggest that on average, for most children, there was little significant change in total nutrient intake from pretest to posttest. Significantly, however, and across all sites the Head Start-present group experienced significant changes in the intake of calcium, magnesium, phosphorus, riboflavin, vitamin A and vitamin B<sub>12</sub>, as Exhibit 6-16 illustrates. These significant changes in the total nutrient intake were not observed among the group of Head Start who were absent from the program or the non-Head Start children whose daily intakes remained very similar to the more marginal intakes observed at pretest. Hence, across all sites, mean intake of these nutrients in the Head Start-present group provided 100 percent or more of the daily recommendations, and was significantly greater than the mean intakes for either the Head Start-absent or non-Head Start groups. Presence and significance of differences varied across sites. Differences were largest and most frequent in Greene and Humphreys Counties, where children had some of the lowest intakes at pretest. The fewest differences were noted in Maricopa County, perhaps due to the more limited scope of the Head Start meal service.

Impact on Distribution of Percent of Nutrient Intake Standard Received. The increased intake of calcium, magnesium, phosphorus, riboflavin, vitamin A and vitamin B<sub>12</sub> also produced significant differences in the percentage of children in the Head Start-present group who consumed 100 percent of the daily recommendations for each of these nutrients, with the

Exhibit 6-16

Pattern of Differences in Mean Nutrient Intake at Posttest for Longitudinal Head Start and Non-Head Start Children within and across Sites

| Nutrient                | Longitudinal Head Start and Non-Head Start Children (Sample A) In: |   |                          |   |   |
|-------------------------|--|---|--------------------------|---|---|
|                         | Greene & Humphreys Counties  | St. Clair County                                    | Maricopa County          | Mingo County  | All Sites   |
| Protein                 | HS-P > HS-A <sup>a</sup>   |   |                          |   |   |
| Calcium                 | HS-P > NHS <sup>c</sup><br>HS-P > HS-A <sup>c</sup>                |   | HS-P > HS-A <sup>a</sup> | HS-P > NHS <sup>a</sup><br>HS-P > HS-A <sup>a</sup> | HS-P > NHS <sup>c</sup><br>HS-P > HS-A <sup>c</sup> |
| Magnesium               | HS-P > NHS <sup>a</sup><br>HS-P > HS-A <sup>c</sup>                | HS-P > NHS <sup>a</sup><br>HS-P > HS-A <sup>a</sup> | HS-P > HS-A <sup>a</sup> |   | HS-P > NHS <sup>c</sup><br>HS-P > HS-A <sup>c</sup> |
| Phosphorus              | HS-P > NHS <sup>a</sup><br>HS-P > HS-A <sup>b</sup>                |   | HS-P > HS-A <sup>a</sup> |   | HS-P > NHS <sup>b</sup><br>HS-P > HS-A <sup>c</sup> |
| Vitamin A               | HS-P > NHS <sup>c</sup><br>HS-P > HS-A <sup>a</sup>                | HS-P > NHS <sup>a</sup><br>HS-P > HS-A <sup>a</sup> |                          | HS-P > NHS <sup>a</sup>                             | HS-P > NHS <sup>c</sup><br>HS-P > HS-A <sup>c</sup> |
| Riboflavin              | HS-P > NHS <sup>a</sup>  |   |                          |   | HS-P > NHS <sup>b</sup><br>HS-P > HS-A <sup>c</sup> |
| Vitamin B <sub>12</sub> | HS-P > NHS <sup>b</sup><br>HS-P > HS-A <sup>b</sup>                |   |                          |   | HS-P > NHS <sup>c</sup><br>HS-P > HS-A <sup>a</sup> |

HS-P = Head Start-present group

HS-A = Head Start-absent group

NHS = Non-Head Start

Significance Levels:

<sup>a</sup> p ≤ 0.05

<sup>b</sup> p ≤ 0.01

<sup>c</sup> p ≤ 0.001



exception of riboflavin.\* Of the children who consumed less than 100 percent of the recommended amounts of calcium, magnesium, phosphorus, vitamin A and vitamin B<sub>12</sub> at pretest, significantly greater numbers of children in the Head Start-present group showed improvement at posttest, as shown in Exhibit 6-17. The most substantial differences were noted for calcium, and phosphorus, where 58 percent and 75 percent, respectively, of the Head Start-present group who were below 100 percent of the nutrient intake standards at pretest improved to 100 percent or more of the standards at posttest. Comparable changes occurred for only 19 percent (calcium) and 26 percent (phosphorus) of the Head Start-absent group, and 26 percent (calcium) and 50 percent (phosphorus) of the non-Head Start group.

These findings indicate that change in nutrient intake from pretest to posttest was minimal, and not statistically significant, for children who did not receive meals and snacks through the Head Start nutrition program. For the group of children who did receive Head Start meals and snacks, there was evidence of significant and beneficial increases in intake of six key nutrients: calcium, magnesium, phosphorus, riboflavin, vitamin A and vitamin B<sub>12</sub>.

Impact on Nutrient Density. Results of nutrient density analyses (see Tables 6-10 and 6-11) add important insight into possible causes for the improvements in nutrient intake reported in the preceding section. As indicated in Exhibit 6-18, pretest to posttest change in nutrient density paralleled the changes in total nutrient intake. Across all sites, children in the Head Start-present group consumed diets superior in nutrient density for five of the six key nutrients: calcium, magnesium, phosphorus, vitamin A and vitamin B<sub>12</sub>. These findings indicate that the increased intake of these nutrients noted in the Head Start-present group were not simply the result of consumption of additional amounts of food, but were also related to consumption of foods particularly concentrated in these nutrients. That is, children in the Head Start-present group apparently consumed significantly greater amounts of particular foods that were high in nutrient density for calcium, magnesium, phosphorus, vitamin A and vitamin B<sub>12</sub> than did children in the Head Start-absent and non-Head Start groups. All of these nutrients occur in significant amounts in milk and other dairy products. The evidence

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\*As Exhibit 6-6 illustrated, fewer than 10 percent of all children in each site (except St. Clair County) consumed less than 100 percent of the recommended amount of riboflavin at pretest.

Exhibit 6-17

Improvement in Percent of Recommended Daily Intake Received from Pretest to Posttest for Head Start-Present, Head Start-Absent and Non-Head Start Children across Sites

| Nutrient                  | Percent of Longitudinal Head Start and Non-Head Start (Sample A) Children In: |                                |                             |
|---------------------------|---|--------------------------------|-----------------------------|
|                           | Head Start-Present Group (n=76)   | Head Start-Absent Group (n=36) | Non-Head Start Group (n=69) |
| Calcium                   |   |                                |                             |
| Below 100% at pretest (n) | 46  | 31                             | 50                          |
| Improved at posttest (n)  | 27  | 6                              | 13                          |
| Improved at posttest (%)  | 58.7  | 19.4                           | 26.0                        |
| Magnesium                 |   |                                |                             |
| Below 100% at pretest (n) | 38  | 21                             | 38                          |
| Improved at posttest (n)  | 19  | 4                              | 17                          |
| Improved at posttest (%)  | 50.0  | 19.0                           | 44.7                        |
| Phosphorus                |   |                                |                             |
| Below 100% at pretest (n) | 36  | 19                             | 42                          |
| Improved at posttest (n)  | 27  | 5                              | 21                          |
| Improved at posttest (%)  | 75.0  | 26.3                           | 50.0                        |
| Vitamin A                 |   |                                |                             |
| Below 100% at pretest (n) | 34  | 14                             | 33                          |
| Improved at posttest (n)  | 24  | 7                              | 11                          |
| Improved at posttest (%)  | 70.6  | 50.0                           | 33.3                        |
| Vitamin B <sub>12</sub>   |   |                                |                             |
| Below 100% at pretest (n) | 29  | 14                             | 30                          |
| Improved at posttest (n)  | 25  | 5                              | 17                          |
| Improved at posttest (%)  | 86.2  | 35.7                           | 56.7                        |

seems to suggest that the provision of milk, as mandated in the CCFP and Head Start meal component regulations (see Exhibit 6-11) may play a large part in the improvements in nutrient intake and overall nutrient density of the diet reported here. This hypothesis is in keeping with the observation made by Fox and Glantz (1981) in their evaluation of the Child Care Food Program, in which day care centers participating in the CCFP were found to serve significantly more milk than day care centers not participating in the CCFP. Differences in the nutrient content of diets served in CCFP day care centers were similar to those reported here, i.e., differences were greatest for calcium, magnesium, phosphorus and riboflavin.

Impact on Patterns of Participation in Federal Food Assistance Programs. Changes in participation in federal food assistance programs from pretest to posttest were examined for Head Start and non-Head Start families to determine whether Head Start had a positive influence on families' enrollment in such programs.\* As Exhibit 6-19 illustrates, there were no significant differences in the patterns of program participation between the Head Start and non-Head Start groups at pretest. There were, however, differences across sites; the proportion of families receiving no food assistance benefits was substantially larger in Maricopa and Mingo Counties.

Overall, Head Start families experienced more positive change\*\* from pretest to posttest than did non-Head Start families (see Exhibit 6-20). That is, across all sites, 39 percent of the Head Start households experienced an increased or improved pattern of participation in food assistance programs versus 29 percent of the non-Head Start households. The most notable differences between Head Start and non-Head Start groups in pretest-to-posttest change occurred in Maricopa County and Mingo County for the families who were receiving no food assistance benefits at pretest. In Maricopa County, half of the Head Start families receiving no food assistance at pretest were participating in one or more programs at posttest, while a similar change occurred in less than a third of the non-Head Start families.

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\* Data on participation in food assistance programs were actually collected on children's households, since many children lived in large extended-family households. The term "family," as used here, actually refers to the entire household. Both terms are used interchangeably throughout this report.

\*\*Households were considered to have an improved participation pattern if they were participating in a new food assistance program at posttest, even if the total number of food assistance programs the household participated in remained the same.

Exhibit 6-18

Pattern of Differences in Nutrient Density at Posttest for Longitudinal Head Start and Non-Head Start Children within and across Sites

| Nutrient                | Longitudinal Head Start and Non-Head Start Children (Sample A) In: |   |   |   |   |
|-------------------------|--|---|---|---|---|
|                         | Greene & Humphreys Counties  | St. Clair County                                    | Maricopa County                                     | Mingo County  | All Sites   |
| Calcium                 | HS-P > NHS <sup>c</sup><br>HS-P > HS-A <sup>c</sup>                |   |   | HS-P > NHS <sup>a</sup><br>HS-P > HS-A <sup>a</sup> | HS-P > NHS <sup>c</sup><br>HS-P > HS-A <sup>c</sup> |
| Magnesium               | HS-P > NHS <sup>c</sup><br>HS-P > HS-A <sup>a</sup>                | HS-P > NHS <sup>c</sup><br>HS-P > HS-A <sup>b</sup> | HS-P > NHS <sup>b</sup><br>HS-P > HS-A <sup>a</sup> |   | HS-P > NHS <sup>c</sup><br>HS-P > HS-A <sup>c</sup> |
| Phosphorus              | HS-P > NHS <sup>c</sup><br>HS-P > HS-A <sup>b</sup>                | HS-P > NHS <sup>a</sup><br>HS-P > HS-A <sup>a</sup> | HS-P > NHS <sup>a</sup><br>HS-P > HS-A <sup>a</sup> |   | HS-P > NHS <sup>c</sup><br>HS-P > HS-A <sup>c</sup> |
| Vitamin A               | HS-P > NHS <sup>c</sup>  | HS-P > NHS <sup>b</sup><br>HS-P > HS-A <sup>a</sup> |   | HS-P > NHS <sup>b</sup><br>HS-P > HS-A <sup>a</sup> | HS-P > NHS <sup>c</sup><br>HS-P > HS-A <sup>a</sup> |
| Riboflavin              |  | HS-P > HS-A <sup>a</sup>                            | HS-P > NHS <sup>a</sup>                             | HS-P > HS-A <sup>b</sup>                            |   |
| Vitamin B <sub>12</sub> |  | HS-P < NHS <sup>d</sup>                             |   |   | HS-P > NHS <sup>a</sup>                             |
| Vitamin C               | HS-P < NHS <sup>d</sup>  | HS-P > NHS <sup>a</sup>                             |   |   |   |

HS-P = Head Start-present group<sup>a</sup>

HS-A = Head Start-absent group

NHS = Non-Head Start

Significance Levels:

<sup>a</sup> p < 0.05

<sup>b</sup> p < 0.01

<sup>c</sup> p < 0.001

<sup>d</sup> Effect in opposite direction; p < 0.05

Exhibit 6-19

Pattern of Participation in Federal Food Assistance Programs at Pretest for Longitudinal Head Start and Non-Head Start Families by Site

| Pattern of Food Assistance Program Participation | Longitudinal Families (Sample A) In: |             |                  |             |                 |             |              |             |             |             |
|--|--------------------------------------|-------------|------------------|-------------|-----------------|-------------|--------------|-------------|-------------|-------------|
|  | Greene & Humphreys Counties          |             | St. Clair County |             | Maricopa County |             | Mingo County |             | All Sites   |             |
|  | HS<br>n=42                           | NHS<br>n=31 | HS<br>n=24       | NHS<br>n=17 | HS<br>n=40      | NHS<br>n=16 | HS<br>n=18   | NHS<br>n=18 | HS<br>n=124 | NHS<br>n=82 |
| Food Stamps Only                                 | n<br>14.3                            | 8<br>25.8   | 4<br>16.7        | 5<br>29.4   | 13<br>32.5      | 5<br>31.3   | 2<br>11.1    | 4<br>22.2   | 25<br>20.2  | 22<br>26.8  |
| WIC Only   | n<br>19.0                            | 5<br>16.1   | 4<br>16.7        | 2<br>11.8   | 4<br>10.0       | 2<br>12.5   | 0<br>0.0     | 2<br>11.1   | 16<br>12.9  | 11<br>13.4  |
| Food Stamps and WIC                              | n<br>40.5                            | 16<br>51.6  | 14<br>58.3       | 7<br>41.2   | 9<br>22.5       | 2<br>12.5   | 6<br>33.3    | 6<br>33.3   | 46<br>37.1  | 31<br>37.8  |
| No Food Assistance                               | n<br>26.2                            | 2<br>6.5    | 2<br>8.3         | 3<br>17.6   | 14<br>35.0      | 7<br>43.8   | 10<br>55.6   | 6<br>33.3   | 37<br>29.8  | 18<br>22.0  |

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Exhibit 6-20

Change in Food Assistance Program Participation Pattern for Longitudinal Head Start and non-Head Start Families Across and Within Sites

|   | Longitudinal Families (Sample A) In |               |                  |              |                 |              |              |             |               |               |
|---|-------------------------------------|---------------|------------------|--------------|-----------------|--------------|--------------|-------------|---------------|---------------|
|   | Greene & Humphreys Counties         |               | St. Clair County |              | Maricopa County |              | Mingo County |             | All Sites     |               |
|   | HS<br>n=42                          | NHS<br>n=31   | HS<br>n=24       | NHS<br>n=17  | HS<br>n=40      | NHS<br>n=16  | HS<br>n=18   | NHS<br>n=18 | HS<br>n=124   | NHS<br>n=81   |
| Families Receiving Either Food Stamps or WIC at Pretest             | 14<br>33.3                          | 13<br>41.9    | 8<br>33.4        | 7<br>41.2    | 17<br>42.5      | 7<br>43.8    | 2<br>11.1    | 6<br>33.3   | 41<br>33.1    | 33<br>40.2    |
| Families With Improved Food Assistance Pattern at Posttest          | 3<br>21.4                           | 6<br>46.0     | 2<br>25.0        | 1<br>14.3    | 3<br>17.6       | 1<br>14.2    | 1<br>50.0    | 1<br>16.7   | 9<br>22.0     | 9<br>27.0     |
| Families Receiving No Food Assistance at Pretest                    | 11<br>26.2                          | 2<br>6.5      | 2<br>8.3         | 3<br>17.6    | 14<br>35.0      | 7<br>43.8    | 10<br>55.6   | 6<br>33.3   | 37<br>29.8    | 18<br>22.0    |
| Families Receiving New Food Assistance at Posttest                  | 7<br>63.6                           | 1<br>50.0     | 2<br>100.0       | 3<br>100.0   | 7<br>50.0       | 2<br>28.5    | 5<br>50.0    | 0<br>0.0    | 21<br>56.8    | 6<br>33.3     |
| Total Families With Some Positive Change in Food Assistance Pattern | 10/25<br>40.0                       | 15/31<br>46.7 | 4/10<br>40.0     | 4/10<br>40.0 | 10/31<br>32.3   | 3/16<br>21.4 | 6/12<br>50.0 | 1/12<br>8.3 | 30/78<br>38.5 | 15/51<br>29.6 |

Differences between groups were either not significant or sample sizes were too small to demonstrate significance, unless otherwise noted.

Families receiving both WIC and Food Stamp benefits at pretest were excluded from these analyses because there was no likely improvement in participation pattern, given the participation parameters examined here.

As percent of families who were receiving either Food Stamps or WIC benefits.

As percent of families who were receiving no food assistance at pretest.

As percent of total eligible sample (n and d, above).

Significance of Chi-Squared Test for independence (1 df):

$$\chi^2 = 4.68; p = 0.03$$

In Mingo County, a positive change occurred for five of the ten Head Start families receiving no food assistance benefits at pretest, however, none of the six comparable non-Head Start families had changed their participation pattern by posttest.

Although the numbers available for analysis are too small to demonstrate significance, and therefore limit the conclusions one can draw, the fact that the families in the longitudinal sample were from the original random assignment groups and were similar in income and other background characteristics suggests that the group differences are due to Head Start intervention, at least in some sites. Head Start may indeed play an important role in identifying families in need of the services available from federal food assistance programs and serve as an effective link between these programs and needy families.

### Cross-Sectional Analyses

Impact on Mean Nutrient Intake and Percent of Recommended Daily Intake Received. Exhibits 6-21 through 6-23 illustrate the pattern of marginal nutrient intakes noted for each of the three treatment groups (Head Start-present, Head Start-absent, and non-Head Start) in the total cross-sectional sample (Samples A, B and C).<sup>\*</sup> As these exhibits clearly indicate, the problems of marginal calcium and iron intakes noted at pretest persisted in the Head Start-absent and non-Head Start groups, but were much improved in the Head Start-present group. The mean intake of calcium for the Head Start-present group in all sites exceeded 100 percent of the standard; mean intakes of iron also met the recommendation in all sites except Greene and Humphreys Counties and Maricopa County, where mean intakes supplied approximately 94 percent of the recommended amount.<sup>\*\*</sup> Similarly, the problem of marginal caloric intake continued only for the Head Start-absent group in Maricopa County.

<sup>\*</sup>Appendix Tables 6-12 through 6-23 contain detailed breakdowns of the nutrient intake data and proportions of nutrient intake standard received for all three treatment groups, both within and across sites. Appendix Tables 6-36 through 6-52 provide additional detailed breakdowns of nutrient intake data by age and sex.

<sup>\*\*</sup>This finding must be considered in light of the children's age increase from pretest to posttest and the concomitant 33 percent decrease in the recommended iron intake (see Appendix Note 6-3). Nonetheless, absolute intakes of iron at posttest were greater than those at pretest--the most substantial increase was noted for the Head Start-present group (see Appendix Tables 6-12 through 6-23).

Exhibit 6-21

Unadjusted Mean Nutrient Intakes Below 100 Percent of Recommended Daily Intake, for Posttested Head Start Children Present in Head Start on Day of Recall by Site

| Nutrient                | Posttested Head Start-Present Children (Samples A, B, and C) In: |                  |                 |              |           |
|-------------------------|--|------------------|-----------------|--------------|-----------|
|                         | Greene & Humphreys Counties                                      | St. Clair County | Maricopa County | Mingo County | All Sites |
| Calories                |  |                  |                 |              |           |
| Protein                 |  |                  |                 |              |           |
| Calcium                 |  |                  |                 |              |           |
| Iron                    | +  |                  | +               |              |           |
| Magnesium               |  |                  | +               |              |           |
| Phosphorus              |  |                  |                 |              |           |
| Vitamin A               |  |                  |                 |              |           |
| Thiamin                 |  |                  |                 |              |           |
| Riboflavin              |  |                  |                 |              |           |
| Niacin                  |  |                  |                 |              |           |
| Vitamin B <sub>6</sub>  |  |                  | ++              |              |           |
| Vitamin B <sub>12</sub> |  |                  |                 |              |           |
| Vitamin C               |  |                  |                 |              |           |

- + 90-99% of recommended intake
- ++ 80-89% of recommended intake
- +++ 70-79% of recommended intake
- ++++ Below 70% of recommended intake



Exhibit 6-22

Unadjusted Mean Nutrient Intakes Below 100 Percent of Recommended Daily Intake for Posttested Head Start Children Absent from Head Start on Day of Recall By Site

| Nutrient                | Posttested Head Start-Absent Children (Samples A, B, and C) In: |                  |                 |              |           |
|-------------------------|---|------------------|-----------------|--------------|-----------|
|                         | Greene & Humphreys Counties                                     | St. Clair County | Maricopa County | Mingo County | All Sites |
| Calories                |   |                  | ++              |              |           |
| Protein                 |   |                  |                 |              |           |
| Calcium                 | ++++  | +                | +++             | +            | ++        |
| Iron                    |   |                  | +               | ++           | +         |
| Magnesium               | ++  |                  | +++             | +            | +         |
| Phosphorus              | +   |                  |                 |              |           |
| Vitamin A               |   |                  |                 |              |           |
| Thiamin                 |   |                  |                 |              |           |
| Riboflavin              |   |                  |                 |              |           |
| Niacin                  |   |                  |                 |              |           |
| Vitamin B <sub>6</sub>  |   |                  | ++              | +            |           |
| Vitamin B <sub>12</sub> | +   |                  |                 |              |           |
| Vitamin C               |   |                  |                 |              |           |

- + 90-99% of recommended intake
- ++ 80-89% of recommended intake
- +++ 70-79% of recommended intake
- ++++ Below 70% of recommended intake

Exhibit 6-23

Unadjusted Mean Nutrient Intakes Below 100 Percent of Recommended Daily Intake for Posttested Non-Head Start Children by Site

| Nutrient                | Posttested Non-Head Start Children<br>(Samples A, B, and C) In: |                  |                 |              |           |
|-------------------------|---|------------------|-----------------|--------------|-----------|
|                         | Greene & Humphreys Counties                                     | St. Clair County | Maricopa County | Mingo County | All Sites |
| Kilocalories            |   |                  |                 |              |           |
| Protein                 |   |                  |                 |              |           |
| Calcium                 | +++   | ++               | +               | +            | ++        |
| Iron                    | +   | +                | +               | +++          | +         |
| Magnesium               |   |                  | ++              |              |           |
| Phosphorus              |   |                  |                 |              |           |
| Vitamin A               |   |                  |                 |              |           |
| Thiamin                 |   |                  |                 |              |           |
| Riboflavin              |   |                  |                 |              |           |
| Niacin                  |   |                  |                 |              |           |
| Vitamin B <sub>6</sub>  |   |                  | ++              |              |           |
| Vitamin B <sub>12</sub> |   |                  |                 |              |           |
| Vitamin C               |   |                  |                 |              |           |

- + 90-99% of recommended intake
- ++ 80-89% of recommended intake
- +++ 70-80% of recommended intake
- ++++ Below 70% of recommended intake

Overall, the pattern of marginal intakes (calcium and iron, as well as magnesium and vitamin B<sub>6</sub> in some sites) in the Head Start-absent and non-Head Start groups was quite similar to that noted in the pretest sample, although somewhat less severe. In contrast, marginal nutrient intakes in the Head Start-present group were very few and much less severe--calcium intakes exceeded 100 percent of the standard in all sites, and iron intakes were above 94 percent of the standard in all sites. Furthermore, the prevalence and severity of problems in the Head Start-present group was substantially lower than would be expected from the previously cited reference data for comparable groups of preschool children (see Exhibit 6-5), especially in St. Clair and Mingo Counties.

In addition to the improvements in intake of calcium, magnesium, phosphorus, riboflavin, vitamin A and vitamin B<sub>12</sub> noted for the Head Start-present group in the longitudinal analyses, the cross-sectional analyses revealed that mean intakes of the Head Start-present group, and proportion of nutrient intake recommendation received, were significantly greater than either the Head Start-absent group or the non-Head Start group, for almost every nutrient examined, including iron (see Tables 6-12 through 6-23).<sup>\*</sup> Interestingly enough, however, virtually no significant differences in intake or percentage of daily recommendation received were noted in comparisons between the Head Start-absent group and the non-Head Start group.

To further substantiate these apparent Head Start effects, a series of regression analyses focusing on nutrient intake were conducted (using the regression model and covariate set outlined in the discussion on analytic approach). All three groups (Head Start-present versus non-Head Start; Head Start-present versus Head Start-absent; Head Start-absent versus non-Head Start) were compared on intake of each nutrient. Detailed results of these analyses are reported in Appendix Tables 6-24 and 6-25. As the adjusted mean nutrient intakes in Exhibits 6-24 through 6-26 illustrate, across-site analyses revealed positive and statistically significant differences in intake between the Head Start-present and non-Head Start groups for all nutrients except fat and cholesterol. Similarly, across all sites, children

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<sup>\*</sup>The additional findings noted in the cross-sectional sample are undoubtedly due to the additional power available in the cross-sectional analyses due to the vastly increased sample sizes (see Chapter Two). The same pattern of effects noted in the longitudinal analyses was found in the cross-sectional analyses. In addition, smaller, but significant, differences for other nutrients were noted as well.

Exhibit 6-24

Adjusted Mean Nutrient Intakes for Head Start-Present and Non-Head Start Children by Site

| Variable                                   | Posttested Head Start-present and non-Head Start Children (Samples A, B, and C) In: |         |                      |         |                     |         |                      |         |                      |         |
|--|---|---------|----------------------|---------|---------------------|---------|----------------------|---------|----------------------|---------|
|  | Greene and Humphreys County   |         | St. Clair County     |         | Maricopa County     |         | Mingo County         |         | All Sites            |         |
|  | HS-P  | NHS     | HS-P                 | NHS     | HS-P                | NHS     | HS-P                 | NHS     | HS-P                 | NHS     |
| Calories                                   |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 1610  | 1538    | 2088 <sup>C</sup>    | 1761    | 1525                | 1512    | 1874 <sup>C</sup>    | 1580    | 1770 <sup>C</sup>    | 1597    |
| n  | 104   | 82      | 70                   | 66      | 56                  | 48      | 64                   | 99      | 294                  | 295     |
| Protein (gm)                               |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 62.96   | 57.38   | 75.40 <sup>C</sup>   | 61.48   | 55.71               | 52.94   | 71.45 <sup>C</sup>   | 53.26   | 66.63 <sup>C</sup>   | 56.09   |
| n  | 103   | 84      | 71                   | 67      | 54                  | 48      | 68                   | 100     | 296                  | 299     |
| Fat (gm)                                   |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 63.46   | 63.85   | 81.91                | 76.87   | 64.58               | 66.88   | 70.96                | 65.83   | 69.95                | 68.11   |
| n  | 102   | 83      | 70                   | 67      | 56                  | 48      | 63                   | 99      | 291                  | 297     |
| Carbohydrate (gm)                          |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 199.95  | 188.73  | 267.00 <sup>C</sup>  | 214.23  | 180.11              | 173.19  | 456.91 <sup>C</sup>  | 195.91  | 223.21 <sup>C</sup>  | 193.80  |
| n  | 105   | 82      | 70                   | 66      | 56                  | 47      | 67                   | 98      | 298                  | 293     |
| Calcium (mg)                               |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 942.71 <sup>C</sup>   | 622.16  | 1056.77 <sup>C</sup> | 696.76  | 844.43 <sup>B</sup> | 706.38  | 1124.19 <sup>C</sup> | 750.32  | 1008.69 <sup>C</sup> | 685.56  |
| n  | 105   | 83      | 70                   | 66      | 54                  | 47      | 68                   | 100     | 296                  | 296     |
| Iron (mg)                                  |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 10.55   | 10.19   | 12.99                | 11.64   | 9.34                | 8.95    | 11.46 <sup>C</sup>   | 9.78    | 11.06 <sup>A</sup>   | 10.32   |
| n  | 103   | 76      | 69                   | 67      | 53                  | 46      | 65                   | 99      | 293                  | 288     |
| Magnesium (mg)                             |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 216.98 <sup>B</sup>   | 181.36  | 284.00 <sup>C</sup>  | 200.84  | 193.19              | 168.26  | 246.85 <sup>C</sup>  | 186.82  | 235.99 <sup>C</sup>  | 184.12  |
| n  | 109   | 92      | 70                   | 67      | 56                  | 48      | 68                   | 99      | 300                  | 306     |
| Phosphorus (mg)                            |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 1125.83 <sup>C</sup>  | 846.83  | 1300.14 <sup>C</sup> | 966.81  | 1016.43             | 923.49  | 1306.00 <sup>C</sup> | 1001.91 | 1201.00 <sup>C</sup> | 928.11  |
| n  | 109   | 92      | 70                   | 66      | 55                  | 48      | 69                   | 99      | 302                  | 305     |
| Log Vitamin A (IU) <sup>d</sup>            |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 3.80 <sup>C</sup>   | 3.51    | 7.31 <sup>C</sup>    | 3.43    | 3.51                | 3.42    | 3.61 <sup>C</sup>    | 3.38    | 3.66 <sup>B</sup>    | 3.44    |
| n  | 103   | 83      | 71                   | 64      | 55                  | 47      | 66                   | 94      | 298                  | 288     |
| Vitamin A (IU) <sup>d</sup>                |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 10301.39  | 4518.64 | 8083.03              | 3272.47 | 4015.96             | 3386.91 | 4862.06              | 2880.18 | 7016.53              | 3616.77 |
| n  | 103   | 83      | 71                   | 64      | 55                  | 47      | 66                   | 94      | 298                  | 288     |
| Thiamin (mg)                               |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 1.26  | 1.21    | 153.00               | 1.43    | 1.10                | 0.99    | 1.38 <sup>C</sup>    | 1.11    | 1.30 <sup>A</sup>    | 1.19    |
| n  | 104   | 79      | 70                   | 67      | 55                  | 45      | 68                   | 97      | 295                  | 288     |
| Riboflavin (mg)                            |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 2.00 <sup>C</sup>   | 1.55    | 2.33 <sup>C</sup>    | 1.62    | 1.64                | 1.53    | 1.90 <sup>C</sup>    | 1.56    | 2.03 <sup>C</sup>    | 1.55    |
| n  | 98  | 81      | 71                   | 64      | 53                  | 48      | 68                   | 99      | 290                  | 292     |
| Niacin (mg)                                |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 14.89   | 13.83   | 17.14                | 15.90   | 11.85               | 11.16   | 14.83 <sup>A</sup>   | 12.24   | 14.45 <sup>A</sup>   | 13.70   |
| n  | 101   | 81      | 71                   | 67      | 55                  | 46      | 67                   | 100     | 294                  | 294     |
| Vitamin B <sub>6</sub> (mg)                |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 1.29  | 1.29    | 1.55 <sup>B</sup>    | 1.18    | 1.18                | 1.17    | 1.39 <sup>A</sup>    | 1.12    | 1.32 <sup>B</sup>    | 1.18    |
| n  | 102   | 78      | 68                   | 67      | 55                  | 48      | 67                   | 99      | 292                  | 292     |
| Log Vitamin B <sub>12</sub> (mcg)          |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 0.58 <sup>C</sup>   | 0.40    | 0.59 <sup>B</sup>    | 0.46    | 0.51                | 0.45    | 0.58 <sup>C</sup>    | 0.39    | 0.58 <sup>C</sup>    | 0.42    |
| n  | 90  | 82      | 66                   | 65      | 54                  | 49      | 68                   | 98      | 278                  | 294     |
| Vitamin B <sub>12</sub> (mcg) <sup>d</sup> |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 4.60  | 3.01    | 4.73                 | 3.07    | 3.77                | 3.43    | 4.23                 | 2.93    | 4.30                 | 3.14    |
| n  | 90  | 82      | 66                   | 65      | 54                  | 49      | 68                   | 98      | 278                  | 294     |
| Vitamin C (mg)                             |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 117.30  | 132.14  | 190.54 <sup>A</sup>  | 146.03  | 86.62               | 79.69   | 114.81 <sup>B</sup>  | 80.35   | 125.90 <sup>A</sup>  | 111.36  |
| n  | 104   | 84      | 70                   | 67      | 55                  | 47      | 64                   | 96      | 293                  | 294     |
| Cholesterol (mg)                           |   |         |                      |         |                     |         |                      |         |                      |         |
| Mean Intake                                | 324.73  | 281.44  | 431.13               | 355.64  | 313.45              | 307.42  | 298.50               | 339.25  | 340.61               | 331.38  |
| n  | 100   | 82      | 70                   | 65      | 56                  | 49      | 69                   | 99      | 295                  | 295     |

<sup>A</sup>significance level p<.05

<sup>B</sup>significance level p<.01

<sup>C</sup>significance level p<.001

<sup>d</sup>significance level not tested on absolute intake, since substantial skewness in the distribution invalidates the assumptions underlying F-tests for statistical significance. Variable was transformed to logarithmic scale (Base 10) to test significance--refer to results for log distributions for significance levels.

Exhibit 6-25

Adjusted Mean Nutrient Intakes for Head Start-Present and Head Start-Absent Children by Site

| Variable                                   | Posttested Head Start-present and Head Start-absent Children (Samples A, B, and C) In: |         |                      |                   |                      |         |                      |         |                      |         |
|--|--|---------|----------------------|-------------------|----------------------|---------|----------------------|---------|----------------------|---------|
|  | Greene and Humphreys County  |         | St. Clair County     |                   | Maricopa County      |         | Mingo County         |         | All Sites            |         |
|  | HS-P   | HS-A    | HS-P                 | HS-A              | HS-P                 | HS-A    | HS-P                 | HS-A    | HS-P                 | HS-A    |
| Calories                                   |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 1610   | 1412    | 2088                 | 1914 <sup>a</sup> | 1525                 | 1323    | 1874 <sup>c</sup>    | 1499    | 1770 <sup>c</sup>    | 1533    |
| n  | 104  | 10      | 70                   | 31                | 56                   | 40      | 64                   | 37      | 294                  | 118     |
| Protein (gm)                               |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 62.96 <sup>b</sup>   | 45.35   | 75.4                 | 70.21             | 55.71 <sup>a</sup>   | 47.2    | 71.45 <sup>c</sup>   | 51.36   | 66.63 <sup>c</sup>   | 54.55   |
| n  | 103  | 9       | 71                   | 31                | 54                   | 41      | 68                   | 36      | 296                  | 117     |
| Fat (gm)                                   |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 63.46  | 58.33   | 81.91                | 83.38             | 64.58                | 36.58   | 70.96                | 61.87   | 69.95 <sup>a</sup>   | 64.38   |
| n  | 102  | 10      | 70                   | 30                | 56                   | 41      | 63                   | 36      | 291                  | 117     |
| Carbohydrate (gm)                          |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 199.55   | 171.12  | 267.00 <sup>b</sup>  | 256.12            | 180.11               | 163.83  | 456.91 <sup>c</sup>  | 178.54  | 223.21 <sup>c</sup>  | 183.00  |
| n  | 105  | 10      | 70                   | 31                | 56                   | 40      | 67                   | 37      | 298                  | 118     |
| Calcium (mg)                               |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 942.71 <sup>c</sup>  | 443.82  | 1056.77 <sup>c</sup> | 733.49            | 844.43 <sup>b</sup>  | 641.31  | 1124.19 <sup>c</sup> | 698.8   | 1008.69 <sup>c</sup> | 653.57  |
| n  | 105  | 10      | 70                   | 31                | 54                   | 41      | 68                   | 33      | 296                  | 119     |
| Iron (mg)                                  |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 10.55  | 8.74    | 12.99                | 12.43             | 9.34                 | 8.87    | 11.46 <sup>c</sup>   | 8.85    | 11.06 <sup>b</sup>   | 9.86    |
| n  | 103  | 9       | 69                   | 28                | 53                   | 40      | 65                   | 37      | 293                  | 110     |
| Magnesium (mg)                             |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 216.96 <sup>b</sup>  | 165.00  | 284.00 <sup>c</sup>  | 215.00            | 193.19 <sup>b</sup>  | 146.42  | 246.85 <sup>c</sup>  | 171.75  | 235.99 <sup>c</sup>  | 173.92  |
| n  | 109  | 10      | 70                   | 31                | 56                   | 40      | 68                   | 37      | 300                  | 118     |
| Phosphorus (mg)                            |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 1125.83 <sup>b</sup>   | 770.6   | 1300.14 <sup>b</sup> | 1063.6            | 1016.43 <sup>b</sup> | 814.05  | 1306.00 <sup>c</sup> | 949.8   | 1201.00 <sup>c</sup> | 900.26  |
| n  | 109  | 10      | 70                   | 31                | 55                   | 41      | 69                   | 37      | 302                  | 119     |
| Log Vitamin A (IU)                         |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 3.8 <sup>b</sup>   | 3.42    | 7.31 <sup>b</sup>    | 3.55              | 3.51 <sup>b</sup>    | 3.33    | 3.61 <sup>a</sup>    | 3.48    | 3.68 <sup>c</sup>    | 3.48    |
| n  | 103  | 10      | 71                   | 31                | 55                   | 39      | 66                   | 35      | 298                  | 117     |
| Vitamin A (IU) <sup>d</sup>                |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 10301.39   | 4394.46 | 8083.03              | 4143.28           | 4015.96              | 2907.98 | 4862.06              | 3987.80 | 7016.53              | 4329.00 |
| n  | 103  | 10      | 71                   | 31                | 55                   | 39      | 66                   | 35      | 298                  | 117     |
| Thiamin (mg)                               |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 1.30 <sup>b</sup>  | 1.20    | 1.26                 | 1.23              | 1.53                 | 1.49    | 1.1 <sup>a</sup>     | 0.94    | 1.38                 | 1.17    |
| n  | 104  | 10      | 70                   | 30                | 55                   | 39      | 68                   | 35      | 295                  | 114     |
| Riboflavin (mg)                            |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 2.0 <sup>c</sup>   | 1.18    | 2.33 <sup>b</sup>    | 1.82              | 1.64                 | 1.38    | 1.9 <sup>c</sup>     | 1.54    | 2.03 <sup>c</sup>    | 1.54    |
| n  | 98   | 9       | 71                   | 31                | 53                   | 40      | 68                   | 35      | 290                  | 115     |
| Niacin (mg)                                |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 14.89  | 12.19   | 17.14                | 17.48             | 11.85                | 10.36   | 14.83 <sup>a</sup>   | 12.14   | 14.45                | 13.39   |
| n  | 101  | 9       | 71                   | 29                | 55                   | 39      | 67                   | 33      | 294                  | 110     |
| Vitamin B <sub>6</sub> (mg)                |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 1.29 <sup>b</sup>  | 1.26    | 1.55                 | 1.32              | 1.18                 | 1.06    | 1.36 <sup>a</sup>    | 1.12    | 1.32 <sup>a</sup>    | 1.17    |
| n  | 102  | 10      | 68                   | 28                | 55                   | 41      | 67                   | 34      | 292                  | 113     |
| Log Vitamin B <sup>12</sup> (mcg)          |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 0.58 <sup>c</sup>  | 0.19    | 0.59                 | 0.58              | 0.51                 | 0.45    | 0.58                 | 0.46    | 0.58 <sup>c</sup>    | 0.46    |
| n  | 90   | 9       | 66                   | 31                | 54                   | 40      | 68                   | 37      | 278                  | 117     |
| Vitamin B <sub>12</sub> (mcg) <sup>d</sup> |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 4.60   | 1.95    | 4.73                 | 4.30              | 3.77                 | 3.13    | 4.23                 | 3.76    | 4.30                 | 3.55    |
| n  | 90   | 9       | 66                   | 31                | 54                   | 40      | 68                   | 37      | 278                  | 117     |
| Vitamin C (mg)                             |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 117.3  | 111.39  | 190.54               | 182.78            | 86.62 <sup>f</sup>   | 83.35   | 114.81               | 96.87   | 125.97               | 117.00  |
| n  | 104  | 10      | 70                   | 31                | 55                   | 39      | 64                   | 37      | 293                  | 117     |
| Cholesterol (mg)                           |  |         |                      |                   |                      |         |                      |         |                      |         |
| Mean Intake                                | 324.73   | 257.4   | 431.13               | 388.07            | 313.45               | 316     | 298.5                | 345.71  | 340.61               | 338.95  |
| n  | 100  | 9       | 70                   | 31                | 56                   | 41      | 69                   | 37      | 295                  | 118     |

<sup>a</sup>Significance level p<.05

<sup>b</sup>Significance level p<.01

<sup>c</sup>Significance level p<.001

<sup>d</sup>Significance level not tested on absolute intake, since substantial skewness in the distribution invalidates the assumptions underlying F-tests for statistical significance. Variable was transformed to logarithmic scale (Base 10) to test significance--refer to results for log distributions for significance levels.

Exhibit 6-26

Adjusted Mean Nutrient Intakes for Head Start-Absent and Non-Head Start Children by Site

| Variable                                   | Posttreated Head Start-Absent and Non-Head Start Children (Samples A, B, and C) in: |         |                  |         |                 |         |              |         |           |         |
|--|---|---------|------------------|---------|-----------------|---------|--------------|---------|-----------|---------|
|  | Greene and Humphreys County   |         | St. Clair County |         | Maricopa County |         | Mingo County |         | All Sites |         |
|  | HS-A  | NHS     | HS-A             | NHS     | HS-A            | NHS     | HS-A         | NHS     | HS-A      | NHS     |
| Calories                                   |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 1412  | 1538    | 1914             | 1761    | 1323            | 1512    | 1499         | 1580    | 1533      | 1597    |
| n  | 10  | 82      | 31               | 66      | 40              | 48      | 37           | 99      | 118       | 295     |
| Protein (gm)                               |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 45.35   | 57.38   | 70.21            | 61.48   | 47.20           | 52.94   | 51.36        | 53.26   | 54.55     | 56.09   |
| n  | 9   | 84      | 31               | 67      | 41              | 48      | 36           | 100     | 117       | 299     |
| Fat (gm)                                   |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 58.33   | 63.85   | 83.38            | 76.87   | 36.58           | 66.88   | 61.87        | 65.83   | 64.38     | 68.11   |
| n  | 10  | 83      | 30               | 67      | 41              | 48      | 26           | 99      | 117       | 297     |
| Carbohydrate (mg)                          |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 171.12  | 188.73  | 256.12           | 214.23  | 163.83          | 173.19  | 178.54       | 195.91  | 183.00    | 193.8   |
| n  | 10  | 82      | 31               | 66      | 40              | 47      | 37           | 98      | 118       | 293     |
| Calcium (mg)                               |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 443.82  | 622.16  | 733.49           | 696.76  | 641.31          | 706.38  | 698.8        | 750.32  | 653.57    | 685.56  |
| n  | 10  | 83      | 31               | 66      | 41              | 47      | 33           | 100     | 119       | 296     |
| Iron (mg)                                  |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 8.74  | 10.19   | 12.43            | 11.64   | 8.87            | 8.95    | 8.85         | 9.78    | 9.86      | 10.32   |
| n  | 9   | 76      | 28               | 67      | 40              | 46      | 37           | 99      | 110       | 288     |
| Magnesium (mg)                             |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 165.00  | 181.36  | 215.0            | 200.84  | 146.42          | 168.26  | 171.75       | 186.82  | 173.92    | 184.12  |
| n  | 10  | 92      | 31               | 67      | 40              | 48      | 37           | 99      | 118       | 306     |
| Phosphorus (mg)                            |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 770.6   | 846.83  | 1063.6           | 966.81  | 814.05          | 923.49  | 949.8        | 1001.91 | 900.26    | 928.11  |
| n  | 10  | 92      | 31               | 66      | 41              | 48      | 37           | 99      | 119       | 305     |
| Log Vitamin A (IU) <sup>a</sup>            |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 3.42  | 3.51    | 3.55             | 3.43    | 3.33            | 3.42    | 3.48         | 3.38    | 3.48      | 3.44    |
| n  | 10  | 83      | 31               | 64      | 39              | 47      | 35           | 94      | 117       | 288     |
| Vitamin A (IU)                             |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 4394.46   | 4518.64 | 4143.28          | 3272.47 | 2907.98         | 3386.91 | 3987.80      | 2880.18 | 4329.00   | 3616.77 |
| n  | 10  | 83      | 31               | 64      | 39              | 47      | 35           | 94      | 117       | 288     |
| Thiamin (mg)                               |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 1.20  | 1.21    | 1.23             | 1.43    | 1.49            | 0.99    | 0.94         | 1.11    | 1.17      | 1.19    |
| n  | 10  | 79      | 30               | 67      | 39              | 45      | 35           | 97      | 114       | 288     |
| Riboflavin (mg)                            |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 1.18  | 1.55    | 1.82             | 1.62    | 1.38            | 1.53    | 1.54         | 1.56    | 1.54      | 1.55    |
| n  | 9   | 81      | 31               | 64      | 40              | 48      | 35           | 99      | 115       | 291     |
| Niacin (mg)                                |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 12.19   | 13.83   | 17.48            | 15.90   | 10.36           | 11.16   | 12.14        | 12.24   | 13.39     | 13.70   |
| n  | 9   | 81      | 29               | 67      | 39              | 46      | 33           | 100     | 110       | 294     |
| Vitamin B <sub>6</sub> (mg)                |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 1.26  | 1.29    | 1.32             | 1.18    | 1.06            | 1.17    | 1.12         | 1.12    | 1.17      | 1.18    |
| n  | 10  | 78      | 28               | 67      | 41              | 48      | 34           | 99      | 113       | 292     |
| Log Vitamin B <sub>12</sub> (mcg)          |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 0.19  | 0.40    | 0.58             | 0.46    | 0.45            | 0.45    | 0.46         | 0.39    | 0.46      | 0.42    |
| n  | 9   | 82      | 31               | 65      | 40              | 49      | 37           | 98      | 117       | 284     |
| Vitamin B <sub>12</sub> (mcg) <sup>a</sup> |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 1.95  | 3.01    | 4.30             | 3.07    | 3.13            | 3.43    | 3.76         | 2.93    | 3.55      | 3.14    |
| n  | 9   | 82      | 31               | 65      | 40              | 49      | 37           | 98      | 117       | 284     |
| Vitamin C (mg)                             |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 111.39  | 132.14  | 182.79           | 146.03  | 83.35           | 79.69   | 96.87        | 80.35   | 117.0     | 111.36  |
| n  | 10  | 84      | 31               | 67      | 39              | 47      | 37           | 96      | 117       | 294     |
| Cholesterol (mg)                           |   |         |                  |         |                 |         |              |         |           |         |
| Mean Intake                                | 257.4   | 281.44  | 388.07           | 355.64  | 316.0           | 347.42  | 345.71       | 339.75  | 338.95    | 331.38  |
| n  | 9   | 82      | 31               | 65      | 41              | 49      | 37           | 99      | 118       | 295     |

<sup>a</sup>Significance level not tested on absolute intake, since substantial skewness in the distribution invalidates the assumptions underlying F-tests for statistical significance. Variable was transformed to logarithmic scale (Base 10) to test significance--refer to results for log distributions.

intake between the Head Start-present and non-Head Start groups for all nutrients except fat and cholesterol. Similarly, across all sites, children in the Head Start-present group consumed significantly greater amounts of all nutrients except thiamin, niacin, vitamin C and cholesterol than children in the Head Start-absent group. In keeping with findings noted in comparisons of unadjusted group means, there were no significant differences between the Head Start-absent and non-Head Start groups for any of the nutrients evaluated.

Thus, even after considering the effect of other influential variables, the nutrient intake of children in the Head Start-present group was significantly greater than that of children in the other two groups for almost all nutrients.\* Specifically, children in the Head Start-present group received approximately:

- 10 percent more calories than non-Head Start children and 13 percent more calories than Head Start-absent children.
- 12 percent more protein than non-Head Start children and 18 percent more protein than Head Start-absent children.
- 13 percent more carbohydrate than non-Head Start children and 18 percent more carbohydrate than Head Start-absent children.
- 32 percent more calcium than non-Head Start children and 35 percent more calcium than Head Start-absent children.
- 7 percent more iron than non-Head Start children and 11 percent more iron than Head Start-absent children.
- 22 percent more magnesium than non-Head Start children and 26 percent more magnesium than Head Start-absent children.
- 23 percent more phosphorus than non-Head Start children and 25 percent more phosphorus than Head Start-absent children.
- 49 percent more vitamin A than non-Head Start children and 38 percent more vitamin A than Head Start-absent children.
- 24 percent more riboflavin than non-Head Start children and 24 percent more riboflavin than Head Start-absent children.

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\*All differences reported were significant at  $p < 0.05$  or less. Refer to Exhibits 6-24 through 6-26 for actual intake data.

- 11 percent more vitamin B<sub>6</sub> than both non-Head Start children and Head Start-absent children.
- 28 percent more vitamin B<sub>12</sub> than non-Head Start children and 21 percent more vitamin B<sub>12</sub> than Head Start-absent children.
- 12 percent more vitamin C than non-Head Start children and 7 percent more vitamin C than Head Start-absent children.

The presence and magnitude of differences in nutrient intake varied greatly from site to site. The greatest number of differences were noted in Mingo County, where findings paralleled those reported for the across-site analyses. The fewest differences were noted in Maricopa County, where calcium intake was the only significant difference between the Head Start-present and non-Head Start groups, while Head Start-present versus Head Start-absent group differences were noted for protein, calcium, magnesium, phosphorus and vitamin A. The smaller number of differences noted in Maricopa County may be due to the decreased scope of Head Start meal service (only one meal and snack) in this site and the tendency for total daily intake of all children in Maricopa County to be less than that of children in other sites, as previously discussed.

It appears that the meals and snacks provided by the Head Start nutrition program had a very significant and positive effect on the nutrient intake of participating children. Overall, no evidence of nutritional inadequacies in the diets of Head Start-present children were detected. (Even the inadequacies that might be expected from pretest baseline data and previously cited reference data were not evident.)

Impact on Distribution of Percent of Nutrient Intake Standard Received. As Exhibits 6-27 and 6-28 illustrate, the distributions of percent of nutrient intake standard received for the Head Start-present group were also substantially different from both the non-Head Start and Head Start-absent groups. Additionally, distributions in the Head Start-present group were substantially different from those seen in the pretest sample (see Exhibit 6-6). In all cases, these differences were the result of greater numbers of children in the Head Start-present group consuming diets that provided 100 percent or more of the recommended amounts of nutrients or greater numbers of children in the non-Head Start or Head Start-absent groups consuming diets that provided lower percentages of the recommendations.



Exhibit 6-27

Percent of Nutrient Intake Standard Received in 24-Hour Intake with Unadjusted Comparisons Between Children Present in Head Start on Day of Recall and Non-Head Start Children by Site

| Nutrients         | Percent of Posttested Head Start-Present and Non-Head Start Children (Samples A, B, and C) In: |             |                   |             |                   |             |                   |              |                   |              |
|-------------------|--|-------------|-------------------|-------------|-------------------|-------------|-------------------|--------------|-------------------|--------------|
|                   | Greene & Humphreys Counties  |             | St. Clair County  |             | Maricopa County   |             | Mingo County      |              | All Sites         |              |
|                   | HS-P<br>n=110  | NHS<br>n=90 | HS-P<br>n=72      | NHS<br>n=68 | HS-P<br>n=58      | NHS<br>n=52 | HS-P<br>n=72      | NHS<br>n=104 | HS-P<br>n=312     | NHS<br>n=314 |
| <b>Calories</b>   |  |             |                   |             |                   |             |                   |              |                   |              |
| 0-33%             | 0.0  | 0.0         | 0.0               | 0.0         | 0.0               | 1.9         | 0.0               | 0.0          | 0.0               | 0.3          |
| 34-66%            | 3.6  | 7.8         | 0.0               | 0.0         | 10.3              | 19.2        | 1.4               | 6.7          | 3.5               | 7.6          |
| 67-99%            | 29.1   | 17.8        | 15.3              | 14.7        | 39.7              | 36.5        | 13.9              | 32.7         | 24.4              | 25.2         |
| 100%+             | 67.3   | 74.4        | 84.7              | 85.3        | 50.0              | 42.3        | 84.7 <sup>b</sup> | 60.6         | 72.1              | 66.9         |
| <b>Protein</b>    |  |             |                   |             |                   |             |                   |              |                   |              |
| 0-33%             | 0.0  | 1.1         | 0.0               | 0.0         | 0.0               | 0.0         | 0.0               | 0.0          | 0.0               | 0.3          |
| 34-66%            | 0.0  | 0.0         | 0.0               | 0.0         | 0.0               | 9.6         | 0.0               | 3.8          | 0.0               | 2.9          |
| 67-99%            | 0.9  | 4.4         | 0.0               | 4.4         | 10.3              | 15.4        | 2.8               | 10.6         | 2.9               | 8.3          |
| 100%+             | 99.1   | 94.4        | 100.0             | 95.6        | 89.7 <sup>a</sup> | 75.0        | 97.2 <sup>a</sup> | 85.6         | 97.1 <sup>c</sup> | 88.5         |
| <b>Calcium</b>    |  |             |                   |             |                   |             |                   |              |                   |              |
| 0-33%             | 0.0  | 7.8         | 1.4               | 14.7        | 0.0               | 9.6         | 1.4               | 5.8          | 0.6               | 8.9          |
| 34-66%            | 7.3  | 40.0        | 4.2               | 22.1        | 13.8              | 26.9        | 4.2               | 26.9         | 7.1               | 29.6         |
| 67-99%            | 18.2   | 25.6        | 19.4              | 29.4        | 31.0              | 21.2        | 9.7               | 33.7         | 18.9              | 28.3         |
| 100%+             | 74.5 <sup>c</sup>  | 26.7        | 75.0 <sup>c</sup> | 33.8        | 55.2 <sup>a</sup> | 42.3        | 84.7 <sup>c</sup> | 33.7         | 73.4 <sup>c</sup> | 33.1         |
| <b>Iron</b>       |  |             |                   |             |                   |             |                   |              |                   |              |
| 0-33%             | 0.9  | 0.0         | 0.0               | 0.0         | 0.0               | 2.4         | 0.0               | 0.0          | 0.3               | 0.8          |
| 34-66%            | 21.8   | 30.0        | 15.3              | 12.5        | 20.7              | 29.3        | 19.4              | 28.2         | 19.6              | 24.6         |
| 67-99%            | 41.8   | 50.0        | 19.4              | 18.8        | 32.8              | 31.7        | 26.4              | 41.0         | 31.4              | 32.8         |
| 100%+             | 35.3   | 20.0        | 65.3              | 68.8        | 46.6              | 36.6        | 54.2              | 30.8         | 48.7              | 41.8         |
| <b>Magnesium</b>  |  |             |                   |             |                   |             |                   |              |                   |              |
| 0-33%             | 0.0  | 0.0         | 0.0               | 0.0         | 1.7               | 7.3         | 0.0               | 0.0          | 0.3               | 2.5          |
| 34-66%            | 1.8  | 30.0        | 0.0 <sup>a</sup>  | 12.5        | 12.1              | 39.0        | 2.8               | 25.6         | 3.5               | 27.0         |
| 67-99%            | 23.6   | 40.0        | 8.3               | 21.9        | 41.4              | 31.7        | 13.9              | 33.3         | 21.2              | 30.3         |
| 100%+             | 74.5 <sup>c</sup>  | 30.0        | 91.7 <sup>c</sup> | 65.6        | 44.8 <sup>b</sup> | 22.0        | 83.3 <sup>c</sup> | 41.0         | 75.0 <sup>c</sup> | 40.2         |
| <b>Phosphorus</b> |  |             |                   |             |                   |             |                   |              |                   |              |
| 0-33%             | 0.0  | 0.0         | 0.0               | 0.0         | 0.0               | 2.4         | 0.0               | 0.0          | 0.0               | 0.8          |
| 34-66%            | 0.0  | 30.0        | 1.4               | 6.2         | 5.2               | 14.6        | 1.4               | 10.3         | 1.6               | 12.3         |
| 67-99%            | 10.9   | 30.0        | 4.2               | 28.1        | 20.7              | 36.8        | 11.1              | 25.6         | 11.2              | 30.3         |
| 100%+             | 89.1 <sup>c</sup>  | 40.0        | 94.4 <sup>c</sup> | 65.6        | 74.1              | 46.3        | 87.5 <sup>b</sup> | 64.1         | 87.2 <sup>c</sup> | 56.6         |
| <b>Vitamin A</b>  |  |             |                   |             |                   |             |                   |              |                   |              |
| 0-33%             | 0.0  | 10.0        | 1.4               | 6.3         | 1.7               | 12.2        | 1.4               | 2.6          | 1.0               | 7.4          |
| 34-66%            | 1.8  | 10.0        | 1.4               | 3.1         | 12.1              | 22.0        | 2.8               | 10.3         | 3.8               | 12.3         |
| 67-99%            | 11.8   | 30.0        | 11.1              | 18.8        | 17.2              | 31.7        | 8.3               | 17.9         | 11.9              | 23.8         |
| 100%+             | 86.4 <sup>c</sup>  | 50.0        | 86.1              | 71.9        | 69.0 <sup>b</sup> | 34.1        | 87.5              | 69.2         | 83.3 <sup>c</sup> | 55.6         |
| <b>Thiamin</b>    |  |             |                   |             |                   |             |                   |              |                   |              |
| 0-33%             | 0.0  | 0.0         | 0.0               | 0.0         | 0.0               | 0.0         | 0.0               | 0.0          | 0.0               | 0.0          |
| 34-66%            | 0.0  | 0.0         | 0.0               | 0.0         | 0.0               | 2.4         | 0.0               | 0.0          | 0.0               | 0.8          |
| 67-99%            | 3.6  | 0.0         | 9.7               | 9.4         | 10.3              | 14.6        | 5.6               | 7.7          | 6.7               | 9.8          |
| 100%+             | 96.4   | 100.0       | 90.3              | 90.6        | 89.7              | 82.9        | 94.4              | 92.3         | 93.3              | 89.3         |

Significance of Chi-Squared Test for Independence (Jdf)

- <sup>a</sup> = p ≤ .05
- <sup>b</sup> = p ≤ .01
- <sup>c</sup> = p ≤ .001

Exhibit 6-27 (Continued)

Percent of Nutrient Intake Standard Received in 24-Hour Intake with Unadjusted Comparisons Between Children Present in Head Start on Day of Recall and Non-Head Start Children by Site

| Nutrients                     | Percent of Posttested Head Start-Present and Non-Head Start Children (Samples A, B, and C) In: |             |                   |             |                 |             |                    |              |                   |              |
|-------------------------------|--|-------------|-------------------|-------------|-----------------|-------------|--------------------|--------------|-------------------|--------------|
|                               | Greene & Humphreys Counties  |             | St. Clair County  |             | Maricopa County |             | Mingo County       |              | All Sites         |              |
|                               | HS-P<br>n=110  | NHS<br>n=90 | HS-P<br>n=72      | NHS<br>n=68 | HS-P<br>n=58    | NHS<br>n=32 | HS-P<br>n=72       | NHS<br>n=104 | HS-P<br>n=312     | NHS<br>n=314 |
| <b>Riboflavin</b>             |  |             |                   |             |                 |             |                    |              |                   |              |
| 0-33%                         | 0.0  | 0.0         | 0.0               | 0.0         | 0.0             | 0.0         | 0.0                | 0.0          | 0.0               | 0.0          |
| 34-66%                        | 0.0  | 0.0         | 0.0               | 0.0         | 0.0             | 0.0         | 0.0                | 1.0          | 0.0               | 0.3          |
| 67-99%                        | 0.0  | 5.6         | 2.8               | 13.2        | 1.7             | 7.7         | 0.0                | 10.6         | 1.0               | 9.2          |
| 100%+                         | 100.0 <sup>b</sup>   | 94.4        | 97.2 <sup>a</sup> | 86.8        | 98.3            | 92.3        | 100.0 <sup>b</sup> | 88.5         | 99.0 <sup>c</sup> | 90.4         |
| <b>Niacin</b>                 |  |             |                   |             |                 |             |                    |              |                   |              |
| 0-33%                         | 0.0  | 0.0         | 0.0               | 0.0         | 0.0             | 0.0         | 0.0                | 0.0          | 0.0               | 0.0          |
| 34-66%                        | 2.7  | 1.1         | 0.0               | 4.4         | 3.4             | 3.8         | 2.8                | 0.6          | 2.2               | 5.4          |
| 67-99%                        | 15.5   | 10.0        | 23.6              | 14.7        | 31.0            | 28.8        | 38.9               | 31.7         | 25.6              | 21.3         |
| 100%+                         | 81.8   | 88.9        | 76.4              | 80.9        | 65.5            | 67.3        | 58.3               | 57.7         | 72.1              | 73.2         |
| <b>Vitamin B<sub>6</sub></b>  |  |             |                   |             |                 |             |                    |              |                   |              |
| 0-33%                         | 0.0  | 2.2         | 0.0               | 1.5         | 1.7             | 7.7         | 1.4                | 6.7          | 0.6               | 4.5          |
| 34-66%                        | 13.6   | 16.7        | 2.8               | 19.1        | 27.6            | 26.9        | 9.7                | 22.1         | 12.8              | 20.7         |
| 67-99%                        | 27.3   | 16.7        | 20.8              | 35.3        | 36.2            | 23.1        | 26.4               | 26.0         | 27.2              | 24.8         |
| 100%+                         | 59.1   | 64.4        | 76.4 <sup>c</sup> | 44.1        | 34.5            | 42.3        | 62.5 <sup>a</sup>  | 45.2         | 59.3 <sup>c</sup> | 50.0         |
| <b>Vitamin B<sub>12</sub></b> |  |             |                   |             |                 |             |                    |              |                   |              |
| 0-33%                         | 0.0  | 3.3         | 1.4               | 2.9         | 3.4             | 5.8         | 1.4                | 6.7          | 1.3               | 4.8          |
| 34-66%                        | 4.5  | 17.8        | 1.4               | 7.4         | 5.2             | 13.5        | 2.8                | 10.6         | 3.5               | 12.4         |
| 67-99%                        | 10.0   | 16.7        | 6.9               | 14.7        | 15.5            | 21.2        | 5.6                | 16.3         | 9.3               | 16.9         |
| 100%+                         | 85.5 <sup>c</sup>  | 62.2        | 90.3              | 75.0        | 75.9            | 59.6        | 90.3 <sup>b</sup>  | 66.3         | 85.9 <sup>c</sup> | 65.9         |
| <b>Vitamin<sup>b</sup> C</b>  |  |             |                   |             |                 |             |                    |              |                   |              |
| 0-33%                         | 1.8  | 6.7         | 0.0               | 11.8        | 1.7             | 9.6         | 0.0                | 14.4         | 1.0               | 10.8         |
| 34-66%                        | 6.4  | 7.8         | 0.0               | 14.7        | 10.3            | 9.6         | 4.2                | 11.5         | 5.1 <sup>a</sup>  | 10.8         |
| 67-99%                        | 7.3  | 6.7         | 1.4               | 0.0         | 17.2            | 13.5        | 8.3                | 8.7          | 8.0               | 7.0          |
| 100%+                         | 84.5   | 78.9        | 98.6 <sup>c</sup> | 73.5        | 70.7            | 67.3        | 87.5 <sup>c</sup>  | 65.4         | 85.9 <sup>c</sup> | 71.3         |

Significance of Chi-Squared Test for Independence (3df)

<sup>a</sup> = p < .05

<sup>b</sup> = p < .01

<sup>c</sup> = p < .001

Exhibit 6-28

Percent of Nutrient Intake Standard Received in 24-Hour Intake with Unadjusted Comparisons Between Children Present In and Absent from Head Start on Day of Recall by Site

| Nutrients         | Percent of Posttested Head Start-Present and Head Start-Absent Children (Samples A, B, and C) In: |              |                   |              |                   |              |                   |              |                   |               |
|-------------------|---|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|---------------|
|                   | Greene & Humphreys Counties   |              | St. Clair County  |              | Maricopa County   |              | Mingo County      |              | All Sites         |               |
|                   | HS-P<br>n=110   | HS-A<br>n=10 | HS-P<br>n=72      | HS-A<br>n=32 | HS-P<br>n=58      | HS-A<br>n=41 | HS-P<br>n=72      | HS-A<br>n=39 | HS-P<br>n=312     | HS-A<br>n=122 |
| <b>Calories</b>   |   |              |                   |              |                   |              |                   |              |                   |               |
| 0-33%             | 0.0   | 0.0          | 0.0               | 0.0          | 0.0               | 0.0          | 0.0               | 0.0          | 0.0               | 0.0           |
| 34-66%            | 3.6   | 10.0         | 0.0               | 0.0          | 10.3              | 29.3         | 1.4               | 7.7          | 3.5               | 13.1          |
| 67-99%            | 29.1  | 40.0         | 15.3              | 12.5         | 39.7              | 46.3         | 13.9              | 33.3         | 24.4              | 32.8          |
| 100%+             | 67.3  | 50.0         | 84.7              | 87.5         | 50.0 <sup>b</sup> | 24.4         | 84.7 <sup>b</sup> | 59.0         | 72.1 <sup>c</sup> | 54.1          |
| <b>Protein</b>    |   |              |                   |              |                   |              |                   |              |                   |               |
| 0-33%             | 0.0   | 0.0          | 0.0               | 0.0          | 0.0               | 2.4          | 0.0               | 0.0          | 0.0               | 0.8           |
| 34-66%            | 0.0   | 0.0          | 0.0               | 0.0          | 0.0               | 4.9          | 0.0               | 2.6          | 0.0               | 2.5           |
| 67-99%            | 0.9   | 20.0         | 0.0               | 0.0          | 10.3              | 17.1         | 2.8               | 5.1          | 2.9               | 9.0           |
| 100%+             | 99.1 <sup>c</sup>   | 80.0         | 100.0             | 100.0        | 89.7              | 75.6         | 97.2              | 92.3         | 97.1 <sup>c</sup> | 87.7          |
| <b>Calcium</b>    |   |              |                   |              |                   |              |                   |              |                   |               |
| 0-33%             | 0.0   | 10.0         | 1.4               | 3.1          | 0.0               | 9.8          | 1.4               | 5.1          | 0.6               | 6.6           |
| 34-66%            | 7.3   | 60.0         | 4.2               | 25.0         | 13.8              | 34.1         | 4.2               | 28.2         | 7.1               | 32.0          |
| 67-99%            | 18.2  | 30.0         | 19.4              | 43.8         | 31.0              | 31.7         | 9.7               | 28.2         | 18.9              | 33.6          |
| 100%+             | 74.5 <sup>c</sup>   | 0.0          | 75.0 <sup>c</sup> | 28.1         | 55.2 <sup>c</sup> | 24.4         | 84.7 <sup>c</sup> | 38.5         | 73.4 <sup>c</sup> | 27.9          |
| <b>Iron</b>       |   |              |                   |              |                   |              |                   |              |                   |               |
| 0-33%             | 0.9   | 0.0          | 0.0               | 0.0          | 0.0               | 2.4          | 0.0               | 0.0          | 0.3               | 0.8           |
| 34-66%            | 21.8  | 30.0         | 15.3              | 12.5         | 20.7              | 29.3         | 19.4              | 28.2         | 19.6              | 24.6          |
| 67-99%            | 41.8  | 50.0         | 19.4              | 18.8         | 32.8              | 31.7         | 26.4              | 41.0         | 31.4              | 32.8          |
| 100%+             | 35.5  | 20.0         | 65.3              | 68.8         | 46.6              | 36.6         | 54.2              | 30.8         | 48.7              | 41.8          |
| <b>Magnesium</b>  |   |              |                   |              |                   |              |                   |              |                   |               |
| 0-33%             | 0.0   | 0.0          | 0.0               | 0.0          | 1.7               | 7.3          | 0.0               | 0.0          | 0.3               | 2.5           |
| 34-66%            | 1.8   | 30.0         | 0.0               | 12.5         | 12.1              | 39.0         | 2.8               | 25.6         | 3.5               | 27.0          |
| 67-99%            | 23.6  | 40.0         | 8.3               | 21.9         | 41.4              | 31.7         | 13.9              | 33.3         | 21.2              | 30.3          |
| 100%+             | 74.5 <sup>c</sup>   | 30.0         | 91.7 <sup>c</sup> | 65.6         | 44.8 <sup>b</sup> | 22.0         | 83.3 <sup>c</sup> | 41.0         | 75.0 <sup>c</sup> | 40.2          |
| <b>Phosphorus</b> |   |              |                   |              |                   |              |                   |              |                   |               |
| 0-33%             | 0.0   | 0.0          | 0.0               | 0.0          | 0.0               | 2.4          | 0.0               | 0.0          | 0.0               | 0.8           |
| 34-66%            | 0.0   | 30.0         | 1.4               | 6.3          | 5.2               | 14.6         | 1.4               | 10.3         | 1.6               | 12.3          |
| 67-99%            | 10.9  | 30.0         | 4.2               | 28.1         | 20.7              | 36.6         | 11.1              | 25.6         | 11.2              | 30.3          |
| 100%+             | 89.1 <sup>c</sup>   | 40.0         | 94.4 <sup>c</sup> | 65.6         | 74.1 <sup>a</sup> | 46.3         | 87.5 <sup>b</sup> | 64.1         | 87.2 <sup>c</sup> | 56.6          |
| <b>Vitamin A</b>  |   |              |                   |              |                   |              |                   |              |                   |               |
| 0-33%             | 0.0   | 10.0         | 1.4               | 6.3          | 1.7               | 12.2         | 1.4               | 2.6          | 1.0               | 7.4           |
| 34-66%            | 1.8   | 10.0         | 1.4               | 3.1          | 12.1              | 22.0         | 2.8               | 10.3         | 3.8               | 12.3          |
| 67-99%            | 11.8  | 30.0         | 11.1              | 18.8         | 17.2              | 31.7         | 8.3               | 17.9         | 11.9              | 23.8          |
| 100%+             | 86.4 <sup>c</sup>   | 50.0         | 86.1              | 71.9         | 69.0 <sup>b</sup> | 34.1         | 87.5              | 69.2         | 83.3 <sup>c</sup> | 55.6          |
| <b>Thiamin</b>    |   |              |                   |              |                   |              |                   |              |                   |               |
| 0-33%             | 0.0   | 0.0          | 0.0               | 0.0          | 0.0               | 0.0          | 0.0               | 0.0          | 0.0               | 0.0           |
| 34-66%            | 0.0   | 0.0          | 0.0               | 0.0          | 0.0               | 2.4          | 0.0               | 0.0          | 0.0               | 0.8           |
| 67-99%            | 3.6   | 0.0          | 9.7               | 9.4          | 10.3              | 14.6         | 5.6               | 7.7          | 6.7               | 9.8           |
| 100%+             | 96.4  | 100.0        | 90.3              | 90.6         | 89.7              | 82.9         | 94.4              | 92.3         | 93.3              | 89.3          |

Significance of Chi-Squared Test for Independence (3df)

<sup>a</sup> = p ≤ .05

<sup>b</sup> = p ≤ .01

<sup>c</sup> = p ≤ .001

Exhibit 6-28 (Continued)

Percent of Nutrient Intake Standard Received in 24-Hour Intake with Unadjusted Comparisons between Children Present In and Absent from Head Start on Day of Recall by Site

| Nutrients                     | Percent of Posttested Head Start-Present and Head Start-Absent Children (Samples A, B, and C) In: |              |                   |              |                 |              |                    |              |                   |               |
|-------------------------------|---|--------------|-------------------|--------------|-----------------|--------------|--------------------|--------------|-------------------|---------------|
|                               | Greene & Humphreys Counties   |              | St. Clair County  |              | Maricopa County |              | Mingo County       |              | All Sites         |               |
|                               | HS-P<br>n=110   | HS-A<br>n=10 | HS-P<br>n=72      | HS-A<br>n=32 | HS-P<br>n=58    | HS-A<br>n=41 | HS-P<br>n=72       | HS-A<br>n=39 | HS-P<br>n=312     | HS-A<br>n=122 |
| <b>Riboflavin</b>             |   |              |                   |              |                 |              |                    |              |                   |               |
| 0-33%                         | 0.0   | 0.0          | 0.0               | 0.0          | 0.0             | 0.0          | 0.0                | 0.0          | 0.0               | 0.0           |
| 34-66%                        | 0.0   | 0.0          | 0.0               | 0.0          | 0.0             | 0.0          | 0.0                | 0.0          | 0.0               | 0.0           |
| 67-99%                        | 0.0   | 0.0          | 2.8               | 9.4          | 1.7             | 4.9          | 0.0                | 5.1          | 1.0               | 2.7           |
| 100%+                         | 100.0   | 100.0        | 97.2              | 90.6         | 98.3            | 95.1         | 100.0 <sup>a</sup> | 94.9         | 99.0 <sup>b</sup> | 94.3          |
| <b>Niacin</b>                 |   |              |                   |              |                 |              |                    |              |                   |               |
| 0-33%                         | 0.0   | 0.0          | 0.0               | 0.0          | 0.0             | 0.0          | 0.0                | 0.0          | 0.0               | 0.0           |
| 34-66%                        | 2.7   | 0.0          | 0.0               | 3.1          | 3.4             | 7.3          | 2.8                | 5.1          | 2.2               | 4.9           |
| 67-99%                        | 15.5  | 10.0         | 23.6              | 21.9         | 31.0            | 31.7         | 38.9               | 25.6         | 25.6              | 25.4          |
| 100%+                         | 81.8  | 90.0         | 76.4              | 75.0         | 65.5            | 61.0         | 58.3               | 69.2         | 72.1              | 69.7          |
| <b>Vitamin B<sub>6</sub></b>  |   |              |                   |              |                 |              |                    |              |                   |               |
| 0-33%                         | 0.0   | 0.0          | 0.0               | 0.0          | 1.7             | 4.9          | 1.4                | 5.1          | 0.6               | 3.3           |
| 34-66%                        | 13.6  | 40.0         | 2.8               | 21.9         | 27.6            | 43.9         | 9.7                | 17.9         | 12.8              | 29.5          |
| 67-99%                        | 27.3  | 10.0         | 20.8              | 21.9         | 36.2            | 24.4         | 26.4               | 35.9         | 27.2              | 26.2          |
| 100%+                         | 59.1  | 50.0         | 76.4 <sup>b</sup> | 56.3         | 34.5            | 26.8         | 62.5               | 41.0         | 59.3 <sup>c</sup> | 41.0          |
| <b>Vitamin B<sub>12</sub></b> |   |              |                   |              |                 |              |                    |              |                   |               |
| 0-33%                         | 0.0   | 30.0         | 1.4               | 0.0          | 3.4             | 2.4          | 1.4                | 5.1          | 1.3               | 4.9           |
| 34-66%                        | 4.5   | 20.0         | 1.4               | 6.3          | 5.2             | 14.6         | 2.8                | 2.6          | 3.5               | 9.0           |
| 67-99%                        | 10.0  | 20.0         | 6.9               | 9.4          | 15.5            | 17.1         | 5.6                | 15.4         | 9.3               | 14.8          |
| 100%+                         | 85.5 <sup>c</sup>   | 30.0         | 90.3              | 84.4         | 75.9            | 65.9         | 90.3               | 76.9         | 85.9 <sup>b</sup> | 71.3          |
| <b>Vitamin C</b>              |   |              |                   |              |                 |              |                    |              |                   |               |
| 0-33%                         | 1.8   | 20.0         | 0.0               | 3.1          | 1.7             | 14.6         | 0.0                | 7.7          | 1.0               | 9.8           |
| 34-66%                        | 6.4   | 10.0         | 0.0               | 0.0          | 10.3            | 12.2         | 4.2                | 10.3         | 5.1               | 8.2           |
| 67-99%                        | 7.3   | 0.0          | 1.4               | 0.0          | 17.2            | 17.1         | 8.3                | 10.3         | 8.0               | 9.0           |
| 100%+                         | 84.5 <sup>a</sup>   | 70.0         | 98.6              | 96.9         | 70.7            | 56.1         | 87.5 <sup>a</sup>  | 71.8         | 85.9 <sup>c</sup> | 73.0          |

Significance of Chi-Squared Test for Independence (3df)

- <sup>a</sup> = p < .05
- <sup>b</sup> = p < .01
- <sup>c</sup> = p < .001

(Most frequently 34 to 66% and 67 to 99%.) Once again, patterns of the non-Head Start and Head Start-absent groups were not significantly different for any nutrient; nor were they markedly different from distributions of the pretest sample.

As Exhibits 6-27 and 6-28 demonstrate, greater numbers of children in the Head Start-present group received 100 percent or more of the recommended intake of almost every nutrient; all but a few of these differences were statistically significant.\* The most sizable differences (across all sites) were noted for calcium, magnesium, phosphorus, vitamin A, vitamin B<sub>6</sub>, vitamin B<sub>12</sub>, and vitamin C.

As might be expected, there was considerable variation among sites in the presence and significance of these distributional differences. The greatest number of significant differences was noted in Mingo County, where distributions for the Head Start-present group were significantly different (greater percentages of children in the high end of the distributions) from the non-Head Start group for all nutrients except thiamin and niacin (see Exhibit 6-27). In keeping with findings discussed previously, differences in Maricopa County were less frequent on a nutrient-by-nutrient basis and also less substantial than in any of the three other sites.

Although neither 24-hour recall data nor the nutrient intake reference standards (RDAs) allow us to interpret the implications of individual intakes below 100 percent of the recommendation, the strong differences in distributional patterns among groups are noteworthy. The shift of Head Start-present children into the higher end of the distribution for so many nutrients indicates that the meals and snacks provided through the Head Start nutrition program had a strong influence on the overall adequacy of their diets. The potential risk for the Head Start-present group, as a whole, is significantly reduced as a result. The lack of difference between the Head Start-absent group and non-Head Start groups, on the other hand, indicates that any potential risk of marginal intake for children in the lower end of the distribution is virtually the same for both groups. Clearly, the diets consumed by children who were absent from Head Start are quite different from the diets of children who were present--it seems, then, that meals provided through the Head Start nutrition program are responsible for the distributional differences noted among the three treatment groups.

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\*Data for the Head Start-absent versus non-Head Start comparisons are listed in Tables 6-26 (across sites) and 6-27 (within site).

Exhibit 6-29

Unadjusted Mean Nutrient Densities Below RDA Reference  
Standard for Posttested Head Start Children  
Present on Day of Recall By Site

| Nutrient                 | Posttested Head Start-Present Children<br>(Samples A, B, and C) In: |                        |                    |                 |              |
|--------------------------|---|------------------------|--------------------|-----------------|--------------|
|                          | Greene &<br>Humphreys<br>Counties                                   | St.<br>Clair<br>County | Maricopa<br>County | Mingo<br>County | All<br>Sites |
| Protein                  |   |                        |                    |                 |              |
| Calcium                  |   | +                      |                    |                 |              |
| Iron                     | +   | +                      | +                  | +               | +            |
| Magnesium                |   |                        |                    |                 |              |
| Phosphorus               |   |                        |                    |                 |              |
| Vitamin A                |   |                        |                    |                 |              |
| Thiamin                  |   |                        |                    |                 |              |
| Riboflavin               |   |                        |                    |                 |              |
| Niacin                   |   |                        |                    |                 |              |
| Vitamin B <sub>6</sub>   | +   | +                      | +                  | +               | +            |
| Vitamin B <sub>12</sub>  |   |                        |                    |                 |              |
| Vitamin C                |   |                        |                    |                 |              |
| Cholesterol <sup>a</sup> | +   | +                      |                    |                 |              |

+ = group mean below nutrient density standard of RDA-referenced diet.

<sup>a</sup>+ = group mean above nutrient density standard suggested in the U.S. Dietary Goals.

Exhibit 6-30

Unadjusted Mean Nutrient Densities Below RDA Reference  
Standard for Posttested Head Start Children  
Absent on Day of Recall By Site

| Nutrient                 | Posttested Head Start-Absent Children<br>(Samples A, B and C) In: |                        |                    |                 |              |
|--------------------------|---|------------------------|--------------------|-----------------|--------------|
|                          | Greene &<br>Humphreys<br>Counties                                 | St.<br>Clair<br>County | Maricopa<br>County | Mingo<br>County | All<br>Sites |
| Protein                  |   |                        |                    |                 |              |
| Calcium                  | +   | +                      | +                  | +               | +            |
| Iron                     | +   | +                      | +                  | +               | +            |
| Magnesium                |   | +                      |                    |                 | +            |
| Phosphorus               | +   | +                      |                    |                 |              |
| Vitamin A                |   |                        |                    |                 |              |
| Thiamin                  |   |                        |                    |                 |              |
| Riboflavin               |   |                        |                    |                 |              |
| Niacin                   |   |                        |                    |                 |              |
| Vitamin B <sub>6</sub>   |   | +                      | +                  | +               | +            |
| Vitamin B <sub>12</sub>  |   |                        |                    |                 |              |
| Vitamin C                |   |                        |                    |                 |              |
| Cholesterol <sup>a</sup> |   | +                      | +                  | +               | +            |

+ = group mean below nutrient density standard of RDA-referenced diet.

<sup>a</sup>+ = group mean above nutrient density standard suggested in the U.S. Dietary Goals.

Exhibit 6-31

Unadjusted Mean Nutrient Densities Below RDA Reference Standard for Posttested Non-Head Start Children By Site

| Nutrient                 | Posttested Non-Head Start Children<br>(Samples A, B, and C) In: |                  |                 |              |           |
|--------------------------|---|------------------|-----------------|--------------|-----------|
|                          | Greene & Humphreys Counties                                     | St. Clair County | Maricopa County | Mingo County | All Sites |
| Protein                  |   |                  |                 |              |           |
| Calcium                  | +   | +                | +               | +            | +         |
| Iron                     | +   | +                | +               | +            | +         |
| Magnesium                |   | +                | +               |              |           |
| Phosphorus               |   | +                |                 |              |           |
| Vitamin A                |   |                  |                 |              |           |
| Thiamin                  |   |                  |                 |              |           |
| Riboflavin               |   |                  |                 |              |           |
| Niacin                   |   |                  |                 |              |           |
| Vitamin B <sub>6</sub>   |   | +                | +               | +            | +         |
| Vitamin B <sub>12</sub>  |   |                  |                 |              |           |
| Vitamin C                |   |                  |                 |              |           |
| Cholesterol <sup>a</sup> |   |                  | +               | +            | +         |

+ = group mean below nutrient density standard of RDA-referenced diet.

<sup>a</sup>+ = group mean above nutrient density standard suggested in the U.S. Dietary Goals.



In summary, distributions of percent of nutrient intake standard received for most nutrients differed markedly among the three treatment groups. In general, children in the Head Start-present group more frequently consumed diets supplying 100 percent of the recommended amounts of most nutrients. The data clearly indicate that the potential risk for problems of deficient nutrient intakes is substantially lower for the Head Start-present group than for either of the other two groups. The lack of agreement between distributions of nutrient intake noted for the Head Start-present and Head Start-absent groups suggests that the meals and snacks provided by Head Start have an important impact on the overall adequacy of children's diets.

Impact on Nutrient Density. Exhibits 6-29 through 6-31 illustrate problems of diets low in nutrient density noted for the three posttest groups. Nutrient densities of the RDA reference diet were again used as benchmarks in evaluating the nutrient density data. Tables 6-28 through 6-33 present more detailed data, including unadjusted comparisons between groups.

In keeping with results reported for the longitudinal analyses, there was an improvement in calcium density from pretest to posttest for the Head Start-present groups in all sites but St. Clair County (refer to Exhibit 6-7). No improvement in nutrient density for calcium was noted for either the Head Start-absent or non-Head Start groups in any of the four sites. Diets low in iron and vitamin B<sub>6</sub> densities persisted for all groups of children in each of the four study sites. Diets of children in St. Clair County appeared to be the most imbalanced overall, with both the Head Start-absent and non-Head Start groups consuming diets low in nutrient density for calcium, iron, magnesium, phosphorus, and vitamin B<sub>6</sub>. Diets of the Head Start-absent group in St. Clair County were also high in cholesterol density.

Overall, diets consumed by the Head Start-present group were high in mean nutrient density for protein, calcium, magnesium, phosphorus, vitamin A, riboflavin and vitamin B<sub>12</sub> than diets consumed by either the Head Start-absent or non-Head Start groups. Diets of Head Start-present children were also lower in concentrations of fat than were diets consumed by children in the non-Head Start group; and were lower in concentrations of both fat and cholesterol than diets consumed by children in the Head Start-absent group. There were no significant differences in nutrient density between the non-Head Start and Head Start-absent groups in either across- or within-site analyses.

In addition to the differences in mean nutrient density noted above, there were also clear and consistent differences from pretest to posttest and among groups in the cross-sectional sample in the percentages of individual children consuming diets low in nutrient density for calcium, magnesium, phosphorus, vitamin A, riboflavin, vitamin B<sub>12</sub> and vitamin C, as Exhibit 6-32 illustrates. Across all sites, the percentage of Head Start-present children consuming such diets was significantly lower than the percentage at pretest (see Exhibit 6-8) or the percentage in either the Head Start-absent or non-Head Start groups. Findings varied from site to site; however, the percentage of children receiving diets poorly balanced in calcium, phosphorus, magnesium and riboflavin was consistently lower for the Head Start-present group in all sites. As discussed previously, many of these differences in nutrient density are presumably due to the addition of milk and other dairy products, through the Head Start nutrition program, to the diets of children in the Head Start-present group.

Following the protocol described previously, multiple regression analyses were undertaken to further validate the Head Start effects noted in the unadjusted comparisons described in the preceding paragraphs. Results are reported in Tables 6-34 through 6-35).

Regression results in the cross-sectional analyses differed somewhat from the results on the longitudinal analyses. Overall, Head Start-present children consumed diets higher in nutrient density for protein, calcium, magnesium, phosphorus, vitamin A, riboflavin and niacin than non-Head Start children. Head Start-present children's diets were also lower in concentrations of fat, as demonstrated in Exhibits 6-34 through 6-36.

Diets of Head Start-absent and non-Head Start children were somewhat higher in iron density, although this difference just reached significance in the across-site analyses ( $p \leq 0.05$ ) and was not significant in any within-site analyses. Clearly, iron density remains a problem for all groups of children who were evaluated in this study. The fact that there were so few problems in iron status noted in the biochemical evaluation (see Chapter Seven) makes the relative importance of shortcomings in overall iron intake and iron density difficult to interpret. Presumably, the supplemental iron received by many children (see Chapter Seven) is partially responsible for the lack of correlation between dietary intake of iron and hematologic

Exhibit 6-32

Prevalence of Diets Low in Nutrient Density<sup>a,b</sup> for Posttested Head Start-Present, Head Start-Absent and Non-Head Start Children By Site

| Nutrient                | Posttested Children (Samples A, B, and C) in: |                |               |                  |                |               |                 |                |               |                 |                |               |                  |                 |                |
|-------------------------|---|----------------|---------------|------------------|----------------|---------------|-----------------|----------------|---------------|-----------------|----------------|---------------|------------------|-----------------|----------------|
|                         | Greene & Humphreys                            |                |               | St. Clair County |                |               | Maricopa County |                |               | Mingo County    |                |               | All Sites        |                 |                |
|                         | HS-P<br>(n=110)                               | HS-A<br>(n=10) | NHS<br>(n=89) | HS-P<br>(n=7)    | HS-A<br>(n=32) | NHS<br>(n=27) | HS-P<br>(n=57)  | HS-A<br>(n=39) | NHS<br>(n=49) | HS-P<br>(n=72)  | HS-A<br>(n=39) | NHS<br>(n=97) | HS-P<br>(n=312)  | HS-A<br>(n=122) | NHS<br>(n=314) |
| Protein                 |   |                |               |                  |                |               |                 |                |               |                 |                |               |                  |                 |                |
| Number                  | 0   | 0              | 1             | 0                | 0              | 1             | 0               | 0              | 0             | 1               | 0              | 4             | 1                | 0               | 6              |
| Percent                 | 0.0   | 0.0            | 1.5           | 0.0              | 0.0            | 1.5           | 0.0             | 0.0            | 0.0           | 0.9             | 0.0            | 3.8           | 0.2              | 0.0             | 1.9            |
| Calcium                 |   |                |               |                  |                |               |                 |                |               |                 |                |               |                  |                 |                |
| Number                  | 37 <sup>e</sup>                               | 9              | 70            | 35 <sup>e</sup>  | 23             | 55            | 23              | 25             | 32            | 29 <sup>d</sup> | 27             | 71            | 124 <sup>m</sup> | 84              | 228            |
| Percent                 | 33.6  | 90.0           | 78.7          | 49.5             | 71.9           | 82.1          | 41.1            | 61.0           | 64.0          | 41.4            | 69.2           | 68.3          | 40.4             | 68.9            | 73.5           |
| Iron                    |   |                |               |                  |                |               |                 |                |               |                 |                |               |                  |                 |                |
| Number                  | 102   | 9              | 79            | 69               | 26             | 62            | 36              | 55             | 46            | 69              | 34             | 97            | 295              | 105             | 284            |
| Percent                 | 94.4  | 100.0          | 96.3          | 98.6             | 89.7           | 91.2          | 90.0            | 100.0          | 93.9          | 97.2            | 97.1           | 96.2          | 97.0             | 92.9            | 91.5           |
| Magnesium               |   |                |               |                  |                |               |                 |                |               |                 |                |               |                  |                 |                |
| Number                  | 17 <sup>o</sup>                               | 6              | 47            | 16 <sup>d</sup>  | 21             | 41            | 25              | 25             | 30            | 19 <sup>c</sup> | 21             | 54            | 77 <sup>o</sup>  | 73              | 172            |
| Percent                 | 15.3  | 60.0           | 52.8          | 22.5             | 65.6           | 60.3          | 43.1            | 62.5           | 58.8          | 27.9            | 53.8           | 52.4          | 25.1             | 60.3            | 54.8           |
| Phosphorus              |   |                |               |                  |                |               |                 |                |               |                 |                |               |                  |                 |                |
| Number                  | 2 <sup>o</sup>                                | 5              | 41            | 14 <sup>o</sup>  | 21             | 36            | 9               | 17             | 19            | 14              | 14             | 29            | 39 <sup>o</sup>  | 57              | 125            |
| Percent                 | 1.8   | 50.0           | 46.1          | 19.7             | 63.6           | 53.7          | 15.8            | 41.5           | 37.3          | 19.7            | 35.9           | 28.2          | 12.6             | 46.7            | 40.3           |
| Vitamin A               |   |                |               |                  |                |               |                 |                |               |                 |                |               |                  |                 |                |
| Number                  | 14 <sup>o</sup>                               | 3              | 32            | 35 <sup>o</sup>  | 14             | 10            | 16              | 21             | 15            | 19 <sup>c</sup> | 12             | 42            | 46 <sup>o</sup>  | 63              | 124            |
| Percent                 | 13.0  | 30.0           | 36.0          | 53.8             | 19.4           | 31.3          | 28.1            | 53.8           | 30.6          | 26.4            | 30.8           | 43.4          | 38.3             | 20.4            | 41.3           |
| Thiamin                 |   |                |               |                  |                |               |                 |                |               |                 |                |               |                  |                 |                |
| Number                  | 19 <sup>c</sup>                               | 0              | 23            | 21               | 10             | 17            | 20              | 14             | 16            | 17 <sup>c</sup> | 10             | 40            | 77               | 34              | 96             |
| Percent                 | 17.4  | 0.0            | 27.1          | 29.6             | 32.3           | 25.0          | 35.1            | 35.9           | 33.3          | 24.6            | 27.0           | 39.6          | 25.2             | 29.1            | 31.8           |
| Riboflavin              |   |                |               |                  |                |               |                 |                |               |                 |                |               |                  |                 |                |
| Number                  | 0   | 1              | 8             | 4                | 3              | 14            | 1               | 4              | 4             | 0               | 4              | 14            | 5                | 12              | 40             |
| Percent                 | 0.0   | 11.1           | 9.2           | 5.6              | 9.4            | 21.5          | 1.8             | 10.0           | 7.8           | 0.0             | 10.8           | 13.7          | 1.7              | 10.2            | 13.1           |
| Niacin                  |   |                |               |                  |                |               |                 |                |               |                 |                |               |                  |                 |                |
| Number                  | 24  | 1              | 13            | 20               | 8              | 14            | 21              | 17             | 17            | 31              | 12             | 45            | 96               | 38              | 89             |
| Percent                 | 22.6  | 11.1           | 14.9          | 27.8             | 26.7           | 20.6          | 26.8            | 43.6           | 34.7          | 44.3            | 34.3           | 43.3          | 31.5             | 33.6            | 28.9           |
| Vitamin B <sub>6</sub>  |   |                |               |                  |                |               |                 |                |               |                 |                |               |                  |                 |                |
| Number                  | 68  | 5              | 51            | 49               | 22             | 34            | 40              | 27             | 28            | 58              | 24             | 72            | 215              | 78              | 205            |
| Percent                 | 64.2  | 50.0           | 60.7          | 71.0             | 75.9           | 79.4          | 70.2            | 65.9           | 56.9          | 82.9            | 66.7           | 69.9          | 71.2             | 67.2            | 67.0           |
| Vitamin B <sub>12</sub> |   |                |               |                  |                |               |                 |                |               |                 |                |               |                  |                 |                |
| Number                  | 12 <sup>o</sup>                               | 6              | 42            | 12 <sup>c</sup>  | 8              | 24            | 8               | 10             | 13            | 9 <sup>o</sup>  | 7              | 38            | 41 <sup>o</sup>  | 31              | 117            |
| Percent                 | 12.8  | 66.7           | 48.3          | 17.9             | 25.0           | 36.4          | 14.3            | 25.0           | 36.4          | 12.7            | 17.9           | 38.0          | 14.2             | 25.8            | 38.4           |
| Vitamin C               |   |                |               |                  |                |               |                 |                |               |                 |                |               |                  |                 |                |
| Number                  | 20  | 3              | 18            | 2 <sup>o</sup>   | 5              | 18            | 16              | 18             | 18            | 26              | 9              | 41            | 55 <sup>e</sup>  | 35              | 95             |
| Percent                 | 18.5  | 30.0           | 20.0          | 2.8              | 15.6           | 26.5          | 28.1            | 46.2           | 36.7          | 36.0            | 23.1           | 41.0          | 18.2             | 29.2            | 30.9           |
| Cholestrol.             |   |                |               |                  |                |               |                 |                |               |                 |                |               |                  |                 |                |
| Number                  | 60  | 6              | 57            | 34               | 17             | 39            | 39              | 19             | 24            | 60 <sup>o</sup> | 17             | 56            | 193              | 59              | 176            |
| Percent                 | 57.1  | 66.7           | 64.8          | 47.9             | 53.1           | 59.1          | 67.2            | 46.3           | 46.2          | 83.3            | 43.6           | 54.9          | 63.1             | 48.8            | 57.1           |

<sup>a</sup>Based on RDA reference Diet (See Appendix Note 6-3).

<sup>b</sup>Percentages may not always reflect percent of total sample size, since outlying cases were excluded on a nutrient-by-nutrient basis.

<sup>c</sup>HS-P vs. NHS difference significant at  $p < .05$ .

<sup>d</sup>HS-P vs. NHS difference significant at  $p < .01$ .

<sup>e</sup>HS-P vs. NHS difference significant at  $p < .001$ .

<sup>f</sup>HS-P vs. HS-A difference significant at  $p < .05$ .

<sup>g</sup>HS-P vs. HS-A difference significant at  $p < .01$ .

<sup>h</sup>HS-P vs. HS-A difference significant at  $p < .001$ .

status.\* On the other hand, it may be that the RDA standards for iron are excessive, as has been suggested by other investigators (Williams, Hennemann and Fox, 1977; Hegsted, 1982).

The additional iron consumed by Head Start children (see Exhibits 6-24 and 6-25) apparently came from the additional calories (food) the children consumed rather than diets higher in nutrient density for iron. This finding may have implications for Head Start policymakers. In particular, policymakers may be interested in recent research that has greatly expanded our understanding of iron nutriture. By carefully considering new information on the factors that influence the absorption of dietary iron, diets superior in iron density (the amount of available iron) could be constructed.\*\* The absorption of iron from alternative protein sources (foods other than meat, fish or poultry) can be substantially increased when consumed in the presence of animal tissue (meat, fish, poultry) or vitamin C (ascorbic acid) (Cook, Morck, Skikne and Lynch, 1981; Hallberg, 1981). Since alternate protein sources (grains and legumes) are generally lower in calories, if the amount of iron absorbed from these foods can be increased, the result will be a diet with higher concentrations of available iron relative to caloric content.

Simple models for calculating the estimated amounts of absorbable iron available in any given meal are now available (Food and Nutrition Board, National Academy of Sciences, 1980). The Food and Nutrition Board suggests in the most current publication of the Recommended Dietary Allowances (1980) that this factor, commonly referred to as bioavailability of ingested iron, be considered in planning and developing diets (meals). Close attention to this issue in the planning and implementation of the Head Start nutrition

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\*Multiple regression analyses attempting to control for the influence of dietary supplements still failed to demonstrate a relationship between iron intake and iron status, as discussed in Chapter Seven. This lack of correlation is in fact not surprising, since 24-hour recall data reflects nutrient intake over the short term, whereas hematologic measures are long-term indicators of nutritional status, and may be influenced by a number of other factors (see Chapter Seven).

\*\*Typically, only 10 percent (approximately) of ingested dietary iron is actually absorbed (Food and Nutrition Board, National Academy of Sciences, 1980). Several factors, including iron status of the individual, type of iron-source food (animal sources versus non-animal sources), and characteristics of other foods ingested along with the iron-source foods, have been shown to significantly increase or decrease the proportion of ingested iron that is actually absorbed (Monsen, 1978).

### Exhibit 6-33

Adjusted Mean Nutrient Densities for Head Start-Present and Non-Head Start Children by Site

| Variable                                   | Posttested Children (Samples A, B, and C) In: |                      |                  |                      |                 |                     |              |                      |           |                      |         |
|--|---|----------------------|------------------|----------------------|-----------------|---------------------|--------------|----------------------|-----------|----------------------|---------|
|  | Greene and Humphreys County                   |                      | St. Clair County |                      | Maricopa County |                     | Mingo County |                      | All Sites |                      |         |
|  | HS-P  | NHS                  | HS-P             | NHS                  | HS-P            | NHS                 | HS-P         | NHS                  | HS-P      | NHS                  |         |
| Protein (gm)                               | Mean  | 39.53 <sup>a</sup>   | 36.74            | 36.11                | 34.42           | 37.15               | 35.03        | 36.56 <sup>a</sup>   | 33.44     | 37.55 <sup>a</sup>   | 34.79   |
|  | n   | 103                  | 84               | 71                   | 67              | 54                  | 48           | 68                   | 100       | 296                  | 299     |
| Fat (gm)                                   | Mean  | 39.59                | 40.78            | 38.92 <sup>b</sup>   | 42.97           | 41.92               | 43.39        | 38.30 <sup>a</sup>   | 41.29     | 39.67 <sup>c</sup>   | 41.96   |
|  | n   | 102                  | 83               | 70                   | 67              | 56                  | 48           | 63                   | 99        | 291                  | 297     |
| Carbohydrate (gm)                          | Mean  | 124.35               | 123.71           | 129.28 <sup>b</sup>  | 120.49          | 119.49              | 117.62       | 125.53               | 125.92    | 125.40               | 122.60  |
|  | n   | 105                  | 82               | 70                   | 66              | 56                  | 47           | 67                   | 98        | 298                  | 293     |
| Calcium (mg)                               | Mean  | 593.35 <sup>c</sup>  | 404.09           | 510.50 <sup>c</sup>  | 394.28          | 564.17 <sup>a</sup> | 483.23       | 580.49 <sup>c</sup>  | 473.33    | 574.42 <sup>c</sup>  | 433.30  |
|  | n   | 105                  | 83               | 70                   | 66              | 54                  | 47           | 67                   | 100       | 296                  | 296     |
| Iron (mg)                                  | Mean  | 6.58                 | 6.62             | 6.14                 | 6.64            | 6.23                | 6.81         | 5.87                 | 6.15      | 6.21 <sup>a</sup>    | 6.53    |
|  | n   | 103                  | 76               | 69                   | 67              | 53                  | 46           | 68                   | 99        | 293                  | 288     |
| Magnesium (mg)                             | Mean  | 139.80 <sup>c</sup>  | 123.29           | 137.04 <sup>c</sup>  | 110.96          | 126.40 <sup>a</sup> | 112.39       | 129.96 <sup>a</sup>  | 118.56    | 134.42 <sup>c</sup>  | 116.44  |
|  | n   | 105                  | 83               | 70                   | 67              | 58                  | 48           | 65                   | 99        | 296                  | 297     |
| Phosphorus (mg)                            | Mean  | 725.08 <sup>c</sup>  | 586.61           | 626.09 <sup>b</sup>  | 546.57          | 669.77              | 613.22       | 669.12               | 637.54    | 675.50 <sup>c</sup>  | 593.12  |
|  | n   | 105                  | 83               | 70                   | 66              | 55                  | 48           | 68                   | 99        | 298                  | 296     |
| Vitamin A (IU)                             | Mean  | 6798.00 <sup>c</sup> | 2945.49          | 4003.64 <sup>c</sup> | 1908.90         | 2843.97             | 2251.37      | 2346.25 <sup>c</sup> | 1872.73   | 4197.64 <sup>c</sup> | 2253.11 |
|  | n   | 103                  | 83               | 71                   | 64              | 55                  | 47           | 69                   | 94        | 298                  | 288     |
| Thiamin (mg)                               | Mean  | .75                  | .83              | .73                  | .79             | .72                 | .68          | .72                  | .70       | .73                  | .85     |
|  | n   | 104                  | 79               | 70                   | 67              | 55                  | 45           | 66                   | 97        | 295                  | 288     |
| Riboflavin (mg)                            | Mean  | 1.27 <sup>c</sup>    | 1.02             | 1.11 <sup>b</sup>    | .92             | 1.10                | 1.03         | 1.07                 | .99       | 91.15 <sup>c</sup>   | .98     |
|  | n   | 98                   | 81               | 71                   | 64              | 53                  | 48           | 68                   | 99        | 290                  | 297     |
| Niacin (mg)                                | Mean  | 9.0                  | 9.94             | 8.18                 | 8.79            | 7.84                | 7.87         | 7.67                 | 7.77      | 8.16 <sup>c</sup>    | 8.67    |
|  | n   | 101                  | 81               | 71                   | 67              | 55                  | 46           | 67                   | 100       | 294                  | 294     |
| Vitamin B <sub>6</sub> (mg)                | Mean  | .79                  | .85              | .76                  | .67             | .80                 | .80          | .74                  | .71       | .76                  | .75     |
|  | n   | 102                  | 78               | 68                   | 67              | 55                  | 48           | 67                   | 99        | 292                  | 292     |
| Vitamin B <sub>12</sub> (mcg) <sup>d</sup> | Mean  | 2.95 <sup>c</sup>    | 1.95             | 2.23 <sup>b</sup>    | 1.76            | 2.39                | 2.25         | 2.14 <sup>c</sup>    | 1.92      | 2.43                 | 1.96    |
|  | n   | 90                   | 82               | 66                   | 65              | 54                  | 49           | 68                   | 98        | 278                  | 294     |
| Vitamin C (mg)                             | Mean  | 75.01                | 82.25            | 96.86                | 80.6            | 60.77               | 55.08        | 62.35                | 53.55     | 72.38                | 69.95   |
|  | n   | 104                  | 84               | 70                   | 67              | 55                  | 47           | 64                   | 96        | 293                  | 294     |
| Cholesterol (mg)                           | Mean  | 206.32               | 184.73           | 207.26               | 194.19          | 197.97              | 233.48       | 152.77 <sup>b</sup>  | 218.28    | 190.96               | 206.35  |
|  | n   | 100                  | 82               | 70                   | 65              | 56                  | 49           | 69                   | 99        | 295                  | 295     |

<sup>a</sup>Significance level  $p < .05$

<sup>b</sup>Significance level  $p < .01$

<sup>c</sup>Significance level  $p < .001$

<sup>d</sup>Significance level not tested on absolute intake, since substantial skewness in the distribution invalidates the assumptions underlying F-tests for statistical significance. Variable was transformed to logarithmic scale (Base 10) to test significance--refer to results for log distributions.

Exhibit 6-34

Adjusted Mean Nutrient Densities for Head Start-Present and Head Start-Absent Children by Site

| Variable                      | Posttested Children (Samples A, B, and C) In: |                       |                  |                      |                 |                      |              |                      |           |                      |         |
|-------------------------------|---|-----------------------|------------------|----------------------|-----------------|----------------------|--------------|----------------------|-----------|----------------------|---------|
|                               | Greene and Humphreys County                   |                       | St. Clair County |                      | Maricopa County |                      | Mingo County |                      | All Sites |                      |         |
|                               | HS-P  | HS-A                  | HS-P             | HS-A                 | HS-P            | HS-A                 | HS-P         | HS-A                 | HS-P      | HS-A                 |         |
| Protein (gm)                  | Mean  | 39.53                 | 35.08            | 36.11                | 37.03           | 37.15                | 35.16        | 36.56                | 35.24     | 37.55                | 35.91   |
|                               | n   | 103                   | 9                | 71                   | 31              | 54                   | 41           | 68                   | 36        | 296                  | 117     |
| Fat (gm)                      | Mean  | 39.59                 | 39.08            | 38.92 <sup>c</sup>   | 44.00           | 41.92                | 40.89        | 38.30 <sup>a</sup>   | 42.28     | 39.67 <sup>a</sup>   | 41.63   |
|                               | n   | 102                   | 10               | 70                   | 30              | 56                   | 41           | 63                   | 36        | 291                  | 117     |
| Carbohydrate (gm)             | Mean  | 124.3                 | 127.3            | 129.28 <sup>c</sup>  | 113.95          | 119.49               | 124.08       | 128.53               | 118.49    | 125.4                | 121.25  |
|                               | n   | 105                   | 10               | 70                   | 31              | 56                   | 40           | 67                   | 37        | 298                  | 118     |
| Calcium (mg)                  | Mean  | 593.35 <sup>c</sup>   | 342.34           | 510.50 <sup>c</sup>  | 402.76          | 564.17               | 486.67       | 580.45 <sup>b</sup>  | 478.27    | 574.42 <sup>c</sup>  | 441.7   |
|                               | n   | 105                   | 10               | 70                   | 31              | 54                   | 41           | 67                   | 37        | 296                  | 119     |
| Iron (mg)                     | Mean  | 6.58                  | 6.91             | 6.14                 | 6.46            | 6.23                 | 6.84         | 5.87                 | 6.36      | 6.21 <sup>a</sup>    | 6.62    |
|                               | n   | 103                   | 9                | 69                   | 28              | 53                   | 40           | 68                   | 33        | 293                  | 110     |
| Magnesium (mg)                | Mean  | 139.8                 | 118.77           | 137.04 <sup>c</sup>  | 112.99          | 126.40 <sup>a</sup>  | 109.95       | 129.96 <sup>b</sup>  | 115.55    | 134.42 <sup>c</sup>  | 115.26  |
|                               | n   | 105                   | 10               | 70                   | 31              | 58                   | 40           | 65                   | 37        | 296                  | 118     |
| Phosphorus (mg)               | Mean  | 725.08 <sup>c</sup>   | 536.15           | 626.09               | 569.4           | 669.77               | 608.94       | 669.12               | 629.9     | 675.50 <sup>c</sup>  | 598.33  |
|                               | n   | 105                   | 10               | 70                   | 31              | 55                   | 41           | 68                   | 37        | 298                  | 119     |
| Vitamin A (IU) <sup>d</sup>   | Mean  | 10301.39 <sup>b</sup> | 4394.46          | 8083.03 <sup>b</sup> | 3272.47         | 4015.96 <sup>b</sup> | 3386.91      | 4862.06 <sup>a</sup> | 2880.18   | 7016.53 <sup>b</sup> | 3616.77 |
|                               | n   | 103                   | 10               | 71                   | 31              | 55                   | 39           | 69                   | 37        | 298                  | 117     |
| Thiamin (mg)                  | Mean  | .75 <sup>a</sup>      | .92              | .73                  | .76             | .72                  | .72          | .72                  | .78       | .73 <sup>a</sup>     | .79     |
|                               | n   | 104                   | 10               | 70                   | 30              | 55                   | 39           | 66                   | 35        | 295                  | 114     |
| Riboflavin (mg)               | Mean  | 1.27 <sup>a</sup>     | .97              | 1.11                 | .96             | 1.10                 | 1.05         | 1.07                 | 1.06      | 91.15 <sup>b</sup>   | 1.04    |
|                               | n   | 98                    | 9                | 71                   | 31              | 53                   | 40           | 68                   | 35        | 290                  | 115     |
| Niacin (mg)                   | Mean  | 9.0                   | 9.71             | 8.18                 | 8.95            | 7.84                 | 7.66         | 7.67                 | 8.52      | 8.16                 | 8.77    |
|                               | n   | 101                   | 9                | 71                   | 29              | 55                   | 39           | 67                   | 33        | 294                  | 110     |
| Vitamin B <sub>6</sub> (mg)   | Mean  | .79 <sup>c</sup>      | .89              | .76                  | .69             | .80                  | .79          | .71                  | .76       | .76                  | .74     |
|                               | n   | 102                   | 10               | 68                   | 28              | 55                   | 41           | 67                   | 34        | 292                  | 113     |
| Vitamin B <sub>12</sub> (mcg) | Mean  | 2.95                  | 1.43             | 2.23                 | 2.24            | 2.39                 | 2.35         | 2.16 <sup>a</sup>    | 2.41      | 2.43                 | 2.30    |
|                               | n   | 90                    | 9                | 66                   | 31              | 54                   | 40           | 68                   | 37        | 278                  | 117     |
| Vitamin C (mg)                | Mean  | 75.01                 | 84.67            | 96.86                | 98.49           | 60.77                | 63.03        | 62.35                | 56.92     | 72.38                | 78.96   |
|                               | n   | 104                   | 10               | 70                   | 31              | 55                   | 39           | 64                   | 37        | 293                  | 117     |
| Cholesterol (mg)              | Mean  | 206.32                | 181.76           | 207.26               | 211.86          | 197.97               | 245.06       | 152.77 <sup>c</sup>  | 272.78    | 190.96               | 226.40  |
|                               | n   | 100                   | 9                | 70                   | 31              | 56                   | 41           | 69                   | 37        | 295                  | 118     |

<sup>a</sup>Significance level p<.05

<sup>b</sup>Significance level p<.01

<sup>c</sup>Significance level p<.001

<sup>d</sup>Significance level not tested on absolute intake, since substantial skewness in the distribution invalidates the assumptions underlying F-tests for statistical significance. Variable was transformed to logarithmic scale (Base 10) to test significance--refer to results for log distributions.

Exhibit 6-35

Adjusted Mean Nutrient Densities for Head Start-Absent and Non-Head Start Children by Site

| Variable                      |      | Posttested Children (Samples A, B, and C) In: |         |                   |         |                   |         |                  |         |                    |         |
|-------------------------------|------|---|---------|-------------------|---------|-------------------|---------|------------------|---------|--------------------|---------|
|                               |      | Greene and Humphreys County                   |         | St. Clair County  |         | Maricopa County   |         | Mingo County     |         | All Sites          |         |
|                               |      | HS-A  | NHS     | HS-A              | NHS     | HS-A              | NHS     | HS-A             | NHS     | HS-A               | NHS     |
| Protein (gm)                  | Mean | 35.08   | 36.74   | 37.03             | 34.42   | 35.16             | 35.03   | 32.54            | 33.44   | 35.91 <sup>c</sup> | 34.79   |
|                               | n    | 9   | 84      | 31                | 67      | 41                | 48      | 36               | 100     | 117                | 299     |
| Fat (gm)                      | Mean | 39.08   | 40.78   | 44.00             | 42.9    | 40.89             | 43.39   | 42.28            | 41.29   | 41.63              | 41.96   |
|                               | n    | 10  | 83      | 30                | 67      | 41                | 48      | 36               | 99      | 117                | 297     |
| Carbohydrate                  | Mean | 127.3   | 123.71  | 113.95            | 120.48  | 124.08            | 117.62  | 118.49           | 125.92  | 121.25             | 122.6   |
|                               | n    | 10  | 82      | 31                | 66      | 40                | 47      | 37               | 98      | 118                | 293     |
| Calcium (mg)                  | Mean | 342.34  | 404.09  | 402.76            | 394.28  | 486.67            | 483.03  | 478.27           | 473.33  | 441.7              | 433.3   |
|                               | n    | 10  | 83      | 31                | 66      | 41                | 47      | 37               | 100     | 119                | 296     |
| Iron (mg)                     | Mean | 6.91  | 6.62    | 6.46              | 6.64    | 6.84              | 6.81    | 6.36             | 6.15    | 6.62               | 6.53    |
|                               | n    | 9   | 76      | 28                | 67      | 40                | 46      | 33               | 99      | 110                | 288     |
| Magnesium (mg)                | Mean | 118.77  | 123.29  | 112.99            | 110.96  | 109.95            | 112.39  | 115.55           | 118.66  | 115.26             | 116.44  |
|                               | n    | 10  | 83      | 31                | 67      | 40                | 48      | 37               | 99      | 118                | 297     |
| Phosphorus (mg)               | Mean | 536.15  | 586.61  | 569.4             | 546.57  | 608.94            | 613.2   | 629.9            | 637.54  | 583.33             | 593.62  |
|                               | n    | 10  | 83      | 31                | 66      | 41                | 48      | 37               | 99      | 119                | 296     |
| Vitamin A (IU) <sup>d</sup>   | Mean | 2675.13 <sup>a</sup>                          | 2945.49 | 2129.62           | 1908.90 | 2089.08           | 2251.37 | 2346.25          | 2791.38 | 2865.90            | 2253.11 |
|                               | n    | 10  | 83      | 31                | 64      | 39                | 47      | 37               | 94      | 117                | 288     |
| Thiamin (mg)                  | Mean | .92   | .83     | .76               | .79     | .72               | .68     | .78 <sup>a</sup> | .70     | .79                | .75     |
|                               | n    | 10  | 79      | 30                | 67.0    | 39                | 45      | 35               | 97      | 114                | 288     |
| Riboflavin (mg)               | Mean | .97   | 1.02    | .96               | .92     | 1.05              | 1.03    | 1.06             | .99     | 1.04               | .98     |
|                               | n    | 9   | 81      | 31                | 64      | 40                | 48      | 35               | 99      | 115                | 292     |
| Niacin (mg)                   | Mean | 9.71  | 9.94    | 8.95              | 8.79    | 7.66              | 7.87    | 8.52             | 7.77    | 8.77               | 8.62    |
|                               | n    | 9   | 81      | 29                | 67      | 39                | 46      | 33               | 100     | 110                | 294     |
| Vitamin B <sub>6</sub> (mg)   | Mean | .89   | .85     | .69               | .67     | .79               | .80     | .76              | .71     | .75                | .75     |
|                               | n    | 10  | 78      | 28                | 67      | 41                | 48      | 34               | 99      | 113                | 292     |
| Vitamin B <sub>12</sub> (mcg) | Mean | 1.43  | 1.95    | 2.24 <sup>a</sup> | 1.76    | 2.35 <sup>a</sup> | 2.25    | 2.41             | 1.92    | 2.43 <sup>a</sup>  | 1.96    |
|                               | n    | 9   | 82      | 31                | 65      | 40                | 49      | 37               | 98      | 117                | 294     |
| Vitamin C (mg)                | Mean | 84.67   | 82.25   | 98.49             | 80.6    | 63.03             | 55.08   | 56.92            | 53.55   | 78.96              | 69.95   |
|                               | n    | 10  | 84      | 31                | 67      | 39                | 47      | 37               | 96      | 117                | 294     |
| Cholesterol (mg)              | Mean | 181.76  | 184.73  | 211.86            | 194.19  | 245.06            | 233.48  | 272.78           | 212.28  | 226.40             | 206.35  |
|                               | n    | 9   | 82      | 31                | 65      | 41                | 49      | 37               | 99      | 118                | 295     |

<sup>a</sup>Significance level  $p < .05$

<sup>b</sup>Significance level  $p < .01$

<sup>c</sup>Significance level  $p < .001$

<sup>d</sup>Significance level not tested on absolute intake, since substantial skewness in the distribution invalidates the assumptions underlying F-tests for statistical significance. Variable was transformed to logarithmic scale (Base 10) to test significance--refer to results for log distributions.

program would be highly beneficial to participating children if satisfaction of the RDA for iron, without provision of excess calories, is to remain a program goal.

Such changes in menu-planning may yield other benefits as well. Despite previously mentioned differences in proportion of calories obtained from protein, fat and carbohydrate, most of the children examined in this study (both Head Start and non-Head Start) could benefit from minor changes in their diets that would decrease the proportion of calories provided by protein and fat, while simultaneously increasing the proportion of calories contributed by complex carbohydrates. Such changes would not only bring children's diets more in line with recommendations currently made by many nutrition educators, but would also increase the overall nutrient density of children's diets since complex carbohydrate foods are generally excellent sources of many nutrients. Evidence has indicated that the vast majority of children consumed much more protein than they actually require. This tendency was strongest in the Head Start-present group, as Exhibits 6-33 through 6-35 illustrated. Substantially greater numbers of Head Start-present children in all sites consumed diets with a disproportionately high amount of calories provided by protein. Diets of greater numbers of Head Start-present children in Greene and Humphreys Counties were also disproportionately low in calories from carbohydrate. This finding is of concern not only because protein is an expensive source of energy, but also because research has suggested that the disproportionately large amounts of protein consumed by Americans may have long term health implications (Pipes, 1977; Food and Nutrition Board, 1980).

An over-emphasis on protein intake in the Head Start performance standards may be inappropriate. If Head Start menus were planned using alternative sources of protein and iron more frequently, and if these foods were served along with some smaller portion of meat, fish or poultry and/or serving of a food high in vitamin C, several nutritional benefits would accrue. First, the total protein content of the meal may be decreased, but the protein-to-calorie ratio is likely to be increased, since the amount of fat (and therefore calories) would also be reduced. Second, the total amount of absorbable iron would be increased, as described previously. Third, the use of such foods will simultaneously increase consumption of complex carbohydrates (i.e., those obtained from whole grains or legumes) and potentially increase the overall nutrient density of the diet. Finally, redirecting the



Exhibit 6-36

Pattern of Participation in Federal Food Assistance Programs for Posttested Head Start and Non-Head Start Families by Site

| Pattern of Food Assistance Program Participation | Posttested Families (Samples A,B,C) In: |                 |                               |                 |                 |                 |                 |                 |                  |                  |
|--|---|-----------------|-------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|
|  | Greene & Humphreys Counties             |                 | St. Clair County <sup>a</sup> |                 | Maricopa County |                 | Mingo County    |                 | All Sites        |                  |
|  | HS<br>n=119                             | NHS<br>n=93     | HS<br>n=105                   | NHS<br>n=80     | HS<br>n=104     | NHS<br>n=56     | HS<br>n=112     | NHS<br>n=104    | HS<br>n=440      | NHS<br>n=333     |
| Food Stamps Only                                 | n<br>24<br>20.2                         | n<br>23<br>24.7 | n<br>22<br>21.0               | n<br>30<br>37.5 | n<br>42<br>40.4 | n<br>22<br>39.3 | n<br>32<br>28.6 | n<br>29<br>27.9 | n<br>120<br>27.3 | n<br>104<br>31.2 |
| WIC Only   | n<br>20<br>16.8                         | n<br>16<br>17.2 | n<br>16<br>15.2               | n<br>5<br>6.2   | n<br>3<br>2.9   | n<br>1<br>1.8   | n<br>7<br>6.3   | n<br>5<br>4.8   | n<br>46<br>10.4  | n<br>27<br>8.1   |
| Both Food Stamps and WIC                         | n<br>55<br>46.2                         | n<br>43<br>46.2 | n<br>62<br>59.0               | n<br>37<br>46.3 | n<br>19<br>18.3 | n<br>6<br>10.7  | n<br>36<br>32.1 | n<br>22<br>21.1 | n<br>172<br>39.1 | n<br>108<br>32.5 |
| No Food Assistance                               | n<br>20<br>16.8                         | n<br>11<br>11.9 | n<br>5<br>4.8                 | n<br>8<br>10.0  | n<br>40<br>38.4 | n<br>27<br>48.2 | n<br>37<br>33.0 | n<br>48<br>46.2 | n<br>102<br>23.2 | n<br>94<br>28.2  |

Significance of Chi-Square d Test for Independence (3df)

$\chi^2 = 10.82; p = 0.013.$

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260

261

focus of some meals to center around alternative sources of protein would be in keeping with the Head Start program goals to increase Head Start children's experience with and consumption of a wide variety of foods.

Finally it is interesting to note that the Latest Thrifty Meal Plan proposed for Food Stamp users by the U.S. Department of Agriculture includes diets planned with energy source patterns that would deemphasize traditional protein sources (meat, fish and poultry) and encourage use of alternative protein sources and complex carbohydrate foods. Low-income families would be advised to purchase more whole grain products, legumes, fruits and vegetables, and purchase less meat, poultry and fish. (CNI Weekly Report, October 28, 1982).

#### Patterns and Effects of Participation in Food Assistance Programs.

Analyses were undertaken to determine any group differences in patterns of food assistance program participation that might be attributable to Head Start intervention. Overall participation patterns at posttest (Samples A, B and C) were similar for Head Start and non-Head Start groups in each site, with the exception of St. Clair County (see Exhibit 6-36). Families with Head Start children in St. Clair County more frequently participated in the WIC program, either alone or in conjunction with the Food Stamps program. This result is not surprising, since the nutritionist who most frequently consults with the Head Start program in St. Clair County is a chief nutritionist with the local WIC program. In addition, the director of the WIC program is a member of the Health Advisory Council for the St. Clair County Head Start program. It seems as though this well-developed relationship between the Head Start and WIC programs may work to the benefit of those St. Clair County Head Start families who are eligible for WIC services.

In order to understand the relative importance of these programs in the diets of Head Start children, we investigated two principal questions:

- did families with different food assistance program participation patterns (e.g., Food Stamps only vs. WIC only) differ substantially from one another, in important background characteristics, either across or within sites? and
- did families' food assistance program participation pattern make a significant difference in children's nutrient intake?

In general, families participating in both the Food Stamps and WIC programs were the most disadvantaged, while families who did not participate in any food assistance programs were the least disadvantaged. As Exhibit 6-37 illustrates, the four groups followed a similar progression from most disadvantaged to least disadvantaged for each of the SES-related background variables examined. The Food Stamps and WIC group was most similar to the Food Stamps only group; both of these groups tended to be more disadvantaged than either the WIC only group or the no food assistance group:

- across all sites, families participating in both Food Stamps and WIC or Food Stamps alone had lower per capita incomes and therefore lower income percentiles. Household members were less frequently employed, and mother's tended to have less education.
- across all sites, families who participated in the WIC program only or who participated in no federal food assistance programs more frequently had one or more household members employed, tended to have higher per capita incomes and mothers who were better educated.\*

These patterns are not surprising when one considers that the WIC program is targeted toward groups with high nutritional risk (e.g., teenage mothers, high-risk pregnancies, low birth weight infants, anemic or poorly growing preschoolers) and until recently focused much less on income-eligibility criteria than the Food Stamp program. Therefore, it is quite conceivable that families participating in WIC alone may be very different from families participating only in the Food Stamps program or in both Food Stamps and WIC programs.

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\*These patterns were consistent in Greene and Humphreys Counties and St. Clair County; however, two exceptions were noted in Maricopa County and Mingo County: the pattern of mother's education was reversed in both of these sites, with mothers in families receiving no food assistance in Maricopa County receiving less education, and mothers in families receiving only WIC benefits in Mingo County having the least education.

Similarly, the Food Stamps only group in Mingo County appears to contradict the patterns noted in other sites. It should be kept in mind, however, that many of the families reporting no employment and current participation in the Food Stamps program in this site were families of striking coal miners who would normally have fallen into the no food assistance group. (See Chapter Two for further discussion of this situation and the effect it had on SES-related variables in the Mingo County site.)

Exhibit 6-37

Characteristics of Various Federal Food Assistance Program Participation Pattern Groups by Site

|                                  |                                     | Posttested Families (Samples A, B, C) In: |                        |                       |                    |                         |
|----------------------------------|-------------------------------------|---|------------------------|-----------------------|--------------------|-------------------------|
| SES Variable                     | Participation Pattern               | Greene & Humphreys Counties n=212         | St. Clair County n=185 | Maricopa County n=160 | Mingo County n=216 | All Sites n=773         |
| Someone in Family Employed       | Food Stamps $\frac{n}{Z}^a$         | 19<br>40.4                                | 12<br>23.1             | 38<br>59.4            | 18<br>29.5         | 87 <sup>a</sup><br>38.8 |
|                                  | WIC Only $\frac{n}{Z}^b$            | 27<br>75.0                                | 17<br>81.0             | 4<br>100.0            | 3<br>25.0          | 51<br>69.9              |
|                                  | Food Stamps and WIC $\frac{n}{Z}^c$ | 47<br>48.0                                | 14<br>14.1             | 15<br>60.0            | 14<br>24.1         | 90<br>32.1              |
|                                  | No Food Assistance $\frac{n}{Z}^d$  | 21<br>67.7                                | 9<br>69.2              | 63<br>94.0            | 60<br>70.6         | 53<br>78.1              |
| Mean Household Per Capita Income | Food Stamps Only $\bar{X}$          | 747.02                                    | 1023.80                | 912.44                | 2083.20            | 1234.03 <sup>f</sup>    |
|                                  | WIC Only $\bar{X}$                  | 1439.60                                   | 1865.89                | 1562.50               | 1584.59            | 1585.44                 |
|                                  | Food Stamps and WIC $\bar{X}$       | 607.68                                    | 871.21                 | 950.69                | 929.83             | 796.95                  |
|                                  | No Food Assistance $\bar{X}$        | 1472.48                                   | 1989.25                | 1880.56               | 2121.06            | 1909.77                 |
| Mean Household Income Percentile | Food Stamps Only                    | 46.10                                     | 47.32                  | 37.83                 | 57.71              | 47.31 <sup>g</sup>      |
|                                  | WIC Only                            | 68.92                                     | 67.67                  | 69.43                 | 51.35              | 65.80                   |
|                                  | Food Stamps and WIC                 | 39.86                                     | 39.11                  | 37.10                 | 28.09              | 36.98                   |
|                                  | No Food Assistance                  | 60.02                                     | 71.23                  | 62.24                 | 56.28              | 60.03                   |
| Mother's Education (years)       | Food Stamps Only                    | 10.29                                     | 10.92                  | 10.09                 | 10.64              | 10.47 <sup>h</sup>      |
|                                  | WIC Only                            | 11.17                                     | 12.52                  | 12.33                 | 9.50               | 11.33                   |
|                                  | Food Stamps and WIC                 | 10.47                                     | 11.34                  | 9.24                  | 10.10              | 10.59                   |
|                                  | No Food Assistance                  | 11.49                                     | 12.28                  | 9.81                  | 10.85              | 10.75                   |

<sup>a</sup>As percent of families receiving only Food Stamps benefits

<sup>b</sup>As percent of families receiving WIC benefits

<sup>c</sup>As percent of families receiving both Food Stamp and WIC benefits

<sup>d</sup>As percent of families receiving no food assistance benefits

Significance of Chi-Squared Test for Independence (3 df):

$\chi^2 = 119.99; p = 0.00$

Significance Level:

<sup>f</sup>p = 0.00

<sup>g</sup>p = 0.00

<sup>h</sup>p = 0.05

To investigate how different participation patterns may have effected Head Start children's nutrient intake, two separate sets of analyses were run, evaluating the Head Start-absent and Head Start-present groups individually. The nutrient content of the diets consumed at home by each group of Head Start children was evaluated using the regression model previously described. An additional analysis was run on the full cross-sectional sample (both Head Start and non-Head Start groups) to detect any differences in overall nutrient density of at-home diets attributable to variations in food assistance program participation patterns.

Few significant differences were detected in across-site analyses. There was no consistent pattern in any of the sites: in some cases there were no significant differences to speak of, in others the most-disadvantaged groups (Food Stamps only and Food Stamps plus WIC groups) had lower intakes than the least-disadvantaged groups (WIC only and no food assistance groups), and in yet other instances, the most-disadvantaged groups had higher intakes than the least-disadvantaged groups. Any differences that were detectable were substantively small and just reached significance.\* These few "differences" are most likely attributable to chance, since there were even fewer differences than what one would expect to find by chance, given the number of analyses that were run.

Although no coherent pattern of differences among participation patterns could be detected, there is an important observation to be made about families' participation in these food assistance programs. As Exhibit 6-36 demonstrated, well over 50 percent of the children in each group participated in one or more federal food assistance programs; in two sites this level approached 90 percent. These programs obviously played an important role in the nutrient intakes of Head Start and Head Start-eligible children reported in this evaluation. This participation may have also been an important factor in the lack of difference between the Head Start-absent and

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\*It should be noted here that differences evaluated in multiple regression analysis were differences between the mean for each participation pattern group and the overall group mean. A more complicated contrast coding scheme, similar to that used for the three-level Head Start comparison would have been required to test for differences in all of the possible between-group comparisons. Such analyses were beyond the scope of the present evaluation and therefore were not undertaken here.

non-Head Start group--these groups did not receive meals and snacks from Head Start, but utilization of other food assistance benefits was essentially equivalent for both groups.

The importance of such programs in the nutrient intakes reported for both Head Start and non-Head Start children cannot be underestimated. As other investigators have cautioned, we must consider the influence of participation in programs, although unmeasured in this evaluation, and realize that any future changes in participation patterns due to program cut-backs or changes in eligibility requirements would be likely to have an important impact on the diets of these children and all Head Start and Head Start-eligible children (Hegsted, 1982).

Impact of Parent Education on Nutrient Content and Nutritional Quality of Diets Provided to Head Start Children at Home. Using the regression model described previously, analyses were undertaken to determine whether participation in Head Start parent meetings and routine (at least once a month) visits to children's classrooms had any impact on parents' feeding behaviors, and consequently on either the nutrient content or nutritional quality of the diets provided to children at home. Two dichotomous variables designating attendance at parent meetings and routine classroom visits were added to the standard set of covariates and factors. Impact on the following dependent measures were evaluated:

- total nutrient content of diets consumed at home by Head Start-present children;
- total nutrient content of diets consumed at home by Head Start-absent children;
- overall nutrient density of at-home diets for both groups of Head Start children; and
- overall nutrient density of at-home diets for both groups of Head Start children, compared to that of non-Head Start children (This analysis was an attempt to uncover any Head Start influence on parents that was not reflected in parent participation in meetings or classroom activities, as reported in this evaluation).

No significant differences in either the nutrient content or nutrient density of diets provided at home by participating Head Start parents and non-participating Head Start parents were detected. Interestingly enough, however, several significant differences in nutrient density were detected

between the total Head Start group and ~~the~~ non-Head Start group. Across all sites, the at-home diets of Head Start children (present and absent groups combined) were higher in density of vitamins A and C and lower in cholesterol density than diets of non-Head Start children (see Exhibit 6-38). Diets of Head Start children were also lower in total fat density, and thereby had lower percentages of calories contributed by fat. At the same time, at-home diets of Head Start children were higher in total carbohydrate density, and thereby had increased percentages of calories contributed by carbohydrate. Although the magnitude of these differences is small (e.g., Head Start children received two to five percent less of their calories from fat), the pattern of differences is interesting. As has been discussed previously, changes in dietary habits to decrease fat and cholesterol consumption and increase consumption of complex carbohydrates are currently encouraged in most nutrition education efforts. It is not unlikely that such changes would be the focus of Head Start nutrition education services, whether formal or informal. Along the same lines, increased consumption of fruits and vegetables high in vitamins C and/or A is also a common nutrition education theme.

As might be expected, differences between Head Start and non-Head Start groups in nutritional quality of diets consumed at home varied greatly from site to site. A larger number of differences were observed in Greene and Humphreys Counties than were observed in any of the other sites--in Greene and Humphreys Counties the at-home diets of Head Start children were also higher in concentrations of calcium, phosphorus, riboflavin and vitamin B<sub>12</sub>. Fewer differences were noted in St. Clair County and Maricopa County, sites where significant numbers of parents had reported involvement in Head Start classroom activities and in parent education sessions focusing on food and nutrition. It is difficult to interpret the apparent conflict in these findings. The data strongly suggest, however, that prevalence and influence of Head Start nutrition education services for parents varies greatly among programs. There is apparently a strong, positive influence in Greene and Humphreys Counties, and a much less pronounced influence in the other three sites.

Exhibit 6-38

Adjusted Mean Nutrient Densities of Diets Consumed at Home for  
Head Start and Non-Head Start Children by Site

| Nutrient                      | Posttested Head Start and Non-Head Start Children (Samples A, B and C) In: |             |                      |             |                     |             |                      |             |                      |              |
|-------------------------------|--|-------------|----------------------|-------------|---------------------|-------------|----------------------|-------------|----------------------|--------------|
|                               | Greene & Humphreys Counties  |             | St. Clair County     |             | Maricopa County     |             | Mingo County         |             | All Sites            |              |
|                               | HS<br>n=115  | NHS<br>n=82 | HS<br>n=100          | NHS<br>n=67 | HS<br>n=96          | NHS<br>n=47 | HS<br>n=104          | NHS<br>n=99 | HS<br>n=408          | NHS<br>n=297 |
| Fat (gm)                      | 38.50 <sup>a</sup>   | 41.01       | 41.97                | 42.74       | 39.43 <sup>b</sup>  | 43.23       | 40.40                | 41.33       | 40.20 <sup>c</sup>   | 41.86        |
| Carbohydrate (gm)             | 129.89 <sup>a</sup>  | 123.28      | 121.22               | 120.63      | 127.89 <sup>a</sup> | 118.23      | 124.21               | 126.05      | 125.56 <sup>b</sup>  | 122.80       |
| Calcium (mg)                  | 399.46 <sup>a</sup>  | 350.73      | 426.42               | 375.48      | 485.35              | 491.19      | 469.41               | 472.41      | 438.11               | 433.33       |
| Phosphorus (mg)               | 582.33 <sup>a</sup>  | 540.77      | 573.72               | 532.88      | 618.79              | 619.08      | 627.39               | 634.75      | 593.74               | 594.80       |
| Vitamin A (I.U.)              | 3371.06 <sup>c</sup>   | 2945.48     | 2557.43 <sup>c</sup> | 1908.89     | 2576.27             | 2251.37     | 2637.73 <sup>c</sup> | 1872.73     | 2814.75 <sup>a</sup> | 2251.75      |
| Riboflavin (mg)               | 1.03 <sup>b</sup>  | 0.92        | 1.01                 | 0.88        | 1.04                | 1.03        | 1.01                 | 0.98        | 0.99                 | 0.98         |
| Vitamin B <sub>12</sub> (mcg) | 1.95 <sup>b</sup>  | 1.63        | 2.10 <sup>c</sup>    | 1.76        | 2.25                | 2.25        | 2.16                 | 1.92        | 2.12                 | 1.95         |
| Vitamin C (mg)                | 92.26  | 84.46       | 99.20                | 80.59       | 62.85               | 56.46       | 65.41 <sup>c</sup>   | 54.69       | 79.66 <sup>a</sup>   | 69.38        |
| Cholesterol (mg)              | 162.26 <sup>b</sup>  | 189.28      | 193.46               | 196.89      | 207.08 <sup>a</sup> | 233.77      | 204.10               | 209.82      | 195.54 <sup>a</sup>  | 205.24       |

<sup>a</sup>Significance level  $p \leq .05$

<sup>b</sup>Significance level  $p \leq .01$

<sup>c</sup>Significance level  $p \leq .001$

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## Conclusions

At pretest, mean intakes of children in all sites provided 100 percent or more of the daily recommendation for protein, vitamin A, thiamin, riboflavin, vitamin B<sub>12</sub> and vitamin C. Mean intakes of calcium were marginal in all sites except Mingo County; iron intakes were marginal in all sites. In some sites mean intakes of calories, magnesium, niacin and vitamin B<sub>6</sub> were also marginal. In spite of adequate mean intakes, substantial numbers of children consumed diets supplying less than 66 percent of the recommended intake for all nutrients except protein and thiamin. Children in Greene and Humphreys Counties consumed diets supplying the least calcium, iron, phosphorus, vitamin B<sub>12</sub> and vitamin C.

Analyses of nutrient intake at posttest revealed many significant differences between the group of children who received Head Start meals and snacks, the non-Head Start group and the group of Head Start children who had not received Head Start meals and snacks in both the longitudinal and cross-sectional samples. In the longitudinal sample, children who had received Head Start meals and snacks consumed significantly greater amounts of calcium, magnesium, phosphorus, riboflavin, vitamin A and vitamin B<sub>12</sub> than either non-Head Start children or Head Start children who had not consumed Head Start meals and snacks. As a result, pretest to posttest improvement in the number of children receiving 100 percent of the recommended daily intake for these nutrients was substantially greater for the Head Start-present group. Results varied across sites, and were greatest in Greene and Humphreys Counties, where pretest intakes had been lowest. The fewest results were found in Maricopa County, where the Head Start nutrition program served fewer meals and snacks than were served in the other programs.

In the cross-sectional sample, substantially more of the children who had received meals and snacks from Head Start received 100 percent or more of the recommended daily intake for almost every nutrient. The greatest number of differences were noted in Mingo County; the fewest in Maricopa County. Calcium and iron were, once again, the most marginal nutrients in all sites. Nonetheless, the mean calcium intake of Head Start children (who had received Head Start meals and snacks) in all sites was well above recommended levels, whereas mean calcium intakes of all groups of non-Head Start children and Head Start children who had not received Head Start meals and snacks failed

to supply 100 percent of the daily recommendation. Similarly, mean iron intake for Head Start children exceeded 100 percent of the recommended amount in two sites and satisfied 94 percent of the recommendations in the two other sites. In contrast, mean iron intakes were marginal in much of the non-Head Start group as well as in the group of Head Start children who did not consume meals and snacks provided through Head Start.

Diets consumed by Head Start and non-Head Start children were generally similar in nutrient density for protein, thiamin, niacin, vitamin B<sub>6</sub> and cholesterol. Across all sites, Head Start children's diets were generally higher in concentrations of calcium, magnesium, phosphorus, vitamin A, riboflavin and vitamin B<sub>12</sub> in both longitudinal and cross-sectional samples.

The Head Start nutrition program was found to be successfully achieving many of its goals. Significant differences between Head Start and non-Head Start families in changes in the pattern of participation in food assistance programs from pretest to posttest suggest that Head Start may play an important role as facilitator, by putting families in need of food assistance benefits in touch with appropriate persons or agencies. Reported incidence of parent education services focusing on food and nutrition was limited in all study sites. Nonetheless, in most sites, the nutrient density of diets provided to Head Start children at home was superior to that of non-Head Start children for vitamins A and C and cholesterol and, to a lesser extent, for fat and carbohydrate.

The meal service component of the Head Start nutrition program served meals and snacks that successfully provided the mandated proportions of children's average daily nutrient needs (one-third of the RDA for part-day programs; one-half to two-thirds of the RDA for full-day programs). In addition, Head Start meals and snacks accounted for 40 to 50 percent of children's total nutrient intake.

## CHAPTER SEVEN

### BIOCHEMICAL EVALUATION

#### Biochemical Indicators

Extensive analysis of the blood samples obtained from the children participating in the evaluation was carried out in an effort to obtain an objective and accurate assessment of important indicators of their health status. These analyses provide information about the iron status and serum cholesterol levels of children in all four Head Start Health Evaluation sites, the vitamin A status of children in two sites, and the vitamin C levels of children in one site. This chapter on the biochemical assessment component of the Head Start Health Evaluation describes the data collection methodology, discusses the medical/scientific terminology necessary for an understanding of the data presented, explains the statistical analyses, and presents the findings.

#### Data Collection Methodology

Venipuncture blood samples were drawn for 92 percent of the children at pretest and for all but nine (1%) children at posttest. Blood was obtained by finger stick from the remaining children. Experienced medical technologists drew the blood and determined hematocrits on site using a portable centrifuge and reader. The remaining assays were performed at the Nutritional Biochemistry Laboratory of the University of Nebraska Medical Center. These included measures of serum cholesterol levels and iron, vitamin A, and vitamin C status.

Exhibit 7-1 shows the biochemical tests included in the comprehensive assessment performed as part of the Head Start Health Evaluation. These were chosen because of their relevance to an understanding of the status of the target population. That is, it has been generally agreed that iron deficiency, a widespread problem in the United States, is especially common among young children and is likely to have adverse effects (Cook and Finch, 1979; Dallman, Siimes, and Stekel, 1980). Therefore, a detailed investigation of

Exhibit 7-1

Laboratory Assays Performed at Pretest and Posttest

| Assay                     | Pretest   | Posttest.                   |
|---------------------------|-----------|-----------------------------|
| Iron status measures      | All Sites | All Sites                   |
| Hematocrit                |           |                             |
| Hemoglobin                |           |                             |
| FEP                       |           |                             |
| TIBC                      |           |                             |
| Iron                      |           |                             |
| TS                        |           |                             |
| Ferritin                  |           |                             |
| Serum Cholesterol         | All Sites | All Sites                   |
| Vitamin A status measures | All Sites | Greene & Humphreys Counties |
| Vitamin A (retinol)       |           | Maricopa County             |
| B-carotene                |           |                             |
| Vitamin C.                | Not done  | Maricopa County             |

the iron status of the children in all four sites was included in the present evaluation. The seven measures of iron status included in this investigation are: hematocrit, hemoglobin, free erythrocyte protoporphyrin (FEP), serum iron, total iron binding capacity (TIBC), transferrin saturation (TS), and ferritin. These contribute to a comprehensive picture of a child's iron status, reflect changes in levels of iron in different body compartments, and are affected at different points in the development of iron depletion. Because there is great interest in the relationship between diet and heart disease and very limited information about lipid levels in young children, serum cholesterol levels were also determined in all sites. Assays for vitamins A and C, however, were restricted to samples from those sites in which there was some reason to believe that levels of these vitamins might be low. Previous research (the Ten-State Nutrition Survey) indicated that

vitamin A levels are sometimes low in a low-income Hispanic population and vitamin C levels are low in some low-income groups. Two measures of vitamin A status (serum retinol and B-carotene) were determined in two sites and vitamin C assays were only performed on the Maricopa County samples.

Exhibit 7-2 presents the names of the blood analyses performed as indicators of iron status, cholesterol, vitamin A, and vitamin C levels and a basic definition of each measure with a brief explanation of its use in an assessment of health and nutritional status. Exhibit 7-3 shows the cutoff points for unacceptable values based upon standards currently accepted in the literature. Although biochemical measures are objective and have been obtained using accepted, standardized laboratory procedures, the "interpretation of laboratory data will always be a matter for some disagreement . . . . The 'cut-off points' selected as representing some degree of risk of deficiency are, and will presumably always be, a matter of some argument and arbitrary decision" (Christakis, 1973, p. 38). Hence, the cutoff points selected for use in the present discussion are intended to represent reasonable reference points for interpreting findings of the comprehensive Head

### Exhibit 7-2

#### Biochemical Measures

| Name of Iron Status Measure and Unit of Measurement | Definition  | Use in Health/Nutritional Status Assessment   |
|---|---|---|
| Hematocrit<br>%                                     | Percentage of the total blood volume which is made up of red blood cells (after the blood sample has been centrifuged or separated into its components) | Indirect measure of iron status, since iron is needed to produce red blood cells. Technical simplicity is a big advantage, but uncertainty as to hematocrit's sensitivity as an indicator of iron deficiency limits its value as the sole measure of iron status.   |
| Hemoglobin<br>gm/dl.                                | Concentration of the component of red blood cells which contains iron and carries oxygen throughout the body.   | Functional (indirect) measure of iron status which provides information on the levels of the iron-containing pigment hemoglobin in the body. Technically simple. Provides information on the end result of severe and/or long-term deficiency but is a relatively insensitive indicator of milder degrees of iron depletion. Hemoglobin and serum ferritin together monitor the two ends of the spectrum of iron status. Lacks sensitivity because of wide range of values in normal (non-anemic) subjects. |

gm = gram (equal to 0.035 ounces)

dl = deciliter or 100 ml

mcg = microgram or  $10^{-6}$  gram (one millionth of a gram)

ng = nanogram, or  $10^{-9}$  grams (one billionth of a gram)

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## Biochemical Measures (continued)

| Name of Iron Status Measure and Unit of Measurement   | Definition  | Use in Health/Nutritional Status Assessment   |
|---|---|---|
| Free Erythrocyte Protoporphyrin (FEP)<br>mcg/dl.      | Concentration of protoporphyrin in the red blood cell which has not combined with iron to form heme, a component of hemoglobin.   | Functional indicator of iron status. Protoporphyrin accumulates in the red blood cell when insufficient iron is available. Assesses adequacy of iron supply for hemoglobin synthesis. Lacks specificity, because levels are elevated in iron deficiency, inflammatory disease, and lead exposure.   |
| Serum iron<br>mcg/dl.                                 | Concentration of iron in the blood (almost all bound to the protein transferrin)  | Direct measure of iron available to the body to make hemoglobin. May be subject to error because of contaminating iron and methodological difficulties. Diurnal variation in serum iron (high values in morning, low at night) may produce false positive and negative results.   |
| Total Iron Binding Capacity (TIBC)<br>mcg/dl.         | Capacity of blood proteins to carry iron; reflects the concentration of transferrin, which binds and transports iron.   | Useful to distinguish iron deficiency from inflammatory disease; in iron deficiency TIBC increases and with inflammatory disease, it decreases. May be subject to error because of contaminating iron or methodological difficulties.   |
| Transferrin Saturation (TS)<br>%                      | Percent saturation of transferrin, the iron-carrying protein in the blood. Calculated by dividing serum iron concentration by TIBC and multiplying by 100.                            | Indicator of adequacy of iron available for hemoglobin production. Easy to calculate but subject to large variations in serum iron concentrations among individuals with possible result of many false positive and negative diagnoses. Not specific to iron deficiency; may also decrease in inflammatory disease. For survey purposes, should be used only in combination with other tests. |
| Ferritin<br>ng/ml.                                    | Concentration of ferritin, an iron-protein complex in the blood.  | Allows the estimation of body iron stores because plasma ferritin concentration has a linear relationship to stores. Methodology complex and expensive. Invaluable measure because of its ability to detect the first stage of iron deficiency (diminished stores). Low levels are specific to iron deficiency.   |
| Mean Corpuscular Hemoglobin Concentration (MCHC)<br>% | Concentration of hemoglobin in the average red cell. Calculated by dividing the hemoglobin concentration by the volume of packed red blood cells (hematocrit) and multiplying by 100. | A red cell index which reflects the average hemoglobin concentration per unit volume of packed red cells. The least sensitive of the red cell indices in its ability to detect iron deficiency. The only red cell index available without sophisticated equipment.  |
| Cholesterol<br>mg/dl.                                 | Concentration of cholesterol in the blood.  | Commonly used measure of cholesterol status of an individual. Its value as a predictor of heart disease and its relationship to long-term dietary intake are unclear.   |
| Vitamin A (retinol)<br>mcg/dl.                        | Concentration of retinol or vitamin A in the blood.   | Indicator of long-term vitamin A intake and resulting status. Remains fairly stable in spite of short-term dietary inadequacies.  |
| B-Carotene<br>mcg/dl.                                 | Concentration of B-carotene, from which vitamin A can be produced.  | Indicator of intake of vitamin A precursor (from which vitamin A can be produced). Reflects recent intake of carotene-containing foods; low levels indicate limited intake of these foods and not a vitamin A deficiency.   |
| Vitamin C<br>mg/dl.                                   | Vitamin C level in the blood.   | Indicator of vitamin C available to the body. Reflects recent intake of vitamin C-containing foods.   |

Exhibit 7-3

Cutoff Points for Biochemical Measures<sup>a</sup>

| Measure                                   | Cutoff                        | Reference                                       |
|---|-------------------------------|---|
| Hematocrit                                | < 34%                         | Christakis (1973)                               |
| Hemoglobin                                | < 11 gm/dl<br>(or 10.5 gm/dl) | Christakis (1973)                               |
| Free erythrocyte protoporphyrin           | > 49 mcg/dl whole blood       | CDC (1978)                                      |
| Serum iron                                | < 40 mcg/dl                   | Christakis (1973)                               |
| Total iron binding capacity               | > 400 mcg/dl                  | Singer et al. (1980)                            |
| Transferrin saturation                    | < 16.0%                       | Cook and Finch (1979);<br>Dallman et al. (1980) |
| Ferritin                                  | < 10 ng/ml                    | Dallman et al. (1980)                           |
| Cholesterol                               | > 200 mg/dl                   | Owen (1974);<br>Prinyasan (1978)                |
| Mean Corpuscular Hemoglobin Concentration | < 30%                         | Nutrition Canada (1973)                         |
| Vitamin A                                 | < 20 mcg/dl                   | Christakis (1973)                               |
| B-carotene                                | < 70 mcg/dl                   | Smith (1980);<br>NY State (1947)                |
| Vitamin C                                 | < 0.4 mg/dl                   | NY State (1947)                                 |

<sup>a</sup> gm = gram, or 0.035 ounces

dl = deciliter, or 100 ml.

mcg = microgram or  $10^{-6}$  grams (one millionth of a gram)

ng = nanogram, or  $10^{-9}$  grams (one billionth of a gram)

Start Health Evaluation assessment of child health. Comparisons have also been made with results of other surveys, such as the Ten-State Nutrition Survey and the First National Health and Nutrition Examination Survey.

### Functions of Biochemical Indicators

To be able to understand and interpret the findings presented in this chapter, it is necessary to be familiar with the functions of the substances whose adequacy can be assessed through the biochemical indicators of iron status, cholesterol, vitamin C and vitamin A levels.

Iron Status. In the Head Start Health Evaluation, the following measures have been used to assess iron status:

- Serum ferritin concentration;
- Serum iron concentration;
- Total iron binding capacity (TIBC);
- Transferrin saturation (TS);
- Free erythrocyte protoporphyrin level (FEP);
- Hemoglobin concentration; and
- Hematocrit level.

In addition, mean corpuscular hemoglobin concentration (MCHC) was calculated according to the definition shown in Exhibit 7-2.

Iron in the body is found in two types of compounds: those involved in metabolism (or the building up and breaking down of materials by the body) and those whose function is primarily storage. The former group consists of proteins involved in the transport and use of oxygen. Hemoglobin, which carries oxygen throughout the body, is the major iron-containing compound in this group. Iron storage compounds serve the important function of maintaining iron levels in the body. When iron in the diet becomes inadequate, iron from the storage forms of iron--ferritin and hemosiderin--is made available for incorporation into hemoglobin and other compounds. When adequate storage iron is not available to compensate for inadequate dietary intake, the functional compounds such as hemoglobin cannot be produced in normal quantities.

The adverse effect that inadequate iron intake has on body iron content is not an all-or-none phenomenon, however. There is instead a



physiological progression which can be monitored through the use of biochemical measures. As shown in Exhibit 7-4, each stage in the progression has at least one laboratory test which can be used to identify it. The progression is generally thought to consist of four stages:

- Stage 1--depletion of iron stores: a decrease in serum ferritin concentration reflects a decrease in storage iron.
- Stage 2--exhaustion of iron stores and decrease in transport iron: decreased serum iron levels and increased iron binding capacity produce a decrease in transferrin iron saturation, which is indicative of impaired iron transport.
- Stage 3--decreased synthesis of hemoglobin and other iron-containing compounds: impaired hemoglobin synthesis is evidenced by an increase in erythrocyte protoporphyrin, a decrease in hemoglobin concentration and lower hematocrit readings (the percentage of total blood volume consisting of red blood cells decreases and in iron deficiency the cells also decrease in size).
- Stage 4--reduction in tissue iron concentrations: lower tissue iron concentrations demonstrate tissue-level depletion (an invasive measure such as a tissue biopsy is required to assess this stage).

A very recent report indicates that in individuals with mild iron deficiency, the laboratory tests discussed above do not strictly conform to the four-stage pattern (Dallman, Refino, and Yland, 1982). That report helps to illuminate the results of this evaluation. For example, the otherwise seemingly anomalous finding of normal serum ferritin levels in conjunction with mild anemia or an elevated TIBC accompanied by decreased, but not yet exhausted, iron stores. In addition, there is considerable overlap between normal and iron-deficient populations in terms of at least four of the biochemical indicators: hemoglobin, free erythrocyte protoporphyrin, transferrin saturation, and serum ferritin. As a consequence, even the comprehensive battery of iron status measures used in the present assessment, interpreted with reference to carefully selected, well-accepted standards cannot perfectly define the normal and at-risk groups. The measures selected, however, are the best that are currently available to investigate iron status. They provide the means to investigate three of the four stages in

Exhibit 7-4

Stages of Iron Deficiency

| Stage   | Indicators   |
|---|--|
| Reduced stores                                    | <p>Reduced iron stores</p> <ul style="list-style-type: none"> <li>● decreased liver iron (hemosiderin)</li> <li>● decreased serum ferritin</li> </ul> <p>No noticeable change in serum iron or total iron binding capacity</p>                               |
| Impaired iron transport                           | <p>More severe reduction in iron stores</p> <p>Serum iron levels generally decreased</p> <p>Increased total iron binding capacity (TIBC)</p> <p>Decreased transferrin saturation (TS)</p> <p>Normal hemoglobin levels</p>                                    |
| Decreased production of iron-containing compounds | <p>Iron stores more severely compromised</p> <p>Circulating iron levels decreased</p> <ul style="list-style-type: none"> <li>● lower hemoglobin levels</li> <li>● lower hematocrit levels</li> <li>● higher free erythrocyte protoporphyrin (FEP)</li> </ul> |
| Tissue depletion                                  | <p>Tissue iron levels decreased</p> <ul style="list-style-type: none"> <li>● tissue biopsy needed</li> </ul>   |

iron deficiency and offer a unique opportunity to construct a detailed picture of the iron status of a large number of low-income children.

Cholesterol. This substance is found in cells throughout the body and has an, as yet, incompletely defined role in the development of heart disease. The present assessment offers an invaluable opportunity to examine serum cholesterol levels in young children; to consider the relationship between serum cholesterol levels and dietary cholesterol intake; and to investigate the effect Head Start participation has on these levels.

Vitamin C. Levels of ascorbic acid were also measured for all children in the Maricopa County sample. Vitamin C serves many important functions in the body and is essential for proper wound healing and normal metabolism. Reduced plasma ascorbic acid levels have been found in a significant number of people, especially among low-income groups. Serum vitamin C levels vary considerably among people and to a large extent are indicators of immediate prior intake, rather than long-term status.

Vitamin A. The children's status on vitamin A was assessed through the use of two indicators in two sites: Greene and Humphreys Counties and Maricopa County. One measure, B-carotene, reflects recent intakes of foods (such as dark green and yellow vegetables) containing the vitamin A precursor carotene and thus serves as a way of verifying reported intake. A second measure serum retinol, or serum vitamin A, is an indicator of long-term vitamin A intake and remains stable in spite of short-term dietary inadequacies. Serum vitamin A levels begin to fall only when stores are close to exhaustion; this occurs only when there is a severe dietary inadequacy or long-term severe illness. Thus, the Head Start Health Evaluation provides the opportunity to examine the effect of Head Start participation on vitamin A status in terms of recent impact (B-carotene levels) and long-term effect (retinol or vitamin A). This dual opportunity is valuable because, although it is unlikely that one year of Head Start participation will affect vitamin A stores in most children, it is very possible that participation has a beneficial short-term effect in the form of increased dietary intake, and that, if sufficient time were to elapse, there might also be a measurable positive long-term effect.

These biochemical measures were used to address the following research questions:

- What is the health/nutritional profile of Head Start and comparison group children in terms of:
  - iron status?
  - serum cholesterol levels?
  - vitamin C and vitamin A concentrations?
- What is the prevalence of problems in these areas?
- Do Head Start children receive hematocrit and/or hemoglobin screening through Head Start?
- Do participants receive nutritional assessments in Head Start?
- What are the impacts of Head Start participation on the health/nutritional status of children?

#### Analysis of Biochemical Data

Subsequent to the data collection, all hematology samples were shipped to the University of Nebraska Medical Center for assays. From these assays Abt Associates received results for 816 children who participated in the posttest across the four sites. To be consistent with reference standards which could be used for interpreting test results, the analyses of the posttest data focused on children 2 to 5 years of age--that is, those who had had their second birthday but had not had their sixth birthday. Since the age range of the 816 subjects was 1.8 years to 6.6 years, limiting the age range resulted in setting aside a total of 14 cases: two under the age of two and 12 over the age of six years. In addition, because there is considerable interest in racial or ethnic differences in iron status (in particular) and in overall health in general, data are presented by the three principal ethnic groups (white, black, and Hispanic) for many of the analyses. Therefore, data for the children who did not belong to one of these three groups were also set aside. Children in this group included six American Indians or Alaskans, two children classified as other Asian or Pacific Islanders, and 12 additional cases whose ethnicity was indicated only as "other". In sum, all analyses focused on data for 2 to 5 year olds belonging to the three principal race groups comprising the sample--white, black, and Hispanic.

The data for each biochemical indicator were examined within site to determine whether any anomalous values should be set aside before analysis.

(Because they deviate substantially from the rest of the data, such observations would have undue impact on the results.) The exploratory rule of thumb described in Technical Appendix 2B provided an indication of whether any data values were so distant from the bulk of the data that they were "outliers," unlikely to have come from a homogeneous population. Subsequently, each of the individual cases that contained apparent outliers was examined to see whether the value should be retained in light of the results of other related biochemical tests. For example, in St. Clair County, if a hemoglobin reading of 8.9 gm/dl or less was an apparent outlier, then the other iron status indicators for any child with such a hemoglobin value were examined to determine whether this low hemoglobin was reasonable in light of these other measures (such as hematocrit and FEP). If there was a conflict between the initial objective determination and the subsequent substantive review, consideration was given to the possible undue weight such an outlier might have analytically if retained versus the need to reflect the status of the population as accurately as possible. Values (see Table 7-1) determined to be outliers were set aside by changing their sign to recode them as missing values, but they were not removed from the data file.\* (In this way, the outlier values could be recalled when needed—for example, for use in runs to determine prevalence rates and for further investigation of this unusual group.)

Data for samples A, B, and C at posttest (as defined in Chapter Two) were examined for evidence of sample differences. There were no sample differences on any biochemical indicator comparing Samples A, B, and C across all sites. However, within site, five instances of sample differences occurred in two sites (Greene and Humphries Counties and St. Clair County) as shown in Table 7-2. Since these minor differences among samples only occurred once on each of five biochemical measures, no adjustments for sample differences were made in the biochemical analyses.

The distribution of the biochemical data was also examined for differences among various groups of children across and within sites.

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\*Children with outlier values on a particular value were not included in the estimates of group means for that value. Moreover, the statistical comparisons of these means are unadjusted for group differences which may be related to the biochemical indicators.

Tables 7-3 through 7-17 present detailed information of each biochemical indicator for the following groups of children\*:

- Head Start vs. Non-Head Start
  - ▲--All children
  - Two to four year olds
  - Males
  - Females
  - Whites, Blacks, Hispanics
- Two to Four Year Olds vs. Four to Six Year Olds
  - All children
  - Whites, Blacks, Hispanics
- Males vs. Females
  - All children
  - Two to four year olds
  - Four to six years olds
  - Whites, Blacks, Hispanics.
- Whites vs. Blacks
- Whites vs. Hispanics
- Blacks vs. Hispanics

In addition to analyses for group differences on the biochemical indicators, several analyses\*\* focused on determining the prevalence of children who exceeded the cutoff or reference standards presented in Exhibit 7-3.

The assessment of prevalence of iron status problems was extended as follows. Although the assessment of iron status on the basis of an individual indicator--generally hemoglobin or hematocrit--is the usual clinical approach and is a very practical, useful one, the use of a single indicator may not produce as accurate a profile of the iron status of a population as desirable. For example, hemoglobin concentration lacks both specificity

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\*Table 7-1 in the Appendix presents the list of outlier values for each biochemical indicator (by Head Start/non-Head Start and race). Although these values were removed from analyses comparing groups, the absence of these values did not change the incidence of significant findings. That is, no additional Head Start effects were present when the data were analyzed with the outlier values present.

\*\*Children with outlier values were included in the prevalence estimates.

and sensitivity: a low level may be caused by conditions other than iron lack and there is a wide range of values observed in normal subjects (Cook and Finch, 1979). Free erythrocyte protoporphyrin and transferrin saturation are generally considered to provide relatively comparable and valuable information about an individual's iron status. As is the case with hemoglobin levels, however, each has its own shortcomings as a diagnostic tool. That is, FEP increases not only when there is inadequate iron available for hemoglobin synthesis, but also when increased lead has been taken into the body. Transferrin saturation falls when there is an iron lack, and also during a relatively mild or short-term infection. Serum ferritin--a more specific measure of iron status than hemoglobin, FEP and transferrin saturation--may be used to distinguish between anemia resulting from inadequate iron and anemia caused by chronic infection. Its concentration falls in iron deficiency and rises during chronic infection--unlike transferrin saturation, which falls, and FEP, which rises, in both situations.

By using these four measures in combination according to the models shown below, it is possible to improve the sensitivity and specificity of the measurement battery in detecting anemia. That is, one cannot only estimate the occurrence of poor iron status based on hemoglobin values alone, but also exclude other causes of anemia (such as chronic infection). In this study, Head Start and non-Head Start children were defined sequentially as anemic or not anemic on the basis of the following four steps:

- Hemoglobin < 11.0 gm/dl.
- Hemoglobin < 11.0 gm/dl. and FEP > 49.0 mcg/dl.
- Hemoglobin < 11.0 gm/dl. and FEP > 49.0 mcg/dl. and Ferritin < 12.0 ng/ml
- Hemoglobin < 11.0 gm/dl. and FEP > 49.0 mcg/dl. and Ferritin < 12.0 ng/ml. and Transferrin Saturation < 16.0%

Because there is evidence of a consistent racial difference in hemoglobin levels--black children appear to have normal values 0.5 to 1.0 gm/dl. lower than normal values for white children--a second sequence of analysis used a relaxed hemoglobin standard of < 10.5 gm/dl. The relaxed

standard was used for all ethnic groups (not black children only) to demonstrate the effect such a reduction has on the percentage of children found to be anemic.

Selection of covariates to be included in a regression model common to the across sites and within sites analyses focused on three general areas of information: demographic/economic status, dietary intake, and participation in programs which might affect iron status in particular and nutritional status in general. Those significantly related to three or more biochemical values and used in the final regression model as covariates are:

- site (in across site model);
- child's race,
- child's gender,
- mother's education, and
- and per capita income percentile.

Site and race are especially important covariates; both entered into the regression equation for five of the twelve biochemical indicators, and site entered alone for five additional indicators. Each of the three additional variables proved to be far weaker predictors than either site or race but were included in the common model for all variables, rather than selectively. In addition, in some instances a dietary intake variable (for example, vitamin C intake) proved to be strongly associated with an individual biochemical indicator (for example, plasma vitamin C concentration) in a particular site. These variables were not included in the final covariate model, but results of analyses incorporating them for appropriate biochemical indicators are discussed below.

Regression analysis was also carried out on longitudinal data using, in addition to the five covariates listed above, the pretest value for the indicator. For example, hemoglobin concentration at pretest was entered along with the five previously mentioned covariates in regression analysis of hemoglobin values at posttest for cases in the longitudinal file.



## Summary of Findings

### Prevalence of Abnormal Findings on Biochemical Indicators at Pretest

Exhibit 7-5 presents the prevalence of abnormal values for the biochemical indicators of the children at pretest. (Comparable information on the posttested children is shown on Table 7-18.) The prevalence of anemia, as defined on the basis of hemoglobin concentration only, ranged from 0 percent in Maricopa County to 18.3 percent in St. Clair County. The proportion of children with below standard hematocrit levels also varied considerably by site from 4.1 percent in Mingo County to 14.3 percent in Greene and Humphreys Counties. More children had unacceptable readings for transferrin saturation than for any of the other iron status measures: 11.4 percent in Maricopa County to 31.8 percent in St. Clair County. It should be noted, however, that it is generally recommended that transferrin saturation not be used as the only test of iron status (Exhibit 7-2).<sup>1</sup> Essentially, no children had low serum ferritin levels, measures generally agreed to reflect iron stores in the body. Vitamin A levels were below standard in only a very few cases, but B-carotene concentrations were low in 29.2 to 61.0 percent of children in the four sites at pretest.

Because it is clear that "no single iron parameter monitors the entire spectrum of iron status," (Cook, 1979) a sequential approach was used to define the iron status of children. Using various definitions of anemia, as shown in Exhibit 7-6, very few pretested children (n=2) were found to have anemia, especially according to the more restrictive definitions including abnormal ferritin and transferrin saturation values. Moreover, lowering the hemoglobin cutoff value to 10.5 gm/dl. to reduce the number of potential false positives, especially among black children, further reduces the numbers of children found to have anemia according to the various definitions. (Table 7-19 presents similar information on the posttested children.)

Exhibit 7-7 presents the same data as Exhibit 7-5 showing how the abnormal values vary by ethnic group among the pretested children. In general, a greater proportion of black children had abnormal iron status levels on hematocrit, hemoglobin\* and FEP's. The abnormal cholesterol levels

\*The apparent racial difference in hemoglobin levels is in agreement with those reported by Garn et al. (1980).

Exhibit 7-5

Percentage of Children With Abnormal Levels on Biochemical Indicators at Pretest (Samples A & D) by Site

| Biochemical Indicator      | Pretested Children (Samples A & D) in: |                           |                         |                      |                    |
|----------------------------|--|---------------------------|-------------------------|----------------------|--------------------|
|                            | Greene & Humphreys Counties<br>n=93    | St. Clair County<br>n=115 | Maricopa County<br>n=90 | Mingo County<br>n=73 | All Sites<br>n=371 |
| Hematocrit < 34.0%         | n 14/ 91<br>% 15.4                     | 12/110<br>10.9            | 8/110<br>7.3            | 3/ 73<br>4.1         | 37/363<br>10.2     |
| Hemoglobin < 11.0 (gm/dl.) | n 5/ 92<br>% 5.4                       | 20/109<br>18.3            | 0/ 90<br>0.0            | 3/ 69<br>4.3         | 28/360<br>7.8      |
| FEP > 49 mcg/dl.           | n 2/ 85<br>% 2.3                       | 15/107<br>14.0            | 0/ 89<br>0.0            | 8/ 68<br>0.0         | 17/349<br>4.9      |
| TIBC > 400 mcg/dl.         | n 2/ 86<br>% 2.3                       | 11/ 88<br>12.5            | 3/ 89<br>3.4            | 9/ 60<br>15.0        | 27/323<br>8.4      |
| Serum iron < 40.0 mcg/dl.  | n 4/ 86<br>% 4.6                       | 8/ 91<br>8.8              | 4/ 87<br>4.6            | 5/ 66<br>7.6         | 21/330<br>8.4      |
| TS < 16.0%                 | n 10/ 86<br>% 11.6                     | 28/ 88<br>31.8            | 10/ 88<br>11.4          | 12/ 59<br>20.3       | 60/321<br>18.7     |
| Ferritin < 10.0 ng/ml.     | n 0/ 89<br>% 0.0                       | 2/105<br>1.9              | 0/ 88<br>0.0            | 0/ 70<br>0.0         | 2/352<br>0.6       |
| Cholesterol > 200 mg/dl.   | n 18/ 87<br>% 20.7                     | 17/ 98<br>17.3            | 12/ 87<br>13.8          | 7/ 67<br>10.4        | 54/339<br>15.9     |
| MCHC < 30.0%               | n 0/ 91<br>% 0.0                       | 3/109<br>2.8              | 0/ 89<br>0.0            | 2/ 69<br>2.9         | 5/679<br>0.7       |
| Vitamin A < 20.0 mcg/dl.   | n 2/ 82<br>% 2.4                       | 0/ 88<br>0.0              | 1/ 85<br>1.2            | 0/ 59<br>0.0         | 3/314<br>0.9       |
| B-carotene < 70.0 mcg/dl.  | n 34/ 85<br>% 38.2                     | 26/ 89<br>29.2            | 36/ 88<br>40.9          | 36/ 59<br>61.0       | 132/321<br>41.1    |

Exhibit 7-6

Percentage of Children Considered Anemic by Four Sequential Definitions of Anemia at Pretest by Site

| Definition of Anemia  |   | Pretested Children (Samples A & D) in: |                           |                         |                      |
|---|---|--|---------------------------|-------------------------|----------------------|
|   |   | Greene & Humphreys Counties<br>n=93    | St. Clair County<br>n=115 | Maricopa County<br>n=90 | Mingo County<br>n=73 |
| Hemoglobin < 11.0   | n | 5/ 91                                  | 20/109                    | 0                       | 5/ 72                |
|   | % | 5.5                                    | 18.3                      | 0.0                     | 7.0                  |
| Hemoglobin < 11.0<br>+ FEP > 49.0                                     | n | 1/ 91                                  | 5/109                     | 0                       | 3/ 72                |
|   | % | 1.1                                    | 4.6                       | 0.0                     | 4.2                  |
| Hemoglobin < 11.0<br>+ FEP > 49.0<br>+ Ferritin < 12.0                | n | 0                                      | 2/109                     | 0                       | 0                    |
|   | % | 0.0                                    | 1.8                       | 0.0                     | 0.0                  |
| Hemoglobin < 11.0<br>+ FEP > 49.0<br>+ Ferritin < 12.0<br>+ TS < 16.0 | n | 0                                      | 2/109                     | 0                       | 0                    |
|   | % | 0.0                                    | 1.8                       | 0.0                     | 0.0                  |
| Hemoglobin < 10.5   | n | 2/ 91                                  | 6/109                     | 0                       | 3/ 72                |
|   | % | 2.2                                    | 5.5                       | 0.0                     | 4.2                  |
| Hemoglobin < 10.5<br>+ FEP > 49.0                                     | n | 1/ 91                                  | 2/109                     | 0                       | 3/ 72                |
|   | % | 1.1                                    | 1.8                       | 0.0                     | 4.2                  |
| Hemoglobin < 10.5<br>+ FEP > 49.0<br>+ Ferritin < 12.0                | n | 0                                      | 1/109                     | 0                       | 0                    |
|   | % | 0.0                                    | 1.0                       | 0.0                     | 0.0                  |
| Hemoglobin < 10.5<br>+ FEP > 49.0<br>+ Ferritin < 12.0<br>+ TS < 16.0 | n | 0                                      | 1/109                     | 0                       | 0                    |
|   | % | 0.0                                    | 1.0                       | 0.0                     | 0.0                  |



Exhibit 7-7

Percentage of Children With Abnormal Levels on Biochemical Indicators at Pretest  
(Samples A and D) by Site and Race

| Biochemical Indicator                  | Pretested children (Samples A & D) in: |                |                  |                 |              |                  |                |                |                |                  |
|--|--|----------------|------------------|-----------------|--------------|------------------|----------------|----------------|----------------|------------------|
|  | Greene & Hupphreys Counties            |                | St. Clair County | Maricopa County |              |                  | Mingo County   | All Sites      |                |                  |
|  | White<br>n=7                           | Black<br>n=86  | Black<br>n=115   | White<br>n=18   | Black<br>n=3 | Hispanic<br>n=69 | White<br>n=73  | White<br>n=98  | Black<br>n=204 | Hispanic<br>n=69 |
| Hematocrit<br>< 34.0%<br>n<br>%        | 2/ 7<br>28.6                           | 12/ 84<br>14.3 | 12/110/<br>10.9  | 3/ 18<br>16.7   | 1/ 3<br>33.3 | 4/ 68<br>5.9     | 3/ 73<br>4.1   | 8/ 98<br>8.2   | 25/197<br>12.7 | 4/ 68<br>5.9     |
| Hemoglobin<br>< 11.0-g/dl.<br>n<br>%   | 0/ 7<br>0.0                            | 5/ 85<br>5.9   | 20/109<br>18.3   | 0/ 18<br>0.0    | 0/ 3<br>0.0  | 0/ 69<br>0.0     | 3/ 69<br>4.3   | 3/ 94<br>3.2   | 25/197<br>12.7 | 0/ 69<br>0.0     |
| FEP<br>> 49 mcg/dl.<br>n<br>%          | 0/ 7<br>0.0                            | 2/ 78<br>2.6   | 15/107<br>14.0   | 0/ 18<br>0.0    | 0/ 3<br>0.0  | 0/ 68<br>0.0     | 0/ 68<br>0.0   | 0/ 93<br>1.1   | 17/188<br>4.1  | 0/ 68<br>0.0     |
| TIBC<br>> 400 mcg/dl.<br>n<br>%        | 0/ 6<br>0.0                            | 2/ 80<br>2.5   | 11/ 88<br>12.5   | 0/ 18<br>0.0    | 0/ 3<br>0.0  | 3/ 68<br>4.4     | 9/ 60<br>15.0  | 9/ 84<br>10.7  | 13/171<br>7.6  | 3/ 68<br>4.4     |
| Serum Iron<br>< 40.0 mcg/dl.<br>n<br>% | 1/ 6<br>16.7                           | 3/ 80<br>3.8   | 8/ 91<br>8.8     | 1/ 18<br>5.6    | 0/ 3<br>0.0  | 3/ 66<br>4.5     | 5/ 66<br>7.6   | 7/ 90<br>7.8   | 11/174<br>6.3  | 3/166<br>4.5     |
| TS<br>< 16.0%<br>n<br>%                | 1/ 6<br>16.7                           | 9/ 80<br>11.3  | 28/ 88<br>31.8   | 2/ 18<br>11.1   | 0/ 3<br>0.0  | 8/ 67<br>11.9    | 12/ 59<br>20.3 | 15/ 83<br>18.1 | 37/171<br>21.6 | 8/ 67<br>11.9    |
| Ferritin<br>< 10.0 ng/ml.<br>n<br>%    | 0/ 7<br>0.0                            | 0/ 82<br>0.0   | 2/105<br>1.9     | 0/ 18<br>0.0    | 0/ 3<br>0.0  | 0/ 67<br>0.0     | 0/ 70<br>0.0   | 0/ 95<br>0.0   | 2/190<br>1.1   | 0/ 67<br>0.0     |
| Cholesterol<br>> 200 mg/dl.<br>n<br>%  | 1/ 7<br>14.3                           | 17/ 80<br>21.3 | 17/ 98<br>17.3   | 2/ 18<br>11.1   | 0/ 2<br>0.0  | 10/ 67<br>14.9   | 7/ 67<br>10.4  | 10/ 92<br>10.9 | 34/180<br>18.9 | 10/ 67<br>14.9   |
| Vitamin A<br>< 20.0 mcg/dl.<br>n<br>%  | 0/ 6<br>0.0                            | 2/ 76<br>2.6   | 0/ 88<br>0.0     | 1/ 17<br>5.9    | 0/ 2<br>0.0  | 0/ 66<br>0.0     | 0/ 59<br>0.0   | 1/ 82<br>1.2   | 2/166<br>1.2   | 0/ 66<br>0.0     |
| B-carotene<br>< 70.0 mcg/dl.<br>n<br>% | 3/ 6<br>50.0                           | 31/ 79<br>39.2 | 26/ 89<br>29.2   | 10/ 18<br>55.6  | 0/ 2<br>0.0  | 26/ 68<br>38.2   | 36/ 59<br>61.0 | 49/ 83<br>59.0 | 57/170<br>33.5 | 26/ 68<br>38.2   |

were more frequent among black (18%) and Hispanic (15%) than white children (11%). The abnormally low B-carotene values were found most frequently among white children (59%). (The abnormal values for each ethnic group at the posttest are shown in Table 7-20.)

The actual levels of the biochemical indicators, in terms of means and standard deviations for the various groups of children, are presented in Tables 7-21 and 7-22 for pretest data and Tables 7-23 through 7-25 for posttest data. Mean values for all measures were well within acceptable ranges with the exception of mean pretest B-carotene concentration in Mingo County, which was slightly below the 70 mcg/dl. value selected as the lower limit of acceptable. At posttest Head Start participants had significantly higher average B-carotene levels than did non-Head Start children. Average vitamin C concentrations at posttest were also significantly higher for Head Start participants than non-participants in Maricopa County (the one site where vitamin C status was assessed.) Both of these measures reflect recent or short-term intake (as opposed to long-term consumption or stores) and may be one indicator of Head Start effect on the nutritional status of participants. It is possible, however, that other sources of intake (for example, vitamin C supplements taken at home) are key determinants of these differences. Within each of the four sites, there were no other significant differences between the two groups of children.

Tables 7-22, 7-24 and 7-25 present data across sites and within sites by ethnic group. Across sites, there were highly significant differences among the ethnic groups for the iron status measures, but all mean values were well within acceptable ranges. Across sites, mean hemoglobin concentration for black children was 0.6 gm/dl: lower than that for white children; this difference has been noted frequently in the literature but there is no satisfactory explanation for its existence (Garn, 1980 and 1981; Williams, 1981).

Serum ferritin concentrations were noticeably higher in black children than in Hispanic or white children. This was especially interesting in light of apparent racial differences in hemoglobin concentrations, but in the opposite direction. This could be interpreted to mean that although iron stores (as indicated by serum ferritin levels) were higher in blacks than in whites or Hispanic children, utilization of hemoglobin production was lower in blacks than in either of the other two groups.

Indicators of Vitamin A status did not show large differences among ethnic groups: whites had slightly higher serum Vitamin A levels and considerably lower B-carotene values than black or Hispanic children. The latter did not appear to have poor vitamin A status, as was observed in the Ten-State Nutrition Survey (USDHEW, 1972).

Exhibit 7-8 presents a comparison of the percentages of children with unacceptable levels on the biochemical indicators in the Head Start Health Evaluation with those of three other assessments of the health status of preschool children: the Preschool Nutrition Survey, the Ten-State Nutrition Survey; and the First National Health and Nutrition Examination Survey. These three studies conducted at least 10 years prior to the Head Start Health Evaluation provide the most complete and comparable data available, but they may not reflect accurately the health status of young children in 1981, the year of the Head Start study. Results, soon to be available from the Second National Health and Nutrition Examination Survey (conducted in the late 1970's) will provide more contemporaneous reference data.

The percent of children in the Head Start Health Evaluation whose status is considered abnormal on the basis of three of the iron status measures--hematocrit, serum iron, and transferrin saturation--is similar to the three earlier studies. In terms of the two other iron status measures for which comparison data are available, however, the results are markedly different. A much smaller percentage of Head Start Health Evaluation participants had low hemoglobin levels than did children in the previous studies. The same is true for TIBC results. Fewer Head Start Health Evaluation subjects also had unacceptable vitamin A status, in terms of both vitamin A and B-carotene concentrations, than did children in the Ten-State Nutrition Survey and the First National Health and Nutrition Examination Survey. Finally, comparison with the limited serum cholesterol data available indicates that across races there was a much higher prevalence of unacceptably high levels among Head Start-eligible children in 1981 than in children evaluated in the Preschool Nutrition Survey. In the present evaluation, this higher prevalence is limited to black and Hispanic children.

#### Health Services Provided by Head Start

The health services mandated by the Head Start Performance Standards which may be related to the biochemical indicators are hematological screen-

Exhibit 7-8

Percentage of Children With Unacceptable Levels on Biochemical Indicators in Four Surveys

| Biochemical Indicator                    | Head Start Health Evaluation (at pretest) | Head Start Health Evaluation (at posttest) |                  | Preschool Nutrition Survey | Ten State Nutrition Survey (low income ratio states) | First National Health and Nutrition Examination Survey |                   |             |        |
|--|---|--|------------------|----------------------------|--|--|-------------------|-------------|--------|
|  | 2-6 yr. olds at pretest                   | 2-6 yr. olds HS                            | 2-6 yr. olds NRS | 2-6 yr olds                | 2-5 yr olds  | 2-3 yr olds  |                   | 4-5 yr olds |        |
|  |   |  |                  |                            |  | Male   | Female            | Male        | Female |
| Hematocrit <34.0%                        | 9.8                                       | 10.4                                       | 10.4             | 10.0 <sup>a</sup>          | —  | —  | —                 | —           | —      |
| Whites                                   | 7.1                                       | 4.0  | 3.7              | —                          | 11.8   | 5.0  | 9.0               | 3.0         | 3.0    |
| Blacks                                   | 12.7                                      | 16.5                                       | 17.7             | —                          | 29.1   | 11.0   | 10.0              | 6.0         | 6.4    |
| Hispanics                                | 5.6                                       | 4.7  | 4.3              | —                          | 14.1   | —  | —                 | —           | —      |
| Hemoglobin <11.0 gm/dl.                  | 7.4                                       | 1.4  | 1.8              | 8.0 <sup>b</sup>           | —  | —  | —                 | —           | —      |
| Whites                                   | 5.2                                       | 0  | 3.0              | —                          | 13.1   | 7.0  | 7.0               | 1.0         | 2.0    |
| Blacks                                   | 10.7                                      | 2.3  | 1.3              | —                          | 34.0   | 19.0   | 15.0              | 6.0         | 3.0    |
| Hispanics                                | 0   | 1.6  | 0                | —                          | 9.5  | —  | —                 | —           | —      |
| Serum Iron <40.0 mcg/dl.                 | 6.2                                       | 10.5                                       | 9.9              | —                          | 5.5  | —  | —                 | —           | —      |
| Whites                                   | 7.8                                       | 12.2                                       | 8.8              | —                          | (Approx.)  | 8.0  | 6.0               | 8.0         | 6.0    |
| Blacks                                   | 6.3                                       | 10.0                                       | 11.3             | —                          | —  | 9.0  | 13.0              | 17.0        | 13.0   |
| Hispanics                                | 4.3                                       | 8.1  | 8.7              | —                          | —  | —  | —                 | —           | —      |
| Transferrin Saturation <16.0%            | 18.1                                      | 24.7                                       | 21.4             | —                          | 21.0 <sup>d</sup>                                    | —  | —                 | —           | —      |
| Whites                                   | 17.6                                      | 27.1                                       | 19.8             | —                          | —  | 27.0   | 21.0              | 22.0        | 17.0   |
| Blacks                                   | 21.5                                      | 24.9                                       | 23.4             | —                          | —  | 24.0   | 44.0              | 27.0        | 23.0   |
| Hispanics                                | —   | 19.4                                       | 19.6             | —                          | —  | —  | —                 | —           | —      |
| Total Iron Binding Capacity >600 mcg/dl. | 8.8                                       | 7.2  | 6.9              | —                          | —  | —  | —                 | —           | —      |
| Whites                                   | 10.6                                      | 6.6  | 4.1              | —                          | —  | 30.0   | 36.0              | 30.0        | 24.0   |
| Blacks                                   | 8.7                                       | 5.8  | 5.0              | —                          | —  | 47.0   | 49.0              | 28.0        | 14.0   |
| Hispanics                                | 2.9                                       | 12.9                                       | 19.6             | —                          | —  | —  | —                 | —           | —      |
| Cholesterol mg/dl.                       |   |  |                  |                            |  |  |                   |             |        |
| >200                                     | —   | 12.2                                       | 10.9             | 4.0 <sup>b</sup>           | —  | —  | —                 | —           | —      |
| Whites                                   | 10.8                                      | 6.2  | 7.0              | —                          | —  | —  | —                 | —           | —      |
| Blacks                                   | 21.1                                      | 16.2                                       | 14.3             | —                          | —  | —  | —                 | —           | —      |
| Hispanics                                | 16.2                                      | 12.9                                       | 10.9             | —                          | —  | —  | —                 | —           | —      |
| >204                                     | —   | —  | —                | 6.5 <sup>c</sup>           | —  | —  | —                 | —           | —      |
| Whites                                   | 7.5                                       | 5.0  | 5.0              | —                          | —  | —  | —                 | —           | —      |
| Blacks                                   | 20.0                                      | 15.0                                       | 12.0             | —                          | —  | —  | —                 | —           | —      |
| Hispanics                                | 13.2                                      | —  | 11.0             | —                          | —  | —  | —                 | —           | —      |
| Vitamin A <20 mcg/dl.                    | 0.9                                       | 0.6  | 0.9              | —                          | —  | —  | —                 | —           | —      |
| Whites                                   | 1.2                                       | 0  | 0                | —                          | 11.3   | —  | —                 | —           | —      |
| Blacks                                   | 1.2                                       | 0  | 2.0              | —                          | 21.3   | —  | 3.4 <sup>e</sup>  | —           | —      |
| Hispanics                                | 0   | 1.7  | 0                | —                          | 51.7   | —  | 13.2 <sup>f</sup> | —           | —      |
| B-Carotene mcg/dl. <70                   | 41.0                                      | 14.0                                       | 23.9             | —                          | —  | —  | —                 | —           | —      |
| Whites < 60                              | 58.3                                      | —  | —                | —                          | 33.7   | —  | —                 | —           | —      |
| Blacks < 60                              | 33.1                                      | —  | —                | —                          | 23.9   | —  | —                 | —           | —      |
| Hispanics < 60                           | 37.1                                      | —  | —                | —                          | 33.4   | —  | —                 | —           | —      |

<sup>a</sup>Data reported are on lowest income group.

<sup>b</sup>12-36 months

<sup>c</sup>37-71 months

<sup>d</sup>Transferrin Saturation <20%: If hemoglobin <10.0 gm/dl., 63.6%; if hemoglobin >10.0 gm/dl., 21.7%.

<sup>e</sup>Data reported are for 1-5 year olds, with sexes combined.

ings (using a hematocrit and/or hemoglobin level) and the nutrition program of meals and snacks. While it is reasonable to assume that all children present in Head Start on a particular day receive the nutrition program, according to Head Start health records, not all children receive the hematology screens or nutrition assessments.

Exhibit 7-9 shows an average 67 percent of the Head Start children receive a hematocrit and/or hematology screen. There is considerable variation among the sites in both the timing and receipt of these screens, however. In St. Clair County 68 percent of the children received a hematology screen and this was the only site in which an appreciable number of children received a hematocrit or hemoglobin screen prior to entry into Head Start. Here the Head Start program requires the children to have a physical examination prior to applying for Head Start. As a follow-up to this exam, Head Start runs a summer screening clinic during which the hematocrit and/or hemoglobin screen is administered if a child has not had the necessary blood tests during his or her physical exam.

In the remaining three sites, the hematology screen was conducted after entry into the program, usually in conjunction with the physical

Exhibit 7-9

Percentage of Head Start Children Receiving Hematological Screens and Nutrition Assessments through Head Start by Site

| Head Start Screen/Assessment | Posttested Head Start Children (Samples A, B, C) in: |                           |                          |                                    |                    |
|------------------------------|--|---------------------------|--------------------------|------------------------------------|--------------------|
|                              | Greene & Humphreys Counties<br>n=127                 | St. Clair County<br>n=108 | Maricopa County<br>n=102 | Mingo County <sup>a</sup><br>n=112 | All Sites<br>n=449 |
| Hematological Screen         | n 48<br>% 37.8                                       | n 73<br>% 67.6            | n 101<br>% 99.0          | n 78<br>% 69.6                     | n 300<br>% 66.8    |
| Nutrition Assessment         | n 52<br>% 40.9                                       | n 46<br>% 42.6            | n 98<br>% 96.1           | n 8<br>% 7.1                       | n 204<br>% 45.4    |

<sup>a</sup>Includes 20 children with no health record in Mingo County



examination. The rates of screening range from 38 percent in Greene and Humphreys Counties, to 70 percent in Mingo County\* and 99 percent in Maricopa County. In all sites, it seems that Head Start is responsible, in large part, for the hematological screening conducted. Data on nutritional assessments conducted by Head Start are also presented in Exhibits 7-9. Across sites, 45 percent of the Head Start children received nutritional assessments. Only in Maricopa County, where Head Start employed a full-time nutritionist on the staff did a substantial proportion (96%) of the children receive nutrition assessments.

The exact causal relationship between the Head Start services and the status of the children at posttest is difficult to assess given the lack of necessary detail in the health records. There, however, do appear to be some significant relationships between the receipt of health services and hematological status at posttest.

Because Head Start tends to perform the hematological assessments using either a hematocrit or a hemoglobin, the combination of these two measures provides assessment information on all of the children. The relationship between the combined hematological measure and the presence of abnormal hematocrit or hemoglobin at posttest indicates that children receiving a hematocrit or hemoglobin screen are less likely to have abnormal values at posttest as shown in Exhibit 7-10.\*\* There is no similar relationship between a nutrition assessment and the hematological status at posttest.

#### Impact of Head Start on Biochemical Indicators of Children

The impact of the Head Start program on the biochemical indicators of the children was investigated on both the longitudinal sample (Sample A) and on all of the posttested children (Samples A, B, C) using regression models. In the longitudinal analysis, the pretest level for a given biochemical indicator was by far the strongest predictor of the level observed at posttest for that indicator. In the longitudinal analysis there were no signi-

\*85 percent of the children with health records received a hematology screen. The rates for the 20 children with missing records are unknown.

\*\*This relationship is primarily due to the relationship between the hematocrit screen and abnormal hematocrit values since there are only six abnormal hemoglobin values. See Table 7-26 for detail.

Exhibit 7-10

Percentage of Head Start Children with Abnormal Levels on Hematocrit or Hemoglobin at Posttest by Receipt of Various Related Health Screens

| Health Related Screens Delivered to Head Start Children | Posttested Head Start Children (Samples A, B, C) in: |          |           |          |          |           |                |          |           |           |        |
|---|--|----------|-----------|----------|----------|-----------|----------------|----------|-----------|-----------|--------|
|   | Greene & Humphreys                                   |          | St. Clair |          | Maricopa |           | Mingo          |          | All Sites |           |        |
|   | Yes  | No       | Yes       | No       | Yes      | No        | Yes            | No       | Yes       | No        |        |
| Hematocrit or Hemoglobin Screen by Head Start           | N  | 48       | 79        | 73       | 35       | 101       | 1 <sup>a</sup> | 78       | 34        | 300       | 149    |
|   | n  | 5/48     | 17/77     | 9/71     | 6/34     | 5/100     | 1/1            | 2/78     | 2/34      | 21/297    | 26/146 |
|   | $\chi^2$   | 10.4     | 22.1      | 12.7     | 17.6     | 5.0       | 100.0          | 2.6      | 5.9       | 7.1       | 17.8   |
|   |  | p = 0.10 |           | p = 0.50 |          | p = 0.001 |                | p = 0.38 |           | p = 0.001 |        |
| Nutritional Assessment by Head Start                    | N  | 52       | 75        | 46       | 62       | 98        | 4 <sup>a</sup> | 8        | 104       | 204       | 245    |
|   | n  | 6/52     | 16/73     | 6/45     | 9/60     | 4/97      | 2/4            | 0/8      | 4/104     | 16/202    | 31/241 |
|   | $\chi^2$   | 11.5     | 21.9      | 13.3     | 15.0     | 4.1       | 50.0           | 0.0      | 3.8       | 7.9       | 12.9   |
|   |  | p = 0.13 |           | p = 0.81 |          | p = 0.001 |                | p = 0.57 |           | p = 0.09  |        |

<sup>a</sup> $\chi^2$  significance is due to unbalanced distribution.

ficant Head Start effects found on any of the biochemical measures either across all sites or within site. There were significant effects on B-carotene within and across sites, however. (These effects are discussed below with the means for the adjusted biochemical indicators.) The regression results are shown in Tables 7-27 through 7-40 for the longitudinal sample and Tables 7-41 through 7-56 for the entire posttest sample.

Exhibit 7-11 displays the average biochemical values adjusted for the covariates included in the regression analyses (race, gender, mother's education, income percentile, site, and Head Start status). It is interesting to note that average hemoglobin concentrations and average ferritin levels in the two sites in which essentially all children are black (Greene & Humphreys Counties and St. Clair County) are not different from those in the other two sites. Examination by race across sites, as in Exhibit 7-12, reveals differences in these two measures among groups: black children across sites have the lowest mean hemoglobin concentration and the highest mean serum ferritin levels. Mean hemoglobin concentration for Hispanic children is as high as that for white children, but mean ferritin levels are the lowest. On a within-site basis, this pattern is repeated in Maricopa County, the only site in which all three ethnic groups were evaluated. Greene and Humphreys Counties display the same white/black difference for mean hemoglobin and, to a lesser extent, for mean ferritin levels. In Mingo County no difference is seen in mean hemoglobin concentrations, but the mean ferritin levels are much higher in black children than in whites. No comparisons are possible within St. Clair County, but the mean hemoglobin concentration for black children is comparable to that for black children in two of the other sites. Mean ferritin levels are also comparable to those for black children in the other three sites.

Adjusted mean carotene levels were significantly higher in Head Start children both across and within the two sites where carotene levels were measured. This effect was not evident for vitamin A levels, however, thus, one year of Head Start participation had a positive effect on short-term vitamin A intake (as evidence by the higher carotene levels) but no on long-term status (as reflected by vitamin A levels). As mentioned earlier, this is not surprising, because the intervention period was relatively brief. There were no other significant differences between Head Start and non-Head Start children for the other biochemical indicators.

Exhibit 7-11

Means Within Site for Biochemical Indicators (Adjusted for Covariates)  
for Children in Samples A, B, and C by Head Start Status<sup>a</sup>

Participating Children (Samples A, B, C) in:

| Biochemical Indicator |   | Greene & Humphreys Counties |               | St. Clair County |             | Maricopa County |              | Mingo County |              | All Sites    |                |
|-----------------------|---|-----------------------------|---------------|------------------|-------------|-----------------|--------------|--------------|--------------|--------------|----------------|
|                       |   | HS<br>n=111                 | MHS<br>n=92   | HS<br>n=94       | MHS<br>n=70 | HS<br>n=93      | MHS<br>n=57  | HS<br>n=111  | MHS<br>n=102 | HS<br>n=408  | MHS<br>n=321   |
| Hematocrit (X)        | n | 111<br>35.5                 | 92<br>36.0    | 93<br>35.6       | 70<br>35.3  | 93<br>36.5      | 57<br>36.5   | 111<br>37.7  | 102<br>38.1  | 408<br>36.4  | 321<br>36.4    |
| Hemoglobin (gm/dl.)   | n | 110<br>12.6                 | 92<br>12.8    | 94<br>12.6       | 69<br>12.6  | 92<br>13.1      | 56<br>13.0   | 109<br>13.2  | 100<br>13.2  | 405<br>12.9  | 317<br>12.9    |
| FEP (mcg/dl.)         | n | 109<br>19.1                 | 92<br>19.0    | 94<br>21.4       | 66<br>22.5  | 93<br>23.3      | 57<br>23.2   | 107<br>16.0  | 98<br>17.3   | 403<br>19.7  | 313<br>20.2    |
| TIBC (mcg/dl.)        | n | 93<br>332                   | 76<br>332     | 84<br>323        | 63<br>319   | 83<br>339       | 57<br>337    | 101<br>315   | 89<br>319    | 361<br>326   | 283<br>326     |
| Iron (mcg/dl.)        | n | 100<br>63.6                 | 80<br>68.6    | 83<br>74.4       | 63<br>68.2  | 88<br>78.0      | 57<br>85.3   | 99<br>67.0   | 92<br>69.4   | 370<br>70.0  | 292<br>72.5    |
| TS (X)                | n | 91<br>18.9                  | 76<br>20.6    | 79<br>22.7       | 61<br>21.7  | 85<br>22.7      | 56<br>25.3   | 95<br>21.2   | 89<br>21.7   | 350<br>21.2  | 282<br>22.2    |
| MCHC (X) (X)          | n | 110<br>35.6                 | 92<br>35.6    | 92<br>35.3       | 40<br>35.5  | 91<br>35.8      | 55<br>35.7   | 107<br>35.0  | 98<br>34.7   | 400<br>35.4  | 315<br>35.4    |
| Ferritin (ng/ml.)     | n | 88<br>24.0                  | 71<br>27.1    | 83<br>30.3       | 63<br>28.0  | 82<br>21.0      | 51<br>19.4   | 99<br>23.1   | 86<br>20.8   | 352<br>24.5  | 273<br>23.9    |
| Cholesterol (mg/dl.)  | n | 101<br>167                  | 82<br>171     | 93<br>168        | 69<br>169   | 89<br>162       | 57<br>159    | 108<br>157   | 97<br>154    | 391<br>163   | 305<br>161     |
| Vitamin A (mcg/dl.)   | n | b<br>36.9                   | 57<br>37.7    | b                | b           | 83<br>36.1      | 55<br>36.6   | b            | b            | 143<br>36.5  | 112<br>37.1    |
| Carotene (mcg/dl.)    | n | 60<br>104.6                 | 56<br>90.2*** | b                | b           | 83<br>100.5     | 56<br>89.1** | b            | b            | 144<br>102.2 | 115<br>89.6*** |
| Vitamin C (mg/dl.)    | n | b                           | b             | b                | b           | 67<br>1.5       | 38<br>1.3    | b            | b            | 67<br>1.5    | 38<br>1.3      |

<sup>a</sup> Significance testing assesses deviation from the total population (grand) mean and is indicated as:

\* p < .05

\*\* .01

\*\*\* .001

ERIC  
Full text available because assays not performed.

Exhibit 7-12

Means by Race for Biochemical Indicators (Adjusted for Covariates) for Children  
at Posttest (Samples A, B, C)<sup>a</sup>

| Biochemical Indicator |   | By Site                     |                |                  |                 |              |                   | Across Sites   |               |                |                |                   |
|-----------------------|---|-----------------------------|----------------|------------------|-----------------|--------------|-------------------|----------------|---------------|----------------|----------------|-------------------|
|                       |   | Greene & Humphreys Counties |                | St. Clair County | Maricopa County |              |                   | Mingo County   |               | All Sites      |                |                   |
|                       |   | White<br>n=42               | Black<br>n=171 | Black<br>n=163   | White<br>n=37   | Black<br>n=8 | Hispanic<br>n=105 | White<br>n=205 | Black<br>n=12 | White<br>n=274 | Black<br>n=351 | Hispanic<br>n=105 |
| Hematocrit (%)        | n | 32<br>36.4                  | 171<br>35.6    | 162<br>35.4      | 37<br>36.8      | 8<br>37.6    | 105<br>36.3       | 201<br>37.9    | 12<br>37.3    | 36.8           | 36.2           | 36.4              |
| Hemoglobin (gm/dl.)   | n | 32<br>13.1                  | 170<br>12.6*   | 162<br>12.6      | 37<br>13.1      | 8<br>12.5*   | 103<br>13.0       | 197<br>13.2    | 12<br>13.1    | 13.1           | 12.7***        | 13.1              |
| FEF (mcg/dl.)         | n | 31<br>18.7                  | 170<br>19.0    | 159<br>21.9      | 37<br>20.6      | 8<br>19.6    | 105<br>24.6*      | 193<br>16.4    | 12<br>20.3    | 18.7*          | 20.1           | 22.2**            |
| TIBC (mcg/dl.)        | n | 26<br>334                   | 143<br>333     | 144<br>321       | 34<br>323       | 7<br>318     | 99<br>345*        | 178<br>317     | 12<br>314     | 324            | 323            | 347               |
| Iron (mcg/dl.)        | n | 29<br>69.6                  | 151<br>65.0    | 145<br>71.9      | 37<br>75.7      | 8<br>88.1    | 100<br>82.2       | 181<br>68.9    | 10<br>55.6    | 71.5           | 69.5           | 75.2              |
| TS (%)                | n | 28<br>21.5                  | 139<br>19.2    | 139<br>22.4      | 33<br>21.4      | 7<br>26.2    | 101<br>24.3       | 173<br>21.5    | 11<br>20.6    | 21.5           | 21.2           | 23.6              |
| MCHC (%)              | n | 32<br>36.1                  | 170<br>35.5    | 161<br>35.4      | 36<br>35.6      | 7<br>33.6*   | 103<br>36.0***    | 194<br>36.8    | 11<br>35.3    | 35.5           | 35.0**         | 36.1*             |
| Ferritin (ng/ml.)     | n | 26<br>23.8                  | 135<br>25.1    | 145<br>29.3      | 31<br>22.8      | 7<br>30.1*   | 95<br>18.9**      | 173<br>21.4**  | 12<br>31.8    | 22.6           | 27.4***        | 18.4***           |
| Cholesterol (mg/dl.)  | n | 30<br>173                   | 153<br>168     | 161<br>169       | 36<br>154*      | 8<br>182*    | 102<br>162        | 193<br>156     | 12<br>156     | 162            | 164            | 164               |
| Vitamin A (mcg/dl.)   | n | 22<br>35.5                  | 95<br>37.7     | b                | 33<br>37.4      | 6<br>34.6    | 99<br>36.1        | b              | b             | 37.1           | 37.2           | 36.2              |
| Carotene (mcg/dl.)    | n | 23<br>106.1                 | 97<br>95.5     | b                | 34<br>80.3**    | 7<br>105.7   | 98<br>100.6       | b              | b             | 93.3           | 89.8           | 105.9             |
| Vitamin C (mg/dl.)    | n | b                           | b              | b                | 28<br>1.6       | 6<br>1.3     | 71<br>1.4         | b              | b             | c              | c              | c                 |

<sup>a</sup>Significance testing assesses deviation from the total population (grand) mean and is indicated as:

\* p < .05

\*\* p < .01

\*\*\* p < .001

<sup>b</sup>NA: Not Available because assays not performed.

<sup>c</sup>Not Available because assay performed in Maricopa County only

Dietary intake variables were examined for inclusion as covariates in the final regression model. Although these variables were not included in the model, two of them were significantly related to the appropriate biochemical measure: total vitamin C intake to serum vitamin C levels ( $p < 0.001$ ), and total vitamin A intake to serum vitamin A ( $p < 0.0001$ ) and carotene ( $p < 0.001$ ) concentrations. This significant relationship also existed between total daily intake of these two vitamins from foods and vitamin supplements and the respective biochemical indicator. This finding is not surprising in light of the fact that serum vitamin C and carotene concentrations are indicators of recent intake. It is, however, important because it is an objective verification of the significantly higher intakes of these two vitamins noted by evaluation nutritionists for Head Start children (see Chapter Six), and it demonstrates that the benefit to Head Start children is not restricted to larger dietary intakes, but is actually reflected in body levels of the two nutrients.

Finally, we examined the relationship between enrollment in medical insurance and Food Stamps or WIC and abnormal hematocrit or hemoglobin levels. Comparisons between the Head Start and non-Head Start group are presented in Exhibit 7-13. Across sites, children in the non-Head Start group who did not have medical insurance were more likely to have abnormal hematocrit or hemoglobin levels. This trend was not consistent in all sites, however. A significant relationship was found between enrollment in Food Stamps or WIC and abnormal hematocrit/hemoglobin readings of children. In all sites except Maricopa County, similar trends were evident for the non-Head Start group, although the differences (both within and across sites) were not statistically significant. Thus, the Food Stamp and WIC programs seem to be targeted to those children most in need of the services.

### Conclusions

The extensive laboratory assessment of health status conducted as part of the Head Start Health Evaluation included measures of iron status, vitamin C and vitamin A levels, and serum cholesterol concentrations. Iron status of Head Start children is not significantly different from that of non-Head Start children after one year of program participation. This finding is not surprising in light of the fact that iron status is affected

Exhibit 7-13

Percent of Children with Abnormal Levels on Hematocrit or Hemoglobin  
at Posttest by Various Health Related Services

| Health Related Services | Greene & Humphreys Counties |            |             |            | St. Clair County |            |             |            |
|-------------------------|-----------------------------|------------|-------------|------------|------------------|------------|-------------|------------|
|                         | HS                          |            | NHS         |            | HS               |            | NHS         |            |
| Medical Insurance       | Yes<br>n=72                 | No<br>n=41 | Yes<br>n=52 | No<br>n=39 | Yes<br>n=87      | No<br>n=19 | Yes<br>n=59 | No<br>n=25 |
| n                       | 10/ 70                      | 11/ 41     | 8/ 51       | 3/ 37      | 13/ 85           | 2/ 18      | 14/ 56      | 3/ 25      |
| %                       | 14.3                        | 26.8       | 15.7        | 8.1        | 15.3             | 11.1       | 25.0        | 12.0       |
| $\chi^2$                | p = 0.10                    |            | p = 0.29    |            | p = 0.65         |            | p = 0.18    |            |
| Food Stamps or WIC      | Yes<br>n=102                | No<br>n=23 | Yes<br>n=85 | No<br>n=14 | Yes<br>n=102     | No<br>n=5  | Yes<br>n=72 | No<br>n=9  |
| n                       | 20/100                      | 1/ 23      | 11/ 83      | 1/ 13      | 14/ 99           | 1/ 5       | 17/ 72      | 1/ 8       |
| %                       | 20.0                        | 4.3        | 13.3        | 7.7        | 14.1             | 20.0       | 23.9        | 12.5       |
| $\chi^2$                | p = 0.07                    |            | p = 0.57    |            | p = 0.72         |            | p = 0.46    |            |

Exhibit 7-13 (continued)

Percent of Children with Abnormal Levels on Hematocrit or Hemoglobin  
at Posttest by Various Health Related Services

| Health Related Services  | Maricopa County          |             |                         |              | Mingo County            |             |                         |             |
|--------------------------|--------------------------|-------------|-------------------------|--------------|-------------------------|-------------|-------------------------|-------------|
|                          | HS                       |             | NHS                     |              | HS                      |             | NHS                     |             |
| Medical Insurance        | Yes<br>n=29              | No<br>n=75  | Yes<br>n=13             | No<br>n=47   | Yes<br>n=70             | No<br>n=44  | Yes<br>n=61             | No<br>n=41  |
| n<br>%<br>x <sup>2</sup> | 5/28<br>10.7<br>p = 0.19 | 3/75<br>4.0 | 1/13<br>7.7<br>p = 0.61 | 2/47<br>4.3  | 1/70<br>1.4<br>p = 0.13 | 3/44<br>6.8 | 2/59<br>3.4<br>p = 0.71 | 2/41<br>4.9 |
| Food Stamps or WIC       | Yes<br>n=64              | No<br>n=41  | Yes<br>n=30             | No<br>n=29   | Yes<br>n=75             | No<br>n=39  | Yes<br>n=57             | No<br>n=52  |
| n<br>%<br>x <sup>2</sup> | 3/64<br>4.7<br>p = 0.55  | 3/40<br>7.5 | 0/30<br>0.0<br>p = 0.07 | 3/29<br>10.3 | 4/73<br>5.3<br>p = 0.14 | 0/39<br>0.0 | 3/56<br>5.4<br>p = 0.74 | 2/50<br>4.0 |



Exhibit 7-13 (continued)

Percent of Children with Abnormal Levels on Hematocrit or Hemoglobin at Posttest by Various Health Related Services

| Health Related Services | All Sites    |             |              |             |
|-------------------------|--------------|-------------|--------------|-------------|
|                         | HS           |             | NHS          |             |
| Medical Insurance       | Yes<br>n=258 | No<br>n=179 | Yes<br>n=185 | No<br>n=152 |
| n                       | 27/253       | 19/178      | 25/179       | 10/150      |
| %                       | 10.7         | 10.7        | 14.0         | 6.7         |
| $\chi^2$                | p = 1.00     |             | p = 0.03     |             |
| Food Stamps or WIC      | Yes<br>n=343 | No<br>n=108 | Yes<br>n=244 | No<br>n=104 |
| n                       | 41/338       | 5/107       | 31/240       | 7/100       |
| %                       | 12.1         | 4.7         | 12.9         | 7.0         |
| $\chi^2$                | p = 0.03     |             | p = 0.11     |             |

by as yet incompletely understood factors, such as bioavailability of iron consumed, iron supplementation, severe or chronic infection or inflammation, and possibly ethnicity.

Close scrutiny of the iron status of a sub-population of children exhibiting one or more of these factors or others suspected of influencing iron status may contribute to a better understanding of Head Start's role. Hence, Head Start's contribution cannot be well defined until iron metabolism and factors affecting it are themselves more clearly defined and understood.

Head Start participation appears to have had a positive effect on B-carotene concentration, which reflects short-term status or recent consumption of foods containing vitamin A. The significantly higher level of this nutrient in the blood reflects significantly higher intakes of vitamin A by Head Start participants in comparison with non-Head Start children.

In addition, Head Start involvement results in screening for anemia of many children who otherwise would most likely not be assessed. Although few children were found who would be classified as anemic, even fewer low-income children received screens for anemia unless they were attending Head Start. Hence Head Start's contribution to children's health, although required by only a few children, is a valuable service to those who would otherwise not have access to a hematology screening and remediation of their problems with anemia.

## CHAPTER EIGHT

### DEVELOPMENTAL EVALUATION

#### Developmental Ability Indicators

One of the primary goals of the Head Start program is to increase the social competence of participating children, and thus to enhance their ability to develop within their present environment and ultimately to maximize their learning experiences in school. Within the definition of social competence, Head Start "takes into account the interrelatedness of cognitive and intellectual development, physical and mental health, nutritional needs, and other factors that enable a developmental approach to help children achieve [their potential]" (Head Start, 1975). To evaluate the developmental skills of the child, Head Start programs perform developmental assessments.\* These assessments examine areas of preschool readiness including physical coordination and development, intellectual development, sensory development with special emphasis on sensory discrimination, emotional development, and social development.

The Head Start Health Evaluation focused primarily on the physical health status of the child. Hence, the evaluation included a more limited developmental assessment, one confined to measures of physical health development and behaviors which could potentially be associated with physical health status.

To this end, the children's fine and gross motor coordination was assessed using these elements:

- a series of gamelike activities specified in the Motor Scale of the McCarthy Scales of Children's Abilities (McCarthy, 1972);
- children's behaviors derived from the evaluator's estimate of the child's willingness to try to perform the McCarthy Motor Scale tasks;

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\*Development assessment is part of the mental health component of the Head Start Performance Standards.

- parent's responses about the child's behavior in terms of the frequency with which the child acted in specified ways (e.g., "has a bad temper" or "gives up easily").

The measures from the McCarthy Scales and their descriptions are presented in Exhibit 8-1. The McCarthy Scales of Children's Abilities were selected for the developmental assessment for several reasons. The Motor Scale appeared to provide a reasonable method to assess the developing motor ability of Head Start and Non-Head Start children. The standardization sample was large (n=1032) and reflected the 1970 U. S. Census population in terms of race, geographic region, and father's occupation. Moreover, the standardization sample included equal numbers of boys and girls. Although there was no specific prior research regarding the performance of low-income children on the McCarthy scales, prior research (Kaufman and Kaufman, 1973) had shown that, for children aged 2-1/2 to 5-1/2 years old, there were no differences in performance on the McCarthy Scales between boys and girls or between black children and white children.\*

The Motor Scale of the McCarthy Scales of Children's Abilities was used as the first indicator of the child's developmental status. It was administered by a data collection team member skilled in dealing with children and especially trained to administer the McCarthy Motor Scale items according to the specifications of the McCarthy protocol. To assess the child's behavior under a variety of circumstances, the developmental testers were particularly trained to distinguish item failures on the McCarthy Scale because of lack of ability of the child to perform the task

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\*While the performance of children on the McCarthy Motor Scale is related to developing physical capability and is appropriate for estimating developing muscle coordination, it is not highly related to other estimates of developing cognitive skills. Correlations of the McCarthy Motor Scale with other ability tests including the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) and the Stanford-Binet are very low ( $r < .10$ ). The correlation between the McCarthy Motor Scale and the McCarthy General Cognitive Scale (based on the published scores of the standardization sample) is higher for children in the evaluation's age range ( $r = .57$  to  $r = .79$ ). However, the three gross motor tests are not included in the computation of the General Cognitive Scale, whereas the two fine motor tests are, thereby increasing the correlation by virtue of the overlap.

Exhibit 8-1

Developmental Evaluation Measures from  
the McCarthy Scales of Children's Abilities

| Measures  | Description  |
|---|--|
| <p><b>McCarthy Motor Scale</b></p> <p><b>Gross Motor Tasks:</b></p> <p>    <b>Leg Coordination</b></p> <p>    <b>Arm Coordination</b></p> <p>    <b>Imitative Action</b></p> <p><b>Fine Motor Tasks:</b></p> <p>    <b>Draw-A-Design</b></p> <p>    <b>Draw-A-Child</b></p> | <p>Child performs tasks involving gross motor coordination of lower extremities; e.g., walking, standing on one foot.</p> <p>Child performs tasks involving gross motor coordination of upper extremities, e.g., bouncing a ball, catching a beanbag, throwing a beanbag through a hole in a target.</p> <p>Child copies simple movements; e.g., folding one's hands, crossing feet.</p> <p>Child performs tasks requiring fine motor coordination and copies forms similar to Bender Gestalt items using a pencil and paper.</p> <p>Child draws picture of a child.</p> |
| <p><b>McCarthy Refusal Score</b></p>  | <p>Number of test items on which child refused to cooperate in performing on McCarthy Motor Scale Tasks.</p>   |

from item failures due to shyness, lack of cooperation with the examiner; or fatigue.

A second developmental indicator, also derived from the administration of the McCarthy Motor Scale, was a count of the number of items which, in the examiner's opinion, the child failed because of lack of cooperation with the testing situation rather than lack of ability to perform the task. This measure was developed for two reasons: (1) to eliminate (from the estimates of the developmental performance) children whose performance on the Motor Scale appeared to be very unreliable, and (2) to determine whether, after participation in the program, Head Start children were more able to cope with a novel situation such as the Head Start Health Evaluation and to perform tasks requested by the examiners.

Two additional measures of the child's behavior were also developed. Using a series of items developed by Walker (1978) which describe child behaviors, parents were asked how often their children behaved that way in the last two months: never, rarely, sometimes, often, or always. The parent's responses to the items were used to develop indices of the child's aggressive and/or withdrawn behavior. The specific behaviors included in each of these indices is shown in Exhibit 8-2.

It is important to point out that developmental and behavioral problems are most frequently assessed by a battery of measures far more extensive than the McCarthy Motor Scale, administered by a trained psychologist or skilled health professional. Such assessment requires an ample amount of "clinical judgment." Because far less elaborate procedures were employed in the Head Start Health Evaluation, the developmental and behavioral assessments cannot be construed as definitive indicators of developmental or behavioral problems. The assessments can, however, be used roughly to indicate the presence or absence of a problem. That is, if the child fails many more of the McCarthy Motor Scale items than expected for children of the same age; refuses to cooperate with the examiner; and is reported by his/her parent to be frequently aggressive or withdrawn, then these combined measures may indicate developmental or behavioral problems. If, however, the child performs reasonably well on the McCarthy Motor Scale, cooperates with the examiner, and is reported by his/her parent to be

Exhibit 8-2

Indices Derived From the Walker Behavior Scale

| Index                  | Items from Walker Behavior Scale  |
|------------------------|---|
| Aggressive Child Index | <p>Fights with children outside home;</p> <p>Gets into accidents and hurts self;</p> <p>Loses interest quickly, goes from one thing to another;</p> <p>Has a bad temper;</p> <p>Bumps into things or drops things;</p> <p>Is a squirmy, fidgety child;</p> <p>Throws and breaks things;</p> <p>Is restless; cannot sit still.</p> |
| Withdrawn Child Index  | <p>Worries about many things;</p> <p>Cries easily without any apparent reason;</p> <p>Has many fears;</p> <p>Is a loner;</p> <p>Appears miserable, unhappy, tearful, and distressed;</p> <p>Stares into space;</p> <p>Is overly serious and sad.</p>  |

infrequently aggressive or withdrawn, then these measures probably indicate that the child is developmentally normal. When all of these indicators do not point in the same direction, the validity of the assessment is less clear.

These developmental measures were designed specifically to address the following research questions:

- What is the prevalence of developmental and behavior problems among Head Start-eligible children?
- What developmental health services do Head Start children receive?
- What developmental services do children receive from sources other than Head Start?
- What are the impacts of the Head Start program's developmental health services on the Head Start children?

The approach to investigating these questions and the results are described below.

#### Analysis of the Developmental Indicators

Analysis proceeded in six stages: First, the four developmental and behavioral indicator\* scores were calculated. The tasks of the Motor Scale of the McCarthy were scored according to the McCarthy protocol and converted to age-specific percentiles as described below. Each child's total Motor Scale raw score was compared with the scores of children of the same age in the McCarthy standardization sample (in three-month intervals of age) and converted to a standard score for children of that age group. The standard scores for each child were then converted into percentile scores.

The McCarthy manual provides tables which permit these conversions, given a child's age and raw Motor Scale score, as shown in Exhibit 8-3. In this example, children of different ages with the same raw score on the Motor Scale tasks receive different percentile scores when compared with children of their own age. Older children receive lower percentile scores for performance similar to younger children. The average percentile score for each

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\*The four indicators are: McCarthy Motor Scale Scores, McCarthy refusals Walker Aggressive Child Index, Walker Withdrawn Child Index.



Exhibit 8-3

Example of McCarthy Percentile Score Calculation Procedure<sup>a</sup>

| Child's Age<br>in years | Raw Score | Standard<br>Score | Percentile<br>Score |
|-------------------------|-----------|-------------------|---------------------|
| 3.126-3.376             | 25        | 62                | 87                  |
| 3.376-3.625             | 25        | 58                | 80                  |
| 3.626-3.875             | 25        | 53                | 60                  |
| 3.876-4.125             | 25        | 47                | 40                  |

<sup>a</sup>The McCarthy procedure could be simplified to convert each child's raw score directly into a percentile score (given the child's age group) because the standard scores are an intermediate representation of the percentile scores.

age group is 50. Hence, a typical performance on the Motor Scale, average for the child's age, is 50 and those who score above or below average receive commensurate scores based on the distribution of scores in the standardization sample of children.

For each child, a count was made of those tasks on the Motor Scale which the examiner deemed to be "refused" rather than "failed" by the child. That is, of the 52 possible tasks which a child could attempt to perform, some of the children scored zero because, in the examiner's opinion, the child had refused to attempt the task. The refusals were scored as a continuous measure. Low scores represent fewer refusals. The refusals are an indicator of lack of cooperation or of unwillingness to cope with the testing situation at both pretest and posttest; they also serve as an indicator of unreliable measurement at pretest.

At both pretest and posttest the reliability of the fine and gross motor tasks was quite high; the Cronbach's alpha coefficient ranged from .69

\*This procedure, although not used in calculating a "standard" McCarthy percentile score, is typically used by experienced and highly trained examiners and is discussed by Hufano and Hoepfner (1974).

to .72 for the fine motor tasks, from .82 to .86 for gross motor tasks, and from .81 to .86 for the entire Motor Scale. The latter reliability estimates for the Motor Scale are very similar to those presented for the standardization sample presented in the McCarthy manual (.78 to .84 for children in 3 to 5 age range).

The ranges of these refusal scores at pretest and posttest were different. At pretest, the scores ran from zero to 52 (90% of the children refused 27 or fewer tasks, and only 23 children refused the entire scale) and at posttest from zero to 37 (90% of the children refused 5 or fewer), thereby suggesting that at least at pretest those children with very high refusal scores probably also had unreliably low McCarthy percentile scores, because each refusal would result in a zero raw score for that task of the Motor Scale. Examination of the distributions of these refusals suggested that there were four distinct groups of children: those who attempted everything (0 refusals), those who refused a few tasks (1-14 refusals), those who refused a substantial number of tasks (15-47 refusals), and those who refused essentially the entire set of tasks (48-52 refusals).\*

The aggressive and withdrawn child indices were developed after factor analysis of the parents' responses to items on the Walker Behavior Scale. Each index is the sum of the weighted parents' responses (never = 1 through always = 5) to the Walker Behavior Scale items shown in Exhibit 8-2. (Low scores on these indices are better.) The reliability of the aggressive and withdrawn child indices was moderate at both pretest and posttest: the Cronbach's alpha coefficients were .73 and .63 at pretest and .74 and .68 at posttest, respectively.

The second stage of the analysis process investigated relationships between the developmental evaluation measures (percentile rank on the Motor Scale, the number of refused items, and scores on the aggressive and withdrawn child indices) and the age and gender of the child. The

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\*There were no children in the latter group at posttest. However, the 25 children in this group at pretest were eliminated from most presentations of the pretest results. Estimates (shown in Appendix Table 8-6) included the performance levels of all the children, regardless of how many items they refused to attempt on the McCarthy Motor Scale, using standard McCarthy scoring procedures. Similar estimates with those children removed are shown in Table 8-6 continued (for Sample A). All other analyses of the McCarthy Motor Scales presented in this chapter excluded the pretest children with the most unreliable estimates of performance.

age relationships were determined by calculating Pearson correlations between the child's age and the child's score on each dependent measure. Gender differences were determined by using t-tests to compare differences in means between the two groups.

Third, regression analyses were used to investigate the relationships between the developmental evaluation and the Head Start treatment in the longitudinal sample (A) and in the posttest sample (Samples A, B, and C). The regression analyses focused first on identifying the variables needed to adjust for differences among children in the various sites and in the Head Start and non-Head Start groups. The regression model was developed by examining the importance (F-statistic, increase in  $R^2$ ) of the following background variables in predicting each dependent variable:

- child's age,
- child's gender,
- child's race (black, non-black),
- per capita income percentile,
- family employment status,
- mother's education, and
- child's pretest score (longitudinal analyses).

Race was coded as "black/non-black" to avoid the confounding of site and race. In Maricopa County, the race variable was coded as "Hispanic/non-Hispanic" and used in place of the "black/non-black" variable. Although other potential covariates were considered (e.g., wave of recruitment), only the covariates found to be significantly associated with at least three of the dependent variables in either the cross-site or within-site analyses were included.

Regression analyses were structured to enter the variables in a fixed sequence into the model: first, all of the covariates, then the three effects-coded site variables, and finally the Head Start variable. For all developmental and behavioral measures, the regression analyses were run within each site and across all sites on three sets of samples of children: cross-sectional pretest (Samples A and D), cross-sectional posttest (Samples A, B, and C) and longitudinal (Sample A at pretest and posttest).

Fourth, analyses of covariance confirming the results of the regression analyses were conducted. In these analyses, the same covariates were entered into the analyses, except that age was used as a blocking factor (in six-month intervals) with site and Head Start. The McCarthy Motor Scale percentile scores, the raw total McCarthy scores and the raw scores for the two subscales (fine and gross) were used as dependent measures to examine whether the use of the regression models with age as a covariate could bias the results on those developmental measures. These analyses and others conducted on transformations of the McCarthy Motor Scale percentile score produced essentially the same results as the regression analyses.

Finally, estimates were made of the developmental services provided by Head Start and through other sources. Information about screening, diagnosis and treatment was obtained from Head Start records. Mothers also were asked about developmental services that children had received from community sources.

### Summary of Findings

#### Prevalence of Potential Developmental and Behavioral Problems

In order to determine the prevalence of potential developmental and behavioral problems, percentile scores of Head Start-eligible children at pretest were computed. As is shown in Exhibit 8-4, one out of three children scored below the 10th percentile on the McCarthy Motor Scales, and 54 percent scored below the 20th percentile. Children in Greene and Humphreys counties performed considerably better on this measure than children in the other three sites; children in St. Clair County performed most poorly.

Table 8-1 in the Appendix compares the mean percentile ranks of boys and girls on the McCarthy Motor Scale. Across sites, girls scored significantly higher than boys at pretest and at posttest, although differences were not significant within sites. Average McCarthy Developmental Percentile scores and refusals by age group are presented in Tables 8-2 and 8-3. There also appears to be a strong correlation between percentile scores and age and between number of refusals and age for some samples of children in one or more sites. These correlations are shown in Tables 8-4 and 8-5 in the Appendix.

Exhibit 8-4

Pretested Children Who Scored at Various Percentile levels on the McCarthy Motor Scales<sup>a</sup>

| Percentile Score | Pretested Children (Samples A and D) in: |                           |                         |                      |                    |
|------------------|--|---------------------------|-------------------------|----------------------|--------------------|
|                  | Greene & Humphreys Counties<br>n=84      | St. Clair County<br>n=105 | Maricopa County<br>n=95 | Mingo County<br>n=62 | All Sites<br>n=346 |
| <10              | 11.9                                     | 43.8                      | 41.1                    | 37.1                 | 34.1               |
| <20              | 32.1                                     | 66.7                      | 55.8                    | 58.1                 | 53.8               |
| <30              | 51.2                                     | 79.0                      | 62.1                    | 64.5                 | 65.0               |
| <40              | 56.0                                     | 85.7                      | 72.6                    | 72.6                 | 72.5               |
| <50              | 61.9                                     | 86.7                      | 83.2                    | 79.0                 | 78.3               |
| <60              | 75.0                                     | 94.3                      | 92.6                    | 85.5                 | 87.6               |
| <70              | 82.1                                     | 98.1                      | 93.7                    | 88.7                 | 91.3               |
| >70              | 17.9                                     | 1.9                       | 6.3                     | 11.3                 | 8.7                |

<sup>a</sup> Children who refused to cooperate with the examiner at pretest were excluded from these analyses.

In addition, we assessed what proportion of the Head Start-eligible children at pretest were identified to have potential developmental or behavioral problems on one or more of the following measures:

- Child's McCarthy Motor Scale percentile score is less than 20;
- Child refused to cooperate with examiner on more than 15 items;
- Child's aggressive index exceeds the mean by more than one standard deviation;
- Child's withdrawn index exceeds the mean by more than one standard deviation.

As Exhibit 8-5 illustrates, given a conservative application of these measures, 34 percent of the children have no evidence of developmental problems. Over half of the children fell below the 20th percentile score on the McCarthy Motor Scale. Prevalence of potential developmental or behavioral problems based on refusals and the aggressive-withdrawn indices, or on any combination of the four measures, were low.

There was some variation in the prevalence of potential problems from site to site. Prevalence was lowest (on all measures except refusals) in Greene and Humphreys Counties. The proportion of children below the 20th percentile on the McCarthy Motor Scale was highest in St. Clair County (66%). Refusals were most common in Mingo County, while prevalence of potential problems of aggression and/or withdrawal was lowest in Greene and Humphreys Counties. Maricopa County had prevalence of withdrawal problems that was approximately eight times that found in Greene and Humphreys and three times that of Mingo County.

#### Developmental Services Provided Through Head Start

According to interviews with Head Start directors and health coordinators in each of the sites, the Head Start developmental assessments are performed by classroom teachers trained to administer a locally determined, usually unstandardized series of tasks. These teacher-administered assessments are reportedly performed on all children once a year in all sites, except Mingo County where they are reportedly performed three times per year. Based on the teachers' screening, children who "fail" are referred for a more complete evaluation by mental health professionals. The latter services are paid for through the handicapped component of Head Start.

Head Start health records provide information about whether Head Start children received a developmental screen after entering Head Start, whether the screen indicated significant findings and, if there were findings, whether Head Start provided treatment or a referral. There were records for only 334 children regarding whether they had received a developmental screen. Data on the 334 children are presented in Exhibit 8-6.

Across the four sites 41 percent of the Head Start children received a developmental screen by Head Start. Of the children who were screened, 16 percent were found to have a problem requiring professional diagnostic services. Only one of three children with potential problems received services according to the records.

Exhibit 8-5

Pretested Children Who Scored Below Criterion<sup>a</sup>  
on One or More Developmental or Behavior Measures at Pretest<sup>a</sup>

| Developmental<br>or Behavior<br>Measure | Pretested Children (Samples A and D) in:  |                                 |                            |                         |                       |      |
|---|---|---------------------------------|----------------------------|-------------------------|-----------------------|------|
|   | Greene &<br>Humphreys<br>Counties<br>n=95 | St.<br>Clair<br>County<br>n=113 | Maricopa<br>County<br>n=95 | Mingo<br>County<br>n=73 | All<br>Sites<br>n=376 |      |
| MMS                                     | n   | 38                              | 75                         | 53                      | 44                    | 210  |
|   | %   | 40.0                            | 66.4                       | 55.8                    | 60.3                  | 55.9 |
| REF                                     | n   | 14                              | 19                         | 3                       | 17                    | 53   |
|   | %   | 14.7                            | 16.8                       | 3.2                     | 23.3                  | 14.1 |
| AI                                      | n   | 4                               | 21                         | 16                      | 13                    | 54   |
|   | %   | 4.2                             | 18.6                       | 16.8                    | 17.8                  | 14.4 |
| WI                                      | n   | 3                               | 22                         | 24                      | 6                     | 55   |
|   | %   | 3.2                             | 19.5                       | 25.3                    | 8.2                   | 14.6 |
| MMS+REF                                 | n   | 14                              | 18                         | 3                       | 14                    | 49   |
|   | %   | 14.7                            | 15.9                       | 3.2                     | 19.2                  | 13.0 |
| MMS+AI                                  | n   | 3                               | 16                         | 9                       | 6                     | 34   |
|   | %   | 3.2                             | 14.2                       | 9.5                     | 8.2                   | 9.0  |
| MMS+WI                                  | n   | 1                               | 17                         | 13                      | 3                     | 34   |
|   | %   | 1.1                             | 15.0                       | 13.7                    | 4.1                   | 9.0  |
| AI+WI                                   | n   | 0                               | 8                          | 8                       | 2                     | 18   |
|   | %   | 0.0                             | 7.1                        | 8.4                     | 2.7                   | 4.8  |
| MMS+REF+AI                              | n   | 1                               | 3                          | 1                       | 4                     | 9    |
|   | %   | 1.1                             | 2.7                        | 1.1                     | 5.5                   | 2.4  |
| MMS+AI+WI                               | n   | 0                               | 6                          | 5                       | 0                     | 11   |
|   | %   | 0.0                             | 5.3                        | 5.3                     | 0.0                   | 2.9  |
| None of above                           | n   | 54                              | 29                         | 27                      | 19                    | 129  |
|   | %   | 56.8                            | 25.7                       | 28.4                    | 26.0                  | 34.3 |

- <sup>a</sup> MMS < 20: McCarthy Motor Scale less than 20th percentile.  
REF > 15: McCarthy refusals greater than 15 items.  
AI > 3.14: Aggressive Index greater than mean plus one standard deviation or 3.14  
WI > 2.19: Withdrawn Index greater than mean plus one standard deviation or 2.19

Exhibit 8-6

Developmental Services Provided to Head Start Children  
According to Head Start Health Records in Each Site

| Developmental Services           | Posttested Children (Samples, A, B, C) in: |                           |                          |                       |                     |
|----------------------------------|--|---------------------------|--------------------------|-----------------------|---------------------|
|                                  | Greene & Humphreys Counties<br>n=127       | St. Clair County<br>n=108 | Maricopa County<br>n=102 | Mingo County<br>n=112 | All Sites<br>n=449  |
| Children Screened                | n 65/107<br>% 60.7                         | n 1/72<br>% 1.4           | n 3/76<br>% 3.9          | n 67/79<br>% 84.8     | n 136/334<br>% 40.7 |
| Children Found to Have a Problem | n 18/64<br>% 28.1                          | n 0/1<br>% 0.0            | n 1/3<br>% 33.3          | n 2/65<br>% 3.1       | n 21/133<br>% 15.8  |
| Children Received Services       | n 5/18<br>% 27.8                           | n 0/0<br>% 0.0            | n 1/1<br>% 100.0         | n 1/2<br>% 50.0       | n 7/21<br>% 33.3    |

Some Head Start programs do notably better in screening children for developmental or behavioral problems. Mingo County Head Start did screens on 85 percent of the enrolled children. The program in Greene and Humphreys Counties screened 61 percent; this site also identified far more children with potential problems (one out of four) than did the other three sites.

The results of our developmental evaluation and the Head Start developmental assessments are not directly comparable. Head Start's assessments can identify more children needing services than our evaluation because the Head Start assessment is broader and covers more areas of potential problems. Comparisons between findings from Head Start screens and our evaluations show differences which suggest that Head Start may be underreferring. Among those 136 children identified by their Head Start health record as having been screened by Head Start for developmental problems, the Head Start Health Evaluation found 27 (20%) to have some important developmental finding (measured as performance below the 10th percentile on the McCarthy Motor Scale). Head Start reported developmental findings for 21 (15.2%) of the screened children. However, 22 of the 27



children found to have an important developmental finding were considered to have "normal" screens by Head Start. In other words, assessments of developmental findings made by our evaluation and Head Start were in agreement for only five out of 21 (25%) of the cases.

In addition, our evaluation identified 36 (18%) out of 198 children who did not receive a developmental assessment to be in need of diagnostic services. Thus, detection of developmental findings by our evaluation was approximately equal (20 vs. 18%) among those children who did and did not receive a developmental assessment.

Site differences in the provision of diagnostic or remedial services are difficult to interpret because so few children were referred. The program referred three children. This evaluation also showed that they needed a referral. Head Start referred four others whom our evaluation did not identify (and there is no way, as indicated above, to verify the appropriateness of the latter referrals).

The content of the developmental services that Head Start provides cannot be assessed directly from the health abstract records. However, a review of individual records of the three children for whom developmental findings were recorded by both Head Start and our evaluation provides some information about the types of developmental problems identified and the validity of the concerns about those children. Notes about the specific problems of individual children were often recorded by members of our data collection team. Notes concerning these children included the following from various domains of the evaluation:

- "Failure to thrive, general developmental delay, infantile approach to objects, poor muscle tone" (pediatrician's notes); "poor comprehension and expression, delay in speech development" (speech pathologist's notes); "poor processing skills" (audiologist's notes).
- "Developmental delay" (pediatrician's notes); "speech delay, fails to integrate thoughts into sentences, difficulty with oral motor coordination, apraxia" (speech pathologist's notes).
- "Speech delay, recommend speech evaluation, check auditory processing skills" (speech pathologist's notes)

It is clear from the above discussions that there is considerable room for improving developmental, diagnostic, and remedial services in all

sites. Developmental screenings of children also could be improved, especially in St. Clair and Maricopa Counties.

#### Developmental Services Provided Through Other Sources

At posttest, all parents were asked whether their children had received developmental screens within the last year. Results, reported in the impact section, show that non-Head Start children are much less likely to be screened for potential developmental or behavioral problems.

#### Impact of Head Start Developmental Services on Children

The beneficial effects that the Head Start program might have on children's developmental progress and behavior were hypothesized to occur through three mechanisms. First, Head Start programs screen children for developmental problems and provide direct services or make referrals for remedial services. If such services are received, Head Start children would be expected to score higher on the McCarthy Motor Scale, and lower on the aggressive and withdrawn indices. Second, all children who regularly engage in motor development activities within the Head Start program setting might be expected to perform better on the McCarthy Motor Scale than children who spend most of their time at home. Thus, even beyond providing developmental screens and direct developmental services, the Head Start program may encourage progress in motor development through indirect services in all participating children. Third, Head Start provides children with a wide range of challenging activities to encourage development of their sense of "I can do that!" If this program is effective, children should be less threatened by the novel testing situation and be more willing to cooperate with the developmental tester. Head Start's affects on these three outcome measures was assessed for the longitudinal and cross-sectional samples.

Longitudinal Analyses. As noted in Exhibit 8-7, there was a substantial decrease from pretest to posttest in the proportion of children who scored below the 20th percentile on the McCarthy Motor Scales. A decrease was evident in both groups, but it was larger for the Head Start group (19%)

Exhibit 8-7

Percentage of Longitudinal Children Who Scored at Various Percentile Levels on the McCarthy Motor Scale<sup>a</sup>

| Longitudinal Children (Sample A) In: |            |             |            |                  |            |             |            |                 |            |             |            |              |            |             |            |             |             |             |             |             |
|--------------------------------------|------------|-------------|------------|------------------|------------|-------------|------------|-----------------|------------|-------------|------------|--------------|------------|-------------|------------|-------------|-------------|-------------|-------------|-------------|
|                                      |            |             |            |                  |            |             |            |                 |            |             |            |              |            |             |            |             |             |             |             |             |
| Greene & Humphreys Counties          |            |             |            | St. Clair County |            |             |            | Maricopa County |            |             |            | Mingo County |            |             |            | All Sites   |             |             |             |             |
| Percentile Score                     | HS<br>n=36 | NHS<br>n=30 | HS<br>n=36 | NHS<br>n=30      | HS<br>n=24 | NHS<br>n=14 | HS<br>n=24 | NHS<br>n=14     | HS<br>n=40 | NHS<br>n=16 | HS<br>n=40 | NHS<br>n=16  | HS<br>n=17 | NHS<br>n=15 | HS<br>n=17 | NHS<br>n=15 | HS<br>n=117 | NHS<br>n=75 | HS<br>n=117 | NHS<br>n=75 |
|                                      | Pretest    |             | Posttest   |                  | Pretest    |             | Posttest   |                 | Pretest    |             | Posttest   |              | Pretest    |             | Posttest   |             | Pretest     |             | Posttest    |             |
| < 10                                 | 11.1       | 10.0        | 13.9       | 13.3             | 33.3       | 28.6        | 12.5       | 21.4            | 35.0       | 56.3        | 25.0       | 25.0         | 35.3       | 26.7        | 41.2       | 20.0        | 27.4        | 26.7        | 21.4        | 18.7        |
| < 20                                 | 27.8       | 26.7        | 22.2       | 40.0             | 70.8       | 42.9        | 12.5       | 28.6            | 50.0       | 56.3        | 40.0       | 37.5         | 64.7       | 40.0        | 52.9       | 26.7        | 49.6        | 38.7        | 30.8        | 34.7        |
| < 30                                 | 47.2       | 50.0        | 38.9       | 53.3             | 83.3       | 71.4        | 33.3       | 28.6            | 60.0       | 56.3        | 55.0       | 50.0         | 76.5       | 40.0        | 76.5       | 46.7        | 63.2        | 53.3        | 48.7        | 46.7        |
| < 40                                 | 52.8       | 53.3        | 44.4       | 76.7             | 95.8       | 85.7        | 41.7       | 35.7            | 72.5       | 68.8        | 62.5       | 68.8         | 76.5       | 53.3        | 88.2       | 46.7        | 71.8        | 62.7        | 56.4        | 61.3        |
| < 50                                 | 55.8       | 66.7        | 63.9       | 76.7             | 95.8       | 85.7        | 58.3       | 35.7            | 85.0       | 81.3        | 77.5       | 68.8         | 82.4       | 53.3        | 88.2       | 60.0        | 77.8        | 70.7        | 70.9        | 64.0        |
| < 60                                 | 69.4       | 80.0        | 72.2       | 86.7             | 100.0      | 92.9        | 66.7       | 57.1            | 95.0       | 93.8        | 82.5       | 81.3         | 88.2       | 60.0        | 94.1       | 86.7        | 87.2        | 81.3        | 77.8        | 80.0        |
| < 70                                 | 77.8       | 90.0        | 91.7       | 90.0             | 100.0      | 92.9        | 75.0       | 57.1            | 97.5       | 93.8        | 87.5       | 87.5         | 94.1       | 60.0        | 94.1       | 100.0       | 91.5        | 85.3        | 87.2        | 85.3        |
| 70+                                  | 22.2       | 10.0        | 8.3        | 10.0             |            | 7.1         | 25.0       | 42.9            | 2.5        | 6.2         | 12.5       | 12.5         | 5.9        | 40.0        | 5.9        |             | 8.5         | 14.7        | 12.8        | 14.7        |

<sup>a</sup>Children who refused to cooperate with the examiner at pretest eliminated from results at both pretest and posttest.

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than the non-Head Start group (4%),\* suggesting that Head Start has its most profound impact on the children who are in most need of the program's direct and indirect services for their needs. Regression analyses, adjusting for various background characteristics and taking the pretest score into account, indicate that, across sites, group differences on the McCarthy Motor Scales are not statistically significant, except in Greene and Humphreys Counties. Head Start children performed better on both the McCarthy Motor Scale and the McCarthy refusal index. This site has the only full-day, five-day a week Head Start program in the study. What this finding may suggest is that full-day Head Start is more effective than part-day programs in terms of the motor development of children and their adaptability to new situations. Results of the regression analyses are presented in Table 8-9 in the Appendix.

Similar analyses were undertaken to assess Head Start effects on the aggression and withdrawn indices. Unadjusted comparisons between the Head Start and non-Head Start groups at pretest and posttest are given in Table 8-6 in the Appendix. Only in St. Clair County did regression analyses yield a significant group difference, with Head Start children being less withdrawn as a result of Head Start intervention than children in the non-Head Start group (see Table 8-9 in the Appendix).

Cross-Sectional Analyses. Exhibit 8-8 shows the proportion of Head Start and non-Head Start children in the cross-sectional sample (A, B and C) who scored below criterion on one or more developmental or behavioral problems. Fewer Head Start than non-Head Start children fell below the 20th percentile on the McCarthy Motor Scale, and refusals and aggressive behavior were also less common. Head Start children tended to be slightly more withdrawn than non-Head Start children. None of these group differences turned out to be statistically significant according to regression results presented in Appendix Tables 8-10.\*\*

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\*Table 8-6 shows unadjusted comparisons on the four developmental indicators at both pretest and posttest by site. Average scores for the McCarthy Motor Scale and the number of refusals are presented in Tables 8-7 and 8-8.

\*\*Descriptive statistics on the cross-sectional posttest sample are presented in Tables 8-11 through 8-14.

Exhibit 8-8

Percentage of Posttest Children Who Scored Below Criterion<sup>a</sup>  
on One or More Developmental or Behavior Measures at Posttest

| Developmental<br>or Behavior<br>Measure<br>Criterion | Posttested Children (Samples A, B, C) in: |                 |                     |                 |                    |             |                 |              |              |                  |      |
|--|---|-----------------|---------------------|-----------------|--------------------|-------------|-----------------|--------------|--------------|------------------|------|
|  | Greene &<br>Humphreys<br>Counties         |                 | St. Clair<br>County |                 | Maricopa<br>County |             | Mingo<br>County |              | All<br>Sites |                  |      |
|  | HS<br>n=127                               | NHS<br>n=101    | HS<br>n=108         | NHS<br>n=86     | HS<br>n=106        | NHS<br>n=61 | HS<br>n=119     | NHS<br>n=109 | HS<br>n=460  | NHS<br>n=357     |      |
| MMS  | n   | 23              | 47                  | 19              | 21                 | 51          | 26              | 51           | 44           | 144              | 138  |
|  | %   | 18.1            | 46.5                | 17.6            | 24.4               | 48.1        | 42.6            | 42.9         | 40.4         | 31.3             | 38.7 |
| REF  | n   | 2               | 11                  | 1               | 3                  | 0           | 0               | 1            | 1            | 4                | 15   |
|  | %   | 1.6             | 10.9                | 0.9             | 3.5                | 0.0         | 0.0             | 0.8          | 0.9          | 0.9              | 4.2  |
| AI   | n   | 9               | 5                   | 6               | 16                 | 21          | 14              | 20           | 21           | 56               | 56   |
|  | %   | 7.1             | 5.0                 | 5.6             | 18.6               | 19.8        | 23.0            | 16.8         | 19.3         | 12.2             | 15.7 |
| WI   | n   | 6               | 3                   | 13              | 11                 | 41          | 21              | 21           | 18           | 81               | 53   |
|  | %   | 4.7             | 3.0                 | 12.0            | 12.8               | 38.7        | 34.4            | 17.6         | 16.5         | 17.6             | 14.8 |
| MMS+REF  | n   | 2               | 11                  | 1               | 3                  | 0           | 0               | 1            | 1            | 4                | 15   |
|  | %   | 1.6             | 10.9                | 0.9             | 3.5                | 0.0         | 0.0             | 0.8          | 0.9          | 0.1              | 4.2  |
| MMS+AI   | n   | 3               | 4                   | 1               | 2                  | 15          | 5               | 9            | 10           | 28               | 21   |
|  | %   | 2.4             | 4.0                 | 0.9             | 2.3                | 14.2        | 8.2             | 7.6          | 9.2          | 6.1              | 5.9  |
| MMS+WI   | n   | 0               | 1                   | 5               | 3                  | 20          | 10              | 13           | 9            | 38               | 23   |
|  | %   | 0.0             | 1.0                 | 4.6             | 3.5                | 18.9        | 16.4            | 10.9         | 8.3          | 8.3              | 6.4  |
| AI+WI  | n   | 1               | 1                   | 0               | 4                  | 12          | 3               | 8            | 9            | 21               | 17   |
|  | %   | 0.8             | 1.0                 | 0.0             | 4.7                | 11.3        | 4.9             | 6.7          | 8.3          | 4.6              | 4.8  |
| MMS+REF+AI   | n   | 0               | 1                   | 0               | 0                  | 0           | 0               | 1            | 0            | 1                | 1    |
|  | %   | 0.0             | 1.0                 | 0.0             | 0.0                | 0.0         | 0.0             | 0.8          | 0.0          | 0.0              | 0.0  |
| MMS+AI+WI  | n   | 0               | 1                   | 0               | 1                  | 8           | 3               | 3            | 5            | 11               | 10   |
|  | %   | 0.0             | 1.0                 | 0.0             | 1.2                | 7.5         | 4.9             | 2.5          | 4.6          | 2.3              | 2.8  |
| None of<br>the Above                                 | n   | 93 <sup>b</sup> | 51                  | 76 <sup>b</sup> | 46                 | 32          | 15              | 54           | 49           | 255 <sup>b</sup> | 161  |
|  | %   | 73.2            | 50.5                | 70.4            | 53.5               | 30.2        | 24.6            | 45.4         | 45.0         | 55.4             | 45.1 |

<sup>a</sup>MMS < 20: McCarthy Motor Scale less than 20th percentile.

REF > 15: McCarthy refusals greater than 15 items.

AI > 3: Aggressive Index greater than mean plus one standard deviation or 3

WI > 2.25: Withdrawn Index greater than mean plus one standard deviation or 2.25.

<sup>b</sup>Head Start significantly greater than non-Head Start;  $p < .05$ .

Within-site analyses on the cross-sectional sample show significant Head Start Effects only in Greene and Humphreys Counties. Head Start children had higher McCarthy percentile scores, had fewer refusals and were less likely to be considered aggressive by their mothers. This replicates (although not entirely) findings reported for the longitudinal sample of children.

Exhibit 8-9 also shows a significant Head Start effect, both across and within sites, with regard to the proportion of children who received a screen for developmental and behavioral problems. Forty-one percent of the Head Start children received such a screen compared to only 8 percent of the non-Head Start children. Most of the Head Start children were screened by the program, rather than by another resource in the community.

Confirmatory analyses, using analysis of covariance and blocking on the age of child in six-month intervals, produced virtually identical results as the regression analyses--whether the dependent measure was the McCarthy total score, or either of the raw Motor sub-Scales (for fine and gross motor coordination). The Head Start children in Greene and Humphreys Counties out-performed the non-Head Start children. Transformations of the McCarthy percentile scores also produced identical results.

### Conclusions

The developmental evaluation demonstrates that Head Start can effectively improve children's muscular coordination and ability to perform in a novel situation. Of the four sites, the one which was most successful was Greene and Humphreys Counties, the only program in the study which provides services to the children full time, five days per week.

Although the difference between the performance of the Head Start children is statistically significant in one site only, there is evidence in two sites that Head Start is associated with developmental gains for children with the lowest scores at pretest--the children who would appear to need the program the most. In these sites, the proportion of the children in the Head Start group at posttest who remained below the 20th percentile on the McCarthy Motor Scale is smaller than the proportion of the non-Head Start children, demonstrating an important pattern of Head Start effects.

Exhibit 8-9

Percentage of Head Start and Non-Head Start Children  
Receiving Developmental Screens Through Head Start and Other Sources

|   |   | Greene/Humphreys                       |     | St. Clair                              |     | Maricopa                               |      | Mingo                                  |     |
|---|---|--|-----|--|-----|--|------|--|-----|
|   |   | HS                                     | NHS | HS                                     | NHS | HS                                     | NHS  | HS                                     | NHS |
| DEVELOPMENTAL<br>SCREEN                       | N | 110                                    | 92  | 95                                     | 73  | 87                                     | 54   | 108                                    | 95  |
|   | n | 36                                     | 3   | 36                                     | 4   | 37                                     | 11   | 55                                     | 6   |
|   | % | 32.7                                   | 3.3 | 37.9                                   | 5.5 | 42.5                                   | 20.4 | 50.9                                   | 6.3 |
|   |   | CHI SQ = 27.921<br>DF = 1<br>P = 0.000 |     | CHI SQ = 23.910<br>DF = 1<br>P = 0.000 |     | CHI SQ = 7.286<br>DF = 1<br>P = 0.007  |      | CHI SQ = 47.851<br>DF = 1<br>P = 0.000 |     |
| DEVELOPMENTAL<br>SCREEN<br>THROUGH HEAD START | N | 36                                     | 3   | 36                                     | 4   | 37                                     | 11   | 55                                     | 6   |
|   | n | 25                                     | 0   | 32                                     | 0   | 23                                     | 0    | 54                                     | 0   |
|   | % | 69.4                                   | 0.0 | 88.9                                   | 0.0 | 62.2                                   | 0.0  | 98.2                                   | 0.0 |
|   |   | CHI SQ = 3.178<br>DF = 1<br>P = 0.075  |     | CHI SQ = 17.778<br>DF = 1<br>P = 0.000 |     | CHI SQ = 13.129<br>DF = 1<br>P = 0.000 |      | CHI SQ = 51.335<br>DF = 1<br>P = 0.000 |     |

From the combination of the four measures of development and behavior, it appears that nearly half of the children are not seen to have a developmental problem. Fortunately, only two to three percent of the children appear to have multiple problems on these measures and these children appear to be in need of handicapped services for developmental delay.



## CHAPTER NINE

### SPEECH AND LANGUAGE EVALUATION

#### Speech and Language Indicators

There have been numerous studies of Head Start's impacts on the language achievement of children and many have demonstrated the program's successes in improving the average language achievement scores of Head Start children. However, few studies have focused directly on the children with problems in language and those with communications disorders as evaluated by a licensed speech pathologist. This is the major difference in the methodology used by the Head Start Health Evaluation.

The speech and language evaluation consisted of two parts--a speech problem component and a language comprehension component. The evaluation combined both of these components to address Head Start's mandate to provide screenings and follow-up services to children with speech and/or language comprehension problems.

Two measures were administered as part of the speech problem component--the Denver Articulation Screening Examination (DASE) and a portion of the Physician's Developmental Quick Screen for Speech Disorders (PDQ). A brief description of these two measures is presented below:

- The Denver Articulation Screening Examination (DASE) is a five-minute test appropriate for children 2-1/2 to 7 years of age. A child is presented with a picture (such as a wagon); the examiner points to the object and asks the child to name it. A child receives a score of one for each sound accurately articulated (in this example, wagon, both w and n are the important sounds). According to Pediatric Screening Tests, the DASE may provide the most accurate results for disadvantaged children because it was standardized on a large sample of representative children (1,400 white, black and Hispanic preschoolers).
- The Physician's Developmental Quick Screen for Speech Disorders, a five-minute test designed by Kulig and Baker, assesses other speech characteristics. Items concerning intelligibility, voice quality, typical pitch, and typical volume were included in the evaluation.

To identify potential speech problems, children's scores on the DASE were compared with expected minimum scores for children in the same age group. If the child failed to meet the minimum score, he or she was identified as having a potential problem with speech articulation. In addition, children who were noted as having abnormal speech characteristics on the portion of the PDQ that was administered were identified as having potential speech quality problems. These two variables and the sum of the two were used in analyses.

It is important to point out that both measures are screening devices designed to identify children in need of further professional diagnostic evaluation to determine whether a speech problem exists. Results cannot be used as a definitive indicator of speech problems.

The assessment of language comprehension problems also consisted of two measures--the Assessment of Children's Language Comprehension (ACLC) and the Fluharty Language Screening Test for Preschool Children. Both were intended as screening devices and thus do not yield information about the language development of children. A brief description of these two measures follows:

- The Assessment of Children's Language Comprehension (ACLC) was developed by Foster, Gidden and Stark (1973). It was designed for the purpose of identifying individual children who have difficulty processing auditory information and was not intended to rank pupils in a class. The ACLC consists of four sections (one, two, three, and four critical elements) which measure the child's ability to process an increasing number of syntactic units (words). A child is shown a picture and presented with a stimulus word; the child then points to what s/he thinks is the appropriate stimulus object in the picture. A score of one is tallied for each object accurately identified. A total score is computed for each critical element section, indicating total number of items passed, failed, and refused. The ACLC was chosen because it avoids problems associated with children's comprehension of culturally biased syntax structures, which may be subject to a significant amount of dialectic variation. No percentile ranks or standard scores are published for the ACLC because the authors strongly recommend against their use.\*

\*Manual for the Assessment of Children's Language Comprehension: Consulting Psychologists Press, Inc., California (1973).

- The Fluharty Language Screening Test for Preschool Children (Sentence Repetition component) measures verbal expression. Norms for this test were established by testing 203 children from lower to middle socioeconomic backgrounds. Black children and white children were included in the norms. The Fluharty has high intra- and intertester reliability as well as high validity with other diagnostic tests. It is considered to be very sensitive in identifying children who are in need of a complete speech and language evaluation. A child repeats the stimulus sentence produced by the examiner and receives a score of one for each sentence repeated accurately. (The examiner also indicates exactly which part of the sentence was inaccurately produced.) A composite pass/fail score, computed by summing scores across sentences, can be compared with published norms.

The ACLC and Fluharty scores and the sum of the two scores were used in the analyses. In addition, a score was computed to assess deficiencies in either speech or language comprehension. Because the ACLC has no norms, to estimate deficiencies, we calculated the average score for children in each (six months) age group. The criterion for flagging the child as deficient was performance below the average for children one year younger on two or more ACLC subtests. Finally, data were obtained about speech and language services (screens and referrals/treatment) from Head Start health records and interviews from parents. The variables used are defined in Exhibit 9-1.

The speech and language evaluation was administered by a speech pathologist recruited from the local community, who was familiar with the regional dialect. In Maricopa County, where the majority of the children spoke Spanish, the tests were administered first in the child's dominant language--either Spanish or English,\* and if the child was bilingual, repeated in the second language.

The speech and language evaluation addressed the following research questions:

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\*The Del Rio Language Screening Test was administered in Maricopa County at the time the children were pretested. Subsequent analyses indicated that the children's responses to the Del Rio, when scaled, were not interpretable in the context of the evaluation. Therefore, the posttest administered in Maricopa County was changed to correspond to that administered in the other sites. This change precluded a longitudinal evaluation in Maricopa County.

Exhibit 9-1

Speech and Language Evaluation Measures

| Speech Measures   | Definition  |
|---|---|
| Articulation  | Item score on Denver Articulation Screening Examination (DASE). Deficient if child's score is below published screening cutoff.   |
| Speech Quality  | From Physician's Developmental Quick Screen for Speech Disorders. Deficient if examiner noted at least one problem with quality of the child's speech (tone, stuttering, hoarseness, etc.). |
| Speech Deficiency   | Deficient if child is scored as deficient in either articulation and speech quality.  |
| Language Comprehension Measures   | Definition  |
| Language Comprehension<br>1 critical element<br>2 critical elements<br>3 critical elements<br>4 critical elements | Item score on Assessment of Children's Language Comprehension (ACLIC). Deficient if child's score is at least one year behind average score on at least two ACLIC subtests.                 |
| Verbal Expression   | Item score on Fluharty Preschool Speech and Language Screening Test (Repetition sub-test). Deficient if child's score is below published screening cutoff.                                  |
| Language Comprehension Deficiency   | Deficient if child is scored as deficient on either language comprehension and verbal expression.   |
| Speech Services   | Definition  |
| Head Start Screen   | Child received a speech screen after entering Head Start.   |
| Head Start Findings   | Child was found by Head Start to have a speech problem.   |
| Head Start Treatment/Referral   | Child was given treatment or referred for speech problem.   |

- What is the prevalence of speech and language comprehension problems in Head Start-eligible children?
- What speech services do Head Start children receive?
- Do children receive speech services through other (non-Head Start) sources?
- What are the impacts of Head Start on remediation of children's speech and language problems?

Our approach to investigating these questions and the results obtained are described below.

#### Analysis of the Speech and Language Data

Analysis proceeded in several phases. First, relationships between the speech items and language comprehension items and age and gender variables were investigated. The age relationships were determined by calculating Pearson correlations (age in months vs. number correct and age in months vs. number refused). Age is strongly correlated with ACLC, DASE, and Fluharty scores. Gender differences were determined by using F-tests to compare differences in means. Results are reported in Tables 9-1 and 9-2 in the Appendix.

Second, the distributions of responses to individual test items, including changes from pretest to posttest, were examined within and across sites. It was determined that data were unreliable for children who refused 25 or more items across the entire test battery; these children, therefore, were excluded from further analyses.

Third, principal components factor analyses were performed to reduce the number of dependent variables. These analyses revealed that the Fluharty appears to measure both language comprehension and speech (see Table 9-3 in the Appendix). For this reason, we have combined DASE and Fluharty scores in some analyses to determine prevalence of speech problems or Head Start impacts in this area.

Fourth, the prevalence of speech and language comprehension problems was estimated for the evaluated children. In addition, estimates were made of the speech and language services provided by Head Start and through other sources. To determine whether Head Start had an impact in remediating

speech and language comprehension deficiencies, we compared what proportion of the Head Start and non-Head Start children in the longitudinal sample (A) had potential problems identified at both pretest and posttest.

Finally, regression analyses were used to investigate the relationships between speech and/or language comprehension deficiencies and Head Start treatment. The regression analyses focused first on identifying the variables needed to adjust for differences among children in the various sites and Head Start and non-Head Start groups. Then, using those covariates, the analyses examined various samples of children for a Head Start effect. Children's scores on each of six components of the speech evaluation -- ACLC: one, two, three, and four critical elements; DASE; and Fluharty -- were used as dependent variables. The total number of areas failed, based on the pass/fail criteria presented in Table 9-4, also was a dependent variable. Only those children who completed the entire test battery were included in the analyses.

The regression model, including covariates, was developed by examining the importance (F-statistic, increase in  $R^2$ ) of the following background variables in predicting each of the dependent variables:

- child's age;
- child's gender;
- child's race (black, non-black);
- family income percentile;
- family employment status; and
- mother's education.

Race was coded as "black/non-black" to adjust the confounding of site and race. In Maricopa County, the race variable was coded as "Hispanic/non-Hispanic" and used in place of the "black/non-black" variable. Although other potential covariates were considered (e.g., wave of recruitment) only the covariables found to be significantly associated with at least three of the dependent variable in either the across- or within-site analyses were included.

Analyses were structured so that the variables were entered in a fixed sequence into the regression model: first, all of the covariates, then the three effect-coded variables, and finally the Head Start variable.

Regression analyses were run within each site, across all sites, and across all sites except Maricopa County, which contained a large number of bilingual children and which showed unusual data associations.\*

### Summary of Findings

#### Prevalence of Speech and Language Comprehension Problems

The prevalence of potential speech and language comprehension problems in the three non-bilingual sites is presented in Exhibit 9-2. The prevalence of problems was extremely high, with two out of three children identified as being in need of professional diagnostic services for speech and/or language comprehension problems. The latter problems (as measured by the ACLC and Fluharty) were somewhat more common than problems with speech (DASE and PDQ).

There was some site variation in the prevalence of problems. Children in Greene and Humphreys Counties and in Mingo County were more likely to be in need of professional diagnostic services for speech or language comprehension problems than children in St. Clair County. Prevalence of both speech and language problems was lowest in St. Clair County.

On the Denver Articulation Screening Examination (DASE), the only screen with normed reference data, the prevalence of articulation problems in the Head Start Health Evaluation at pretest was slightly higher (20%) than in the normed sample (defined to be 15%). This slightly higher overall prevalence is due to children in Greene and Humphreys Counties (26%) and in Mingo County (23%); children in St. Clair County had a prevalence of articulation problems (14%) that was slightly below the normed sample.

The prevalence figures reported here reflect only whether a child failed a speech and language screen; they do not indicate how many children had "borderline" scores and how many children failed the screen by a wider margin. To examine the degree of failure, screening norms were lagged first

\*Age was not significantly related to speech and language scores in Maricopa County--an unexpected finding since speech and language should improve with age. Moreover, children in Maricopa County scored unusually high for their age, a result that is counterintuitive for a bilingual site. These findings might be the result of a ceiling effect on the speech exam by the relatively older children in Maricopa County; i.e., many of the children received perfect or nearly perfect scores.

Exhibit 9-2

Children Identified to be in Need of Diagnostic Services for Speech and Language Comprehension<sup>a</sup>

| Speech and Language Comprehension Measures                                    | Pretested Children (Samples A and D) in: |                   |                   |                                  |
|---|--|-------------------|-------------------|----------------------------------|
|   | Greene or Humphreys Counties             | St. Clair County  | Mingo County      | All non-Bilingual Sites          |
| Any deficiency (either speech or language comprehension)                      | n 59/85<br>% 69.4                        | n 47/92<br>% 51.1 | n 39/53<br>% 73.6 | n 142/230 <sup>a</sup><br>% 63.0 |
| <u>Speech</u>   |  |                   |                   |                                  |
| Denver Articulation Screening Examination (DASE)                              | n 22/85<br>% 25.9                        | n 13/92<br>% 14.1 | n 12/52<br>% 23.1 | n 47/229<br>% 20.4               |
| Speech Quality (Physician(s) Developmental Quick Screen for Speech Disorders) | n 29/73<br>% 39.7                        | n 24/90<br>% 26.7 | n 21/46<br>% 45.7 | n 74/209<br>% 35.4               |
| Any Speech Deficiency (DASE or PDQ)   | n 39/85<br>% 45.9                        | n 28/92<br>% 30.4 | n 26/53<br>% 49.1 | n 93/230<br>% 40.4               |
| <u>Language Comprehension</u>   |  |                   |                   |                                  |
| Assessment of Children's Language Comprehension (ACLC)                        | n 41/85<br>% 48.2                        | n 27/87<br>% 31.0 | n 7/28<br>% 25.0  | n 75/221<br>% 33.9               |
| Sentence Repetition of Fluharty Screening Test for Preschool Children         | n 27/85<br>% 31.8                        | n 12/92<br>% 13.0 | n 28/52<br>% 53.8 | n 67/229<br>% 29.3               |
| Any Language Comprehension Deficiency (ACLC or Fluharty)                      | n 51/85<br>% 60.0                        | n 35/92<br>% 38.0 | n 29/53<br>% 54.7 | n 115/230<br>% 50.0              |

<sup>a</sup> Pretest data are not available for the bilingual site, Maricopa County.



by six months and then by a full year (see Exhibit 9-3 and Table 9-5) to determine whether maturation would make a difference. That is, if a 4-year-old were judged on 3-year-old level norms, would the speech or language deficiency "disappear." If so, Head Start might decide that, intervention for that child had a lower priority than intervention for some other child's problem.

It is evident that nearly a third of the children who were identified as deficient on the ACLC were within six months of having a non-deficient level of language comprehension, and over half were within a year of this level. However, nearly 90 percent of children screened as having articulation problems (DASE) were more than a year behind the reference standard, and nearly 80 percent of the children who were screened as deficient on the Flaharty were more than a year behind. These figures suggest that the

Exhibit 9-3

Children Identified To Be in Need of Diagnostic Services  
for Speech and Language Comprehension by Different  
Age Cutoffs Across Sites

| Any Deficiency                | Pretested Children (Samples A and D) in: |               |              |
|-------------------------------|--|---------------|--------------|
|                               | At Pretest                               | Six-Month Lag | One-Year Lag |
|                               | 63.0                                     | 52.2          | 46.1         |
| <u>Speech</u>                 |  |               |              |
| DASE                          | 20.5                                     | 17.9          | 17.9         |
| PDQ                           | 35.4                                     | 23.4          | 19.6         |
| Any                           | 40.4                                     | 31.7          | 28.7         |
| <u>Language Comprehension</u> |  |               |              |
| ACLC                          | 33.9                                     | 23.1          | 15.8         |
| Fluharty                      | 29.3                                     | 26.2          | 23.1         |
| Any                           | 50.0                                     | 38.8          | 30.9         |

Head Start program may want to focus attention on providing services to children who fail the articulation (DASE) and repetition (Fluharty) screens. These figures also indicate that the evaluation's battery of speech and language screens may be somewhat conservative and includes a proportion of children with speech and language deficiencies which are correctable through maturation.

Speech and Language Services Provided Through Head Start

The Head Start Performance Standards state that "during the course of the health screening, procedures must be in effect for identifying speech problems, determining their cause, and providing services." At posttest, data were abstracted from Head Start health records of children in the evaluation to determine what proportion had received a speech screen, was diagnosed to have a speech problem, and was referred for or received treatment. As shown in Exhibit 9-4, one out of three Head Start children had been screened for speech or language comprehension problems. Of the children who

Exhibit 9-4

Speech and Language Services Provided to  
Head Start Children According to Head Start Health Records

| Speech and Language Services   | Posttested Children (Samples A, B, and C) in: |                  |                 |              |                 |
|--|---|------------------|-----------------|--------------|-----------------|
|  | Greene or Humphreys Counties                  | St. Clair County | Maricopa County | Mingo County | All Sites       |
| Children screened  | n 50/127<br>% 39.4                            | 70/108<br>64.8   | 17/102<br>16.7  | 3/112<br>2.7 | 140/449<br>31.2 |
| Children with diagnosed speech or language comprehension problems (% of children screened) | n 12/50<br>% 24.0                             | 8/70<br>11.4     | 14/17<br>82.4   | 1/3<br>33.3  | 35/140<br>25.0  |
| Children who received services   | n 10/12<br>% 83.3                             | 3/8<br>37.5      | 13/14<br>92.9   | 1/1<br>100.0 | 27/35<br>77.1   |

were screened, 25 percent were diagnosed as having a speech and/or language comprehension problem; the majority of these children (77%) received remedial services. These data suggest that there is an urgent need for Head Start to improve its screening services, but that the program is generally successful in treating those few children who, when screened, are found to have problems. (As shown in Table 9-6 in the Appendix, there was a fairly high level of agreement between results of screens conducted by the Head Start Health Evaluation and findings recorded in the health records, particularly in identifying children with either a speech or language comprehension problem.)

There was considerable site variation in the proportion of children who were screened, were found to have speech problems, and were referred for or received treatment for such problems. In both St. Clair County and Greene and Humphrey Counties, a considerable percentage of Head Start children were screened. (In St. Clair, one out of four children were screened prior to entering Head Start.) A more selective process for screening seems to have been used in both Maricopa and Mingo Counties. What the data suggest is that Head Start classroom teachers (or parents) in these two sites identify children suspected of having speech and/or language comprehension problems and arrange for diagnostic screening only for those children. In Maricopa County, of the group that was screened, 82 percent of the children were, in fact, found to have a problem\*. Furthermore, children with speech problems in Maricopa and Mingo Counties were more likely to receive treatment than in the other sites.

Although St. Clair County Head Start screened more children than programs in other sites, it only arranged for treatment services for about one-third of children with problems. It is unclear whether this is due to lack of emphasis on such services or whether responsibility for following-up referrals is left to parents, who then fail to take their children for required treatment.

We also investigated whether certain special groups of Head Start children were more likely than others to have been screened for speech and language comprehension problems or to have received treatment. Several

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\*The theory of "selective screening" was confirmed in comparisons of children with speech problems who had or had not been screened, as illustrated in Exhibit 9-5. This emphasis appears strongest in Maricopa County and less so in Mingo County, where very few children were screened.

Exhibit 9-5

Comparison of Speech Findings for  
Head Start Children Screened and Not Screened<sup>a</sup>

| Type of Deficiency                                    | Posttested Children (Samples A, B, and C) in: |                     |                    |                 |                 |
|---|---|---------------------|--------------------|-----------------|-----------------|
|   | Greene or<br>Humphreys<br>Counties            | St. Clair<br>County | Maricopa<br>County | Mingo<br>County | All<br>Sites    |
| <u>Speech and/or<br/>Language Compre-<br/>hension</u> |   |                     |                    |                 |                 |
| Screened  | n<br>21/50<br>%<br>42.0                       | 34/70<br>48.6       | 9/17<br>64.3       | 2/3<br>66.7     | 66/140<br>48.2  |
| Not Screened  | n<br>34/77<br>%<br>44.2                       | 18/38<br>47.4       | 17/67<br>25.4*     | 56/109<br>51.4  | 125/291<br>43.0 |
| <u>Speech Problems</u>                                |   |                     |                    |                 |                 |
| Screened  | n<br>16/49<br>%<br>32.7                       | 22/70<br>31.4       | 5/17<br>35.7       | 1/2<br>50.0     | 44/135<br>32.6  |
| Not Screened  | *n<br>22/73<br>%<br>30.1                      | 14/38<br>36.8       | 12/64<br>18.8      | 43/103<br>41.7  | 91/278<br>32.7  |
| <u>Language<br/>Comprehension</u>                     |   |                     |                    |                 |                 |
| Screened  | n<br>13/50<br>%<br>26.0                       | 21/70<br>30.0       | 7/17<br>50.0       | 2/3<br>66.7     | 43/137<br>31.4  |
| Not Screened  | n<br>19/77<br>%<br>24.7                       | 11/38<br>28.9       | 9/67<br>13.4*      | 22/109<br>20.2* | 61/291<br>21.0* |

<sup>a</sup>Statistical significance indicated as \* for  $p = <.05$ .

significant results are evident. Most consistently, if a mother thinks that her child has a speech problem, Head Start is far more likely to provide speech services. Moreover, Head Start provides more speech services to children who are covered by medical insurance or who have easy access to medical care. There are also indications that children from families with the lowest family incomes and those who were born to teenaged mothers receive more speech services from Head Start. There is no evidence, however, that children from families with prior Head Start experience have fewer speech or

language comprehension problems (as shown in Table 9-7 in the Appendix). What the findings suggest is that Head Start is responsive to mothers' concerns about their children's speech or language comprehension, but tends to provide screens and services to children who are most easily served (see Exhibit 9-6 and Tables 9-8 through 9-10 in the Appendix). This suggests that Head Start is performing a critical service to low-income children, particularly in view of the fact that prevalence of potential problems is relatively high.

#### Speech and Language Services Provided Through Other Sources

As part of the medical history interview, mothers were asked whether the child had seen a doctor or speech therapist or received special training for a speech problem. If speech services were received, mothers were asked whether the services were provided through Head Start. Only very few children (three in St. Clair County, one in Maricopa County, and five in Mingo County) had received a speech exam through a source other than Head Start, and none received speech training other than through Head Start (see Exhibit 9-7).

#### Impact of Head Start on Remediation of Children's Speech and Language Comprehension Problems

Longitudinal Analyses. To determine whether Head Start services had an impact in remediating speech and language comprehension problems, we compared what proportion of the Head Start and non-Head Start children in the longitudinal sample (A) were identified to be in need of professional diagnostic services at both pretest and posttest. As is illustrated in Exhibit 9-8, 17 percent fewer Head Start than non-Head Start children across the three non-bilingual sites were identified as having any deficiency (speech and/or language comprehension) at both timepoints. A similar trend was evident within all non-bilingual sites. None of the group differences (either across or within sites) was statistically significant ( $p < .05$ ), however.

Exhibit 9-6

Summary of the Delivery of Head Start Speech and Language Services Provided to Special Groups of Children

|  | Greene & Humphreys Counties (n=206)  | St. Clair County (n=175) | Maricopa County (n=112)                             | Mingo County (n=168) | Across All Sites (n=661)   | Across All Non-Bilingual Sites (n=549)                                   |
|--|--------------------------------------|--------------------------|---|----------------------|--|--|
| Per capita income < \$1295 versus higher           |                                      |                          |   |                      | low income -> more screens (p < .01)                                       | low income -> more screens (p < .05)                                     |
| Mother's education < 12 years versus higher        |                                      |                          |   |                      |  |  |
| Mothers < 18 years at birth of child versus higher |                                      |                          | older mothers -> more treatment referrals (p = .05) |                      | older mothers -> more treatment/referrals (p < .05)                        |  |
| Mother reports speech problems versus not          | problem -> more screens (p < .05)    |                          | problem -> more screens (p < .001)                  |                      | problem -> more screens (p < .001) and more treatment/referrals (p < .01)  | problem -> more screens (p < .05) and more treatment/referrals (p < .05) |
| Medical insurance versus no medical insurance      | insurance -> fewer screens (p < .05) |                          |   |                      | insurance -> more screens (p < .05) and more treatment/referrals (p = .01) |  |
| Easy Access to medical care versus difficult       |                                      |                          |   |                      | easy access -> more screens (p = .05)                                      |  |
| Participate in subsidy program versus not          |                                      |                          |   |                      |  |  |

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Exhibit 9-7

Speech and Language Services Received Through Sources Other than Head Start According to Mother's Report

|  | Posttested Children (Samples A, B, and C) in: |                              |   |                          |                         |
|--|---|------------------------------|---|--------------------------|-------------------------|
|  | Greene or<br>Humphreys<br>Counties<br>n=219   | St. Clair<br>County<br>n=183 | Maricopa<br>County<br>n=164                   | Mingo<br>County<br>n=223 | All<br>Sites<br>n=789   |
| Child received<br>speech exam (n=789)                                  | n<br>14/219<br>%<br>6.4                       | n<br>8/183<br>%<br>4.4       | n<br>17/164<br>%<br>10.4                      | n<br>21/223<br>%<br>9.4  | n<br>60/789<br>%<br>7.6 |
| Speech exam pro-<br>vided by source<br>other than Head<br>Start (n=54) | n<br>0/14<br>%<br>0.0                         | n<br>3/8<br>%<br>37.5        | n<br>1/17<br>%<br>5.9                         | n<br>5/21<br>%<br>23.8   | n<br>9/60<br>%<br>15.0  |
| Child received<br>special speech<br>training (n=626)                   | n<br>8/52<br>%<br>15.4                        | n<br>1/188<br>%<br>0.5       | n<br><del>13/165</del><br>%<br><del>7.9</del> | n<br>5/221<br>%<br>2.3   | n<br>27/626<br>%<br>4.3 |
| Training provided<br>by source other<br>than Head Start<br>(n=27)      | n<br>0/8<br>%<br>0.0                          | n<br>0/1<br>%<br>0.0         | n<br>0/13<br>%<br>0.0                         | n<br>0/2<br>%<br>0.0     | n<br>0/27<br>%<br>0.0   |

In addition, we compared the proportion of children in the longitudinal sample found to have potential speech and/or language development deficiencies at posttest. Results, presented in Exhibit 9-9, again suggest that prevalence of potential speech and/or language deficiencies is lower in the Head Start group ( $p < .08$ ). With regard to specific types of problems, findings were not consistent from site to site, although they seem to confirm pretest/posttest results reported earlier. Results of regression analyses on language comprehension improvements by the longitudinal sample do not confirm hints of a Head Start impact alluded to above. (Results are presented in Table 9-11 and 9-12 in the Appendix.)

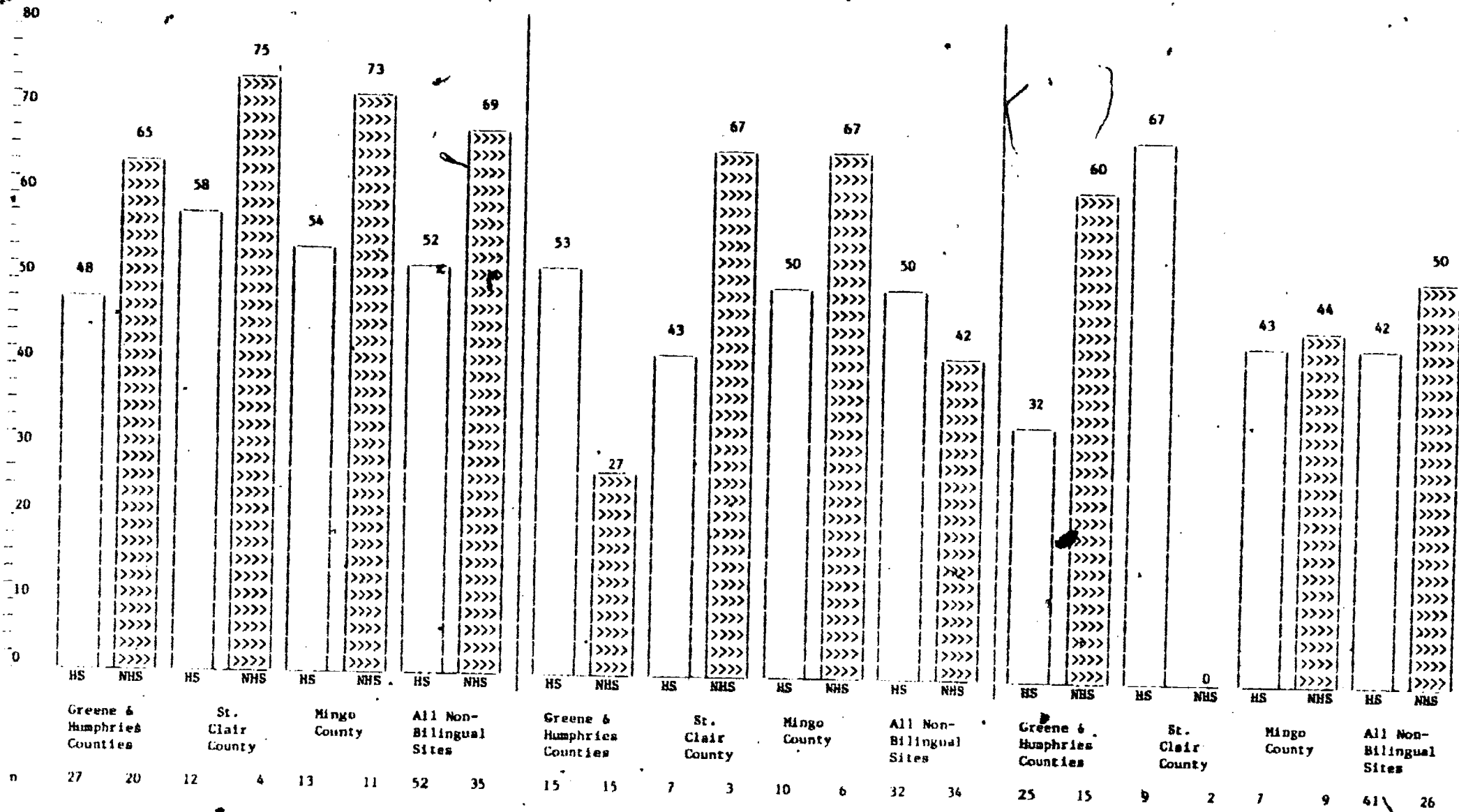
Exhibit 9-8

Proportion of Children with Potential Speech and Language Comprehension Deficiencies at Both Pretest and Posttest  
Longitudinal Sample A

Any Deficiency

Any Speech Deficiency

Any Language Comprehension Deficiency



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Exhibit 9-9

Proportion of Children with Speech and/or Language Comprehension Deficiencies at Posttest

| Posttest Scores                   | Longitudinal Children (Sample A) in: |           |                  |           |                 |           |              |           |           |           |       |
|-----------------------------------|--------------------------------------|-----------|------------------|-----------|-----------------|-----------|--------------|-----------|-----------|-----------|-------|
|                                   | Greene & Humphreys Counties          |           | St. Clair County |           | Maricopa County |           | Mingo County |           | All Sites |           |       |
|                                   | HS                                   | NHS       | HS               | NHS       | HS              | NHS       | HS           | NHS       | HS        | NHS       |       |
| Any deficiency                    | n                                    | 15/39     | 13/25            | 8/19      | 8/14            | 7/27      | 4/12         | 8/16      | 8/13      | 38/101    | 33/64 |
|                                   | %                                    | 38.5      | 52.0             | 42.1      | 57.1            | 25.9      | 33.3         | 50.0      | 61.5      | 37.6      | 51.6  |
|                                   |                                      | p = 0.287 |                  | p = 0.393 |                 | p = 0.635 |              | p = 0.534 |           | p = 0.078 |       |
| Speech deficiency                 | n                                    | 11/37     | 5/24             | 4/19      | 7/14            | 5/26      | 1/11         | 6/14      | 6/11      | 26/96     | 19/60 |
|                                   | %                                    | 29.7      | 20.8             | 21.1      | 50.0            | 19.2      | 9.1          | 42.9      | 54.5      | 27.1      | 31.7  |
|                                   |                                      | p = 0.440 |                  | p = 0.081 |                 | p = 0.444 |              | p = 0.561 |           | p = 0.539 |       |
| Language comprehension deficiency | n                                    | 9/39      | 10/25            | 7/19      | 4/14            | 5/27      | 3/12         | 4/16      | 4/13      | 25/101    | 21/64 |
|                                   | %                                    | 23.1      | 40.0             | 36.8      | 28.6            | 18.5      | 25.0         | 25.0      | 30.8      | 24.8      | 32.8  |
|                                   |                                      | p = 0.248 |                  | p = 0.618 |                 | p = 0.644 |              | p = 0.730 |           | p = 0.261 |       |

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Exhibit 9-10

Proportion of Children with Possible Speech and Language Comprehension Problems

| Speech and Language Comprehension Measures | Posttested Children (Samples A, B, and C) in: |        |                  |        |                 |       |              |        |           |         |         |
|--|---|--------|------------------|--------|-----------------|-------|--------------|--------|-----------|---------|---------|
|  | Greene & Humphreys Counties                   |        | St. Clair County |        | Maricopa County |       | Mingo County |        | All Sites |         |         |
|  | HS  | NHS    | HS               | NHS    | HS              | NHS   | HS           | NHS    | HS        | NHS     |         |
| Any Deficiency                             | n   | 55/127 | 42/95            | 50/106 | 42/80           | 26/81 | 13/46        | 61/118 | 70/105    | 192/432 | 167/326 |
|  | X   | 43.3   | 44.2             | 47.2   | 52.5            | 32.1  | 28.3         | 51.7*  | 66.7      | 44.4    | 51.2    |
| <u>Speech</u>                              |   |        |                  |        |                 |       |              |        |           |         |         |
| DASE (Articulation)                        | n   | 30/122 | 18/91            | 25/104 | 18/75           | 6/76  | 3/41         | 24/108 | 35/92     | 85/410  | 74/299  |
|  | X   | 24.6   | 19.8             | 24.0   | 24.0            | 7.9   | 7.3          | 22.2*  | 38.0      | 20.7    | 24.7    |
| PDQ (Speech Quality)                       | n   | 17/120 | 12/89            | 19/105 | 12/76           | 13/76 | 7/41         | 32/103 | 26/77     | 81/404  | 57/283  |
|  | X   | 14.2   | 13.5             | 18.1   | 15.8            | 17.1  | 17.1         | 31.1   | 33.8      | 20.0    | 20.1    |
| Any Speech Deficiency                      | n   | 38/122 | 22/92            | 34/106 | 25/77           | 17/78 | 8/42         | 47/112 | 52/95     | 136/418 | 107/306 |
|  | X   | 31.1   | 23.9             | 32.1   | 32.5            | 21.8  | 19.0         | 42.0   | 54.7      | 32.5    | 35.0    |
| <u>Language Comprehension</u>              |   |        |                  |        |                 |       |              |        |           |         |         |
| ACLIC (Auditory)                           | n   | 25/127 | 28/94            | 24/105 | 25/79           | 7/79  | 3/46         | 19/116 | 15/99     | 75/427  | 71/318  |
|  | X   | 19.7   | 29.8             | 22.9   | 31.6            | 8.9   | 6.5          | 16.4   | 15.2      | 17.6    | 22.3    |
| Fluharty (Expression)                      | n   | 12/126 | 14/95            | 13/106 | 12/80           | 13/79 | 5/44         | 16/118 | 28/105    | 54/429  | 59/324  |
|  | X   | 9.5    | 14.7             | 12.3   | 15.0            | 16.5  | 11.4         | 13.6*  | 26.7      | 12.6*   | 18.2    |
| Any language Comprehension Deficiency      | n   | 32/127 | 33/95            | 31/106 | 30/80           | 16/81 | 5/46         | 25/118 | 37/105    | 104/432 | 105/326 |
|  | X   | 25.2   | 34.7             | 29.2   | 37.5            | 19.8  | 10.9         | 21.2*  | 35.2      | 24.1*   | 32.2    |

\*Group differences are statistically significant ( $p < .05$ ).

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Cross-sectional Analyses. In the cross-sectional sample (A, B, and C), the proportion of children with possible speech and/or language comprehension problems was compared between the Head Start and non-Head Start groups. As illustrated in Exhibit 9-10, prevalence of any potential deficiency was somewhat lower in the Head Start group. This is primarily due to a significantly lower proportion of Head Start children identified as having language comprehension problems ( $p < .05$ ); group differences were evident for speech deficiencies.\*

Closer examination of the data and the particular problems children experienced shows some differences among sites. In two sites--St. Clair and Mingo Counties--the prevalence of speech deficiencies at both time points was lower for the Head Start group. The trend was reversed in Greene and Humphreys Counties. This finding is puzzling at first because Mingo County Head Start screened such a small proportion of enrolled children, as noted in Exhibit 9-7. Speech and language comprehension services are scarce or nonexistent in this area. In response, Head Start contracted with a speech pathologist from another community to provide needed services and to train Head Start classroom staff to screen and provide remedial services. In fact, a detailed manual was prepared for use by teachers to ensure services would be delivered to children in need, even after the retirement of the speech pathologist. Head Start's emphasis on teacher training clearly paid off in this site. It is a model that may be replicable in other communities experiencing difficulties arranging for speech and language development services.

Regression analyses confirmed these Mingo County findings: Head Start was significantly associated with higher scores in the DASE with fewer potential problems (Results are presented in Table 9-13 in the Appendix). The regression analyses also indicated that Head Start children in Greene and Humphreys Counties received higher scores in the three-critical-elements portion of the ACLC. The few significant Head Start effects that were found (42 regression analyses--for seven dependent variables in six-site combinations) might be due to chance. Moreover, the non-Head Start group in

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\*There is some question about the reliability of the pre/posttest findings. As shown in Table 9-12 in the Appendix, approximately 20 percent of the children with no deficiencies at pretest were found to have potential problems at posttest.

St. Clair county performed better in sentence repetition (Fluharty) than the Head Start children.\*

The picture is somewhat different with regard to language comprehension problems. In Greene and Humphreys Counties, the only full-day Head Start program in the study, there is evidence of a possible Head Start effect in remediating language comprehension problems. [Group differences approached significance ( $p = .08$ ).] This may suggest that full-day programs are more effective in remediating such problems, probably because children spend more time in the classroom. A similar trend was not found in any of the other sites; in fact, it was reversed in St. Clair County (where the number of children in the Head Start on non-Head Start group was extremely small).

### Conclusions

In general, there was high agreement between results of the Head Start Health Evaluation and those of the Head Start program on the presence of potential speech and language comprehension problems requiring professional diagnostic services. Analyses indicated that there is a high prevalence of potential speech and/or language comprehension problems (2 out of 3 children) before children are eligible to enter Head Start. However, only a third of the Head Start children in the posttest sample were screened for speech problems, and of those, one in five received a formal speech assessment and only 27 received services. Thus, it is not surprising that subsequent descriptive and regression analyses provided little evidence of a consistent Head Start effect.

Head Start children in the longitudinal sample who had a speech and/or language comprehension problem at pretest had fewer problems at posttest than did non-Head Start children; however, sample sizes for this analysis were small (87 children across all sites) and the differences were not statistically significant. Regression analyses indicated two areas in which Head Start may have had a significant effect. Head Start children in Greene and Humphreys Counties, the only site with a full-time (5 days/week, 6 hours/day) program, had higher scores on the 3-critical elements component of the ACLC

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\*Tables 9-14 through 9-19 present unadjusted comparison data between the Head Start and non-Head Start groups by site and age group for all speech and language comprehension measures.

( $p < .05$ ) and Head Start children in Mingo County, which provided special training to Head Start classroom staff to help them provide speech services, had higher scores on the DASE and fewer speech problems ( $p < .05$ ).

Thus, there is evidence that, even in the absence of comprehensive services, full day programs may be more successful in improving children's language comprehension. Moreover, it appears that Head Start classroom staff can be trained to be aware of articulation problems and to encourage children to speak more clearly. These findings, though limited to single programs, may be useful for all of Head Start, especially in areas where it is difficult to provide specialized speech services.

## CHAPTER TEN

### VISION EVALUATION

#### Vision Indicators

Many researchers believe that early detection of vision problems is an important indicator of possible later academic problems (particularly as regards reading). "If vision is poor", the American Optometric Association's Optometric Preventive Health Care Project Team's report states, "chances of success in the classroom are also poor" (American Optometric Association, 1980). Other researchers agree, though the opposite--that children who do well on vision perception tests also do well in reading achievement--cannot be clearly supported (Pierce, 1977).

With early detection of vision problems, treatment is possible; "early diagnosis and treatment can help prevent or reduce their impact on learning" (American Optometric Association, 1980). Myopia, for instance, in children past their first birthday should be corrected to prevent perceptual, intellectual or psychological problems. (Woodruff, 1975). Similarly, prevention of amblyopia and strabismus must be attempted as early as possible during the visual development (Backman, 1978). To detect and treat these conditions, professional visual examinations are recommended within the first six months of life. (Backman, 1978). In general, "prevention [of visual problems] is maximized when the population 'at risk' can be identified at the earliest time. . . (Woodruff, 1975).

A comprehensive vision examination was administered as part of the Head Start Health Evaluation, to assess the presence of actual or potential vision system impairment in each of the children. The vision exam occurred in a room that could be darkened and in which the lighting could be easily controlled by the examining optometrist. Several testing aides were used in the exam--a slide projector showing a cartoon for the pursuit test which assesses binocular integration, and slides showing a hand of different sizes which could be rotated for the visual acuity test.

The study employed two optometrists to collect the vision data across the four sites. These optometrists were selected because of their extensive experience in collecting vision data on young children in their private practices. One optometrist collected the vision data in Greene and Humphreys Counties and Maricopa County while the other collected the same data from St. Clair and Mingo Counties.

From the examination, seven variables were constructed for use in analyses. The variables document whether a child passed various portions of the examination; i.e. the examination determined presence or absence of a given problem. Each variable is described briefly in Exhibit 10-1.

It is important to note that the examinations for stereopsis, binocular integration, and visual acuity frequently did not produce reliable results because the children were too young to follow the instructions of the examiners. Hence prevalences of some deficiencies detected in the vision evaluation were related to age. Most of the unreliable data in the stereo acuity and binocularity tests come from children below 3.25 years of age. When the youngest children could respond to the examination, they generally passed it. Unidentified unreliability may account for some percentage of children who appear to be deficient in these areas.

The vision data were used to investigate four research questions:

- What is the prevalence of vision problems in Head Start and comparison children?
- What vision services do Head Start children receive?
- Do children receive vision services through sources other than Head Start?
- What are the impacts of the Head Start program with regard to remediation of the vision problems of Head Start participants?

The analytic techniques that were employed to address the research questions and the results of these analyses are described below.

#### Analysis of the Vision Data

Four types of analyses were undertaken to investigate vision status and services for Head Start and non-Head Start children. First, the distribution of the dependent variables was examined for outliers. No suspect data points were identified.

## Definitions of Vision Evaluation Measures

| <u>Measure</u>        | <u>Definition</u>   |
|-----------------------|---|
| Ocular-Motility       | (Eye Movement Control) Ability to maintain fixation on a moving target and/or the ability to accurately fixate on various targets. This skill allows easy shifting of the eyes along the lines of print in a book, a speedy and accurate return to the next line, effective scanning of vertical columns, and quick and accurate shift from desk to chart or chalkboard and vice versa. |
| Strabismus            | A type of inadequate eye teaming performance where both eyes are unable to simultaneously direct their gaze at the same point in space. This may occur intermittently, constantly, or alternating.  |
| Convergence           | Ability of the eyes to simultaneously direct gaze at the same near target in space.   |
| Retinoscopy           | A diagnostic method of determining the refractive error of the eye, hyperopia, myopia, or presence of astigmatism. A prescription for glasses can then be determined.   |
| Visual acuity         | The measurement of sharpness of sight. For example, 20/20 means that a target approximately 5/16ths of an inch in height was recognized at 20 feet.   |
| Stereopsis            | (Central depth perception) Ability to perceive three-dimensionality. This skill allows effective craft inspection, superior judgment of "me-it" relationships in athletic endeavors, sureness security in general movement.   |
| Binocular Integration | (Eye teaming ability) This visual skill allows simultaneous alignment and inspection for accurate and immediate symbol and object awareness. Difficulty in matching right and left eye fields may result in strabismus (one eye turns in or out), suppression (blocking out of the vision of one eye) and/or, task rejection (day-dreaming, avoidance behavior, etc.).                  |



Second, contingency-table analyses were used to compare the prevalence of vision problems among Head Start-eligible children. In the longitudinal sample, we examined what proportion of the children were determined to have vision problems at both pretest and posttest, as well as the proportion of children who had received remedial services through Head Start.

Third, regression analyses were run to examine the impact of Head Start in remediating seven vision problems: ocular-motility, strabismus, convergence, retinoscopy, visual acuity, stereopsis, and binocular integration. The analyses entered the variables in a fixed sequence into the regression model: first, all of the covariates, then the three effects-coded site variables, and finally the Head Start variable. After considering a variety of potentially important covariables (age, gender, race, per capita income, family employment status, and mother's education) and including only those that were significantly associated with at least three dependent variables, the final covariate set included:

- child's gender;
- child's race (black vs. non-black);
- mother's education.
- pretest score (longitudinal analyses).

Regressions were run for both the longitudinal and the cross-sectional samples of children.

### Summary of Findings

#### Prevalence of Vision Problems

Percentages of children who were found to have vision problems at pretest are presented in Exhibit 10-2. Across the four sites, 61 percent of the children were diagnosed to have one or more vision deficiencies. The most commonly identified problems were in the areas of stereo acuity, ocular-motility, stereopsis,\* and binocular integration.\* There were no important differences in prevalence of problems between males and females.

\*These estimates may be unreliable, as noted previously, particularly for young children who had difficulty following the instructions of examiners.

Exhibit 10-2

Prevalence of Vision Problems in Head Start-Eligible Children  
at Pretest

| Vision Problem                   |   | Pretest Children (Samples A & D) in: |                           |                         |                      |                    |
|----------------------------------|---|--------------------------------------|---------------------------|-------------------------|----------------------|--------------------|
|                                  |   | Greene & Humphreys Counties<br>n=95  | St. Clair County<br>n=113 | Maricopa County<br>n=95 | Mingo County<br>n=73 | All Sites<br>n=376 |
| Any Deficiency                   | n | 39/95                                | 83/113                    | 58/95                   | 49/73                | 229/376            |
|                                  | % | 41.1                                 | 73.5                      | 61.1                    | 67.1                 | 60.9               |
| Ocular-Motility                  | n | 29/95                                | 65/109                    | 44/95                   | 33/73                | 171/372            |
|                                  | % | 30.5                                 | 59.6                      | 46.3                    | 45.2                 | 46.0               |
| Stereopsis                       | n | 11/90                                | 20/81                     | 11/90                   | 14/60                | 56/321             |
|                                  | % | 12.2                                 | 24.7                      | 12.2                    | 23.3                 | 17.4               |
| Binocular Integration            | n | 1/85                                 | 14/93                     | 16/93                   | 22/58                | 53/329             |
|                                  | % | 1.2                                  | 15.1                      | 17.2                    | 37.9                 | 16.1               |
| Strabismus                       | n | 2/94                                 | 14/108                    | 9/93                    | 6/70                 | 31/365             |
|                                  | % | 2.1                                  | 13.0                      | 9.7                     | 8.6                  | 8.5                |
| Convergence                      | n | 4/94                                 | 12/108                    | 9/92                    | 9/70                 | 34/364             |
|                                  | % | 4.3                                  | 11.1                      | 9.8                     | 12.9                 | 9.3                |
| <u>Retinoscopy</u>               |   |                                      |                           |                         |                      |                    |
| Hyperopia                        | n | 3/89                                 | 7/107                     | 8/93                    | 11/70                | 29/359             |
|                                  | % | 3.4                                  | 6.5                       | 8.6                     | 15.7                 | 8.1                |
| Myopia                           | n | 0/89                                 | 4/107                     | 1/93                    | 0/70                 | 5/359              |
|                                  | % | 0                                    | 3.7                       | 1.1                     | 0                    | 1.4                |
| Astigmatism                      | n | 1/89                                 | 13/107                    | 12/93                   | 3/70                 | 29/359             |
|                                  | % | 1.1                                  | 12.1                      | 12.9                    | 4.3                  | 8.1                |
| Visual Acuity<br>( $\leq$ 20/40) | n | 3/89                                 | 5/107                     | 4/93                    | 2/70                 | 14/359             |
|                                  | % | 3.4                                  | 4.7                       | 4.3                     | 2.9                  | 3.9                |

There was considerable variation in the prevalence of vision deficiencies across the four sites. Using all of the vision evaluation measures, three out of four children in St. Clair County was diagnosed to have one or more vision deficiencies. In contrast, only 41 percent of the children in Greene and Humphreys Counties fell into this category; this site had the lowest prevalence of vision problems. There also were differences in the types of vision deficiencies that were diagnosed. Problems with ocular-motility, stereopsis, strabismus, myopia and visual acuity were more common in children in St. Clair County than in the other three sites. Mingo County children, on the other hand, were more likely to have problems with binocular integration, convergence and hyperopia.

Comparisons of vision problems among Head Start and non-Head Start children at pretest indicate only one statistically significant difference (among the 50 chi-squared tests that were calculated): Head Start children in Greene and Humphreys Counties had more stereo acuity problems than did non-Head Start children ( $p < .05$ ). However, there was no evidence that children in Head Start had a higher incidence of vision problems.

Published national reference data on vision performance for children aged three to five years do not exist. However, a recent statement by the American Academy of Ophthalmology to the Select Panel on the Promotion of Child Health (American Academy of Ophthalmology, 1981, Vol. 1, p. 28) reported that as many as 20 percent of American children of all ages suffer from visual acuity problems and an additional 5 to 7 percent have some form of eye disease. The National Health Examination Survey of 1963-65 also described the prevalence in children of certain vision deficiencies, particularly deficiencies in visual acuity, color discrimination, and phoria. However, the children in this survey were six years of age and older, so that survey results are not necessarily comparable to those obtained in the Head Start Health Evaluation. Nonetheless, the above prevalence data suggest that the level of vision deficiencies in study children (4% overall visual acuity prevalence) is considerably lower than that recently reported by the Select Panel for the Promotion of Child Health. However, when all problems are included, the proportion of children with problems is significantly higher. The data suggest preschool children need vision examinations so that problems can be identified and treatments begun, despite the difficulties of assessment for young children.

## Vision Services Provided through Head Start

Head Start health records provide information about whether Head Start children received a vision screen after entering Head Start, whether any problems were found and, if there were findings, whether Head Start provided treatment or a referral. As shown in Exhibit 10-3, slightly over half of the children across the four sites had received a vision screen according to the Head Start health records. Of the screened children, one out of ten were diagnosed to have a vision deficiency by more indepth testing. This finding is puzzling at first when compared to prevalence rates of vision problems reported earlier. The discrepancy is explained by the fact that Head Start screens only for visual acuity problems and obvious strabismus; no comprehensive vision screens are done on the children. Prevalence of these types of vision problems reported in Head Start health records is thus comparable to that found in the Head Start Health Evaluation. Less than one-third of the children identified by Head Start to have vision problems were referred for or received treatment.

Some Head Start programs did notably better than others in getting children screened for vision problems and arranging for more indepth testing and treatment services for those diagnosed to have a problem. Almost all children in Maricopa County received a vision screen, but only 13 percent of the children were referred for or received remedial treatment. St. Clair County Head Start referred no children for treatment. In contrast, Mingo County Head Start screened only one out of three children, but provided follow-up care to all children with vision problems (usually through assistance from the Lions Club). There also were some differences from site to site in the proportion of children whose records indicated a vision problem. The presence of problems was highest in Maricopa County (16%) and lowest in St. Clair County (4%).

We checked to see whether findings reported in the Head Start health records were in agreement with results of the Head Start Health Evaluation vision exam. Results are presented in Table 10-1 in the Appendix. Overall, there was agreement on only one-third of the children who were diagnosed to have vision problems. The Head Start vision screens turned up a substantial number (66%) of "false positives"--children deemed to have problems who

according to the more comprehensive exam were found not to have any deficiencies. Given that the initial screen was conducted by a paraprofessional, this may be a reasonable rate of overreferral. On the other hand, the Head Start vision screens resulted in 7% false negatives--children needing services who were mistakenly declined.

Exhibit 10-3

Vision Services Provided by Head Start According to Head Start Health Records

|                                |        | Greene & Humphreys Counties<br>n=127 | St. Clair County<br>n=108 | Maricopa County<br>n=102 | Mingo County<br>n=112 | All Sites<br>n=449 |
|--------------------------------|--------|--------------------------------------|---------------------------|--------------------------|-----------------------|--------------------|
| Received Vision Screen         | n<br>% | 52/127<br>40.9                       | 50/108<br>46.3            | 101/102<br>99.0          | 36/112<br>32.1        | 239/449<br>53.2    |
| Significant Findings on Screen | n<br>% | 5/52<br>9.6                          | 2/50<br>4.0               | 16/101<br>15.8           | 3/36<br>8.3           | 26/239<br>10.9     |
| Treatment/Referral Provided    | n<br>% | 3/5<br>60.0                          | 0/2<br>0                  | 2/16<br>12.5             | 3/3<br>100.0          | 8/26<br>30.8       |

These false screening results are a direct result of the way in which Head Start screens children. In all sites paraprofessional staff are used to do vision screens, rather than optometrists or ophthalmologists. Even though Head Start staff have received special training in vision screening, results of their screens are frequently incorrect. Consideration should be given to increasing the use of professionals to perform vision screens and to increasing the proportion of children screened. A number of vision problems currently go undiagnosed, which can have detrimental effects on children's educational attainment in Head Start and their later achievement in school. Consideration should also be given to improving the reporting mechanism for Head Start vision screens. As discussed in Chapter Two, the Program Information Record (PIR) is not a satisfactory tool. Despite the PIR instructions, the reported completion rates of "medical screens" are actually "medical examinations." The other medical screens, and their actual low rates of performance are not reported.

The prevalence of vision deficiencies was high: 61 percent of the children were diagnosed to have one or more vision problems at pretest. Data collected at posttest suggest that the pretest data overestimate prevalence of such problems by almost a factor of two, in part because optometrists encountered difficulties testing young children.

These comments indicate a need for Head Start to educate parents about the importance of remedial services for vision problems and the implications of withholding them in terms of the child's future. In addition, Head Start staff should follow-up with parents to ensure that needed services are obtained.

#### Vision Services Provided through Sources Other than Head Start

In the medical history interview, mothers in both Head Start and non-Head Start groups were asked whether their child had ever had a vision examination or vision therapy for various types of vision problems. According to these reports shown in Exhibit 10-4, across the four sites, 40 percent of the Head Start and 10 percent of the non-Head Start children had ever been screened for vision deficiencies. Vision exams for Head Start children, provided by a source other than Head Start were most common in Greene and Humphreys Counties, for over one-third of the Head Start children examined. In contrast, only 14 percent of the Head Start children examined in Mingo County received this examination outside of Head Start. Virtually all non-Head Start children examined received that examination through some other source. Within all sites, Head Start children received significantly more vision examinations.

#### Impacts of Head Start's Vision Services on Remediation of Children's Vision Problems

Longitudinal Analyses. Exhibit 10-5 shows the proportion of children in the longitudinal sample (A) diagnosed to have any vision deficiencies at posttest. Data are presented by two definitions: one resulting from the comprehensive vision examination of the Head Start Health Evaluation and

Exhibit 10-4

Vision Services Provided through Sources Other than Head Start According to Mothers' Report

| Vision Services                                  | Posttested Children (Samples A,B, and C) in: |              |                  |             |                 |             |              |              |             |               |
|--|--|--------------|------------------|-------------|-----------------|-------------|--------------|--------------|-------------|---------------|
|  | Greene & Humphreys Counties                  |              | St. Clair County |             | Maricopa County |             | Mingo County |              | All Sites   |               |
|  | HS<br>n=127                                  | NHS<br>n=101 | HS<br>n=108      | NHS<br>n=86 | HS<br>n=106     | NHS<br>n=61 | HS<br>n=119  | NHS<br>n=109 | HS<br>n=460 | NHS<br>n=357  |
| Received Vision Examination                      | n<br>38.0                                    | n<br>12.2**  | n<br>41.9        | n<br>4.8**  | n<br>41.8       | n<br>11.9** | n<br>37.2    | n<br>9.3**   | n<br>39.5   | n<br>9.5***   |
| Examination Provided by Non-Head Start Source    | n<br>34.8                                    | n<br>100.00  | n<br>27.3        | n<br>100.0  | n<br>28.9       | n<br>100.0  | n<br>14.3    | n<br>100.0   | n<br>28.7   | n<br>100.0*** |
| Vision Therapy Recommended for Strabismus        | n<br>28.6                                    | n<br>0.0     | n<br>40.0        | n<br>0      | n<br>25         | n<br>0      | n<br>25.0    | n<br>33.3    | n<br>30.0   | n<br>18.8     |
| Vision Therapy Provided by Non-Head Start Source | n<br>0                                       | n<br>0       | n<br>100.0       | n<br>0      | n<br>0          | n<br>0      | n<br>0       | n<br>100.0   | n<br>33.3   | n<br>100.0    |

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\*p < .05  
 \*\*p < .01  
 \*\*\*p < .001

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Proportion of Children with Vision Deficiencies at Posttest

| Vision Measures  | Longitudinal Children (Sample A) in: |           |                  |           |                 |           |              |           |           |           |        |
|--|--------------------------------------|-----------|------------------|-----------|-----------------|-----------|--------------|-----------|-----------|-----------|--------|
|  | Greene & Humphreys Counties          |           | St. Clair County |           | Maricopa County |           | Mingo County |           | All Sites |           |        |
|  | HS                                   | NHS       | HS               | NHS       | HS              | NHS       | HS           | NHS       | HS        | NHS       |        |
| Any Deficiency (Head Start Health Evaluation Definition) | n                                    | 8/ 43     | 6/ 31            | 7/ 25     | 6/ 16           | 19/ 40    | 11/ 16       | 4/ 18     | 6/ 17     | 38/126    | 29/ 80 |
|  | %                                    | 18.6      | 19.4             | 28.0      | 37.5            | 47.5      | 68.8         | 22.2      | 35.3      | 30.2      | 36.3   |
|  |                                      | p = 0.935 |                  | p = 0.524 |                 | p = 0.150 |              | p = 0.630 |           | p = 0.363 |        |
| Any Deficiency (Head Start Definition)                   | n                                    | 2/ 43     | 2/ 31            | 2/ 25     | 1/ 17           | 6/ 40     | 2/ 16        | 2/ 18     | 2/ 17     | 12/126    | 7/ 81  |
|  | %                                    | 4.7       | 6.5              | 8.0       | 5.9             | 15.0      | 12.5         | 11.1      | 11.8      | 9.5       | 8.6    |
|  |                                      | p = 0.735 |                  | p = 0.794 |                 | p = 0.809 |              | p = 0.952 |           | p = 0.830 |        |
| Child Received Vision Exam                               | n                                    | 20/ 43    | 16/ 30           | 16/ 24    | 13/ 17          | 25/ 38    | 12/ 16       | 13/ 17    | 13/ 18    | 74/122    | 54/ 81 |
|  | %                                    | 46.5      | 53.3             | 66.7      | 76.5            | 65.8      | 75.0         | 76.5      | 72.2      | 60.7      | 66.7   |
|  |                                      | p = 0.566 |                  | p = 0.497 |                 | p = 0.506 |              | p = 0.774 |           | p = 0.385 |        |

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the other coinciding with vision problems that Head Start screens for visual acuity and obvious strabismus. There was a significant drop in the prevalence of vision problems according to the Head Start Health Evaluation definition from 61 percent at pretest for both groups to 30 percent in the Head Start and 36 percent in the non-Head Start group across the four sites. Prevalence of vision deficiencies according to Head Start's definition, however, remained virtually unchanged. The decrease in prevalence in all likelihood was caused by unreliable pretest data on some vision measures, particularly for very young children, as discussed earlier in this chapter. This is supported by data presented in Table 10-2 in the Appendix, which shows that 50 percent of the Head Start and 79 percent of the non-Head Start children diagnosed to have a vision deficiency at pretest were not found to have problems at posttest. It is highly unlikely that an actual decrease in vision problems occurred because, unlike with other health problems, they are difficult to remedy. Even if glasses were prescribed and the child was wearing them, a vision problem still probably would have been noted for the child.

In all sites, the proportion of children with any deficiency (according to our definition) was lower for the Head Start than non-Head Start group at posttest. Group differences were not statistically significant, however, either across or within sites. A similar trend was not evident with regard to vision deficiencies defined by Head Start which showed inconsistent results from site to site. Thus, there appears to be no positive Head Start effect.

Cross-sectional Analyses. The proportion of vision deficiencies diagnosed at posttest in the cross-sectional sample is presented in Exhibit 10-5. Approximately one-third of the children in both the Head Start and non-Head Start groups were found to have vision deficiencies. Children in Maricopa County were much more likely to have vision problems than children in the other three sites. The profile of vision deficiencies found is similar to those presented for the pretest sample (see Exhibit 10-2). Problems with binocular integration, ocular-motility and stereopsis were most common in both groups of children.\* A series of regression analyses were

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\*Tables 10-3 and 10-4 in the Appendix provides more detailed information on vision problems of children in the cross-sectional sample.

Exhibit 10-6

Prevalence of Vision Deficiencies at Posttest<sup>a</sup>

| Vision Deficiencies   | Posttested Children (Samples A, B, and C) are: |                |                  |                 |                 |                |              |               |             |                |           |               |           |                |           |                |           |                 |           |                 |
|-----------------------|--|----------------|------------------|-----------------|-----------------|----------------|--------------|---------------|-------------|----------------|-----------|---------------|-----------|----------------|-----------|----------------|-----------|-----------------|-----------|-----------------|
|                       | Greene & Humphreys Counties                    |                | St. Clair County |                 | Maricopa County |                | Mingo County |               | All Sites   |                |           |               |           |                |           |                |           |                 |           |                 |
|                       | HS<br>n=127                                    | NHS<br>n=101   | HS<br>n=108      | NHS<br>n=86     | HS<br>n=106     | NHS<br>n=61    | HS<br>n=119  | NHS<br>n=109  | HS<br>n=460 | NHS<br>n=357   |           |               |           |                |           |                |           |                 |           |                 |
| Any deficiency        | n<br>26.8                                      | 34/127<br>26.8 | n<br>24.2        | 24/99<br>24.2   | n<br>28.3       | 30/106<br>28.3 | n<br>32.5    | 27/83<br>32.5 | n<br>51.9   | 55/106<br>51.9 | n<br>61.7 | 37/60<br>61.7 | n<br>21.2 | 25/118<br>21.2 | n<br>27.6 | 29/105<br>27.6 | n<br>31.5 | 144/457<br>31.5 | n<br>33.7 | 117/347<br>33.7 |
| Ocular Motility       | n<br>3.1                                       | 4/127<br>3.1   | n<br>4.0         | 4/100<br>4.0    | n<br>35.2       | 37/105<br>35.2 | n<br>28.6    | 24/84<br>28.6 | n<br>14.4   | 15/104<br>14.4 | n<br>15.0 | 9/60<br>15.0  | n<br>37.3 | 44/118<br>37.3 | n<br>35.2 | 37/105<br>35.2 | n<br>22.0 | 100/454<br>22.0 | n<br>21.2 | 76/360<br>21.2  |
| Stereopsis            | n<br>18.9                                      | 24/127<br>18.9 | n<br>8.4*        | 8/95<br>8.4*    | n<br>26.7       | 27/101<br>26.7 | n<br>21.1    | 16/76<br>21.1 | n<br>14.2   | 15/106<br>14.2 | n<br>15.0 | 9/60<br>15.0  | n<br>20.7 | 23/111<br>20.7 | n<br>21.6 | 22/102<br>21.6 | n<br>20.0 | 89/445<br>20.0  | n<br>16.5 | 55/333<br>16.5  |
| Binocular Integration | n<br>25.2                                      | 32/127<br>25.2 | n<br>23.5        | 20/85<br>23.5   | n<br>17.1       | 18/105<br>17.1 | n<br>27.5    | 22/80<br>27.5 | n<br>34.6   | 36/104<br>34.6 | n<br>50.0 | 30/60<br>50.0 | n<br>27.4 | 31/113<br>27.4 | n<br>24.2 | 24/99<br>24.2  | n<br>26.1 | 117/449<br>26.1 | n<br>29.6 | 96/324<br>29.6  |
| Strabismus            | n<br>5.5                                       | 7/127<br>5.5   | n<br>13.0*       | 13/100<br>13.0* | n<br>4.7        | 5/106<br>4.7   | n<br>10.7    | 9/84<br>10.7  | n<br>15.1   | 16/106<br>15.1 | n<br>16.7 | 10/60<br>16.7 | n<br>5.9  | 7/119<br>5.9   | n<br>5.7  | 6/106<br>5.7   | n<br>7.6  | 35/458<br>7.6   | n<br>10.9 | 38/350<br>10.9  |
| Convergence           | n<br>1.6                                       | 2/127<br>1.6   | n<br>3.0         | 3/100<br>3.0    | n<br>10.4       | 11/106<br>10.4 | n<br>9.5     | 8/84<br>9.5   | n<br>1.9    | 2/106<br>1.9   | n<br>3.3  | 2/60<br>3.3   | n<br>7.6  | 9/119<br>7.6   | n<br>6.7  | 7/105<br>6.7   | n<br>5.2  | 124/458<br>5.2  | n<br>5.7  | 120/349<br>5.7  |
| Retinoscopy           |  |                |                  |                 |                 |                |              |               |             |                |           |               |           |                |           |                |           |                 |           |                 |
| Hyperopia             | n<br>0.8                                       | 1/124<br>0.8   | n<br>1.0         | 1/97<br>1.0     | n<br>8.6        | 9/105<br>8.6   | n<br>1.3*    | 1/80<br>1.3*  | n<br>5.8    | 6/104<br>5.8   | n<br>3.3  | 2/60<br>3.3   | n<br>9.6  | 11/115<br>9.6  | n<br>9.8  | 10/102<br>9.8  | n<br>6.0  | 127/448<br>6.0  | n<br>4.1  | 14/339<br>4.1   |
| Astigmatism           | n<br>2.4                                       | 3/127<br>2.4   | n<br>4.0*        | 4/101<br>4.0*   | n<br>15.1       | 16/106<br>15.1 | n<br>14.3    | 12/84<br>14.3 | n<br>12.3   | 13/106<br>12.3 | n<br>18.0 | 11/61<br>18.0 | n<br>5.5  | 6/109<br>5.5   | n<br>12.5 | 12/96<br>12.5  | n<br>8.5  | 38/448<br>8.5   | n<br>11.4 | 39/347<br>11.4  |
| Visual Acuity         | n<br>1.6                                       | 2/125<br>1.6   | n<br>1.1         | 1/91<br>1.1     | n<br>3.2        | 3/93<br>3.2    | n<br>3.0     | 2/66<br>3.0   | n<br>1.0    | 1/104<br>1.0   | n<br>1.7  | 1/59<br>1.7   | n<br>3.8  | 4/105<br>3.8   | n<br>5.5  | 5/91<br>5.5    | n<br>2.3  | 110/477<br>2.3  | n<br>2.9  | 9/307<br>2.9    |

<sup>a</sup> Significance indicated as \* for  $p < .05$ .

performed to determine whether differences between the Head Start and non-Head Start groups were statistically significant. Results of these analyses (presented in Tables 10-5 and 10-6) showed only one significant difference (most likely due to chance): Head Start children in Greene and Humphreys Counties were more often deficient in stereopsis than non-Head Start children in that site.

### Conclusions

The prevalence of vision deficiencies was high: 61 percent of the children were diagnosed to have one or more vision problems at pretest. There are strong indications that these pretest figures overestimate prevalence of such problems by almost a factor of two, in large part because examining optometrists encountered difficulties with young children.

Head Start is instrumental in providing vision screens for enrolled children. Almost four times as many Head Start as non-Head Start children had ever been screened. Some Head Start programs did notably better than others in getting children screened and arranging for treatment.

There is room for considerable improvement in all of the sites. Discrepancies were found between the results of the Head Start Health Evaluation exam and findings reported in the Head Start health records in terms of children diagnosed to have visual acuity problems or obvious strabismus (which is what Head Start screens are designed to detect), in part because all sites rely on paraprofessionals to do the screens. As a result, vision problems of a number of children, which can have a detrimental effect on children's educational attainment, go undiagnosed. There was no evidence that the screens provided by Head Start lowered the prevalence of vision problems or that more Head Start than non-Head Start children received needed treatment for vision problems. However, according to the results of this evaluation, three- and four-year-olds may have more vision problems than previously suspected.

## CHAPTER ELEVEN

### HEARING EVALUATION

#### Hearing Indicators

A major challenge to the Head Start Health Evaluation was to collect reliable hearing data on children aged three to six. Collecting hearing data on children of this age requires reliability in both procedures and equipment. Children can fail hearing evaluations for many reasons, including lack of cooperation and maturational ability. Because skill and experience with testing young children were considered essential, experienced audiologists from Children's Hospital of Pittsburgh and the University of Pittsburgh School of Medicine conducted the hearing evaluation.

Reliable equipment, which was transportable was also a major issue for the hearing evaluation. For purposes of the evaluation, it was important to be able to distinguish between equipment unreliability and hearing impairment associated with upper respiratory infections and otitis media. Therefore, the hearing evaluation combined audiometric testing at four frequency levels (500, 1000, 2000, and 4000 Hz) and tympanometry, in conjunction with a pediatric evaluation that assessed the presence of serous or recurrent otitis media. The dependent variables that emerged from these evaluations are described briefly in Exhibit 11-1.

The hearing evaluation aimed to describe the health status of the children in terms of past and present hearing deficiencies. The hearing evaluation for the Head Start Health Evaluation was designed to address the following questions:

- What is the prevalence of hearing problems in Head Start - eligible children?
- What hearing services do Head Start children receive through Head Start?
- Do children receive hearing services through sources other than Head Start?
- What are the impacts of Head Start in remediating hearing problems of Head Start children?

Analyses and findings for each of these questions are described below.

Exhibit 11-1

Hearing Measures

| Variable   | Description   |
|--|---|
| Audiometry   |   |
| Hearing deficiency in speaking range                           | Failure in either ear at 500 Hz (25 dB threshold), 1000 Hz (20 dB threshold), or 2000 Hz (20 dB threshold)  |
| Hearing deficiency at 4000 Hz                                  | Failure in either ear at 4000 Hz (25 dB threshold)  |
| Tympanometry   |   |
| Deficiency in middle-ear impedance                             | Failure in tympanometry examination in either ear; that is, the tympanometric chart gives no evidence of peak in at least one ear.                                  |
| Otitis Media   | Pediatric examination showed evidence of serous or recurrent otitis media.  |
| Audiometry and Tympanometry                                    | Failure in either ear at 500 Hz (25 dB threshold)... <u>and</u> tympanometric chart gives no evidence of peak in same ear.  |
| Audiometry and Serous or Recurrent Otitis Media                | Failure in either ear at 500 Hz (25 dB threshold), <u>and</u> clinical assessment of serous or recurrent otitis media   |
| Audiometry, Tympanometry, and Serous or Recurrent Otitis Media | Failure in either ear at 500 Hz (25 dB threshold), <u>and</u> tympanogram failure in same ear <u>and</u> no clinical assessment of serous or recurrent otitis media |
| Audiometry Failure in Both Ears                                | Failure within speaking range in both ears at either pretest or posttest  |

## Analyses of Hearing Data

The hearing evaluations were analyzed to determine the prevalence of hearing deficiency of each type within each site. The percentage of children who had a hearing deficiency in the speaking range, a hearing deficiency at B4 Hearing

4000 Hz, a middle-ear impedance failure, and/or a history of otitis media was determined. The prevalence figures do not include data for children with incomplete test results on a particular hearing measure. Therefore, because children with a deficiency are likely to have more incomplete data, the estimates of hearing problems are probably conservative.

Relationships between background variables, hearing problems, and Head Start services were investigated using multiple regression techniques. The final regression model included the following covariates:

- child's age
- child's gender
- child's race (black vs. non-black)
- mother's education, and
- family's employment status.

The covariables associated with at least three of the dependent variables in either the across- or within-site analyses were included. Analyses were structured to enter the variables into the regression model in a fixed sequence: first all of the covariates, then the three effects-coded site variables, and finally the Head Start variable.

Site differences were estimated using effects-coded site variables. Regression analyses examined the six major dependent variables (hearing loss in the speaking range; hearing loss at 4000 Hz; tympanogram; otitis media; hearing loss and tympanogram failure; hearing loss and otitis media).

Analyses of service data used contingency table analyses and chi-squared tests to investigate differences in hearing services provision to Head Start and comparison children and to special groups of children within Head Start. Because little services data were available, these analyses were limited in scope.

## Summary of Findings

### Prevalence of Hearing Problems

The prevalence of hearing problems in the children evaluated at pretest, as shown in Exhibit 11-2, was high. Almost one-third of the children were diagnosed as having some level of hearing loss; 14 percent had otitis media; and 4 percent had both otitis media and hearing loss. Caution should be used, however, in interpreting these prevalence data.

The pretest data may overstate the magnitude of hearing problems, particularly with regard to hearing loss, by as much as a factor of three. The Select Panel for the Promotion of Child Health (1981, Vol. 1, p.28) estimates that approximately 10 percent of all children have a hearing deficit. Their estimate is quite similar to prevalence data obtained in the Head Start Health Evaluation posttest. (Results of these analyses are presented in a later section of this Chapter.) These prevalence rates particularly at pretest, do suggest an expected rate of test failure for children of this age group. They may not, however, provide a reliable estimate of rates of hearing loss in these children.

The differences in terms of hearing problems between pretest and posttest were investigated thoroughly. In large part, they appear to be attributable to the young age of children at the time of pretest examination. No national study has ever studied or reported hearing levels of children less than six years of age because it is difficult to obtain complete or reliable data on younger children. (The Health Examination Survey of 1963-65 which tested hearing levels of adults and children six years or older reported a high incidence of missing or unreliable data for six- and seven-year olds.) At pretest, a large number of children failed the hearing evaluation because of their inability or unwillingness to respond appropriately to the testing situation.

There was considerable site-to-site variation in prevalence rates of hearing problems at pretest. Children in Greene and Humphreys Counties and in Mingo County consistently failed the audiometry and tympanometry tests more frequently than did children in St. Clair or Maricopa Counties. Prevalence rates were not associated with the gender of the child. However, significant racial differences emerged for the tympanometry: failures of white children were over twice the rate of both black and Hispanic children.

Exhibit 11-2

Prevalence of Hearing Problems for Head Start-Eligible Children

| Hearing Problems                                    | Pretested (Samples A and D) Children in: |                           |                         |                         |                           |
|---|--|---------------------------|-------------------------|-------------------------|---------------------------|
|   | Greene & Humphreys Counties<br>n=95      | St. Clair County<br>n=113 | Maricopa County<br>n=95 | Mingo County<br>n=73    | All Sites<br>n=376        |
| Any Hearing Loss                                    | n<br>40/79<br>%<br>50.6                  | n<br>18/99<br>%<br>18.2   | n<br>26/90<br>%<br>28.9 | n<br>22/58<br>%<br>37.9 | n<br>106/326<br>%<br>32.5 |
| Hearing Loss in Speaking Range (500, 1000, 2000 Hz) | n<br>34/72<br>%<br>47.2                  | n<br>14/97<br>%<br>14.4   | n<br>21/86<br>%<br>24.4 | n<br>17/48<br>%<br>35.4 | n<br>86/303<br>%<br>28.4  |
| Hearing Loss at 4000 Hz                             | n<br>24/74<br>%<br>32.4                  | n<br>7/97<br>%<br>7.2     | n<br>12/88<br>%<br>13.6 | n<br>8/52<br>%<br>15.4  | n<br>51/311<br>%<br>16.4  |
| Deficiency in Middle-Ear Impedance                  | n<br>36/80<br>%<br>45.0                  | n<br>28/107<br>%<br>26.2  | n<br>15/92<br>%<br>16.3 | n<br>27/67<br>%<br>40.3 | n<br>106/346<br>%<br>30.6 |
| Otitis Media <sup>a</sup>                           | n<br>13/95<br>%<br>13.7                  | n<br>15/112<br>%<br>13.4  | n<br>13/93<br>%<br>14.0 | n<br>12/73<br>%<br>16.4 | n<br>53/373<br>%<br>14.2  |
| Hearing Loss and Deficiency in Impedance            | n<br>18/67<br>%<br>26.9                  | n<br>8/95<br>%<br>8.4     | n<br>6/86<br>%<br>7.0   | n<br>9/44<br>%<br>20.5  | n<br>41/292<br>%<br>14.0  |
| Hearing Loss and Otitis Media                       | n<br>4/73<br>%<br>5.5                    | n<br>1/96<br>%<br>1.0     | n<br>5/87<br>%<br>5.7   | n<br>3/48<br>%<br>6.3   | n<br>13/304<br>%<br>4.3   |

<sup>a</sup> Combination of prevalence of serous otitis media and recurrent otitis media (see Exhibit 3-2).



## Hearing Services Provided Through Head-Start\*

The Head Start Performance Standards state that the "health screening shall include . . . hearing testing [and] treatment and followup services [should be obtained] . . . for all problems detected." Data were obtained from Head Start health record abstracts following the posttest evaluation concerning hearing tests, deficiencies detected, and referrals for or treatment of deficiencies. Data are presented in Exhibit 11-3.

Across the four sites, 61 percent of the Head Start children received tests for hearing deficiencies, although this varied tremendously from site to site. Head Start programs in Maricopa and Mingo Counties tested almost all of the enrolled children. In contrast, only 37 percent of children in Greene and Humphreys Counties and approximately half of the children in St. Clair were tested. St. Clair is the only site in which a considerable proportion of the hearing tests were conducted prior to Head Start entry. The test was part of a health examination which children are required to obtain before Head Start enrollment in that program. Only ten percent of the children were diagnosed as having hearing problems, according to the records. Almost all of these children were referred for treatment, except in St. Clair County where no referrals were made.

The posttest findings of the Head Start Health Evaluation indicate that the Head Start hearing tests detected many of the same children to have hearing problems (see Table 11-1 in the Appendix).

### Impacts of Head Start on Remediation of Children's Hearing Problems

Longitudinal Analyses. A very limited set of analyses were conducted on the longitudinal sample (A) to determine whether Head Start had an impact on remediation of hearing problems, in large part because the pretest data were deemed to overestimate prevalence of such deficiencies. A comparison of the proportion of children with hearing problems at both pretest and posttest and those with an incidence of hearing problems between pretest and posttest is shown in Exhibit 11-4. The majority of children for whom

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\*No data are available about hearing tests/services provided to non-Head Start children or to Head Start children through non-Head Start sources.

Exhibit 11-3

Hearing Services Provided by Head Start According to  
Head Start Health Records

| Hearing Services               | Posttest Head Start Children (Samples A, B, C) in: |                                      |                           |                          |                       |                    |
|--------------------------------|--|--------------------------------------|---------------------------|--------------------------|-----------------------|--------------------|
|                                |  | Greene & Humphreys Counties<br>n=127 | St. Clair County<br>n=108 | Maricopa County<br>n=102 | Mingo County<br>n=112 | All Sites<br>n=449 |
| Received Test                  | n<br>%   | 45/127<br>35.4                       | 45/108<br>41.7            | 10/102<br>9.9            | 84/112<br>75.0        | 275/449<br>61.2    |
| Significant Hearing Findings   | n<br>%   | 3/45<br>6.7                          | 2/45<br>4.4               | 12/101<br>11.9           | 10/84<br>11.9         | 27/275<br>9.8      |
| Hearing Referral for Treatment | n<br>%   | 3/3<br>100.0                         | 0/2<br>0.0                | 9/12<br>75.0             | 10/10<br>100.0        | 22/27<br>81.5      |

Exhibit 11-4

Percentages of Children in Longitudinal Sample (Sample A) who Failed Posttest and Either Failed or Passed Pretest

| Hearing Problem   | Failed Posttest/<br>Failed Pretest | Failed Posttest/<br>Passed Pretest |
|---|------------------------------------|------------------------------------|
| Hearing loss in either ear within speaking range                | 6/48<br>12.5                       | 9/121<br>7.4                       |
| Failure on tympanometric examination of either ear              | 12/57<br>21.1                      | 4/124<br>3.2                       |
| Hearing loss at 500 Hz and serous or recurrent otitis media     | 1/9<br>11.1                        | 2/160<br>1.3                       |
| Failure on tympanometric examination and hearing loss at 500 Hz | 1/21<br>4.8                        | 7/132<br>5.3                       |
| Serous or recurrent otitis media                                | 8/30<br>26.7                       | 10/176<br>5.7                      |
| Any deficit in speaking range                                   | 9/60<br>15.0                       | 11/122<br>9.0                      |

problems were noted at pretest were not found to have problems at posttest (Table 11-2). However, children with problems at posttest more often also had been diagnosed as having problems at pretest. (This finding suggests that error in the pretest was largely in the direction of false positives rather than false negatives.) Reductions in hearing loss are clinically not possible; yet there was a significant decrease in such deficiencies from pretest to posttest.

Cross-Sectional Analyses. Information concerning hearing deficiencies of children in the cross-sectional sample are presented in Exhibit 11-5 and Tables 11-2 through 11-4 in the Appendix. Only 12 percent of the children in both the Head Start and non-Head Start group were diagnosed to have any hearing loss. Deficiencies in middle-ear impedance or the presence of otitis media was about the same for both groups of children. With the exception of lower prevalence of middle-ear impedance in the non-Head Start group in Maricopa County, none of the group differences were statistically significant. Results of regression analyses (reported in Table 11-5) confirm that Head Start did not have an effect on any hearing outcomes, with the possible exception of provision of hearing screens and treatment on which no data were obtained for the non-Head Start group.

Finally, we investigated whether special groups of children were more likely to have been screened for hearing deficiencies than others. Because almost all children in Maricopa and Mingo Counties had been screened, these two sites were excluded from these analyses. Analyses yielded two results: (1) children who were reported to have ear infections (or a history) by their mothers were more likely to be screened; and (2) screens were more common for families not covered by medical insurance, which suggests that Head Start targets services to children most in need or who would otherwise not receive them.

#### Conclusions

The prevalence of hearing problems was twice as high at pretest than at posttest--a finding that may be related to difficulties in testing the hearing of young children. Prevalence of hearing impairments at posttest was 12 percent, which is similar to other national estimates of children's hearing problems. The incidence of serous or recurrent otitis media was 14 percent for the Head Start and 12 percent for the non-Head Start group.

Prevalence of Hearing Problems for Head Start and Non-Head Start Children  
in the Cross-Sectional Posttest Sample (A, B, C)

|   |        | Greene & Humphreys Counties |               | St. Clair County |               | Maricopa County |                          | Mingo County   |                | All Sites      |                |
|---|--------|-----------------------------|---------------|------------------|---------------|-----------------|--------------------------|----------------|----------------|----------------|----------------|
|   |        | HS<br>n=127                 | NHS<br>n=101  | HS<br>n=108      | NHS<br>n=86   | HS<br>n=106     | NHS<br>n=61              | HS<br>n=119    | NHS<br>n=109   | HS<br>n=460    | NHS<br>n=357   |
| Any Hearing Loss                                    | n<br>% | 16/124<br>12.9              | 14/90<br>15.6 | 15/105<br>14.3   | 11/75<br>14.7 | 7/105<br>6.7    | 4/60<br>6.7              | 16/119<br>13.4 | 9/105<br>8.6   | 54/453<br>11.9 | 38/330<br>11.5 |
| Hearing Loss in Speaking Range (500, 1000, 2000 Hz) | n<br>% | 13/123<br>10.6              | 13/90<br>14.4 | 12/101<br>11.9   | 10/75<br>13.3 | 7/105<br>6.7    | 3/59<br>5.1              | 15/117<br>12.8 | 9/104<br>8.7   | 47/446<br>10.5 | 35/328<br>10.7 |
| Hearing Loss at 4000 Hz                             | n<br>% | 9/124<br>7.3                | 8/90<br>8.9   | 9/103<br>8.7     | 6/75<br>8.0   | 6/105<br>5.7    | 4/59<br>6.8              | 15/117<br>12.8 | 8/104<br>7.7   | 39/449<br>8.7  | 26/328<br>7.9  |
| Deficiency in Middle-Ear Impedance                  | n<br>% | 5/105<br>4.8                | 10/85<br>11.8 | 11/99<br>11.1    | 7/69<br>10.1  | 10/104<br>9.6   | 1/60<br>1.7 <sup>a</sup> | 24/113<br>21.2 | 16/109<br>14.7 | 50/421<br>11.9 | 34/323<br>10.5 |
| Otitis Media <sup>b</sup>                           | n<br>% | 18/127<br>14.2              | 10/101<br>9.9 | 13/108<br>12.0   | 13/86<br>15.1 | 16/106<br>15.1  | 6/61<br>9.8              | 16/119<br>13.4 | 12/109<br>11.0 | 63/460<br>13.7 | 41/357<br>11.5 |
| Hearing Loss at 500 Hz and Deficiency in Impedance  | n<br>% | 4/104<br>3.8                | 6/78<br>7.7   | 7/94<br>7.4      | 5/62<br>8.1   | 4/104<br>3.8    | 0/59<br>0.0              | 13/111<br>11.7 | 8/104<br>7.7   | 28/413<br>6.8  | 19/303<br>6.3  |
| Hearing Loss at 500 Hz and Otitis Media             | n<br>% | 3/124<br>2.4                | 3/90<br>3.3   | 4/101<br>4.0     | 6/75<br>8.0   | 1/105<br>1.0    | 1/59<br>1.7              | 6/117<br>5.1   | 5/104<br>4.8   | 14/447<br>3.1  | 15/328<br>4.6  |

<sup>a</sup> Group differences are statistically significant.

<sup>b</sup> Combination of prevalence of serous otitis media and recurrent otitis media (see Table 3-19).

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Two-thirds of the Head Start children were tested for hearing deficiencies, although there was variation from site to site. Screenings were provided for almost all children in Maricopa and Mingo Counties; somewhat less than half of the children were tested in St. Clair County and only one-third of the children in Greene and Humphreys Counties received such services. Head Start's record with regard to referrals for treatment for children diagnosed to have problems was excellent, except in St. Clair County where no children were referred.

There were no differences in the hearing status of Head Start and non-Head Start children at posttest which could be attributed to program intervention. This is not surprising given the fact that most hearing deficiencies, particularly hearing loss, clinically cannot be remedied. All Head Start can do is ensure that problems are diagnosed and that treatment is obtained.

The design of the evaluation was not conducive to determining the real effects of Head Start on ear disease. Nonetheless, Head Start could provide an effective follow-up program for otitis media with repeated screening throughout the program year. One could hypothesize that a program of this nature would increase awareness of middle-ear problems in children and lead to increased intervention. There is some evidence, the health coordinators have commented, that Head Start has increased the frequency of hearing screens and improved arrangements for follow-up of suspected problems.

## REFERENCES

The American Optometric Association. Optometric preventive health care. St. Louis, Missouri, 1980, 7.

Backman, H. A. How environment affects visual development: A selected review. Journal of the American Optometric Association. 1975, 46, 998.

Beaton, G. H. Assessing nutrient adequacy of food as consumed: How to interpret the data. Paper presented at the Inaugural Symposium, Western Human Nutrition Research Center, Presidio of San Francisco, August, 1981.

Birch, H. G. and Gussow, J. D. Disadvantaged Children: Health, Nutrition and School Failure. New York: Grune and Stratton, 1970.

Bishop, Y. M. M., Fienberg, S. E., and Holland, P. W. Discrete Multivariate Analysis. Cambridge, MA: MIT Press, 1975.

Bothwell, T. H. and Finch, C. A. Iron Metabolism. Boston, MA: Little, Brown and Co., 1962. Brownlee, K. A. Statistical Theory and Methodology in Science and Engineering. New York: John Wiley and Sons, 1960.

Brownlee, K. A. Statistical theory and methodology in science and engineering. New York: John Wiley and Sons, 1960.

Bruhelle, J. National Caries Program of the National Institute of Dental Research Report. The Nation's Health, 1982, 22, (2), 4.

Butler, J. A. and Baxter, E. D. Current structure of the health care delivery system for children. In Harvard Child Health Project, Volume III, Developing a better health care system for children, 1977, 35.

Buros, O. K. (Ed.) McCarthy scales of children's abilities. The Eighth Mental Measurement Yearbook. Highland Park, N.J.: Gryphon Press, 1978, 309-316.

Center for Disease Control. Nutrition Surveillance Annual Summary. Washington, D.C.: United States Department of Health and Human Services, Public Health Service, 1979.

Center for Disease Control. Preventing lead poisoning in young children: A statement by the Center for Disease Control. Washington, D.C.: United States Department of Health and Human Services, Public Health Service, 1978.

## REFERENCES

Children's Defense Fund. EPSDT: Does it spell health care for poor children? Washington, D.C.: The Washington Research Project, 1977, 30.

Christakis, G. (Ed.). Nutritional assessment in health programs. American Journal of Public Health, 1973, 63, 38-75.

Cohen, J. Statistical Power Analysis for Behavioral Sciences, revised edition. New York: Academic Press, 1977.

Cohen, J. and Cohen, P. Applied Multiple Regression: Correlation Analysis for the Behavioral Sciences. Hillsdale, New Jersey: Lawrence Erlbaum Associates, 1975.

Comstock, E., St. Pierre, R. G., and MacKiernan, Y. Measuring individual plate waste in school lunches. Journal of the American Dietetic Association, September, 1981, 79, \_\_\_\_\_.

Cook, D. and Finch, A. Assessing iron status of a population. American Journal of Clinical Nutrition, 1979, 32, 2115-2119.

Dallman, P. R., Refine, C., and Yland, M. J. Sequence of development of iron deficiency in the rat. American Journal of Clinical Nutrition, 1982, 35, 671-677.

Dallman, R., Siimes, M., and Stekel, A. Iron deficiency in infancy and childhood. American Journal of Clinical Nutrition, 1980, 33, 86-118.

Davis, R., Gold, M., and Makuc, D. Access to health care for the poor: does the gap remain? Annual Review of Public Health, 1981, 2, 159-182.

Doyle, A. Incidence of illness in early group and family day-care. Pediatrics, 1976, 58, 607-613.

Drumwright, Amelia F. The Denver Articulation Screening Exam. Ladoca Project and Publ. Found., Inc. 1973.

Dutton, D. Children's health care: The myth of equal access. In: Select Panel for the Promotion of Child Health. Better Health for Our Children: 1981, Vol. 4, 357-440 (DHHS Publ No. [PHS] 79-55071).



## REFERENCES

Dwyer, Johanna J. Nutrition education and information. In: Better health for our children: The report of the select panel for the promotion of child health. Washington, D.C.: United States Department of Health and Human Services, 1981.

Egbunu, L., and Starfield, B. Child health and social status. Pediatrics, 1982, 69, XXX-XXX.

Emmons, L., Hayes, M. Accuracy of 24-hour recalls of young children. Journal of the American Dietetic Association, 1973, 62, 409-415.

Fienberg, S. E. The analysis of cross-classified categorical data, second edition. Cambridge, MA: MIT Press, 1980.

Food and Nutrition Board, National Academy of Sciences. Recommended dietary allowances. Washington, D.C.: National Research Council, National Academy of Sciences, 1980.

Foster, R., Giddan, J. J., and Stark, J. Assessment of Children's Language Comprehension. Consulting Psychologists Press, Inc., 1973.

Fox, M. K., and Glantz, F. An Examination of Meal Quality in Day Care Centers and Family Day Care Homes. In Evaluation of the Child Care Food Program: Final Report on the Congressionally Mandated Studies, Cambridge, Massachusetts: Abt Associates, 1982.

Fria, T. Personal communication, Children's Hospital of Pittsburgh and University of Pittsburgh School of Medicine, 1981.

Frisancho, A. R. New norms of upper limb fat and muscle areas for assessment of nutritional status. American Journal of Clinical Nutrition, 1981, 34, 2540-2545.

Frisancho, A. New norms of upper limb fat and muscle areas for assessment of nutritional status. American Journal of Clinical Nutrition, 1980, 34, 2540-2545.

Frisancho, A. R. Triceps skinfold and upper arm muscle size norms for assessment of nutritional status. American Journal of Clinical Nutrition, 1974, 27, 1052.

## REFERENCES

Garn, S. M., Ryan, A. S., and Abraham, S. The black-white difference in hemoglobin levels after age, sex and income matching. Ecology of Food and Nutrition, 1980, 10, 69-70.

Garn, S. M., Ryan, A. S., Owen, G. M., and Abraham, S. Income matched black-white hemoglobin differences after correction for low transferrin saturations. American Journal of Clinical Nutrition, 1981, 34, 1645-1647.

Gersovitz, M., Madden, J. P., and Smiciklas-Wright, H. Validity of the 24-Hour Dietary Recall and Seven-Day Record for Group Comparisons. Journal of the American Dietetic Association, 73, 48-55.

Habicht, J. P., Martorell, R., Yarbrough, C., Malina, R. M., and Klein, R. E. Height and weight standards for preschool children. Are these really ethnic differences? Lancet, 1974, 611.

Haggerty, R. J., Roghmann, K. J., and Pless, T. B. Child Health in the Community. New York: John Wiley and Sons, 1975.

Hammill, P. V. V., Driad, T. A., Johnson, C. L., Reed, R. B., Roche, A. F., and Moore, W. M. Physical growth: National Center for Health Statistics profiles. American Journal of Clinical Nutrition, 1979, 32, 607-629.

Hegsted, M. Dietary Standards. Journal of the American Dietetic Association, January 1975, 66, 13-21.

Hegsted, M. What is a Healthful Diet? Primary Care, September, 1982, 9, 445-472.

Himes, J. H. Subcutaneous fat thickness as an indicator of nutritional status. In Greene, L. S. and Johnston, F. E. (Eds.) Social and biological predictors of nutritional status, physical growth and neurological development. New York: Academic Press, 1980, 9-32.

Hoaglin, D. C. A poissonness plot. The American Statistician, 1980, 34, 146-149.

Hoaglin, D. C. Letter values: A set of selected order statistics. In: Hoaglin, D., Mosteller, F., and Tukey, J. W. (Eds.) Understanding Robust and Exploratory Data Analysis. New York: John Wiley and Sons, 1983, pp. 33-57.

## REFERENCES

Hoaglin, D. C. Resistant cross-age smoothing of age-specific percentiles. Memorandum SGEDA-261. Cambridge, MA: Department of Statistics, Harvard University, 1982.

Hoaglin, D. C., Iglewicz, B., and Tukey, J. W. Small sample performance of a resistant rule for outlier detection. In: 1980 proceedings of the statistical computing section. Washington, D.C.: American statistical Association, 1981, pp. 148-152.

Hoekelman, R.A. (Ed). Principles of pediatrics; New York: McGraw Hill, 1978.

Hufano, L. and Hoepfner, R. Review of the McCarthy scales of children's abilities. Measurement and Evaluation in Guidance, 1974, 6, 251-254.

Jelliffe, D. B. The assessment of the nutritional status of the community. WHO Monograph No. 53. Geneva, Switzerland: World Health Organization, 1966.

Kaufman, A. S., and Kaufman, N. L. Sex differences on the McCarthy scales of children's abilities. Journal of Clinical Psychology, 1973, 29, 362-365.

Kerlig, S. G. and Baker, K. A. Physician's developmental quick screen for speech disorders (PDQ). Galveston, TX: Department of Pediatrics, University of Texas Medical Branch at Galveston, 1975.

Kingsley, A. and Reynolds, E. L. The relation of illness patterns in children to ordinal position in the family. Journal of Pediatrics, 1949, 35, 17-23.

Kovar, J. G. Adolescent Americans: What of their medical and health problems. The Sciences, April 1979, 18-21.

Kovar, M. G. Health status of U.S. children and use of medical care. Public Health Reports 1982, 97, 3-15.

Leventhal, J. M. Enuresis. In Behavioral problems in childhood: A primary care approach. New York: Grune and Stratton, 1981.

## REFERENCES

Linusson, E., Sanjur, D., and Erickson, E. Validating the 24-Hour Recall Method as a Dietary Survey Tool. Archivos Latinoamericanos de Nutricion, 1974, 24 (2), 277-294.

Madden, J. P., Goodman, S. J., and Guthrie, H. A. Validity of the 24-Hour Recall. Journal of the American Dietetic Association, 1976, 68, 143-147.

Malina, R. M. Anthropometric correlates of strength and performance. Exercise and Sport Science Reviews, 1975, 3, 249-274.

McCarthy, D. McCarthy scales of children's abilities. New York: The Psychological Corporation, 1972.

Miller, R. G., Jr. Simultaneous statistical inference. New York: McGraw-Hill Book Company, 1966.

Mosteller, F. and Tukey, J. W. Data analysis and regression. Reading, MA: Addison-Wesley, 1977.

Mundel, D. S. Policy for primary medical care for children: a framework of basic choices. In Harvard Child Health Project, Volume III, Developing a better health care system for children, 1977, p. 1.

National Center for Health Statistics. Volume of physician visits by place of visit and type of service, U.S., July 1963-June 1964, Rockville, MD: National Center for Health Statistics, 1965.

National Center for Health Statistics. Physician visits: volume and interval since last visit, U.S. 1969. Rockville, MD: National Center for Health Statistics, 1972.

National Center for Health Statistics. Physician visits: volume and interval since last visit, U.S., 1975. Rockville, MD: National Center for Health Statistics, 1975.

National Center for Health Statistics. Monocular visual acuity of persons 4-74 years, U.S., 1971-72. Rockville, MD: National Center for Health Statistics, 1977, 43.

## REFERENCES

National Center for Health Statistics. Basic dental examination findings of persons 1-74 years, United States, 1971-1974, by Kelly, J. E. and Harvey, C. R. Vital and Health Statistics. Series 11, No. 214. DHEW Publication Number (PHS) 79-1662. Public Health Service. Washington, D.C.: U.S. Government Printing Office, May 1979.

National Center for Health Statistics: Advance Report, Final Natality Survey, 1977. Monthly Vital Statistics Report, 1979, 27, (Supp.) DHEW Publication No. (PHS) 79-120.

New York State Joint Legislative Committee on Nutrition. Nutritional Assay of 1200 New York Schoolchildren. Legislative Document No. 61, 1947.

North, A. F., Jr. Health services in Head Start in Zigler, E. and Valentine, J. (Eds.) Project Head Start: A legacy of the war on poverty. New York: The Free Press, 1979.

Owen, G. M., Kram, K. M., Garry, P. J., Lowe, J. E., and Lubin, A. H. A study of nutritional status of preschool children in the United States, 1968-1970. Pediatrics, 1974, 53 (Supp.); 597-645.

Paradise, J. L. Otitis media during early life: How hazardous to development? Pediatrics, 1981, 68, 869-873.

Pipes, P. L. Nutrition in infancy and childhood. St. Louis: C. V. Mosby Company, 1977.

Pipes, P. L. Nutrition in Infancy and Childhood... Primary Care, September, 1982, 9, 497-516.

Quah, R. Stark, A., and Meigs, J. Children's blood lead levels in New Haven: a population-based demographic profile. Environmental Health Perspectives.

Roche, A. F. Growth assessment in abnormal children. Kidney International 1978, 14.

Roche, A. F. and Himes, J. H. Incremental growth charts. American Journal of Clinical Nutrition, 1979, 33, 2041.

## REFERENCES

Schour, I. and Massler, M. Survey of gingival disease using the PMA Index. Journal of Dental Research (1948), 27, 733. Reprinted in Dunning, J. M. Principles of Dental Health (2nd ed.). Cambridge, MA: Harvard University Press, 1977.

Select Panel for the Promotion of Child Health. Better Health for our Children: A National Strategy. Volumes I-IV. Washington, D.C., U.S. Department of Health and Human Services, Public Health Service, 1981.

Singer, J. D., Granahan, P., Goodrich, N., Meyer, L. D., Barclay, C. D., Goodson, B. D., Fox, M. K., Himes, J. H., and Smith, J. Iron Status and its selected correlates: United States 1971-1974. Cambridge, MA: Abt Associates Inc., 1980.

Smith, J. Personal communication, University of Nebraska Medical School Nutritional Biochemistry Laboratory, 1980.

Sorenson, A. W., and Hansen, R. G., Index of food quality, Journal of Nutrition Education, 1975, 7, 53-57.

Srinivasan, S. R., Frerichs, R. R., and Berenson, G. S. Serum lipids and lipoproteins in children. In: Strong, W. (Ed.). Atherosclerosis: Its Pediatric Aspects. New York: Grune and Stratton, 1978.

Stare, F. J. (Ed.). Atherosclerosis. MEDCOM Learning Series, 1974.

Starfield, B., Bice, T., Schach, E., Rabin, D., and White, K. How "regular" is the "regular source of medical care?" Pediatrics, 1973, 51, 822-32.

Teale, D. W., Klein, J. O., Rosner, B. A. Epidemiology of otitis media in children, Annals of Otology, Rhinology, Laryngology, 1980, Supplement 68, 89.

Tukey, J. W. Exploratory Data Analysis. Reading, MA: Addison-Wesley, 1977.

U.S. Department of Agriculture and U.S. Department of Health and Human Services. Nutrition and Your Health: Dietary Guidelines for Americans, 1980.

U.S. Department of Agriculture. A planning guide for food service in child care centers, Washington, D.C.: Food and Nutrition Service, 1976.

## REFERENCES

U.S. Department of Health, Education, and Welfare. National Center for Health Statistics. Preliminary findings of the first health and nutrition survey, U.S., 1971-1972: Dietary intake and biochemical findings. Government Printing Office, 1974 (DHEW Publ No. [HRA] 74-1219-1).

U.S. Department of Health, Education and Welfare. Head Start performance standards. Washington, D.C.: Office of Child Development, 1975.

U.S. Department of Health and Human Services. Health United States 1980. Government Printing Office, 1981a.

U.S. Department of Health and Human Services. Better health for our children: A national strategy. Select Panel for the Promotion of Child Health. Volumes I-IV. Washington, D.C., Government Printing Office, 1981b [PHS] (DHHS Pub. No. 79-55071.)

U.S. Department of Health and Human Services. Health United States, 1981. Washington, D.C.: Government Printing Office, 1982. (DHHS Pub. No. [PHS] 82-1232).

Vaughan, V. C. and McKay, R. J. Nelson's Textbook of Pediatrics. Philadelphia: W. B. Saunders, 1975.

Velleman, P. F. and Hoaglin, D. C. Applications, basics, and computing of exploratory data analysis. Boston, MA: Duxbury Press, 1981.

Walker, D. K., Gortmaker, S. L., and Weitzman, M. Chronic illness and psychosocial problems among children in Genesee County. Boston, MA: Harvard School of Public Health, August, 1981.

Wilk, M. B. and Gnanadesikan, R. Probability plotting methods for the analysis of data. Biometrika, 1968, 55, 1-17.

Williams, D. Racial differences of hemoglobin concentration: measurements of iron, copper, and zinc. American Journal of Clinical Nutrition, 1981, 34, 1694-1700.

Williams, S., Henneman, A., and Fox, H. Contribution of food service programs in preschool centers to children's nutritional needs. Journal of the American Dietetic Association; 1977, 71, 610-613.

## REFERENCES

Winter, S. T. The male disadvantage in diseases acquired in childhood. Developmental Medicine and Child Neurology, 1972, 14, 517-520.

Wolfe, B. Children's utilization of medical care. Medicare Care, 1980, 18, 1196-1207.

Young, C. M. Dietary Methodologies In Assessing Changing Food Consumption Patterns. Washington, D.C.: National Academy Press, 1981.

Zigler, E. and Valentine, J. (Eds.) Project Head Start: A legacy of the war on poverty. New York: The Free Press, 1979.



## APPENDIX 1A

### EVALUATION METHODOLOGY

#### Design of the Head Start Health Evaluation

The Head Start Health Evaluation was designed to focus on the health status of Head Start children, within the context of previous findings, and to establish the linkages between the health status of Head Start participants and their participation in Head Start. The general design was to select a sample of Head Start programs, (to collect extensive data on program operations) and, within each program, to administer a coordinated battery of health measures to a sample of participants. This approach, based on a sample of Head Start programs, required that Head Start participants be examined before and after their participation in Head Start to determine whether this participation had had an impact on their health status, and, if so, in what manner. Further, to guard against a variety of inappropriate inferences, it was essential to assess health status changes for a comparable group of non-participants from the same communities. Because changes in health status might be due to community health influences other than Head Start, the inclusion of the comparison group provided guards against incorrect attributions of impact. The overall design is illustrated in Table 1A-1.

During Stage I of the evaluation (which began in winter 1980) a pool of low-income children was recruited in each site. This pool consisted of children who met the income and other requirements for Head Start participation. At Stage II (in late March 1980) the children were randomly assigned within same age and sex categories; one-half of the eligible children were randomly

Table LA-1

Evaluation Design and Implementation Stages ,  
for Longitudinal Sample

|           |                                      |                       |                                 |                    |
|-----------|--------------------------------------|-----------------------|---------------------------------|--------------------|
| Stage I   | Pool of Head Start-Eligible Children |                       |                                 |                    |
| Stage II  | Head Start Group                     |                       | Non-Head Start Comparison Group |                    |
| Stage III | Pretest<br>Spring<br>1980            | No<br>Pretest<br>test | Pretest<br>Spring<br>1980       | No<br>Pre-<br>test |
| Stage IV  | Head Start<br>Fall 80 - Spring 81    |                       | No Head Start                   |                    |
| Stage V   | Posttest, Spring 1981                |                       |                                 |                    |

assigned to enter Head Start the following fall, while the remaining children were assigned to the non-Head Start comparison group. Thus, treatment and comparison groups were comparable by design. Because the complete health examination undertaken in the pretest could possibly confound study results (that is, by giving all children a thorough preliminary examination, it was possible that subsequent referrals for health services based on the pretest assessments could mask the effects of later Head Start treatments),

not all children in the Head Start and comparison groups were permitted to participate in the pretest data collection. Hence, at Stage III, only half of the children in each group were assigned to be examined during the pretest (in the spring of 1980).

Splitting the sample in this manner complicated the study because it required almost twice as much analysis in order to ensure that results held for both the children who were pretested and those who were not. But such an approach acted to protect against a worst-case possibility. (As it turned out results for these two samples were practically identical. While this might suggest that it was unnecessary to split the sample at pretest, such an inference is unfounded. Had this not been done, a major threat to the validity of the study would have been untestable, thus leaving study findings open to doubt.)

At Stage IV of the evaluation (beginning in fall 1980) children assigned to the treatment group entered the Head Start program and participated in the program (during the 1980-81 program year). At the time of posttest data collection, these children had received Head Start services for approximately one program year (8-9 months).

During the posttest at Stage V. (in spring 1981) the health status of all children in the study was assessed; that is, the pretested children in both the Head Start group and the non-Head Start comparison group were reassessed, and the remainder of the children in both groups, who had not been pretested the previous spring, were assessed for the first time.

#### Site Selection Considerations

The characteristics and number of sites to be included in the evaluation was the subject of lengthy discussions between the evaluation staff and the Administration for Children, Youth and Families. It was recognized that the use of a data collection team

of health specialists to collect health data (e.g., pediatricians for general pediatric health, pedodontists for dental health, and audiologists for hearing) would be costly and thus would limit the number of evaluation sites or result in very small samples of children in each of a larger number of sites. After much consideration of alternative strategies, available resources permitted implementation of the evaluation in four Head Start sites and examination of approximately 250 children per site.

Several site and program characteristics were used to select the four sites:

- urban versus rural setting;
- region of the country;
- strength of local health care system and availability of free or subsidized health care for Head Start eligibles;
- ethnicity of the Head Start population;
- size of the Head Start program; and
- strength of Head Start health services locally.

The rationale for using this set of characteristics was as follows. On average, rural areas have fewer physicians and hospitals per capita. When combined with the greater distances that must be travelled in order to obtain services, access to health care is often substantially worse in rural rather than in urban sites. Since a substantial portion of Head Start programs serve rural areas, it was necessary to represent such sites in this evaluation.

Region of the county has a subtler influence. Although available health care services vary widely across regions, the variation within a region is also very great. Thus, although it was possible to obtain, within some regions, a sample representative of the range of health care services, it was preferable to select a balanced sample of sites across regions to improve the face validity of the sample used for the evaluation.

The strength of the local health care system and the availability of free or subsidized health care services for the poor vary widely across the nation. Some areas have large numbers of doctors and clinics, while others have few. In many areas, health services are so uneven that one or more vital services may not be available locally. (For example, one of the selected sites had no dentist within easy reach.) Further, although in some areas nearly all Head Start children were eligible for Medicaid, this was not universally the case and in one site, there was no Medicaid program. Since, when an alternative health delivery service is available, Head Start simply mediates the delivery of the needed health care, the absence of such alternatives within a community invariably increases the management and resource burden on the local Head Start program. A comprehensive examination of the Head Start health care system thus had to take account of this important local variation in health care resources.

During the program year, 1980-81, the Head Start children served were 42 percent black, 33 percent white, and 20 percent Hispanic. To reflect this distribution, two predominately black, one white, and one Hispanic site were appropriate, given a total of four sites.

In addition, the size of the Head Start program was an important site selection criteria. Given an initially estimated within-site sample size requirement to recruit 150 Head Start and 150 comparison children (to allow for attrition), only large Head Start programs, serving more than 300, were chosen for participation in the study. Further, to increase the probability of identifying Head Start impacts on the health status of low-income children, selection was also limited to Head Start programs with well-implemented health and nutrition programs that were in compliance with the Head Start Performance Standards for the health component. Thus, Head Start sites were excluded from consideration

if they were known to have weak health components. (While a process study examining Head Start services could be conducted in such sites, most of the major study issues could not be appropriately addressed.) No attempt, however, was made to identify Head Start programs with "model" health components. Instead sites were considered, if the Head Start management information system, the Program Information Record (PIR), showed that the health program at that site was, by and large, operating competently and in a manner "typical" of that region. Thus, "typical" sites were selected, not so much to "represent" all Head Start programs but to evaluate standard health services delivery in the presence of the range of contextual factors which confront Head Start. Westinghouse Health Systems (the technical assistance contractor for the Head Start health services) and the U. S. Department of Health and Human Services regional offices also provided the assessments of the Head Start health services delivered in candidate sites for the Head Start Health Evaluation.

These criteria led to the selection of the following four sites:

- Greene County (Leakesville) and Humphreys County (Belzoni), Mississippi;
- St. Clair County (East St. Louis), Illinois;
- Maricopa County (Phoenix), Arizona; and
- Mingo County (Williamson), West Virginia.

The following site and program descriptions highlight the important features of each of the four sites. These characteristics are summarized in Table 1A-2 as well.

Table 1A-2

Site, Health, and Head Start Program Characteristics of the Four Locations Chosen for the Head Start Health Evaluation

| Characteristic                                 | Greene & Humphreys Counties | St. Clair County    | Maricopa County  | Mingo County |
|--|-----------------------------|---------------------|--|--------------|
| <u>Site Characteristics</u>                    |                             |                     |  |              |
| Degree of Urbanization of Largest Community    | Rural                       | Urban               | Urban  | Rural        |
| Department of Health and Human Services Region | 4                           | 5                   | 9  | 3            |
| <u>Health Services Characteristics</u>         |                             |                     |  |              |
| Number Physicians per 100,000                  | 36/35 <sup>a</sup>          | 77                  | 199 <sup>b</sup>   | 90           |
| Number of Hospitals                            | 1/2                         | 6                   | 29   | 1            |
| <u>Program Characteristics</u>                 |                             |                     |  |              |
| Funded Enrollment                              | 613 <sup>c</sup>            | 650                 | 419  | 300          |
| Total Actual Enrollment                        | 620                         | 899                 | 458  | 345          |
| Percent Children with Medicaid                 | 38.9                        | 68.2                | 0.0  | 27.1         |
| Schedule:                                      |                             |                     |  |              |
| Days/Week                                      | 5                           | 2 or 4 <sup>d</sup> | 4  | 4            |
| Hours/Day                                      | 6.5                         | 6                   | 3.5 to 4   | 6            |
| Number of Years Children Enrolled              | Two to three years          | Two to three years  | One year (with one-year home-based program prior to center enrollment for some children) | Two years    |
| Predominant Ethnicity of Children Enrolled     | Black                       | Black               | Hispanic   | White        |

<sup>a</sup> Data for each county are presented separately: Greene/Humphreys.

<sup>b</sup> Many physicians and hospitals concentrated in areas of Maricopa County which are not accessed by families studied.

<sup>c</sup> Total funded enrollment for the grantee was 3700, total actual enrollment was 4278.

<sup>d</sup> Program operates four days/week. Some children only attend two days.

Greene and Humphreys. This "site" actually combined two rural counties in Mississippi with similar demographic and health service characteristics and served by the same Head Start grantee. Friends of Children, the Head Start grantee, was responsible for services to children in 11 counties, in addition to Greene and Humphreys, making it one of the largest Head Start programs in the country. Its total funded enrollment was 3700 children in the 1980-81 program year, of which 200 were enrolled in the programs in Greene County and 413 were enrolled in Humphreys County. With a schedule of five days per week and 6.5 hours per day, this program was the most intensive among those included in the Head Start Health Evaluation. Most of the children served by the program were black. They typically entered Head Start shortly after their third birthday and attended for two to three years prior to entering public school.

Delivery of health services to children in Greene and Humphreys counties was the most challenging in the evaluation. Lack of cooperation by the Welfare Department in the identification of EPSDT-eligible children meant that few of the required health services were Medicaid reimbursable. The skilled and dedicated management of the Head Start health component, in the face of such enormous local constraints, was evident and was an important factor in the delivery of health services.

St. Clair County. This site consisted of urban East St. Louis, Illinois and the surrounding more rural area. Although 1970 Census information showed high medical underservice in the county, during the succeeding decade many health care providers opened clinics in various parts of East St. Louis, even in the public housing projects, thereby vastly improving access to health care for low-income families. The Head Start grantee, the Economic Opportunity Commission, was funded to serve 650 children, 95 percent of whom lived in East St. Louis. The program operated on a four days per week schedule, but allowed the children to enroll for either a two-day or a four-day program of 6 hours per day. Turnover in enrollment was very high. Most of the Head Start children were black and some attended Head Start for two to three years prior to entry into public school.

In St. Clair County the Head Start program, on the recommendation of the Health Advisory Board, had taken a highly constructive approach to the delivery of



health services. Prior to entry into Head Start and as a part of the application process, the child's parent was responsible for having the child screened for medical and (more recently) dental problems. This was feasible since health care services were readily available to most of the families in East St. Louis, although those in other areas in St. Clair County were less well served. Head Start reviewed the results of those pre-entry health screens, assisted in follow-up as needed, usually during the summer before the child entered the program. Because almost all of the children served by Head Start were Medicaid-eligible, the program needed to spend very few of its resources on health care service.

Maricopa County. This site was located in the suburbs of Phoenix, Arizona. Although many families in this county are economically very well off, those who are low-income are frequently considerably below the average for Maricopa County. Some areas of Maricopa County, such as Phoenix and Scottsdale, have exceptionally high levels of medical service; but the evaluation focused on suburbs of Phoenix, primarily Mesa, Chandler, Glendale, El Mirage, and Surprise. At the time of the evaluation, Arizona had no Medicaid program. (A Medicaid program has been instituted subsequently, however.) Without this program, access to publicly-supported health services was particularly difficult for low-income families. Although many low-income families used the Maricopa County Department for health care, some of the communities studied did not have a primary care clinic. Of the three Head Start programs operating in Maricopa County; the evaluation focused on the program operated by the Maricopa County Community Services Department. This program was funded for 419 children during the 1980-81 school year. Most children participated only for one year prior to entry into kindergarten. However, a small group of approximately 88 children participated in a one-year home-based program prior to center enrollment. The center schedule was four days per week, and most centers ran two half-day programs of approximately 3.5 to 4 hours per day. The majority (68%) of the children in the Maricopa County Head Start program were Hispanic, another 20 percent were white, and the remainder were black, Native American, or Asian. Some of the children enrolled in this program were from families of undocumented workers. For them, enrollment in Head Start provided the only access they had to health care services, because their families were not eligible for publicly-supported health services.

In Maricopa County, health services were available from the Maricopa County Health Department through a contract between Head Start and that agency. Since health services were sometimes geographically remote, the Health Department used local satellite primary care clinics, or Head Start transported the children to the nearest clinic for medical services. Dental services were provided to Head Start children in a mobile trailer which was moved from center to center. Because there was no Medicaid in Arizona, Head Start's contract with the Health Department provided all health services to children through an arrangement similar to a health maintenance organization (HMO).

Mingo County. This site was located in the heart of the Appalachian mountains of West Virginia. It is very rural and relatively inaccessible. Many families in this county are supported by the coal mining industry. Although overall the ratio of physicians to members of the general population was above average, few health services were available outside of Williamson, the county seat. The Head Start program grantee, the Mingo County Economic Opportunity Commission, was funded to serve 300 children. Approximately 90 percent of those enrolled were white. Most children, enrolled in this program, participated for two years on a schedule of six hours per day, four days per week.

In Mingo County there were very few health services available and, because the Medicaid reimbursement for medical screens was so low, local physicians were reluctant to treat Head Start participants with Medicaid coverage. On the other hand, Medicaid-eligible children did receive dental services without similar difficulties.

A Comprehensive Management Review (CMR) of this program, conducted just prior to the posttest data collection, revealed that this program was out-of-compliance with the Head Start Performance Standards on 87 items, many of them pertaining to the delivery of health services. (CMR's of the other programs were much more positive.) Staffing changes during 1980-81 in the Head Start central office, including the health coordinator, greatly fragmented the health service delivery effort and the effectiveness of this program. Coupled with the on-going need to renegotiate constantly for provision of health services by local providers, the delivery of health services to children in this site was the most chaotic observed by the evaluation.

### Samples of Children

As mentioned previously, the evaluation design specified recruitment of 300 children per site and an optimistically low attrition rate of approximately 16.7 percent (50 out of 300 children) over the approximately 16 months between recruitment and posttest. The actual attrition rates of the children from the sample vastly exceeded the prior estimates.

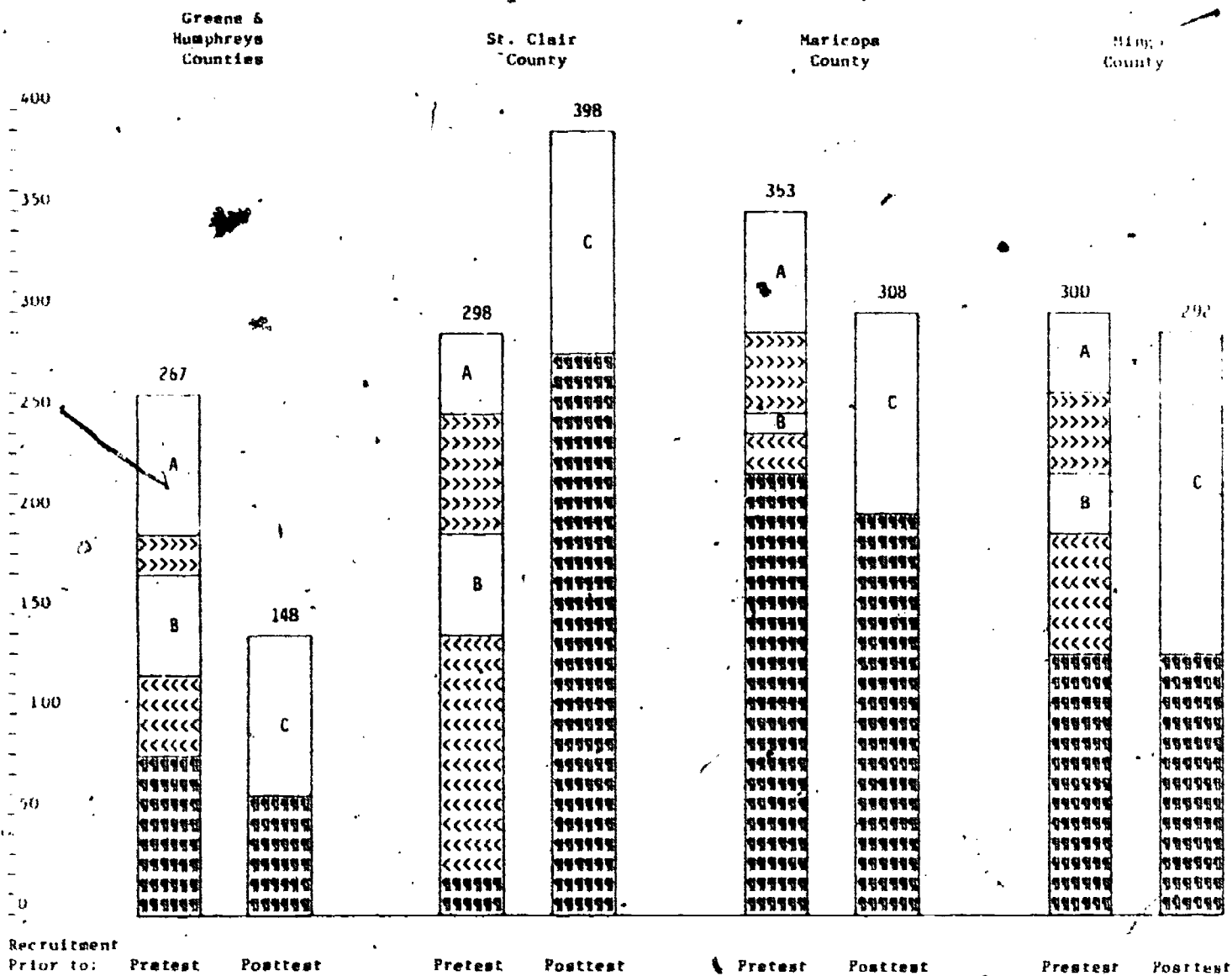
The experience of the evaluation vis-a-vis a Head Start-eligible population of children is shown in Exhibit C. This experience is instructive and reflects each of the Head Start program's own experience with recruitment and turnover among their eligible population: Greene and Humphreys Counties generally experienced the lowest rates of attrition and turnover while St. Clair County experienced a very high rate of attrition from the program. (Although the attrition rate in Maricopa County was very high among the children recruited for the evaluation, the Head Start program's added requirement that the family provide transportation for their child greatly delimited the children who participated in the program and reduced the numbers of children lost to attrition.) Hence the evaluation team's difficulties in retaining the families who had initially agreed to participate in the Head Start Health Evaluation was very similar to that of the Head Start program in each site with respect to recruitment and attendance of the children in the program.

As shown in Table 1A-3, 1218 children were recruited for the Head Start Health Evaluation between January and March 1980, prior to the pretest. However, of those rostered, nearly 38 percent were lost to attrition without a family background interview or health examination.

The pretest recruitment, therefore, produced the following results. Sample recruitment goals, although nearly met in all of

Table 1A-3

Number of Children Recruited for the Head Start Health Evaluation and the Proportions Evaluated Versus Lost by Attrition



Key to Samples:

- A Initial recruitment sample: received both pretest and posttest (longitudinal sample).
- B Initial recruitment sample: received posttest only.
- C Augmentation sample recruited prior to posttest: received posttest only.
- >>> D >>> Initial recruitment/attrition sample: received pretest only.
- <<< E <<< Initial recruitment/attrition sample: received neither pretest nor posttest.
- \*\*\*\*\* Rostered and signed consent to participate only, never completed the family background questionnaire.

the sites, produced fewer than desired children with sufficient family and health information needed for the evaluation. At the time of the pretest data collection in April 1980, those children with at least a completed family background questionnaire numbered 277 in St. Clair County, 180 in Greene and Humphreys Counties, 170 in Mingo County, and only 130 in Maricopa County. This shortfall, coupled with expected additional sample attrition, meant that the recruitment period had to extend beyond the pretest in order to ensure adequate sample sizes for posttest data collection. Recruitment for the augmentation sample occurred in Stage IV of the evaluation (see Table 1A-1).

Such modifications in the samples of children ultimately required five classifications of children to distinguish among those who remained in the study, those who dropped out, and those who were added after the pretest. These have been defined as separate samples of children in this report. Table 1A-4 shows the samples of children for each of the sites in the Head Start Health Evaluation who had sufficient information to analyze in one or more parts of the evaluation. The column percentages indicate, within each site, the contribution of each sample (from A to E) to the total sample size. This exhibit also demonstrates that rates of attrition among families who only participated in a part of the evaluation (Samples D and E) varied considerably among the sites: 50 percent in St. Clair County, 31 percent in Mingo County, 27 percent in Maricopa County, and 18 percent in Greene and Humphreys Counties. In all sites except St. Clair County, Sample C amply replaced the children lost from the study through attrition.

Because of the substantial changes in the original sample from attrition and augmentation, the evaluation conducted an extensive investigation of the possible implications of these sample

Table 1A-4

Number of Children in Evaluation by Sample and Site

| Sample |   | Greene & Humphreys Counties | St. Clair County | Maricopa County | Mingo County | All Sites |
|--------|---|-----------------------------|------------------|-----------------|--------------|-----------|
| A      | n | 74                          | 42               | 56              | 36           | 208       |
|        | % | 26.6                        | 10.8             | 24.3            | 10.9         | 17.0      |
| B      | n | 56                          | 41               | 11              | 31           | 139       |
|        | % | 20.1                        | 10.6             | 4.8             | 9.4          | 11.3      |
| C      | n | 98                          | 111              | 100             | 161          | 470       |
|        | % | 35.3                        | 28.6             | 43.5            | 48.6         | 38.3      |
| D      | n | 21                          | 71               | 39              | 37           | 168       |
|        | % | 7.6                         | 18.3             | 17.0            | 11.2         | 13.7      |
| E      | n | 29                          | 123              | 24              | 66           | 242       |
|        | % | 10.4                        | 31.7             | 10.4            | 19.9         | 19.7      |
| TOTAL  |   | 278                         | 388              | 230             | 331          | 1227      |

- A. Initial recruitment sample: received both pretest and posttest (longitudinal sample).
- B. Initial recruitment sample: received posttest only.
- C. Augmentation sample recruited prior to posttest: received posttest only.
- D. Initial recruitment/attrition sample: received pretest only.
- E. Initial recruitment/attrition sample: received neither pretest nor posttest.

changes. These investigations occurred at two points in time, in the fall after the Head Start children entered the program and after the posttest data collection as part of the analysis. In general, the first investigation indicated that minor differences existed

between the Head Start and non-Head Start samples, but none were statistically significant. The more intensive investigation after the posttest produced a similar result; no consistent statistically significant differences among the samples (A, B, C vs. D, E) in either their health or personal characteristics. (The characteristics of the children who were only rostered was unknown and could not be examined further.)

### Health Measures

Other design questions concerned the focus of the health measurement battery. Some of the basic questions included: What measures were required to assess Head Start program achievements due to the Performance Standards? What extant reliable measures were available? Would these measures provide comparable health indicators to prior studies and evidence of Head Start's impacts on children's health?

Since the evaluation was to assess Head Start in light of the Performance Standards, measures were selected to cover the full range of health services mandated by these standards (see Table 1A-5). In general, these health measures consisted of a series of examinations and observations of the child conducted by health professionals and paraprofessionals, and several parent interviews to fill out the child and family's health history. The following battery of health examinations was chosen:

- pediatric evaluation;
- dental evaluation;
- anthropometric evaluation;
- hematology evaluation;
- developmental evaluation;
- speech and language evaluation;

Table 1A-5

Health Services Mandated by Head Start Performance Standards

Health Services

Health history, including:

Copy of immunization record

Health screens, including:

Growth assessment (height, weight, age),

Vision testing (for visual acuity and strabismus),

Hearing testing;

Hemoglobin and hematocrit level,

Tuberculin testing where indicated;

Selected additional screens: sickle cell anemia, intestinal parasites, and lead poisoning;

Determination of immunization status,

Identification of speech problems;

Identification of special needs of handicapped children

Medical examination of:

All systems or regions suspect by history or health screen

Specific regions commonly important in age group (skin, eyes, nose, throat, heart, lungs, groin)

Medical treatment of:

All health problems detected

Completion of recommended immunizations against seven diseases

Dental examination and basic services including:

Relief of pain or infection

Restoration of decayed primary and permanent teeth

Pulp therapy for primary and permanent teeth, as necessary

Extraction of non-restorable teeth.

Dental prophylaxis and instruction in self-care oral hygiene procedures

Application of topical fluoride in unfluoridated communities

Health education, including:

Provision of information to parents of all available health resources

Encouragement of parents to become involved in health care process

Integration of health education into ongoing program activities

Familiarization of children with all health services they will receive prior to delivery of services

Nutrition services including:

Nutrition assessment

Meals and snacks



- vision evaluation;
- hearing evaluation; and
- nutritional observation.

In addition to these child evaluations, a parent interview would consist of three major parts:

- health history of child;
- nutritional evaluation of child; and
- family background.

There were some extant measures to consider. Although the Head Start Health evaluation was one of the first longitudinal assessments of the impacts of health intervention programs on the health status of low-income children, the experiences of other health researchers in such previous major cross-sectional surveys of children's health status as the First National Health and Nutrition Examination Survey, the Preschool Nutrition Survey, and the Ten-State Nutrition Survey provided guidance. Table 1A-6 compares some of the characteristics of the Head Start Health Evaluation with these prior surveys.

Although these prior cross-sectional studies proved to be quite useful in designing the current effort, great care had to be exercised in applying the lessons of this previous research to the present evaluation. Because this evaluation was longitudinal rather than cross-sectional in design and because it focused on a single treatment, Head Start, it differed markedly from all prior research in this area. The contribution of these prior studies to the design of the present evaluation was therefore greatest in the area of cross-sectional measurement selection and in the choice of standard methods of analyzing and reporting health-related information. In addition, the prior data were particularly useful as

Table 1A-6

**Characteristics of Four Surveys of the Health Status  
of Low-Income Children**

| Survey Characteristic             | Preschool Nutrition Survey                        | Ten-State Nutrition Survey                       | First National Health & Nutrition Examination Survey | Head Start Health Evaluation                            |
|-----------------------------------|---|--|--|---|
| Sample Size: Children below age 6 | 3441  | 3700   | 1500   | 1227  |
| Ethnic Distribution (Percent):    |   |  |  |   |
| White                             | 80  | 43   | 66   | 35  |
| Black                             | 14  | 40   | 34   | 57  |
| Hispanic                          | 5   | 17   |  | 12  |
| Other                             | 1   | 1  |  | 2   |
| Geographic Distribution           | 36 states + D.C.                                  | 10 states  | 100 sites  | 4 sites   |
| Survey Dates                      | Nov. 1968-<br>Dec. 1970                           | May 1968-<br>May 1970                            | 1971-<br>1974  | April 1980-<br>April 1981                               |
| Income Distribution               | 33% had incomes > 3x (poverty level)              | 5% had incomes > 3x (poverty level)              | random with poor over-sampled                        | all below poverty level                                 |
| Objective                         | Describe nutritional status of preschool children | Ascertain incidence and location of malnutrition | Establish national nutrition surveillance system     | Establish health status and estimate Head Start impacts |

sources of reference data for comparison with these low-income children's health and nutritional status.

The health measures used in the Head Start Health Evaluation also had to permit attribution of changes in health status over the course of a year to the intervention of the Head Start program. The selection and development of the appropriate measures was complex in that many of the measures useful for a cross-sectional analysis, that is, useful in determining health status, are of limited utility in examining longitudinal changes in this status.

One of the important problems in this regard was measuring degrees of "wellness". For a large number of health domains it is only possible to quantify degrees of disease, the absence of disease being designated as the state of being "well". There are often no degrees of "wellness". Thus, we would generally expect to see no change over the program year in children originally classified as "well". For example, children with good hearing or vision should not be expected to hear or see "better" after a year in Head Start. Consequently, if change was to be measured it generally had to be sought in improvements measured in that segment of the population for which a health problem was identified. Because the number of children afflicted with any given condition is generally small, statistical analysis was consequently more difficult.

After consideration of these design issues, the evaluation selected and developed the following battery of evaluation measures.

Pediatric Evaluation. This evaluation, administered by a pediatrician, assessed the child's general health condition in conjunction with a detailed health history (described below). Since no extant examination instrument proved completely acceptable, the final instrument was developed by selecting and modifying items from three sources: the Rochester Child Health Study, the First National Health and Nutrition Examination Survey, and the physical examination form used in the Medical Diagnostic Clinic of Children's Hospital in Boston.

The pediatric examination instrument contained nineteen separate sections, each for a different body area or system, and was used to record and describe any abnormal findings. The examination contained items pertaining to the head, eyes, nose, throat and ears, including the eardrum and auditory canal, auscultation of the lungs, abdominal and kidney evaluation, evaluation of heart sounds, joint movements, and reflexes. Blood pressure was also recorded.

Dental Evaluation. This evaluation, in conjunction with a dental history (described below), was administered by a pedodontist. The dental examination included an assessment of a variety of aspects of dental health. The number and location of decayed and filled surfaces and missing teeth provided a measure of the prevalence and incidence of dental caries, the treatment needs of the children studied, and the results of dental services. A periodontal inspection assessed inflammation of the gingiva or soft gum tissues. The degree of plaque was measured using an oral hygiene index developed for the evaluation. A classification of the occlusion, or the relationship of the upper and lower teeth, and an index of open bite were also recorded. The dental evaluation concluded with a clinical judgment of the child's dental health status. Findings included abnormal caries, inflammation, premature loss of permanent teeth, and presence of nonvital teeth.

Anthropometric Evaluation. This evaluation was structured to be administered by a paraprofessional trained to follow a specific protocol for collecting reliable anthropometric information. The measures chosen were considered standard for determining growth status including height, weight, arm circumference, and triceps skinfold thickness.

Hematologic Evaluation. This evaluation was based on assays of blood samples collected from children during the health evaluations. Blood samples were collected by laboratory technologists accustomed to performing venipunctures on children. The assays performed included hematocrit, hemoglobin, free erythrocyte protoporphyrin, total iron binding capacity, serum iron, transferrin saturation, ferritin, cholesterol, vitamin C, vitamin A, and B-carotene.

Developmental Evaluation. The developmental evaluation, like the anthropometric evaluation, was designed for administration by a paraprofessional trained to follow a specific protocol. The Motor Scale of the McCarthy Scales of Children's Abilities was used. The McCarthy Motor Scale

contains items that assess the fine and gross motor development of the child--for example, the ability to draw a circle or stand on one foot--abilities considered to be related to the physical health of children. According to the reviews of this instrument in Buros (1978, pp. 309-314), this battery was better suited to the detection of developmental disabilities than other tests. Furthermore, a study by Kaufman and Kaufman (1973) provided evidence that the McCarthy scales were comparatively less sensitive to black-white differences in children below 6 years of age.

The other developmental measures employed were assessments of the child's behavior according to parental report. These assessments of the child's behavior were based on parents' responses about the frequency of 29 commonly occurring behaviors. These behaviors were scaled to describe the extent to which the child appears overly aggressive or withdrawn.

Speech and Language Evaluation. This battery was administered by speech pathologists. The evaluation included screening for both speech and language problems. The battery included several speech evaluation measures. The Denver Articulation Screening Examination by Drumwright (1973) was used to assess the children's articulation and a portion of the Physician's Developmental Quick Screen for Speech Disorders assessed other speech characteristics, including intelligibility, voice quality, typical pitch, and typical volume.

Another portion of the battery assessed both receptive and productive language problems. The language comprehension instrument, the Assessment of Children's Language Comprehension (ACLC by Foster, Gidden, and Stark, 1973), assessed language comprehension and consisted of four subsections which measured the child's ability to process an increasing number of syntactic units. Each child was shown a picture and presented with a stimulus word; the child then pointed to the appropriate stimulus object in the picture. Another section of the speech and language evaluation measured verbal expression by using the sentence repetition component of the Fluharty Language Screening Test for Preschool Children. The child repeated the stimulus sentence produced by the speech pathologist and received a score for each sentence repeated accurately.

Vision Evaluation. The vision evaluation, administered by an optometrist, was intended to detect the presence of actual or potential vision system impairment in each child. It consisted of a set of components designed to examine the following vision functions: oculomotility, strabismus, convergence, retinoscopy, visual acuity, stereo acuity, binocular function, and color differentiation. In addition, the eyes were examined, both externally and internally, to determine the presence or absence of eye damage, lens or nerve damage, encrusted eyes, or other physical eye disorders. The parent of each child was also interviewed to determine awareness and understanding of any visual difficulties of the child:

Hearing Evaluation. The purpose of the evaluation was to determine hearing impairments in one or both ears, secondary to chronic or recurrent otitis media. Designed to be administered by an audiologist accustomed to testing preschool children, it included pure tone audiometry and impedance tympanometry. The audiometry tests for hearing loss in each ear were conducted at 500, 1000, 2000, and 4000 Hz. In addition, the tympanometry measured middle-ear impedance and was used to detect occlusion or other pathologies associated with the middle ear. In general, this evaluation provided information on both hearing loss from conductive and sensorineural problems.

Family Background Interview. This interview was designed to obtain baseline data on the family and child at the outset of the Head Start Health Evaluation and, also, data on any changes which took place between pretest and post-test. At each site an evaluation assistant administered the interview to parents or primary caretakers of each Head Start and non-Head Start child. The interview obtained demographic information about family size (number of household members--adults and children), marital status, access to services, education of adults, mobility of the household, insurance coverage, income, employment status, ethnicity, and language used. This interview also examined the parent's impressions of the child's behavior and, for Head Start children, the parent's knowledge of services provided to their child.

Health History. A medical, dental, and vision history of the child was administered to each child's parent at the time of the health evaluation and was intended to provide important health information to aid in the evaluation of

the child's health status. The medical health history was developed from a variety of sources, including the Rochester Child Health Study, the Health Interview Survey (National Center for Health Statistics), and the medical history intake form from the Medical-Diagnostic Clinic of Children's Hospital Medical Center in Boston. Items were modified to meet the requirements of the evaluation of health services and the evaluation's longitudinal design. This portion of the history included prenatal and childhood health, illnesses and infections, evidence of exposure to tuberculosis or intake of lead, incidence of accidents and injuries of the child, hospitalizations, records of immunizations and access to and utilization of medical services.

The dental portion of the health history focused on dental care, oral hygiene habits, dental service utilization, and access to flouride. The health history also included a vision history which focused on evidence of vision problems that could be observed by the parent (such as the child's complaining of headaches or burning eyes), prior prescriptions for glasses, or vision therapy for the child, and utilization of other vision services (such as a vision examination).

Dietary and Nutritional Habits Interview. This parent interview was designed to be administered by a nutritionist and contained two parts: a 24-hour dietary intake, and a 3-month food frequency covering the child as well as the nutrition habits of the family. The 24-hour recall and food frequency was adapted from the First National Health and Nutrition Examination Survey protocol.

The primary purpose of the interview was to examine in more depth the child's dietary practices, the family dietary practices, the family's food preparation practices, the parent's knowledge of nutrition, the family's participation in food subsidy programs (such as Food Stamps and WIC), and evidence of any Head Start impact on the eating habits of the child. The information collected from this parent interview provided evidence of the family knowledge, attitudes, and behaviors related to good nutritional practices.

Nutrition observation. Used only at the posttest on the Head Start children, this instrument was designed to be administered by a nutritionist or person trained in collecting food data in accurate portion sizes. A dietary

interview (described below), including a 24-hour recall of the child's consumption, was part of the evaluation battery. Since Head Start parents could not reliably report their child's consumption while in center care, an observation of this portion of the child's day was designed. This instrument included records of the child's intake of foods consumed during meals and snacks at the Head Start center.

### General Analytic Methodology

Because the measures collected to address the research questions varied tremendously in type, form and purpose, the analyses of these data have drawn on a variety of statistical techniques. These techniques are summarized in Table 1A-7.

The analysis of the pretest data was primarily descriptive and aimed at providing an assessment of the health status of children in terms of their health characteristics and particularly, the types of health deficiencies with which these Head Start-eligible and low-income children confront the Head Start health services delivery system. Since preliminary analyses demonstrated that both the randomly-assigned groups of low-income children (those who would enter Head Start in the fall of the 1980 and those who would not participate in the program during the 1980-81 program year) were essentially equivalent, analyses and data presentation of the pretest data reflect the combination of both groups of children. Simple, overall descriptions of the health status of the children were not sufficient. The dramatic variations from one site to another in health services available to low-income children and the consequent health status of the children made it necessary to pay careful attention to the pretest results in each site, as well as across all four sites.

Moreover, although there was considerable similarity in the apparent quality of the health services delivery system for each



Table 1A-7.

Summary of Major Statistical Techniques by Domain of Analysis

| Domain of Analysis | Statistical Technique  |
|--------------------|--|
| Attrition          | Contingency tables and analysis of variance                                  |
| Pediatric          | Contingency tables   |
| Dental             | Contingency tables and Poisson models  |
| Anthropometry      | Contingency tables, smoothing, regression, and analysis of covariance        |
| Diet/Nutrition     | Contingency tables, regression, and analysis of covariance                   |
| Hematology         | Contingency tables, regression, and analysis of covariance                   |
| Developmental      | Contingency tables, regression, and analysis of covariance                   |
| Speech             | Contingency tables, regression, and analysis of covariance                   |
| Vision             | Contingency tables, regression analysis, and discrete multi-variate analysis |
| Hearing            | Contingency tables and regression, and analysis of covariance                |

of the programs according to the estimates available in the management information Program Information Records (PIR's), there was considerable variability in the actual circumstances each program confronted in delivery of health services to the Head Start

children. Considerably more in-depth information on the actual content of the children's health records was required to assess the delivery of health services in each of the sites. Again, the variation from site-to-site required paying attention to each program's service delivery, as well as to the pattern of delivery across all four sites to understand the potential impacts of the delivery of health services.

The analysis of the posttest data also focused particularly on comparisons between the experiences of the Head Start and non-Head Start children during the 1980-81 program year. Parent reports on both groups of children provided wide-ranging information on both the need for health services and the receipt of those services during the previous year. In many cases, the Head Start health records provided more detailed information on the services received by the Head Start children than the mother's of these children provided. In addition, for each of the children in the longitudinal sample, each health problem which had been identified at pretest and communicated to the child's local health provider (and to the Head Start program for the Head Start children) was specifically followed up at posttest for evidence of treatment and/or medical management. Some of the most detailed analyses conducted during the evaluation, focused on this information.

Using the posttest data, extensive analyses were conducted to assess the apparent impacts of the Head Start health services delivery system on the health status of children by direct comparisons of the Head Start and non-Head Start groups. These analyses also adjusted for any apparent non-equivalences between groups where feasible. Analyses focused on the longitudinal sample of 208 children identified a few Head Start impacts. Similar analyses of the entire posttest sample of 817 children (which had somewhat more power to detect small effects) produced slightly more evidence of some of the impacts of the health services where those health services were delivered. Extensive examination of various types of "at risk" children provided little more insight.

**Appendix 1B**

**Reference Guide to Location of Findings  
in Head Start Health Evaluation Report**

APPENDIX 1B

REFERENCE GUIDE TO LOCATION OF FINDINGS  
IN HEAD START HEALTH EVALUATION REPORT

| <u>Page Number<br/>in<br/>Executive<br/>Summary</u> | <u>Topic<br/>in<br/>Part<br/>Two</u> | <u>Source of<br/>Information<br/>in<br/>Final Report</u> | <u>Page Number<br/>in<br/>Final Report</u> |
|---|--------------------------------------|--|--|
|   | <u>Question One</u>                  |  |  |
| 9   | Accidents                            | Exhibit 3-8  | 80   |
|   | Perinatal Health                     |  | .  |
| 9   | Children                             | Exhibit 3-7  | 78   |
| 9   | Mother's                             | Exhibit 3-6  | 78   |
| 9   | Mother's Age                         | Table 3-10   | 3A-11                                      |
|   | Pediatric Health                     |  |  |
| 9   | Any Problem                          | Exhibit 3-4  | 77   |
| 10  | Specific Problem                     | Exhibit 3-2  | 74   |
|   | Dental                               |  |  |
| 10  | Affected Surfaces                    | Exhibit 4-3  | 107  |
| 10  | Urgent Care                          | Exhibit 4-6  | 109  |
| 10  | Nutrition                            | Exhibit 6-4  | 171  |
| 10  | Motor Development                    | Exhibit 8-4  | 283  |
|   | Speech and Language                  |  |  |
| 10  | Any Problem                          | Exhibit 9-2  | 302  |
| 10  | Articulation Delay                   | Exhibit 9-3  | 303  |
| 10  | Vision                               | Exhibit 10-2   | 321  |
| 11  | Hearing                              | Exhibit 11-2   | 335  |
|   | <u>Question Two</u>                  |  |  |
|   | Medical                              |  |  |
| 11  | Examinations                         | Exhibit 2-4  | 59   |
| 11  | Treatment                            | Exhibit 2-4  | 59   |

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|---|--------------------------------------|--|--|
|   | <b>Dental</b>                        |  |  |
| 11  | Examinations                         | Exhibit 2-4  | 59   |
| 11  | Problems                             | Exhibit 2-4  | 59   |
| 11  | Treatment                            | Exhibit 2-4  | 59   |
| 11  | One Site: Decay                      | Exhibit 4-12   | 120  |
| 11  | One Site: Increase                   | Exhibit 4-10   | 117  |
| 11  | One Site: Fillings                   | Exhibit 4-10   | 117  |
|   | <b>Nutrition</b>                     |  |  |
| 12  | Intakes Head Start                   | Exhibit 6-13   | 190  |
|   | Intakes Non-Head                     |  |  |
| 12  | Start                                | Exhibit 6-27   | 214-5                                      |
| 12  | Food Assistance                      | Exhibit 6-20   | 203  |
| 12  | Meals at Home                        | Exhibit 6-38   | 237  |
|   | <b>Nutritional</b>                   |  |  |
| 12  | Assessment                           | Exhibit 7-9  | 262  |
| 12  | Blood Tests                          | Exhibit 7-9  | 262  |
|   | <b>Immunizations</b>                 |  |  |
| 12  | Total                                | Exhibit 2-4  | 59   |
| 12  | By Head Start                        | Exhibit 3-12   | 85   |
| 12  | Development Assessment               | Exhibit 8-6  | 286  |
| 13  | Speech and Language                  | Exhibit 9-4  | 304  |
| 13  | Vision Screen                        | Exhibit 10-3   | 324  |
| 13  | Hearing Screen                       | Exhibit 11-3,  | 337  |
|   | <b>Parent Involvement</b>            |  |  |
| 13  | Visited Classroom                    | Exhibit 6-14   | 193  |
| 13  | Visited Once/Week                    | Exhibit 6-15   | 194  |
|   | <b>Food and Nutrition</b>            |  |  |
| 13  | Meeting                              | Exhibit 6-14   | 193  |

| <u>Page Number<br/>in<br/>Executive<br/>Summary</u> | <u>Topic<br/>in<br/>Part<br/>Two</u>                      | <u>Source of<br/>Information<br/>in<br/>Final Report</u> | <u>Page Number<br/>in<br/>Final Report</u> |
|---|---|--|--|
| 13  | Health Records &<br>Reports                               | Exhibit 2-4  | 59   |
|   | <u>Question Three</u>                                     |  |  |
| 14  | Medical Examination                                       | Exhibit 3-18   | 94   |
| 14  | Other Preventive<br>Health Services                       | Exhibit 3-19   | 95   |
| 14  | Treatment of Prob-<br>lems Found                          | Table 3-16   | 3A-24                                      |
| 14  | Problems at Post-<br>test                                 | Table 3-14   | 3A-15                                      |
| 14  | Single & Multiple<br>Problems                             | Table 3-17   | 3A-25                                      |
|   | <u>Dental Examination</u>                                 |  |  |
| 14  | Head Start  | Exhibit 4-8  | 113  |
| 14  | Non-Head Start  | Exhibit 4-9  | 115  |
| 14  | Fillings  | Exhibit 4-14   | 122  |
| 14  | Dental Visits   | Exhibit 4-18   | 127-8                                      |
|   | <u>Nutrition</u>  |  |  |
| 15  | Meals at Home   | Exhibit 6-38   | 237  |
| 15  | Head Start Present<br>vs. Absent<br>vs. Non-Head<br>Start | Exhibit 6-25   | 210  |
| 15  | Start   | Exhibit 6-26   | 210  |
|   | <u>Speech Evaluation</u>                                  |  |  |
| 15  | Head Start  | Exhibit 9-4  | 304  |
| 15  | Non-Head Start  | Exhibit 9-7  | 309  |
|   | <u>Therapy Services</u>                                   |  |  |
| 15  | Head Start  | Exhibit 9-4  | 304  |
| 15  | Non-Head Start  | Exhibit 9-7  | 309  |

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|   | Vision Screen                        |  |  |
| 15  | Head Start                           | Exhibit 10-3   | 324  |
| 15  | Non-Head Start                       | Exhibit 10-4   | 326  |
|   | <u>Question Four</u>                 |  |  |
|   | Pediatric Evaluation                 |  |  |
|   | Problems at Post-                    |  |  |
| 15  | test                                 | Table 3-14   | 3A-15                                      |
|   | Treatment of Prob-                   |  |  |
| 16  | lems Found                           | Table 3-16   | 3A-24                                      |
|   | Dental Evaluation                    |  |  |
| 16  | Head Start                           | Exhibit 4-8  | 113  |
| 16  | Fillings                             | Exhibit 4-10   | 117  |
| 16  | Dental Hygiene                       | Exhibit 4-15   | 123  |
|   | Prevalence of                        |  |  |
| 16  | Cavities                             | Exhibit 4-11   | 118  |
| 16  | Anthropometry                        | Exhibit 5-8  | 145  |
|   | Nutrition                            |  |  |
| 16  | Cross-Sectional                      | Exhibit 6-24   | 209  |
| 16  | Longitudinal                         | Exhibit 6-16   | 197  |
|   | Head Start Present                   |  |  |
| 17  | vs. Absent                           | Exhibit 6-16   | 197  |
|   | vs. Non-Head                         |  |  |
| 17  | Start                                | Exhibit 6-16   | 197  |
| 17  | Food Assistance                      | Exhibit 6-20   | 203  |
|   | Biochemical Evaluation               |  |  |
| 17  | B-carotene                           | Exhibit 7-8  | 261  |
| 17  | Abnormal Hgb or Hct                  | Exhibit 7-10   | 264  |
| 17  | All Measures                         | Exhibit 7-11   | 266  |

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**Developmental Evaluation**

|    |              |             |     |
|----|--------------|-------------|-----|
| 17 | No Problems  | Exhibit 8-8 | 291 |
| 17 | Longitudinal | Exhibit 8-7 | 289 |

**Speech and Language  
Evaluation**

|    |                        |              |     |
|----|------------------------|--------------|-----|
|    | <b>Deficiencies at</b> |              |     |
| 18 | Posttest               | Exhibit 9-9  | 311 |
| 18 | One Site               | Exhibit 9-10 | 312 |
| 18 | Vision Evaluation      | Exhibit 10-5 | 327 |
| 18 | Hearing Evaluation     | Exhibit 11-5 | 340 |



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|---|--|--|--|
|   | <u>Pediatric Evaluation</u>            |  |  |
|   | <u>Pediatric Health</u>                |  |  |
| 19  | Any Problem                            | Exhibit 3-4  | 77   |
| 19  | Specific Problem                       | Exhibit 3-2  | 74   |
|   | <u>Perinatal Health</u>                |  |  |
| 20  | Mother's                               | Exhibit 3-6  | 78   |
| 20  | Mother's Age                           | Table 3-10   | 3A-11                                      |
|   | <u>Medical Services</u>                |  |  |
| 20  | Examination                            | Exhibit 3-10   | 81   |
| 20  | Immunization                           | Exhibit 3-10   | 81   |
| 20  | TB Test                                | Exhibit 3-12   | 85   |
| 20  | Lead Test                              | Exhibit 3-12   | 85   |
|   | <u>Problems at Post-</u>               |  |  |
| 20  | test                                   | Table 3-14   | 3A-15                                      |
| 21  | Treatment                              | Exhibit 3-20   | 96   |
|   | <u>Other Preventive</u>                |  |  |
| 21  | Health Services                        | Exhibit 3-19   | 95   |
|   | <u>Dental Evaluation</u>               |  |  |
|   | <u>Comparison to</u>                   |  |  |
| 21  | Prior Surveys                          | Exhibit 4-7  | 111  |
| 21  | Pretest Prevalence                     | Exhibit 4-3  | 107  |
| 21  | Dental Services                        | Exhibit 4-8  | 113  |
|   | <u>Impacts</u>                         |  |  |
| 22  | Incidence                              | Exhibit 4-10   | 117  |
| 22  | Prevalence                             | Exhibit 4-11   | 118  |
| 22  | Brush Teeth                            | Exhibit 4-18   | 127-8                                      |
| 22  | Hygiene Practices                      | Exhibit 4-15   | 123  |

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| <u>Anthropometric Evaluation</u>                    |  |  |  |
| Pretest   |  |  |  |
| 22  | Percentiles                            | Exhibit 5-3  | 139  |
| Posttest  |  |  |  |
| 22  | Percentiles<br>Below 10th              | Exhibit 5-9  | 146  |
| 23  | Percentile                             | Exhibit 5-10   | 148  |
| <u>Nutrition Evaluation</u>                         |  |  |  |
| Pretest & Prior                                     |  |  |  |
| 23  | Surveys                                | Exhibit 6-5  | 173  |
| Problematic   |  |  |  |
| 23  | Nutrients                              | Exhibit 6-4  | 171  |
| Head Start Present                                  |  |  |  |
| 24  | vs. Absent                             | Exhibit 6-25   | 210  |
| vs. Non-Head  |  |  |  |
| 24  | Start                                  | Exhibit 6-24   | 209  |
| 24  | Marginal Intakes                       | Exhibit 6-21   | 205  |
| 24  |  | Exhibit 6-22   | 206  |
| 24  |  | Exhibit 6-23   | 207  |
| 24  | Longitudinal Impact                    | Exhibit 6-16   | 197  |
| 24  | Less than 100% RDA                     | Exhibit 6-17   | 199  |
| 25  | Head Start Meals                       | Exhibit 6-13   | 190  |
| 25  | vs. Absent                             | Exhibit 6-25   | 210  |
| vs. Non-Head  |  |  |  |
| 25  | Start                                  | Exhibit 6-24   | 209  |
| 25  | Food Assistance                        | Exhibit 6-20   | 203  |
| 25  | Parent Education                       | Exhibit 6-14   | 193  |
| 25  | At-Home Diet                           | Exhibit 6-38   | 237  |

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|---|--|--|--|
| <u>Biochemical Evaluation</u>                       |  |  |  |
| 26  | Prior Surveys                          | Exhibit 7-8  | 261  |
| 26  | Hematologic Screen                     | Exhibit 7-9  | 262  |
| 26  | Abnormal Levels                        | Exhibit 7-10   | 264  |
| 26  | WIC/Food Stamps                        | Exhibit 7-13   | 269-71                                     |
| <u>Biochemical<br/>Indicators</u>                   |  |  |  |
| 26  |  | Exhibit 7-11   | 266  |
| <u>Developmental Evaluation</u>                     |  |  |  |
| 27  | Pretest Results                        | Exhibit 8-5  | 285  |
| <u>Developmental<br/>Screen</u>                     |  |  |  |
| 27  |  | Exhibit 8-6  | 286  |
| <u>Developmental<br/>Services</u>                   |  |  |  |
| 27  |  | Exhibit 8-6  | 286  |
| <u>Impacts on Children</u>                          |  |  |  |
| 27  | Below Average                          | Exhibit 8-7  | 289  |
| 27  | Longitudinal                           | Table 8-9  | 8A-12                                      |
| <u>Speech and Language<br/>Evaluation</u>           |  |  |  |
| 28  | Pretest                                | Exhibit 9-2  | 302  |
| 28  | Articulation Delays                    | Exhibit 9-3  | 303  |
| 28  | Speech Screen                          | Exhibit 9-4  | 304  |
| 28  | Speech Services                        | Exhibit 9-6  | 308  |
| 28  | Impacts                                | Table 9-11   | 9A-21                                      |

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|---|--|--|--|
|---|--|--|--|

Vision Evaluation

|    |                    |              |     |
|----|--------------------|--------------|-----|
| 29 | Pretest Prevalence | Exhibit 10-2 | 321 |
| 29 | Vision Screening   | Exhibit 10-4 | 326 |
| 29 | Vision Problems    | Exhibit 10-5 | 327 |
| 29 | Vision Services    | Exhibit 10-3 | 324 |
| 29 |                    | Exhibit 10-4 | 326 |

Hearing Evaluation

|    |                     |              |     |
|----|---------------------|--------------|-----|
| 29 | Posttest Prevalence | Exhibit 11-5 | 340 |
| 29 | Pretest Prevalence  | Exhibit 11-2 | 335 |
| 29 | Hearing Screen      | Exhibit 11-3 | 337 |
| 30 | Hearing Status      | Exhibit 11-5 | 340 |

## APPENDIX 1C

### ACKNOWLEDGEMENTS

This six-year evaluation is the accumulated achievement of numerous persons and groups. Without the cooperation, patience, and assistance of all, we never could have completed the study. Several of these deserve special recognition for their contributions to the evaluation effort.

We are especially grateful to Dr. Bernard Brown, the Government Project Officer for this evaluation, for his continuing interest, assistance, and support. At several points in the evaluation, he played a central role in pursuing some of the more complex methodological issues of this study. Two other ACYF officials were particularly instrumental in conducting this study. They are Dr. Raymond C. Collins, Director, Office of Program Development and Mr. Dennis Deloria, Program Analyst, Office of Program Development. Both provided continuing interest and constructive guidance throughout.

We also express our appreciation to other ACYF officials who contributed their interest and enthusiasm to this study-- Dr. Phyllis Stubbs, Director, Health Services Branch, Head Start Bureau; Dr. Margaret Phillips, Nutritionist, Head Start Bureau; Ms. Marion Slatin, Child Health Specialist, Health Services Branch, Head Start Bureau; and Dr. Linda Randolph, formerly Director, Health Services Branch, Head Start Bureau, currently Director, Office of Public Health, New York State Department of Public Health. To the staff of the Regional Offices, we extend our warm appreciation for their help in "trouble-shooting" at some critical stages in the evaluation.

We further acknowledge the valuable assistance and patient support the Head Start Program directors and staff at each of the study sites have provided in the evaluation effort. They gave generously of their time, responding to questions about the operations of their program and services delivered to children and families. We are especially grateful to the following: in Greene and Humphreys Counties--Marvin Hoagin and Barbara Jackson; in St. Clair County--Barbara Westerfield and Frances Young; in Maricopa County--Roberto Armijo, Irma Moreno, Mary Beles, and Jean Hughes (from the Maricopa County Health Department); and in Mingo County--Patty Spence, Peggy Childers and Ida Mae Copley. Very special and heartfelt thanks go to the families and children who participated in the evaluation. We sincerely appreciate the time they donated during the data collection periods. Together, program staff and the participating families in both the Head Start and comparison groups provided invaluable insights into how the Head Start health services affect the lives of children.

Our National Advisory Panel provided the evaluation staff with guidance, assistance, invaluable insight and support from the start of this six-year undertaking. In essence, the expertise and experience they freely shared with us made it possible to conduct this evaluation. Several panel members remained with us throughout and deserve special recognition for their contributions to the study: William Bryant, D.M.D.; Jacob Cohen, Ph.D.; Johanna Dwyer, Ph.D.; Thomas Fria, Ph.D.; Fernando Guerra, M.D.; Gertrude Hunter, M.D.; Jacqueline Liebergott, Ph.D.; George Owen, M.D.; Steven Shusterman, D.M.D.; and Jack Smith, Ph.D.

Our data collection teams of consulting health professionals contributed significantly to the evaluation with their time, insights, dedication, willingness to work under unusual circumstances, and good humor. Many of the following individuals returned for each of the three years of data collection (pilot, pretest and posttest):

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| Karen Fullerton     | Roni Pelzman       | Kathy Wallach |
| Barbara Jacobs      | Mary Rajala        | Ed Wong       |

Many Abt Associates staff contributed energy, ideas, and time to making the data collection operations work. Our data collections were made possible by the conscientious and resourceful work of evaluation assistants at each of the sites. They were responsible for recruiting families into the evaluation, maintaining contact with them, and organizing their participation during the data collections. The outstanding evaluation assistants were: Janice Brown, Emilia Borbia, Tammi Bucci, Gail Horton, Cozie Leverette, Felicia Newby, Maria Rodriguez, Judy Simon, Sandra Thompson and Dora White.

Other staff who contributed enormously to the data collections were Alan Bell, Dr. David Connell, Ellen Glovsky and Ed Maddox; each played major roles in designing and conducting the pilot test and some aspects of the pretest of the evaluation. Dr. John Himes designed the anthropometric data protocol and Mary Kay Fox refined the nutrition and meal observation protocols. Others who also played major roles in site development were William Accomando, Barbara Shank, Janet Smith, and Nancy Stevens. Mary Kay Fox, John Himes and Clinton Sornberger contributed significantly to training the data collection teams.



Catherine Barclay, Diane Foster, Mary Kay Fox, John Himes, Marrit Nauta, Jeffrey Pearce, and Janet Wertheimer ably managed the twenty-five (or more) person teams during the posttest of the evaluation. Julita Milliner, Joanne Nester, Collette Wallace, and Gail Vasington organized and supervised the meal observations staff.

Finally, I want to acknowledge the Abt Associates staff and consultants who played major roles in analyzing and reporting the data. Drs. -John Himes, Clinton Sornberger, and David Hoaglin have contributed, in successive stages, as Directors of Analysis. In the later phases of the study, Jeffrey Pearce designed and managed the data base and Ellen Lee contributed analysis support. Most of the chapters of the report have had numerous contributions from many analysts and staff members. Those primarily responsible for the final analyses and content of each are listed below:

- Chapter 1: Linda B. Fosburg, Ph.D.
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I also especially thank David Hoaglin, Marrit Nauta, Peter Wolff, Steven Fosburg and Walter Stellwagon for helping to edit these discrete chapters into a report.

Finally, I wish to express my gratitude to the project's administrative and secretarial staff. Sharon Pinkham was there in the beginning and has provided support in many ways during the final phases; Barbara Quinlan played a major role in managing production of the many drafts of this report; Lisa Wenzel has patiently produced draft after draft; and Ann Zwetchkenbaum has contributed to the final layout.

To the many more contributors who played less conspicuous, but no less important roles, we thank you. We are indebted to all for their energy, encouragements and contributions.

Linda B. Fosburg, Ph.D.

Project Director .

March 1984

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THE EFFECTS OF  
HEAD START HEALTH SERVICES:

REPORT  
OF THE  
HEAD START HEALTH EVALUATION

VOLUME II

March 15, 1984

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HHS-105-77-1042

Prepared for:  
The Administration for Children, Youth and Families  
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CHAPTER TWO

APPENDIX NOTES



Appendix Note 2-1

Head Start Performance Standards

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Head Start Performance Standards

Subpart C-Health Services Objectives and Performance Standards.

1304.2-1 Health Service general objectives

The general objectives of the health services component of the Head Start program are to:

(a) Provide a comprehensive health services program which includes a broad range of medical, dental, mental health and nutrition services to preschool children, including handicapped children, to assist the child's physical, emotional, cognitive and social development toward the overall goal of social competence.

(b) Promote preventive health services and early intervention.

(c) Provide the child's family with the necessary skills and insight and otherwise attempt to link the family to an ongoing health care system to ensure that the child continues to receive comprehensive health care even after leaving the Head Start program.

1304.3-3 Medical and dental history, screening and examinations.

(a) The health service component of the performance standards plan shall provide that for each child enrolled in the Head Start program a complete medical, dental, and developmental history will be obtained and recorded, a thorough health screening will be given, and medical and dental examinations will be performed. The plan will provide also for advance parent or guardian authorization for all health services under this subpart.

(b) Health screenings shall include:

(1) Growth assessment (head circumference up to two years old) height, weight, and age.

(2) Vision testing.

(3) Hearing testing.

(4) Hemoglobin or hematocrit determination.

(5) Tuberculin testing where indicated.

(7) Based on community health problems, other selected screenings where appropriate, e.g., sickle cell anemia, lead poisoning, and intestinal parasites.

(8) Assessment of current immunization status.

(9) During the course of health screening, procedures must be in effect for identifying speech problems, determining their cause, and providing services.

(10) Identification of the special needs of handicapped children.

(c) Medical examinations for children shall include:

(1) Examination of all systems or regions which are made suspect by the history or screening test.

(2) Search for certain defects in specific regions common or important in this age group, i.e., skin, eye, ear, nose, throat, heart, lungs, and groin (inguinal) area.

1304.3-4 Medical and dental treatment.

(a) The plan shall provide for treatment and follow-up services which include:

(1) Obtaining or arranging for treatment of all health problems detected. (Where funding is provided by non-Head Start funding sources there must be written documentation that such funds are used to the maximum feasible extent. Head Start funds may be used only when no other source of funding is available.)

(2) Completion of all recommended immunizations--diphtheria, pertussis, tetanus (DPT), polio, measles, German measles. Mumps immunization shall be provided where appropriate.

(3) Obtaining or arranging for basic dental care services as follows:

(i) Dental examination

(ii) Services required for the relief of pain or infection.

(iii) Restoration of decayed primary and permanent teeth.

(iv) Pulp therapy for primary and permanent teeth as necessary.

(v) Extraction of non-restorable teeth.

(vi) Dental prophylaxis and instruction in self-care oral hygiene procedures.

(viii) Application of topical fluoride in communities which lack adequate fluoride levels in the public water supply.

(b) There must be a plan of action for medical emergencies.

1304.3-5 Medical and dental records.

The plan shall provide for: (a) the establishment and maintenance of individual health records which contain the child's medical and develop-

mental history, screening results, medical and dental examination data, and evaluation of this material, and up-to-date information about treatment and follow-up; (b) forwarding, with parent consent, the records to either the school or health delivery system or both when the child leaves the program; and (c) giving parents a summary of the record which includes information on immunization and follow-up treatment; and (d) utilization of the Health Program Assessment Report (HPAR); and (e) assurance that in all cases parents will be told the nature of the data to be collected and the uses to which the data will be put, and that the uses will be restricted to the stated purposes.

#### 1304.3-6 Health education.

(a) The plan shall provide for an organized health education program for program staff, parents and children which ensures that:

(1) Parents are provided with information about all available health resources;

(2) Parents are encouraged to become involved in the health care process relating to their child. One or both parents should be encouraged to accompany their child to medical and dental exams and appointments;

(3) Staff are taught and parents are provided the opportunity to learn the principles of preventive health, emergency first-aid measures, and safety practices;

(4) Health education is integrated into ongoing classroom and other program activities.

(5) The children are familiarized with all health services they will receive prior to the delivery of those services.

#### 1304.3-8 Mental health services.

(a) The mental health part of the plan shall provide that a mental health professional shall be available, at least on a consultation basis, to the Head Start program and to the children. The mental health professional shall:

(4) Advise and assist in developmental screening and assessment;

(5) Assist in providing help for children with atypical behavior or development, including speech.

#### 1304.3-9 Nutrition objectives.

The objectives of the nutrition part of the health services component of the Head Start program are to:

(a) Help provide food which will help meet the child's daily nutritional needs in the child's home or in another clean and pleasant environment, recognizing individual differences and cultural patterns, and thereby promote sound physical, social, and emotional growth and development.

(b) Provide an environment for nutritional services which will support and promote the use of the feeding situation as an opportunity for learning;

(c) Help staff, child and family to understand the relationship of nutrition to health, factors which influence food practices, variety of ways to provide for nutritional needs and to apply this knowledge in the development of sound food habits even after leaving the Head Start program;

(d) Demonstrate the interrelationships of nutrition to other activities of the Head Start program and its contribution to the overall child development goals; and

(e) Involve all staff, parents and other community agencies as appropriate in meeting the child's nutritional needs so that nutritional care provided by Head Start complements and supplements that of the home and community.

#### 1304.3-10 Nutrition services.

(a) The nutrition services part of the health services component of the performance standards plan must identify the nutritional needs and problems of the children in the Head Start program and their families. In so doing account must be taken of:

(1) The nutrition assessment data (height, weight, hemoglobin/hematocrit) obtained for each child;

(2) Information about family eating habits and special dietary needs and feeding problems, especially of handicapped children; and

(3) Information about major community nutrition problems.

(b) The plan, designed to assist in meeting the daily nutritional needs of the children, shall provide that:

(1) Every child in a part-day program will receive a quantity of food in meals (preferably hot) and snacks which provides at least 1/3 of daily nutritional needs with consideration for meeting any special needs of children, including the child with a handicapping condition;

(2) Every child in a full-day program will receive snack(s), lunch, and other meals as appropriate which will provide 1/2 to 2/3 of daily nutritional needs depending on the length of the program;

(3) All children in morning programs who have not received breakfast at the time they arrive at the Head Start program will be served a nourishing breakfast.

(4) The kinds of food served conform to minimum standards for meal patterns;

(5) The quantities of food served conform to recommended amounts indicated in CCD Head Start guidance materials; and

(6) Meal and snack periods are scheduled appropriately to meet children's needs and are posted along with menus; e.g., breakfast must be served at least 2 1/2 hours before lunch, and snacks must be served at least 1 1/2 hours before lunch or supper.

Appendix Note 2-2

Information for Interpreting Tables of Regression Results

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Information for Interpreting Tables of Regression Results

Results of regression analyses have been reported in a standardized format across chapters. In all analyses, selected covariates were first entered into the equation to adjust for background differences in the samples. Covariates are listed in a table footnote, but the tables do not report coefficients or standard errors for individual covariates.

Effects-coded site variables (see Technical Appendix 2B, p. 15) were included in the cross-site analyses. The effects (b) and their standard errors ( $se_b$ ) are reported for the first three sites; the coefficient for the fourth site (Mingo County) can be determined by subtracting the sum of the other site effects from zero. Significant site effects are indicated by asterisks (\* =  $p < .05$ ; \*\* =  $p < .01$ ).

After adjusting for covariate and site differences, a dichotomous Head Start variable (0 = non-Head Start, 1 = Head Start) was entered; a positive coefficient (b) therefore indicates a positive Head Start effect of size b (see Technical Appendix 2B, p. 14). If the effect was significant, an asterisk (\* or \*\*) was added to the coefficient. Head Start effects are repeated after the site effects in cross-site analyses. Tables for within-site analyses for each sample, which follow several pages of cross-site statistics, report the value and standard error only for the within-site Head Start effect.

The F-statistic, R-squared (variance accounted for), and residual mean square also are reported for each analysis (both across and within sites). These statistics are based on the entire regression equation, including covariates. Thus, a significant F does not necessarily reflect a significant Head Start effect.



CHAPTER TWO

APPENDIX TABLES

Table 2-1

Comparisons of Head Start Health Services Delivered According to the Local PIR<sup>a</sup> and Regional (National) Averages<sup>b</sup>

|  | Greene & Humphreys Counties |                  | St. Clair County     |                  | Maricopa County |                  | Mingo County         |                  | All Sites                        |                  |
|--|-----------------------------|------------------|----------------------|------------------|-----------------|------------------|----------------------|------------------|----------------------------------|------------------|
|  | PIR                         | Regional Average | PIR                  | Regional Average | PIR             | Regional Average | PIR                  | Regional Average | PIR                              | National Average |
| Total Enrollment   | 620                         |                  | 899                  |                  | 458             |                  | 345                  |                  | 2322                             |                  |
| Percent Children with Medicaid                                 | n 195/620<br>% 31.5         | 32.5             | n 684/899<br>% 76.1  | 59.5             | d               | 56.9             | n 138/345<br>% 40.0  | 51.5             | n 1017/2322<br>% 43.8            | 47.2             |
| Medicaid Percent Receiving Medical Screens Paid by Medicaid    | n No Info.<br>%             | 80.0             | n 684/684<br>% 100.0 | 85.0             | d               | 88.0             | n 38/138<br>% 27.5   | 80.3             | n 722/822 <sup>c</sup><br>% 87.8 | 81.5             |
| Medicaid Percent with Medical Findings                         | n No Info.<br>%             | 22.7             | n 26/684<br>% 3.8    | 20.3             | d               | 17.4             | n 34/138<br>% 24.6   | 24.6             | n 60/822 <sup>c</sup><br>% 7.3   | 22.8             |
| Medicaid Percent Receiving Medical Treatment Paid by Medicaid  | n No Info.<br>%             | 88.5             | n 26/26<br>% 100.0   | 84.2             | d               | 85.3             | n 10/34<br>% 29.4    | 86.5             | n 36/60 <sup>c</sup><br>% 60.0   | 7/13<br>85.8     |
| Medicaid Percent Receiving Dental Examination Paid by Medicaid | n No Info.<br>%             | 61.5             | n 613/684<br>% 89.6  | 69.6             | d               | 58.5             | n 138/138<br>% 100.0 | 66.8             | n 751/822 <sup>c</sup><br>% 91.4 | 63.7             |
| Medicaid Percent with Dental Findings                          | n No Info.<br>%             | 42.5             | n 52/684<br>% 7.6    | 28.1             | d               | 28.3             | n 50/138<br>% 36.2   | 35.2             | n 102/822 <sup>c</sup><br>% 12.4 | 32.9             |
| Medicaid Percent Receiving Dental Treatment Paid by Medicaid   | n No Info.<br>%             | 88.9             | n 52/52<br>% 100.0   | 80.5             | d               | 90.7             | n 47/50<br>% 94.0    | 82.5             | n 99/102<br>% 97.1               | 84.7             |

<sup>a</sup>Base is total actual local enrollment reported in Program Information Record in all programs except for Friends of Children. The latter pertains to Greene and Humphreys Counties only.

<sup>b</sup>Base is total grantees in region.

<sup>c</sup>Excluding Greene and Humphreys Counties.

<sup>d</sup>There was no Medicaid program in Maricopa County prior to and during the evaluation.

Table 2-2

Comparisons of Head Start Health Services Delivered According to the Local PIR<sup>a</sup>, the Abstract of Local Health Records of the Evaluation of Children<sup>b</sup>, and Regional (National) Estimates<sup>c</sup>

|  | Greene & Humphreys Counties |                           | St. Clair County |                  | Maricopa County <sup>e</sup> |                 | Mingo County     |                  | All Sites                    |                  |
|--|-----------------------------|---------------------------|------------------|------------------|------------------------------|-----------------|------------------|------------------|------------------------------|------------------|
|  | PIR                         | Abstract Records          | PIR              | Abstract Records | PIR                          | Abstract Record | PIR              | Abstract Records | PIR                          | Abstract Records |
| Total Enrollment   | 620                         | 127                       | 899              | 108              | 458                          | 102             | 345              | 112              | 2322                         | 449              |
| Percent Children with Medicaid                                 | n<br>Z                      | 195/620<br>31.5           | 49/127<br>38.6   | 684/899<br>76.1  | 73/108<br>67.6               | 0<br>0          | 138/345<br>40.0  | 30/112<br>26.8   | 1017/2322<br>43.8            | 152/449<br>33.9  |
| Medicaid Percent Receiving Medical Screens Paid by Medicaid    | n<br>Z                      | No Info.<br>33/49<br>67.3 | 684/684<br>100.0 | 68/73<br>93.2    |                              |                 | 38/138<br>27.5   | 23/30<br>76.7    | 722/822 <sup>d</sup><br>87.8 | 124/152<br>81.6  |
| Medicaid Percent with Medical Findings                         | n<br>Z                      | No Info.<br>9/49<br>18.4  | 26/684<br>3.8    | 2/73<br>2.7      |                              |                 | 34/138<br>24.6   | 2/30<br>6.7      | 60/822 <sup>d</sup><br>7.3   | 13/152<br>8.6    |
| Medicaid Percent Receiving Medical Treatment Paid by Medicaid  | n<br>Z                      | No Info.<br>6/9<br>66.7   | 26/26<br>100.0   | 0/2<br>0.0       |                              |                 | 10/34<br>29.4    | 1/2<br>50.0      | 36/60 <sup>d</sup><br>60.0   | 7/13<br>53.8     |
| Medicaid Percent Receiving Dental Examination Paid by Medicaid | n<br>Z                      | No Info.<br>31/49<br>63.3 | 613/684<br>89.6  | 68/73<br>93.2    |                              |                 | 138/138<br>100.0 | 18/30<br>60.0    | 751/822 <sup>d</sup><br>91.4 | 117/152<br>77.0  |
| Medicaid Percent with Dental Findings                          | n<br>Z                      | No Info.<br>6/49<br>12.2  | 52/684<br>7.6    | 34/73<br>46.6    |                              |                 | 50/138<br>36.2   | 3/30<br>10.0     | 102/822 <sup>d</sup><br>12.4 | 43/152<br>28.3   |
| Medicaid Percent Receiving Dental Treatment Paid by Medicaid   | n<br>Z                      | No Info.<br>5/6<br>83.3   | 52/52<br>100.0   | 21/34<br>61.8    |                              |                 | 47/50<br>94.0    | 3/3<br>100.0     | 99/102<br>97.1               | 29/43<br>67.4    |

<sup>a</sup> Base is total actual local enrollment reported in Program Information Record except for Greene and Humphreys Counties which is the disaggregated numbers specific to those counties.

<sup>b</sup> Base is total Head Start group included in evaluation and percentage reflects medical examinations, only.

<sup>c</sup> Base is total grantees in region.

<sup>c</sup> Base is total grantees in region.

<sup>d</sup> Excluding Greene and Humphreys Counties.

<sup>e</sup> Arizona does not have a Medicaid program, consequently, there are no children covered by that program in Maricopa County.

CHAPTER FOUR

APPENDIX NOTES

Appendix Note 4-1

Use of dmf Index vs. Other Alternatives

Appendix Note 4-1

Use of dmf Index vs. Other Alternatives

The selection of dmf index for use in analyzing and presenting the dental evaluation findings was a judgment call. Besides this summative measure of dental services, we included other measures which should be sensitive to receipt of services, e.g., the plaque index, and also presented each factor (d,m,f) separately.

We recognized that dmf combines variables, some indicative of receipt of dental services and some indicative of the lack of services. We considered alternatives, but none were as satisfactory given the distribution of the data collected in this evaluation.

The ratio  $\frac{f}{d+f}$  results in the following distribution of values for children:

| Values    |     |
|-----------|-----|
| 0         | 77% |
| .001-.999 | 17% |
| 1         | 6%  |

and  $\frac{d}{d+f}$  results in the following distribution of values for children:

| Values    | Greene & Humphrey Counties | St. Clair County | Maricopa County | Mingo County |
|-----------|----------------------------|------------------|-----------------|--------------|
| 0         | 6.1%                       | 37.2%            | 48.2%           | 28.9%        |
| .001-.999 | 11.9                       | 4.2              | 25.3            | 31.6         |
| 1         | 81.9                       | 58.6             | 26.5            | 60.5         |

CHAPTER SIX

APPENDIX NOTES

Appendix Note 6-1

Preliminary Analyses to Evaluate Potential Biases  
Resulting From Use of Direct Observation Methodology to  
Gather Data on Meals and Snacks Served in Head Start Centers



Appendix Note 6-1

This Appendix reports results of preliminary analyses undertaken to assess the impact of using the observation methodology in gathering data on foods consumed by children during the hours they attended Head Start. Although one could evaluate both the 24-hour recall data and the observation data from a number of different perspectives, the analyses reported here were structured to determine whether or not there was any systematic bias in the observation data that would have favored Head Start and produced artifactual Head Start effects. It was hypothesized that such a bias could have occurred as a result of one or both of the differences in protocol, as described previously. That is:

- observation data could favor Head Start simply because all foods consumed had been recorded as they were observed. Since mothers had to recall what foods their children had eaten on the previous day, they may have forgotten, or indeed not seen, some foods;
- observation data may have resulted in larger portion sizes, and thereby greater nutrient contributions, since observers were able to weigh and measure foods to determine accurate average serving sizes before meals were served to the children.

Problems due to poor memory on the part of the mother cannot be fully assessed. However, it is believed that potential bias resulting from such difficulties was minimal. Every effort was made to prompt mothers' recalls in a non-leading fashion, and considerable effort was expended to obtain data from other persons on foods that might have been consumed by children when they were not in their mother's care or when mothers were not observing their child's food consumption. Previous investigators have noted that there is generally good agreement between the foods that are reported in 24-hour recalls and foods that were actually consumed (Emmons and Hayes, 1973; Linusson, Sanjur and Eriskcon, 1974; Young, 1981).

Problems are more likely to result from inaccuracies in describing portion sizes of foods consumed and the resultant discrepancies in computed nutrient content of the total diet. Several investigators have reported the tendency for respondents to overestimate small intakes and underestimate larger intakes, resulting in an overall decrease in the number of persons in the sample with very high or low intakes (Linusson, Sanjur and Eriskcon, 1974;

Madden, Goodman and Guthrie, 1976; Gersovitz, Madden and Smiciklas-Wright, 1978). This effect has been termed the "flat-slope syndrome." Despite this problem, investigators have found that the data obtained through 24-hour recalls provide reasonably accurate measures of mean nutrient intake at the group level (Gersovitz, Madden and Smiciklas-Wright, 1978; Madden, Goodman and Guthrie, 1976).

Estimation of portion sizes through the observation methodology is unlikely to result in a "flat slope syndrome" and, simply due to the hands-on nature of the methodology, is likely to result in more accurate descriptions of the portions of food consumed. The observation methodology used in this evaluation was adapted from one developed by Abt Associates for an evaluation of the Nutrition, Education and Training (NET) Program for the U. S. Department of Agriculture. Analyses undertaken for that study reported a correlation of approximately 0.93 between estimates made by observers and the actual portion sizes (Comstock, St. Pierre and Mackiernan, 1981).

Given these circumstances, it was hypothesized that any bias in the data due to the use of the observation methodology in Head Start centers that would favor Head Start and produce invalid findings would result from a systematic upward bias in the total portion size of foods reported (since observers would not tend to underestimate larger portions of food, as respondents in 24-hour recalls tend to do). In structuring analyses to determine whether any such bias existed in the data, the following steps were taken:

- the gram weight equivalent of mothers' reported portion sizes (using the food model system) were computed;\*
- individual foods were aggregated for both recalls and observations into twenty-one major food groups;\*\*
- the average gram weight in each of the major food groups was computed for both recall and observation data. (Recall data for Head Start-absent and non-Head Start children were evaluated separately).

---

\*Meal observation data were already recorded in gram weights.

\*\*Milk and milk drinks; creams; milk deserts; cheeses; meats, poultry, fish; eggs and egg mixtures; legumes, nuts, seeds; bread, crackers, bread products; cakes, cookies, pastries; ready-to-eat cereals; grains; citrus fruits and juices; non-citrus fruits and juices; potatoes; dark green vegetables; yellow vegetables; other vegetables; mixed dishes; fats; sugar and sweets; and beverages (not including milk or juice).

Average portion sizes from observations and recalls were then compared on three levels:

- overall average--the average portion size in each of the twenty-one food groups, determined by averaging all meals and snacks. The observation data for the Head Start-present group was compared to recall data for both the Head Start-absent group and the non-Head Start group;
- average portion sizes based on lunch meals only--comparison of Head Start-present versus each of the other two groups;
- average portion sizes for same group of children--Head Start observation versus the at-home recall. (The Head Start-absent subgroup who had valid but incompatible observations were used in this comparison.)

Results of all analyses revealed that there were no significant biases in portion size estimations that would have favored Head Start meals and snacks and thus produced erroneous results in the nutrition analyses. In fact, as Exhibits 6A-A through 6A-C show, any significant differences in portion size detected were in a direction that would have favored at-home intakes (Head Start-absent and non-Head Start groups) rather than observations (Head Start-present group). That is, where significant differences in portion size existed, they were consistently due to larger portion sizes reported in the recall data set.

These preliminary analyses successfully demonstrate that it is unlikely that the significant and positive differences noted for the Head Start-present group in this evaluation were due to some bias in the data produced by use of the observation methodology in Head Start centers. In fact, it seems as though the size of the differences may actually have been somewhat masked by the tendency for portion sizes reported in recalls to be larger than observed portion sizes. Whether this difference in portion sizes is an anomaly produced by the food model system used in collecting 24-hour recall data, is an example of a tendency for respondents to overestimate small portions, or is in fact illustrative of a tendency for children to eat more at home and less at Head Start cannot be evaluated with the available data.

Exhibit 6A-A

Overall Average Portion Sizes in Eighteen Major Food Groups<sup>a</sup>  
by Data Collection Methodology

| Food Group                    |                                   | Recalls <sup>b</sup> | Observations | Significance <sup>c</sup> |
|-------------------------------|-----------------------------------|----------------------|--------------|---------------------------|
| Milk/Milk Drinks:             | Average portion size <sup>d</sup> | 184.71               | 174.33       | 0.007                     |
|                               | n                                 | 256                  | 231          |                           |
| Milk Deserts:                 | Average portion size              | 77.66                | 67.05        | 0.229                     |
|                               | n                                 | 49                   | 40           |                           |
| Cheeses:                      | Average portion size              | 35.42                | 15.22        | 0.000                     |
|                               | n                                 | 62                   | 33           |                           |
| Meat/Poultry/Fish:            | Average portion size              | 54.15                | 46.90        | 0.017                     |
|                               | n                                 | 263                  | 204          |                           |
| Eggs/Egg Mixtures:            | Average portion size              | 71.71                | 50.94        | 0.000                     |
|                               | n                                 | 130                  | 80           |                           |
| Legumes/Nuts/<br>Seeds:       | Average portion size              | 61.04                | 39.05        | 0.001                     |
|                               | n                                 | 121                  | 73           |                           |
| Bread/Crackers,<br>etc:       | Average portion size              | 34.88                | 21.81        | 0.000                     |
|                               | n                                 | 248                  | 261          |                           |
| Cakes/Cookies/<br>Pastry:     | Average portion size              | 40.13                | 25.62        |                           |
|                               | n                                 | 128                  | 69           |                           |
| Ready-to-Eat<br>Cereals:      | Average portion size              | 64.70                | 53.29        | 0.000                     |
|                               | n                                 | 187                  | 92           |                           |
| Grains:                       | Average portion size              | 142.48               | 73.41        | 0.000                     |
|                               | n                                 | 66                   | 73           |                           |
| Citrus Fruits/<br>Juices:     | Average portion size              | 184.07               | 87.58        | 0.000                     |
|                               | n                                 | 109                  | 140          |                           |
| Non-Citrus Fruits/<br>Juices: | Average portion size              | 123.81               | 67.49        | 0.000                     |
|                               | n                                 | 102                  | 221          |                           |
| Potatoes:                     | Average portion size              | 51.13                | 47.27        | 0.462                     |
|                               | n                                 | 165                  | 48           |                           |
| Dark Green Vege-<br>tables:   | Average portion size              | 60.77                | 42.27        | 0.074                     |
|                               | n                                 | 26                   | 41           |                           |
| Deep Yellow Vege-<br>tables:  | Average portion size              | 88.88                | 42.35        | 0.064                     |
|                               | n                                 | 17                   | 50           |                           |
| Other Vegetables:             | Average portion size              | 59.89                | 34.34        | 0.000                     |
|                               | n                                 | 142                  | 182          |                           |
| Fats:                         | Average portion size              | 7.85                 | 6.01         | 0.002                     |
|                               | n                                 | 167                  | 135          |                           |
| Sugar and Sweets:             | Average portion size              | 28.69                | 12.52        | 0.000                     |
|                               | n                                 | 178                  | 107          |                           |

<sup>a</sup>Only those food groups for which there were five or more cases in each category (recall and observation) are reported here.

<sup>b</sup>Based on 24-hour recalls for Non-Head Start group.

<sup>c</sup>Based on 2-tailed t-tests.

<sup>d</sup>Gram weights.

Exhibit 6A-B

Average Portion Sizes in Sixteen Major Food Groups<sup>a</sup> for Lunch Meals  
by Data Collection Methodology

| Food Group                    |   | Recalls <sup>b</sup> | Observations  | Significance <sup>c</sup> |
|-------------------------------|---|----------------------|---------------|---------------------------|
| Milk/Milk Drinks:             | Average portion size, <sup>d</sup><br>n | 204.11<br>64         | 191.18<br>251 | 0.214                     |
| Milk Deserts:                 | Average portion size<br>n               | 67.95<br>5           | 91.40<br>32   | 0.304                     |
| Meat/Poultry/Fish:            | Average portion size<br>n               | 52.83<br>157         | 55.40<br>188  | 0.543                     |
| Eggs/Egg Mixtures:            | Average portion size<br>n               | 100.00<br>7          | 46.12<br>8    | 0.000                     |
| Legumes/Nuts/<br>Seeds:       | Average portion size<br>n               | 50.22<br>43          | 65.10<br>63   | 0.193                     |
| Bread/Crackers/<br>etc.:      | Average portion size<br>n               | 40.08<br>175         | 23.09<br>211  | 0.000                     |
| Cakes/Cookies/<br>Pastry:     | Average portion size<br>n               | 45.71<br>17          | 28.88<br>41   | 0.073                     |
| Ready-to-eat<br>Cereals:      | Average portion size<br>n               | 68.84<br>15          | 60.50<br>72   | 0.749                     |
| Grains:                       | Average portion size<br>n               | 157.09<br>25         | 73.41<br>73   | 0.001                     |
| Citrus Fruits/<br>Juices:     | Average portion size<br>n               | 209.59<br>21         | 51.73<br>30   | 0.000                     |
| Non-Citrus Fruits/<br>Juices: | Average portion size<br>n               | 141.49<br>19         | 60.29<br>87   | 0.000                     |
| Potatoes:                     | Average portion size<br>n               | 40.55<br>34          | 54.21<br>45   | 0.000                     |
| Dark Green Vege-<br>tables:   | Average portion size<br>n               | 68.36<br>8           | 42.27<br>41   | 0.000                     |
| Other Vegetables:             | Average portion size<br>n               | 80.89<br>53          | 39.24<br>177  | 0.011                     |
| Fats:                         | Average portion size<br>n               | 8.10<br>51           | 8.70<br>68    | 0.000                     |
| Sugar and Sweets:             | Average portion size<br>n               | 35.23<br>29          | 25.88<br>33   | 0.393                     |

<sup>a</sup>Only those food groups for which there were five or more cases in each category (recall and observation) are reported here.

<sup>b</sup>Based on 24-hour recalls for Non-Head Start group.

<sup>c</sup>Based on 2-tailed t-tests.

<sup>d</sup>Gram weights.

Exhibit 6A-C

Average Portion Sizes for Eleven Major Food Groups<sup>a</sup>  
by Data Collection Methodology for the Same Group of Children<sup>b</sup>

| Food Group                    |                                   | Recalls <sup>b</sup> | Observations | Significance <sup>c</sup> |
|-------------------------------|-----------------------------------|----------------------|--------------|---------------------------|
| Milk/Milk Drinks:             | Average portion size <sup>d</sup> | 183.53               | 190.53       | 0.635                     |
|                               | n                                 | 44                   | 44           |                           |
| Meat/Poultry/Fish:            | Average portion size              | 56.37                | 38.23        | 0.019                     |
|                               | n                                 | 34                   | 34           |                           |
| Legumes/Nuts/<br>Seeds:       | Average portion size              | 37.49                | 36.65        | 0.939                     |
|                               | n                                 | 10                   | 10           |                           |
| Bread/Crackers/<br>etc.:      | Average portion size              | 40.03                | 21.85        | 0.000                     |
|                               | n                                 | 45                   | 45           |                           |
| Ready-to-Eat<br>Cereals:      | Average portion size              | 66.40                | 17.36        | 0.102                     |
|                               | n                                 | 11                   | 11           |                           |
| Citrus Fruits/<br>Juices:     | Average portion size              | 163.93               | 92.14        | 0.006                     |
|                               | n                                 | 14                   | 14           |                           |
| Non-Citrus Fruits/<br>Juices: | Average portion size              | 116.92               | 84.68        | 0.065                     |
|                               | n                                 | 24                   | 24           |                           |
| Potatoes:                     | Average portion size              | 56.97                | 73.63        | 0.462                     |
|                               | n                                 | 7                    | 7            |                           |
| Other Vegetables:             | Average portion size              | 38.37                | 27.42        | 0.317                     |
|                               | n                                 | 20                   | 20           |                           |
| Fats:                         | Average portion size              | 9.31                 | 7.43         | 0.348                     |
|                               | n                                 | 9                    | 9            |                           |
| Sugar and Sweets:             | Average portion size              | 23.11                | 27.06        | 0.557                     |
|                               | n                                 | 14                   | 14           |                           |

<sup>a</sup> Only those food groups for which there were five or more cases in each category (recall and observation) are reported here.

<sup>b</sup> Recalls based on at-home intake for subset of children in the Head Start-absent group. Observations based on data for the same set of Head Start-absent children--those children who had valid but incompatible observation data. (See Chapter Six, section on Special Head Start Subgroups.)

<sup>c</sup> Based on 2-tailed t-tests.

<sup>d</sup> Gram weights.

Appendix Note 6-2

Notes on Appropriate Use of Reference Nutrient Intake Standards

483.

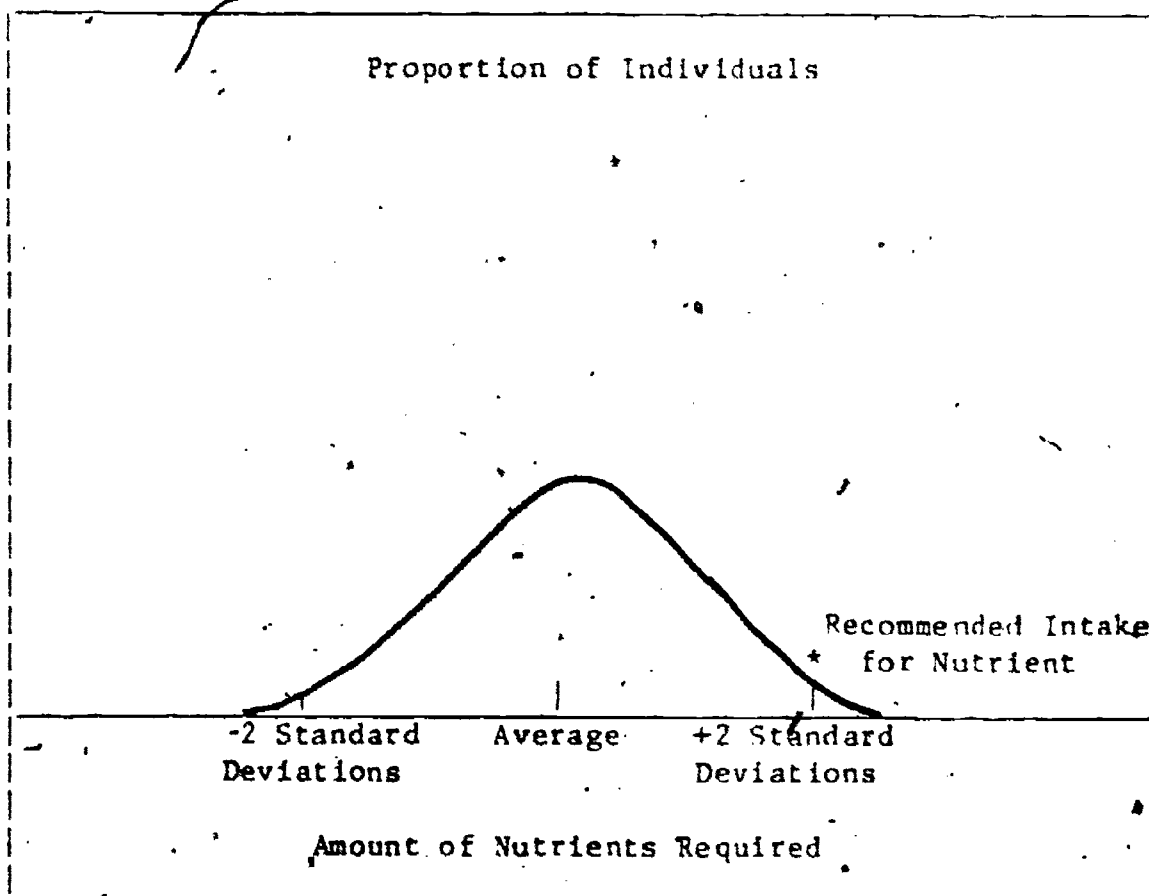
The reader should note that the approach taken in using a set of reference standards to measure prevalence of nutrition problems, in Head Start and non-Head Start groups differs greatly from that used in most other domains in the Head Start Health Evaluation. That is, the standards cannot be used as arbitrary cutoff points by which to measure whether individual children have "passed" or "failed" some measure of nutritional intake. There are several important reasons for this difference. First, the standards used in evaluating nutrient intake are based largely on the 1980 Recommended Dietary Allowances (see Appendix Note 6-3). These standards, as the name implies, recommendations rather than requirements. These recommendations are oriented toward population groups rather than individuals. Thus, an individual whose nutrient intake fails to meet the recommended level on a particular day is not necessarily deficient in that nutrient. The practice of evaluating nutrient intake data in this manner, though somewhat common place, is an invalid use of the standards and frequently overestimates the prevalence of truly deficient intakes (Hegsted, 1975).

It is important to recognize that nutrient intake standards have been developed using the sometimes limited data available on actual nutrient requirements for particular age and sex groups. Frequently, little is known about the variability in individual requirements within these groups. Since evidence is available that many individuals may need more than the "average requirement" for any nutrient, and since recommendations must be set so that the needs of these individuals are met, nutrient intake standards are generally set well above the average requirement. That is, the standards are set at a level of intake expected to be "adequate to meet the known nutritional needs of practically all healthy persons" (Food and Nutrition Board, National Academy of Sciences, 1981). As such, the RDA may well exceed the actual requirements of many individuals. Exhibit 6A-D depicts the ideal approach taken in setting recommended levels of nutrient intake when sufficient evidence is available on the distribution of requirements within a population group. Theoretically, if nutrient requirements within age and sex groups followed a normal distribution, the recommended level of intake would be adequate to meet the needs of 97.5 percent of all individuals (and would exceed the needs of many of them). Thus, nutrient intake standards cannot be reliably used as cut-off points for identifying individuals consuming "inadequate" amounts of nutrients.



Exhibit 6A-D

Establishment of Recommended Levels of Nutrient Intake<sup>a,b,c</sup>  
Based on the Distribution of Nutrient Requirements  
Within a Population Group



<sup>a</sup> Although sufficient information is not always available on the distribution of requirements within a group, this general approach--setting the standard well above the known "average requirement"--is routinely used in establishing nutrient intake standards.

<sup>b</sup> Recommended levels of caloric intake are generally set equal to the average requirement rather than at some level above that requirement. The sedentary lifestyle and prevalence of obesity in the U.S. generally decrease the caloric requirements of large numbers of individuals.

<sup>c</sup> Adapted from Beaton, 1981.

One can make reasonable judgments about the relative risk of inadequate intakes within a population group, however. That is, the risk of deficient intakes within a group increases as the average intake is less than the level recommended as safe for that population group (Food and Nutrition Board, National Academy of Sciences, 1981). Hence, the appropriate approach to describing the problem of marginal or deficient nutrient intakes in the groups of children evaluated here precludes computation of an actual prevalence estimate. Rather, the prevalence of marginal nutrient intakes can be addressed only in terms of potential risk of deficient intakes within the various groups of children examined.

The notion of group risk is especially appropriate for our analyses of Head Start's nutrition program because it accurately reflects Head Start's approach in this area. Meal service in Head Start, the major focus of the nutrition program, is a group function. The feeding of each individual child in Head Start is not contingent upon a battery of tests to determine the child's nutritional needs.\* Instead, the aim of providing nutritionally adequate meals and snacks in the Head Start setting is to increase the likelihood that the average Head Start child's total daily intake will be at least at the RDA specified level for each essential nutrient. Such an approach should, as stated above, meet the needs of at least 97.5 percent of the Head Start children for all of the essential nutrients.

An additional rationale for not attempting to measure the adequacy of individual intakes stems from the nature of the dietary data used in this nutrition evaluation. The 24-hour recall is limited in its ability to accurately depict an individual's true food consumption habits (Beaton, 1981). The day-to-day variations in dietary intake are great, thus it would be naive to expect a description of food intake over a single 24-hour period to adequately characterize an individual's typical pattern of intake. Much research has been done on this issue, and it is commonly accepted that food consumption data must be collected over longer periods of time (three-day or

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\*Head Start Performance Standards do call for individual assessment of nutritional need. Such assessments are done on a varying basis from site to site (see section on Head Start's nutrition services), and sometimes lead to family referrals--for example, to WIC--for additional food assistance. Such assessments do not, however, generally lead to individualized meal service in Head Start centers for designated children.

seven-day food records, 24-hour recalls repeated over a period of time, or a complete dietary history) before nutrient intake profiles can reasonably be expected to characterize typical dietary practices for an individual (Beaton, 1981). Although the 24-hour recall is not adequate for individual-level analysis, it is routinely used in characterizing nutrient intake patterns of specific population groups. Hence, even if one were to disregard the previously identified problems associated with using recommended nutrient intake standards in evaluating the adequacy of individual intakes, one would have to accept the fact that nutrient data obtained through 24-hour recall would not support such analyses.\*

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\*Some progress has been made recently in attempting to develop more accurate approaches to estimating the prevalence of individuals with deficient nutrient intakes. A primary requirement for such analyses, however, is that the nutrient intake data accurately reflect typical intake patterns (including some assessment of day-to-day variation). Data from single 24-hour recalls are unfortunately not sufficient for such analyses (Beaton, 1981).

Appendix Note 6-3

Reference Standards Used in the Nutrition Evaluation

Exhibit 6A-E

Nutrient Intake Standards Used in Nutrition Evaluation<sup>a</sup>

| Nutrient  | 2-3 year olds | 4-6 year olds |
|---|---------------|---------------|
| Calories (kcal per kg body weight) <sup>b</sup> | 82.0          | 82.0          |
| Protein (gm per kg body weight) <sup>b</sup>    | 1.5           | 1.5           |
| Calcium (mg/day) <sup>c</sup>                   | 800.0         | 800.0         |
| Iron (mg/day) <sup>c</sup>                      | 15.0          | 10.0          |
| Magnesium (mg/day) <sup>c</sup>                 | 150.0         | 200.0         |
| Phosphorus (mg/day) <sup>c</sup>                | 800.0         | 800.0         |
| Vitamin A (I.U./day) <sup>d</sup>               | 2000.0        | 2500.0        |
| Thiamin (mg/1000 kcal) <sup>b</sup>             | 0.4           | 0.4           |
| Riboflavin (mg/1000 kcal) <sup>b</sup>          | 0.5           | 0.5           |
| Niacin (mg/1000 kcal) <sup>b,e</sup>            | 6.6           | 6.6           |
| Vitamin B <sub>6</sub> (mg/day) <sup>c</sup>    | 0.9           | 1.3           |
| Vitamin B <sub>12</sub> (mg/day) <sup>c</sup>   | 2.0           | 2.5           |
| Vitamin C (mg/day) <sup>c</sup>                 | 45.0          | 45.0          |
| Cholesterol (mg/day)                            | 300.0         | 300.0         |

<sup>a</sup>RDA standards for carbohydrate and fat have not been established.

<sup>b</sup>Adapted from NHANES and TSNS standards, adjusting for total body weight (calories and protein) or total caloric intake (thiamin, riboflavin, niacin)--closely approximate average 1980 RDA values.

<sup>c</sup>1980 RDA Standards.

<sup>d</sup>1976 RDA Standard--based on I.U. of total Vitamin A value rather than retinol equivalents.

<sup>e</sup>Based on milligrams preformed niacin rather than niacin equivalents.

Exhibit 6A-F

Nutrient Density of RDA Reference Diet<sup>a</sup>  
 (Amount of nutrient per 1000 kilocalories)

|                               |        |
|-------------------------------|--------|
| Protein (gm)                  | 17.6   |
| Calcium (mg)                  | 544.0  |
| Iron (mg)                     | 9.6    |
| Magnesium (mg)                | 116.5  |
| Phosphorus (mg)               | 544.0  |
| Vitamin A value (I.U.)        | 1507.5 |
| Thiamin (mg)                  | 0.61   |
| Riboflavin (mg)               | 0.60   |
| Niacin (mg)                   | 6.71   |
| Vitamin B <sup>6</sup> (mg)   | 0.84   |
| Vitamin B <sup>12</sup> (mcg) | 1.50   |
| Vitamin C (mg)                | 31.5   |
| Cholesterol (mg)              | 200.0  |

<sup>a</sup>Based on 1980 RDA standards for average caloric and nutrient intakes. Figures represent average of standards for 2- to 3-year old group and 4- to 6-year old group. Caloric standard = 1500 kcal.

Appendix Note 6-4

Detailed Description of the Contrast Coding Scheme Used For  
Multiple-Group Comparisons in the Nutrition Evaluation

The regression model used in the nutrition evaluation used a three-level, contrast-coded Head Start factor. In order to accurately describe potential Head Start effects and understand any differences noted among the three groups (Head Start-present, Head Start-absent, and non-Head Start), each basic regression model was elaborated into three versions--one for each comparison between a pair of groups:

- Head Start-present group vs. non-Head Start group;
- Head Start-present group vs. Head Start-absent group; and
- Head Start-absent group vs. non-Head Start group.

Because the effects for the three groups require two degrees of freedom, the contrast variable for a comparison between a pair of groups must be accompanied by a second contrast variable (whose values are essentially determined by the first contrast variable). Exhibit 6A-G shows the pairs of variables used for the three types of group comparison.

Through each of the three iterations of the regression, all other covariates and factors in the model remained the same; thus, the final solution (constant, F statistic,  $R^2$ , residual mean squared error) was unchanged.

Exhibit 6A-G

Contrast Coding Schemes Used in Regression Analyses  
to Detect Differences Among the Three Treatment Groups<sup>a</sup>

| Comparison                                     | Major Contrast Variable           | Additional Contrast Variable       |
|--|-----------------------------------|------------------------------------|
| Head Start-present<br>vs.<br>Non-Head Start    | HS-P = +1<br>HS-A = 0<br>NHS = -1 | HS-P = +1<br>HS-A = -2<br>NHS = +1 |
| Head Start-present<br>vs.<br>Head Start-absent | HS-P = +1<br>HS-A = -1<br>NHS = 0 | HS-P = +1<br>HS-A = +1<br>NHS = -2 |
| Head Start-absent<br>vs.<br>Non-Head Start     | HS-P = 0<br>HS-A = +1<br>NHS = -1 | HS-P = -2<br>HS-A = +1<br>NHS = +1 |

<sup>a</sup>HS-P = Head Start-present group; HS-A = Head Start-absent group; NHS = Non-Head Start group



## TECHNICAL APPENDIX 2A

### IMPLEMENTATION OF THE EVALUATION DESIGN

Implementation of the evaluation design for the Head Start Health Evaluation took place in a series of stages, as shown previously in Table 1A-1. Stage I comprised the following activities: Head Start program selection (subsequently referred to as site selection), site preparation and development, and sample recruitment. At Stage II, preparation for data collection involved revision of a battery of measures, equipment procurement, team recruitment, staff training, and random assignment of samples. Stage III consisted of the pretest data collection and the follow-up of health problems. At Stage IV, activities centered on a second wave of sample recruitment and on preparations for the posttest data collection (equipment procurement, team recruitment, and staff training). Finally, Stage V consisted of the posttest data collection and follow-up of health problems.

#### Stage I Activities

##### Site Selection

Whereas it had originally been assumed that site selection for the Head Start Health Evaluation should both be random, and include enough sites to permit generalizations to policy relevant populations (e.g., all Head Start grantees and delegate agencies), it soon became apparent, based on other related undertakings (e.g., the First and Second Health and Nutrition Examination Surveys), that the cost of a similar undertaking would far exceed the available resources for this study. Ultimately, a large-scale random site selection strategy was abandoned in favor of a site sampling scheme that emphasized a balance among a preselected set of stratifying variables for typical Head Start sites and adequate sample size both within and between sites.

The pilot test for the Head Start Health Evaluation had raised several important issues which bore on the site selection strategy for the main study. In that pilot study a random sampling procedure, stratified by degree of urbanization (rural, middle-sized city, and large city) and region

of the country (U. S. Department of Health and Human Services Regions I and IV) was used to select three pilot sites: one rural and one large city program from Head Start Region I and one middle-sized city program from Region IV. The principal condition required of a pilot site was that the health component be well implemented (in compliance with the Head Start Performance Standards). This was a self-evident constraint in that it made no sense to attempt to evaluate the impact of a program that was only poorly or partially implemented. In order to ensure that this condition was met, two additional sites (for each degree of urbanization) were randomly selected as alternate candidates in case the first (and second) site would prove to be unacceptable. Regional office personnel of the U.S. Department of Health and Human Services and the Head Start Health Liaison Specialist from Westinghouse Health Systems (contractor for Head Start health training and technical assistance) were independently asked to identify acceptable sites and, further, to denote the best of the three randomly selected sites for each stratum. According to these expert sources, only five of the nine sites were considered acceptable in terms of the degree of implementation of their health components and the administrative stability of the Head Start program. Furthermore, there was consensus on the selection of the three best sites.

From this experience, it was evident that selection of sites at random was likely to yield some sites which were not in compliance with the Head Start Performance Standards for the health component, and these would be poor subjects for this evaluation. Inclusion of such sites would weaken the study's potential for finding health impacts. The sampling approach adopted for the main study was equivalent to rephrasing the evaluation question to be "What are the expected impacts of a well-implemented Head Start health component?"

The pilot study also showed that Head Start programs are heterogeneous in many respects--the populations served, the health and nutritional needs of the children, and the health services provided. Consequently, pooling data on children across sites could result in problems of interpretation or misleading findings. For example, strong effects at one site might be obscured by null or negative effects at another. To maximize the ability to detect program impacts on a site-by-site basis (and to examine the interrelationship between site characteristics and impacts), adequate

sample sizes of children at each site would be needed. In order to compute within-site sample requirements, we examined the variety of health problems under consideration to determine the prevalence of each problem in the target population and the amount of change in these problems that one might expect over the course of a Head Start program year. A sample of 125 participants and 125 non-participants per site was deemed to be adequate to assess those health services and conditions that affect large numbers of Head Start children. We recognized, however, that this within-site sample size would effectively preclude the evaluation from assessing how Head Start deals with some health problems that affect only a small proportion of the population. In order to obtain a final sample of 250 children, given possible attrition, the evaluation proposed to recruit an initial sample of 300 children at each site. Thus, in the event of large site variation on important variables, the sample size within each site would be large enough to support inferences about Head Start impacts separately for each site.

The characteristics and number of sites to be included in the evaluation was the subject of lengthy discussions between the evaluation staff and the Administration for Children, Youth and Families. It was recognized that the use of a data collection team of health specialists to collect health data (e.g., pediatricians for general pediatric health, pedodontists for dental health, and audiologists for hearing) would be costly and would thus limit the number of evaluation sites or result in very small samples of children in each of a larger number of sites. After much consideration of alternative strategies, available resources permitted implementation of the evaluation in four Head Start sites on approximately 250 children per site.

Several site and program characteristics were used to select the four sites:

- urban versus rural setting;
- region of the country;
- strength of local health care system and availability of free or subsidized health care for Head Start eligibles;
- ethnicity of the Head Start population;
- size of the Head Start program; and
- strength of Head Start health services locally.

The rationale for using this set of characteristics was as follows. On average, rural areas have fewer physicians and hospitals per capita. When combined with the greater distances that must be travelled in order to obtain services, access to health care is often substantially worse in rural rather than in urban sites. Since a substantial portion of Head Start programs serve rural areas, it was necessary to represent such sites in this evaluation.

Region of the county has a subtler influence. Although available health care services vary widely across regions, the variation within a region is also very great. Thus, although it was possible to obtain, within some regions, a sample representative of the range of health care services, it was preferable to select a balanced sample of sites across regions to improve the face validity of the sample used for the evaluation.

The strength of the local health care system and the availability of free or subsidized health care services for the poor vary widely across the nation. Some areas have large numbers of doctors and clinics, while others have few. In many areas, health services are so uneven that one or more vital services may not be available locally. (For example, one of the selected sites had no dentist within easy reach.) Further, although in some areas nearly all Head Start children were eligible for Medicaid, this was not universally the case and in one site, there was no Medicaid program. Since, when an alternative health delivery service is available, Head Start simply mediates the delivery of the needed health care, the absence of such alternatives within a community invariably increases the management and resource burden on the local Head Start program. A comprehensive examination of the Head Start health care system thus had to take account of this important local variation in health care resources.

During the program year, 1980-81, the Head Start children served were 42 percent black, 33 percent white, and 20 percent Hispanic. To reflect this distribution, two predominately black, one white, and one Hispanic site were appropriate, given a total of four sites.

In addition, the size of the Head Start program was an important site selection criteria. Given an initially estimated within-site sample size

requirement to recruit 150 Head Start and 150 comparison children (to allow for attrition), only large Head Start programs, serving more than 300, were chosen for participation in the study. Further, to increase the probability of identifying Head Start impacts on the health status of low-income children, selection was also limited to Head Start programs with well-implemented health and nutrition programs that were in compliance with the Head Start Performance Standards for the health component. Thus, Head Start sites were excluded from consideration if they were known to have weak health components. (While a process study examining Head Start services could be conducted in such sites, most of the major study issues could not be appropriately addressed.) No attempt, however, was made to identify Head Start programs with "model" health components. Instead sites were considered if the Head Start management information system, the Program Information Record (PIR), showed that the health program at that site was, by and large, operating competently and in a manner "typical" of that region. Thus, "typical" sites were selected, not so much to "represent" all Head Start programs but to evaluate standard health services delivery in the presence of the range of contextual factors which confront Head Start. Westinghouse Health Systems (the technical assistance contractor for the Head Start health services) and the U. S. Department of Health and Human Services regional offices also provided the assessments of the Head Start health services delivered in candidate sites for the Head Start Health Evaluation.

These criteria led to the selection of the following four sites:

- Greene County (Leakesville) and Humphreys County (Belzoni), Mississippi;
- St. Clair County (East St. Louis), Illinois;
- Maricopa County (Phoenix), Arizona; and
- Mingo County (Williamson), West Virginia.

Exhibit 2A-1 shows some of the distinguishing characteristics of the four programs selected for the evaluation.

Exhibit 2A-1

Characteristics of the Four Head Start Programs  
Selected for the Head Start Health Evaluation

| Program Characteristics                    | Greene & Humphreys Counties | St. Clair County   | Maricopa County  | Mingo County |
|--|-----------------------------|--------------------|--|--------------|
| Predominant Ethnicity of Children Enrolled | Black                       | Black              | Hispanic   | White        |
| Degree of Urbanization of Local Community  | Rural                       | Urban              | Urban  | Rural        |
| Number of Years Children Enrolled          | Two to three years          | Two to three years | One year (with one-year Home-Based program prior to center enrollment for some children) | Two years    |

Site Preparation and Development

Site preparation and development required close coordination and cooperation among regional office staff of the Administration for Children, Youth and Families, Head Start program staff, Head Start parents, health care professionals, and evaluation staff. The complexity of the evaluation design alone made implementation difficult. Logistics were a major undertaking, but they were essential to successful implementation of the study.

To conduct the evaluation, it was necessary to gain support for the study, first from the regional offices of the Administration for Children, Youth and Families (U. S. Department of Health and Human Services) and from the local Head Start programs. This process began immediately after the national office of the Administration for Children, Youth and Families made the final selection of first-choice of Head Start programs for longitudinal

evaluation sites. To this end, several visits were made to each of the four Head Start programs to brief policy councils, health advisory panels, and program staff on study objectives, the design, and other details of the study (e.g., random assignment, health measures, and follow-up of urgent health problems). Recognizing the limitations of a solely verbal presentation of a complex evaluation strategy such as the Head Start Health Evaluation, a slide presentation was prepared as a visual aid to briefing various audiences. The slides contained graphic presentations of the stages of the evaluation with photographs of children receiving each portion of the health evaluation, and parents being interviewed. Following extensive site development work, all four Head Start programs that were selected agreed to participate in the study.

A critical task in this process was to negotiate acceptable procedures with each local Head Start program for the random assignment of Head Start-eligible children to either Head Start or a non-Head Start comparison group. This was essential because the potential strength of the design for the longitudinal study depended critically on the feasibility of implementing random assignment of children into Head Start and non-Head Start groups.

Implementation of random assignment procedures was difficult and raised many concerns: parents about the effect on their children and Head Start directors about the impact on the Head Start program itself. Questions were raised about the ethics of withholding services from children who require them. Our approach was simple and direct. We explained that without random assignment it would be difficult to provide conclusive evidence of Head Start impacts. Second, we discussed the fact that each site had many more Head Start-eligible children than the program could serve, and consequently some children would not be able to enroll. Any selection procedure applied to all Head Start-eligible children would fill all of the available Head Start enrollment positions but would leave numerous children outside the program's services. Furthermore, it was pointed out that participation in the evaluation meant that both Head Start children and non-Head Start comparison children would receive an extensive health evaluation at least once during the study, thereby extending health benefits to all participating children. For some non-Head Start children, the benefits

of participation in the study would go beyond the health evaluation. If deemed severely in need of health services at either pre- or posttest, non-Head Start children would be referred for services which would be paid for through a special grant to the Head Start programs.

The evaluation staff and Head Start program staff reached several other important agreements. Head Start agreed to reserve 150 slots for children recruited for the Head Start Health Evaluation. It was understood, however, that evaluation staff would be responsible for sample recruitment and for filling those slots. Head Start staff, on the other hand, would recruit additional children for entry into the program to fill slots not reserved for the study. Any child, diagnosed as handicapped and recruited by the evaluation staff, was referred directly to Head Start for participation in the program but not in the evaluation. Agreement was also reached with Head Start that parental refusal to participate in the study did not necessarily exclude the child's entry into Head Start. That is, parents could apply for enrollment into Head Start, although no guarantees would be given that the child would be accepted. Non-Head Start children who remained in the comparison group during the evaluation and who desired entry into Head Start after completion of the posttest data collection would be given priority.

#### Sample Recruitment

The next task in site development was the identification and recruitment of 300 Head Start-eligible children in each of the four sites. Only children who were eligible to enter Head Start in fall 1980, who had not previously been professionally diagnosed as handicapped and had no prior Head Start experience were included. (Families with prior Head Start experience, however, were not excluded from participation in this study.)

Because the recruitment process was lengthy and required an extensive knowledge of the community, a group of local evaluation assistants were hired. Their primary responsibility was to identify Head Start-eligible children and encourage their parents (or guardians) to participate in the



study. In addition, they served as liaison with the local Head Start program. All evaluation assistants were familiar with the local Head Start program; several were former Head Start parents and some had served on Head Start policy councils.

Recruitment of a sample of the desired size required a variety of formal and informal approaches. The more formal approaches included contacting all social service and health care agencies (e.g., the county welfare department; Food Stamp center; Women, Infants, and Children (WIC) Supplemental Food program; county health department; and local Health care clinics), as well as the Head Start program, to obtain referrals to families with children of the proper age eligible to enter Head Start in the fall of 1980. In most cases the social service and health care agencies were willing to recommend to families that they contact the evaluation assistant, but were unwilling to provide names of families without first obtaining the families' permission. Although it had been hoped that Head Start would have waiting lists which could be used in recruitment, these lists (if they existed at all) did not contain a substantial number of children.

Informal approaches, including word of mouth and direct canvassing, were also successful means for identifying Head Start-eligible children. In most sites, evaluation assistants went door-to-door to local families, asking parents with eligible children whether they knew of other families with children of the appropriate age.

An extensive public relations campaign was also conducted. Its aim was to give local residents an understanding of how and why the study was being done. This was accomplished through radio announcements, newspaper advertisements, and announcements in churches, supermarkets, and community agencies. Posters and brochures announcing "WHERE CHILD HEALTH IS CONCERNED, WE CAN HELP EACH OTHER" familiarized residents with study objectives and told what participation in the study would involve (see Figure 2A-1).

All leads were followed up by evaluation assistants, who screened each family for income eligibility, age of children, and other site-specific Head Start eligibility criteria, such as availability of transportation.

Figure 2A-1

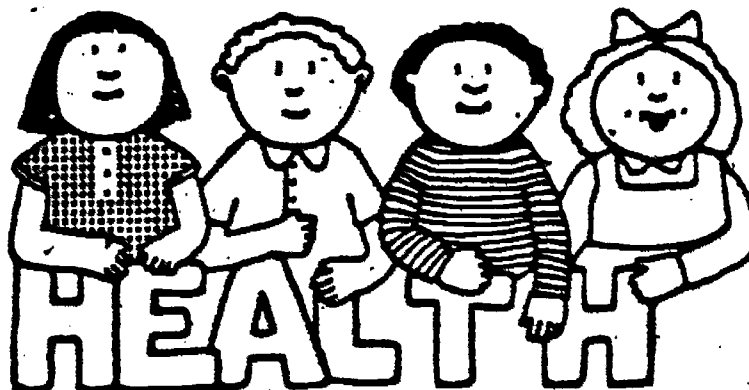
Brochure Used to Familiarize Communities with the Head Start Health Evaluation and to Recruit Families into the Study

## **Where Child Health Is Concerned We Can Help Each Other...**

We are conducting the Head Start Health Evaluation. This study is designed to determine whether the medical, dental and nutritional services provided by Head Start are helping:

- Head Start children,
- their families, and,
- their communities.

If your child will be three to five years of age in September 1980, and you think your child would be eligible for Head Start, we would like you and your child to participate in the study. Call the study representative:



Families found to be eligible for Head Start were given more detailed information about the study and the random assignment process and asked whether they were willing to participate.

Families were subsequently interviewed about a variety of demographic and family background characteristics. Completed interviews were sent to the central evaluation staff for processing. This interview provided the information needed to randomly assign the children within age, sex, and ethnicity strata to either Head Start or the non-Head Start comparison group.

Pretest sample recruitment took place from January through March 1980 and produced the following results. Sample recruitment, although nearly met in all sites, produced fewer than desired children with sufficient family and health information needed for the evaluation. At the time of the pretest data collection in April 1980, those children with at least a completed family background questionnaire numbered 277 in St. Clair County, 180 children in Greene and Humphreys Counties, 170 children in Mingo County, and only 130 in Maricopa County. This shortfall, coupled with expected additional attrition, meant that the recruitment period had to extend beyond the pretest in order to ensure adequate sample sizes for posttest data collection. Recruitment for the augmentation sample occurred in Stage IV of the evaluation (see Table 1A-3).

### Stage II Activities

A number of activities took place simultaneously with sample recruitment by evaluation assistants in preparation for data collection. These included revision of the battery of measures based on pilot study results, procurement of equipment, recruitment and training of data collection staff, location of examination centers in each of the four sites, and random assignment of the sample of recruited children.

#### Revision of Measurement Battery

The measurement battery for the Head Start Health Evaluation was extensive and included instruments for recording information from each of the

health evaluations of the child, as well as from the interviews with the child's parent. The health evaluation sections (described more fully in Appendix 1A) included:

- a pediatric health evaluation;
- a dental evaluation;
- an anthropometric evaluation;
- a hematologic evaluation;
- a developmental evaluation;
- a speech evaluation;
- a vision evaluation; and
- a hearing evaluation;

and the parent interviews included:

- a health history of the child;
- a nutrition evaluation; and
- questions about family background.

All of the instruments were administered on the day the child's health evaluation was conducted, except for the family background questionnaire.

Based on the results of the pilot study, revisions were made in the measurement battery. The extent of these revisions varied with the instrument. Some of the most extensive revisions were in the parent interviews--the family background questionnaire, health history, and nutrition habits questionnaire.

#### Equipment Procurement

A large portion of the equipment was either loaned or donated by merchants and corporations around the country. Exhibit 2A-2 lists the equipment obtained and the source of each piece. Many items required considerable advance planning, because the standard equipment might not meet the transportability needs of the data collection, or because there was a wide range of prices for similar equipment. For example, a height board or

Exhibit 2A-2

Equipment Procured for Pretest Evaluation

| Data Collection Domain | Item  | # Required            | Source   | Donated/<br>Purchased   |
|------------------------|---|-----------------------|--|-------------------------|
| Dental                 | Mirrors   | 35                    |  | Donated                 |
|                        | Mirror handles  | 35                    |  | Donated                 |
|                        | Explorers   | 35                    |  | Donated                 |
|                        | Liquid disclosing solution                            | 3 bottled             |  | Donated                 |
|                        | Cidex sterilizing solution                            | 1 gallon              | Rower Dental Supply Division of Health Co., Inc., Boston, MA | Donated                 |
|                        | Sterilizing basin                                     | 1                     |  |                         |
|                        | 2X2 gauze sponges                                     | 12 boxes              |  | Donated                 |
|                        | Cotton swabs  | 500                   |  | Donated                 |
|                        | Paper cups  | 500                   |  | Donated                 |
|                        | Good Lite™  | 1                     |  | Donated                 |
|                        | Bulbs for light                                       | 3                     |  | Purchased               |
|                        | Mouth prop  | 1                     |  | Purchased               |
|                        | Periodontic probes                                    | 6                     |  | Donated                 |
| Bean bag chair         | 1   | Local Store           | Purchased  |                         |
| Hematology Collection  | Large Centrifuge                                      | 1                     |  | Purchased               |
|                        | Cushions, shield for centrifuge                       | 1 set                 |  | Purchased               |
|                        | 12-place head for centrifuge                          | 1                     | Scientific Products Bedford, MA 01730                        | Purchased               |
|                        | Micro-hematocrit centrifuge                           | 1                     |  | Purchased               |
|                        | Hematocrit capillary tube reader                      | 1                     |  | Purchased               |
|                        | Chart-type hematocrit reader                          | 1                     |  | Purchased               |
|                        | Supplies for blood draws, i.e., band-aids, gauze pads | Enough for four sites | University of Nebraska                                       | Included in subcontract |

Exhibit 2A-2 (continued)

Equipment Procured for Pretest Evaluation

| Data Collection Domain | Item                      | # Required  | Source  | Donated/<br>Purchased |
|------------------------|---------------------------|-------------|---|-----------------------|
| Anthropometry          | Skinfold calipers         | 1           | Pfister Import<br>Carlstadt, NJ                     | Purchased             |
|                        | Stadiometer               | 1           | University of<br>Nebraska                           | Purchased             |
|                        | Scale, balance beam       | 1           | Healthco Inc.<br>Canton, MA                         | Purchased             |
|                        | Ross Insetapes            | 4           | Ross Labs.  | Donated               |
|                        | Growth charts             | 500         | Ross Labs.  | Donated               |
| Vision                 | Classon projector         | 1           | National Inst.<br>of Health                         | Loaned                |
|                        | Bulbs                     | 3           | Claus Gelotte<br>Cambridge, MA                      | Purchased             |
|                        | Phoropter & stand         | 1           | New England<br>School of<br>Optometry<br>Boston, MA |                       |
|                        | Slide projector           | 1           | Abt Associates                                      | Loaned                |
|                        | Finger puppet             | 1           | Local Store   | Purchased             |
|                        | Occluder patch            | 1           |   | Donated               |
|                        | Bioputer                  | 1           | Piano Child<br>Development<br>Center<br>Chicago, IL | Loaned                |
|                        | Retinoscope               | 1           |   | Loaned                |
|                        | Photometer                | 1           | Team Staff  | Loaned                |
|                        | Stereofly & glasses       | 1 set       |   | Purchased             |
|                        | Ishihara color plate book | 1           | Bernell, Inc.<br>Long Island, NY                    | Purchased             |
|                        | Keystone peek-a-boo test  | 1 set       | Keystone, Inc.                                      | Purchased             |
|                        | Diagnostic set            | 1 set       | Dr. Wilburn<br>Lord                                 | Loaned                |
|                        | Batteries                 | 3           | Healthco, Inc.<br>Canton, MA                        | Purchased             |
|                        | Typing stand              | 1           | Abt Associates                                      | Loaned                |
| Paint brush            | 1                         | Local Store | Purchased   |                       |
| Extension cords        | 1                         | Team Staff  | Loaned  |                       |

Exhibit 2A-2 (continued)

Equipment Procured for Pretest Evaluation

| Data Collection Domain | Item                           | # Required | Source  | Donated/<br>Purchased |
|------------------------|--------------------------------|------------|---|-----------------------|
| Vision<br>(continued)  | Plug adapter                   | 1          | Team Staff  | Loaned                |
|                        | "Hand" slide                   | 1          | Local Store   | Purchased             |
|                        | Cartoon slides                 | 1          | Local Store   | Purchased             |
| Developmental          | McCarthy test materials        | 1 set      | Psychological Corporation                                 | Purchased             |
| Nutrition              | Food models                    | 6 sets     | Alan Shapiro<br>Baltimore, MD                             | Purchased             |
|                        | Code books                     | 6          | Reproduced at<br>AAI                                      | Purchased             |
|                        | Vitamin samples                | 6 sets     | Various<br>Manufacturers                                  | Donated               |
| Speech                 | ACLC test materials            | 1 set      | Consulting Psychologists<br>Press, Palo Alto, CA          | Purchased             |
|                        | Del Rio test materials         | 1 set      | National Educational Laboratory Publishers,<br>Austin, TX | Purchased             |
| Audiology              | Audiometer                     | 1          | Quinta Assoc.<br>E. Hackensack,<br>NJ                     | Loaned                |
|                        | Tympanometer                   | 1          | American<br>Electromedics<br>Littleton, MA                | Loaned                |
|                        | Paper for Tympanometer stapler | 12 rolls   | American<br>Electromedics<br>Littleton, MA                | Purchased             |
|                        | Ring toy                       | 1          | Toy Store   | Purchased             |
|                        | Can of blocks                  | 1          | Toy Store   | Purchased             |
| Physical Exam          | Pediatric blood pressure cuff  | 1          | Healthco, Inc.<br>Canton, MA                              | Donated               |
|                        | Diagnostic set                 | 1          | Team Pediatrician   | Donated               |
|                        | Stethoscope                    | 1          | Team Pediatrician   | Loaned                |
|                        | Bean bag chair                 | 1          | Local Store   | Purchased             |
| Children's Incentives  | T-Shirts                       | 500        | Bailey Sportswear,<br>Boston, MA                          | Purchased             |

stadiometer, which cost about \$650 when purchased from the manufacturer, could be handmade in plywood for under \$200.

Biomedical Data Collection Team Recruitment

A team of approximately 20 persons was required to collect pretest data for the Head Start Health Evaluation. The team contained several health care professionals (pediatrician, pedodontist, optometrist, speech pathologist, audiologist, laboratory technologist, and four to five nutritionists). The remainder of the team was composed of two interviewers responsible for obtaining medical and dental histories, one developmental tester, a site coordinator, an assistant site coordinator, a quality controller, and three to five evaluation assistants and transportation coordinators. Exhibit 2A-3 lists the affiliations of the members of the biomedical team.

Exhibit 2A-3

Affiliations of Members of the Biomedical Team

|                       |   |
|-----------------------|---|
| Pediatricians         | Associated Pediatricians of Boston (affiliated with Boston City Hospital)                             |
| Pedodontists          | Children's Hospital Medical Center in Boston  |
| Optometrists          | Plano Child Development Center in Chicago;<br>Private practice in Mississippi                         |
| Speech Pathologists   | Private practice or university local to each<br>Private practice in Mississippi                       |
| Speech Pathologists   | Private practice or university local to each<br>site and familiar with the dialect and colloquialisms |
| Audiologists          | Children's Hospital of Pittsburgh*  |
| Medical Technologists | University of Nebraska Medical School,<br>Laboratory of Nutritional Biochemistry                      |
| Nutritionists         | Abt Associates staff and others, mostly<br>alumnae of the Frances Stern Nutrition<br>Center in Boston |
| Other Positions       | Abt Associates local to each site; and Abt<br>Associates, Cambridge, MA                               |



Subcontracts, consulting agreements, and short-term Abt Associates employee agreements were negotiated to acquire the professional services of many members of the team. In general, most health care professionals collected data for the Head Start Health Evaluation under subcontract with the medical institution that carried malpractice insurance on the professionals and therefore would provide coverage in the unlikely event that such an issue arose.

Prior to data collection, it was necessary to secure approvals for certain of the health professionals to collect data in states outside the area of their medical licensure. Such approvals were required for the team pediatrician, optometrist, and dentist. Other team members did not require approvals. The audiologists had national licensure; the laboratory technologists could function under the license of either the pediatrician or the pedodontist; and the speech pathologists were local and therefore had the appropriate licenses. Making arrangements for approvals was nonetheless complex. The by-laws of most boards of licensure were not written to accommodate the needs of a national health evaluation in which health professionals engaged in collecting data, rather than practicing medicine. However, with few exceptions, all medical boards of licensure eventually developed a procedure to approve the data collection by out-of-state medical professionals. These approvals ranged from permanent or temporary licensure to authorizations or waivers. In only two instances was it necessary to recruit staff currently licensed and practicing within the state.

#### Biomedical Team Training

In late March 1980, all members of the biomedical teams participated in three to four days of training. (Nutritionists were trained one additional day because of the complexity and detail involved in the collection and coding of dietary data.) In general, the training had three purposes: (1) to orient staff to the study site and the logistic procedures, (2) to develop familiarity with the data collection instruments and protocols, and (3) to practice the data collection procedures on sufficient numbers of three- to six-year old children and parents to become familiar with the

routine and to achieve high interrater reliability. All staff received general orientation to the study, including a description of all data collection instruments. Following orientation, training and practice sessions in each specialty area were held with senior consultants or Abt Associates staff. Finally, all biomedical team members were trained in administrative and site operations procedures to be followed during the pretest.

#### Location of Examination Center

Another task prior to data collection was the selection of an appropriate facility to serve as an examination center in each of the four sites. The ideal facility would have at least six private rooms (one each for the pediatric evaluation, dental and audiology evaluation,\* blood draw, developmental evaluation, speech evaluation, and optometric evaluation) and several semi-private rooms for the nutritionists and health history interviewers. Such ideal facilities were not easy to find. Examination sites included three unoccupied offices in a small office building, a church, and an armory. Two sites required separate examination centers. Greene and Humphreys Counties are nearly 200 miles apart; two separate examination centers were used. Two examination facilities, approximately 40 miles apart, also were used in the Maricopa County site.

#### Sample Random Assignment

The evaluation design called for randomly assigning the sample into four equivalent groups in each site, as shown in Table 1A-1. Recruitment information collected by the evaluation assistants on each child was sent to the central evaluation staff. This information was coded, and a unique identification number was assigned. The children were divided into strata

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\*The dental and audiology evaluations were performed in a combined space for three reasons: (1) both evaluations required a sound-proof space (audiology so that the children could hear and dental so the children not be heard because the children tended to cry from fear, (2) both evaluations could be performed in the amount of time required by other single evaluations (approximately 15 minutes), and (3) the audiologist had time available to function as the dental evaluation recorder.

based on their age (in three-month intervals) gender and ethnicity. To ensure the equivalence of the assigned treatment and comparison groups, children were randomly selected from the cells defined by the strata and assigned to Head Start and non-Head Start. This assured a balanced sample at the time of the initial data collection.

All children recruited by mid-March were randomly assigned to a treatment group (Head Start or non-Head Start) and to an examination group (to be examined at pretest and posttest or at posttest only). The results of the original random assignment are shown in Exhibit 2A-4.

Immediately after random assignment had taken place in late March and early April of 1980, families were informed of the results by local evaluation assistants. Although some parents were disappointed when their child was not assigned to the Head Start group, most agreed to remain in the study.

Exhibit 2A-4

Number and Percentage of Children Randomly Assigned to Head Start and Non-Head Start Groups by the Original and Final Assignment<sup>a</sup>

| Treatment Group     |   | Greene & Humphreys Counties<br>n = 180 |      | St. Clair County<br>n = 277 |      | Maricopa County<br>n = 130 |      | Mingo County<br>n = 170 |      | All Sites<br>n = 756 |      |
|---------------------|---|--|------|-----------------------------|------|----------------------------|------|-------------------------|------|----------------------|------|
|                     |   | HS                                     | NHS  | HS                          | NHS  | HS                         | NHS  | HS                      | NHS  | HS                   | NHS  |
| Original Assignment | n | 89                                     | 91   | 149                         | 128  | 64                         | 66   | 86                      | 84   | 388                  | 368  |
|                     | % | 49.5                                   | 50.5 | 53.8                        | 46.2 | 49.2                       | 50.8 | 50.6                    | 49.4 | 51.3                 | 48.7 |
| Final Assignment    | n | 98                                     | 82   | 136                         | 141  | 81                         | 49   | 90                      | 80   | 405                  | 351  |
|                     | % | 54.4                                   | 45.6 | 49.1                        | 50.9 | 62.3                       | 37.7 | 52.9                    | 47.1 | 53.6                 | 46.4 |

<sup>a</sup>The differences between the original and final assignments are explained below in the Pretest Data Collection section.

Families also were notified about their assignment to examination group. During the pretest data collection, however, random assignment to the examination group had to be abandoned because of scheduling difficulties and no-shows for the evaluation. All families willing to come to the examination center were invited to participate in the pretest data collection. The need to abandon random assignment to examination group had the potential of biasing the results of the longitudinal evaluation. For example, if only children with health problems participated in the pretest, this group would not be comparable to children participating only in the posttest. An analysis of health characteristics of both groups of children showed that no bias was introduced, as discussed in Appendix 2C. Despite this adjustment in the examination group assignments, the objective of administering pretesting only half of the children was achieved. We could not determine at the time of the pretest, however, what proportion of the "no shows" would eventually leave the evaluation entirely.

### Stage III Activities

#### Pretest Data Collection

In each of the four sites, pretest data were collected in a one-week period during April 1980. An average of 19 children were processed at the examination center each day. To help limit attrition, a large proportion of the families were provided with transportation to and from the center by local evaluation assistants, who had scheduled appointments with the families. Coordination of arrivals and departures of families from the examination center frequently was a complex task.

The pretest data collection was intensive and long for each of the study participants. Many families spent more than two hours at the examination center. Not surprisingly, many of the children became fatigued as they progressed through various health evaluations. The length of time required and the often less-than-ideal environment in which the assessments took place may have reduced some children's ability to cooperate.

Interviews were conducted with five or six staff members from the local Head Start program to obtain a better understanding of the operation of the program and the services offered to children and their families. Typically, these Head Start staff included the director, the parent participation coordinator, the nutritionist, the health coordinator, and the social services coordinator.

### Sample Problems

After the pretest data collection, the difficulties of maintaining random assignment to the Head Start and non-Head Start group were exacerbated by the Head Start program's annual recruitment of children for entry in the fall. Although the evaluation staff had anticipated this and had tried to make arrangements with each of the Head Start programs to cooperate with the random assignment, problems occurred that affected assignments of both Head Start and non-Head Start children. In some cases children shifted from the non-Head Start to the Head Start group, for example when the Head Start recruiters inadvertently began recruiting children in the non-Head Start group. In other cases, parents knew (as part of the informed consent procedure to participate in the study) that, if they decided to drop out of the evaluation, they could apply to Head Start to have their child enrolled. However, in other cases, the Head Start group of children decreased because there were not sufficient spaces in the local Head Start center for evaluation children assigned to enter Head Start or because the child simply would not "go to school." This combination of events led to a change in group status for 14 percent of the children recruited prior to pretest. (Similar to assignment changes that occurred at pretest, we carefully checked whether these changes introduced only biases; none were found.) These children were retained because their assignment changed before the Head Start treatment began or in cases of children who would not "go to school" so soon after Head Start began that those children received no appreciable benefit from the program.

Exhibit 2A-5 shows the distribution of Head Start and non-Head Start children in each of the four sites who participated in the pretest--50

Exhibit 2A-5

Number and Percentage of Pretest Children in the Head Start and Non-Head Start Group by the Original and Final Assignment

| Treatment Group     |   | Greene & Humphreys Counties<br>n = 95 |      | St. Clair County<br>n = 113 |      | Maricopa County<br>n = 95 |      | Mingo County<br>n = 73 |      | All Sites<br>n = 376 |      |
|---------------------|---|---------------------------------------|------|-----------------------------|------|---------------------------|------|------------------------|------|----------------------|------|
|                     |   | HS                                    | NHS  | HS                          | NHS  | HS                        | NHS  | HS                     | NHS  | HS                   | NHS  |
| Original Assignment | n | 47                                    | 48   | 65                          | 48   | 53                        | 42   | 44                     | 29   | 209                  | 167  |
|                     | % | 49.5                                  | 50.5 | 57.5                        | 42.5 | 55.8                      | 44.2 | 60.3                   | 39.7 | 55.6                 | 44.4 |
| Final Assignment    | n | 52                                    | 43   | 61                          | 52   | 62                        | 33   | 40                     | 33   | 215                  | 160  |
|                     | % | 54.7                                  | 45.3 | 54.0                        | 46.0 | 65.3                      | 34.7 | 54.8                   | 45.2 | 57.2                 | 42.8 |

percent of the total sample of children recruited. Although 56 percent of the pretested children were originally assigned to enter Head Start in the fall, ultimately (after assignment changes occurred), 57 percent of the children were in the Head Start group.

Follow-up on Health Problems

As a result of the pretest evaluation, numerous children were identified as having health problems. These problems were followed up in two ways. For all children, complete summaries of the results of the health assessments conducted during the pretest were forwarded for follow-up to the primary medical caregiver identified by the mother or guardian. The primary medical caregivers named varied from general practitioners and pediatricians to a local health clinic. Where no primary caregiver was named by the mother, arrangements were made with a physician of health clinic in the community (typically those serving Head Start children) to accept the

referral for follow-up. This procedure for followup on health problems was chosen for several reasons. First, the evaluation team was permitted only to conduct health examinations for purpose of the study, but were not licensed (in almost all cases) to practice medicine in the Head Start site. Second, it was deemed important to give the child's (or family's) "own doctor" an opportunity to interpret the results of the pretest examination and to ensure continuity of health care provision for the child. It should be noted, however, that few families asked their doctor about pretest examination results.

Children diagnosed by the evaluation's biomedical team as having health problems that required immediate medical attention were referred for follow-up care. (See Chapter Three for a discussion of the various types of health problems that needed immediate treatment.) A mechanism was set up to pay for needed medical services for children who did not have medical and dental insurance. Each of the four Head Start programs received a grant from the Administration for Children, Youth and Families to pay for medical services for these children. This aid was intended primarily to pay for services to non-Head Start children. Some funds were used, however, to provide services to the Head Start group before they entered the program and became eligible for Head Start services. Local evaluation assistants were responsible for making the arrangements for follow-up medical care and for providing families with transportation as needed. It was the responsibility of local family physicians, however, to make an appropriate referral on behalf of the family or child.

As discussed in Chapters Three and Four, some of the children that were referred at pretest for urgent medical and dental problems were not included in some analyses because the treatment received had the potential of biasing study results.

#### Stage IV Activities

##### Sample Recruitment

The shortfall in the number of children recruited prior to pretest meant that a second wave of recruitment was required to bolster Head Start

and non-Head Start sample sizes in each site. The second recruitment was begun immediately after the pretest data collection, but its intensity increased during the fall of 1980 and winter of 1981.

To augment the non-Head Start group of children, the evaluation assistants continued to door-to-door recruitment for additional Head Start-eligible children. In addition, they occasionally made contact with non-Head Start families who were recruited prior to pretest to ensure their continued willingness to participate in the evaluation. The recruitment of children to augment the Head Start group was conducted differently. Each program was asked for a list of all children who enrolled in fall 1980. From this list, all children currently participating in the evaluation were removed. No other selection criteria were applied to the list. Subsequently, a random sample of Head Start children was drawn. The number of children drawn from each program varied and was based on the estimated number required (taking projected attrition into account) to ensure there would be at least 100 Head Start children in the posttest at each site. The families drawn were subsequently contacted by the evaluation assistant and asked to participate in the posttest data collection.

#### Preparation for the Posttest Data Collection

Procurement of equipment, licensing of team members, and location of evaluation centers was similar to pretest logistics; the only difference was one of scale. Because the posttest was to be conducted on twice as many children as the pretest thus requiring two weeks of data collection per site, and data collection would occur at two sites simultaneously, allowances had to be made for sufficient supplies and equipment, staff, and time to examine over 200 children in each site. The size of the data collection team was expanded to include an additional speech pathologist, developmental evaluator, medical history interviewer, assistant in the laboratory, and two nutritionists. In some instances, because of busy professional schedules, team members could work only for one week of data collection so that arrangements had to be made for a substitution at the end of the first week. The amount of equipment required, as shown in Exhibit 2A-2, doubled. In two



of the sites, larger examination centers had to be located (which accommodated more people more comfortably).

Posttest Data Collection

As noted earlier, the posttest data collection was scheduled for a two-week period in each of the four sites. Furthermore, data were collected in two sites simultaneously in April and May of 1981, rather than sequentially, as had been done in the pretest. An average of 20 children were evaluated each day of data collection. Transportation was again provided to almost of the families because it was one of the only ways to ensure that they would come to the evaluation site at the appointed time.

The length of time required to complete all of the child's health evaluations and the parent interviews varied, depending to a large extent on the child's willingness to separate from his/her mother. Because many of the children were older and better able to cope with this unusual environment (e.g., a health clinic in a church or armory) than at pretest, it was possible to complete the evaluations on some of the families in approximately two hours. Exhibit A2-6 shows the distribution of the Head Start and non-Head Start children who participated in the posttest.

Exhibit 2A-6

Number and Percentage of Posttest Children in the Head Start and non-Head Start Group by Original and Final Assignment

| Treatment Group     | Greene & Humphreys Counties<br>n=228 |      | St. Clair County<br>n=194 |      | Maricopa County<br>n=167 |      | Mingo County<br>n=228 |      | All Sites<br>n=817 |      |
|---------------------|--------------------------------------|------|---------------------------|------|--------------------------|------|-----------------------|------|--------------------|------|
|                     | HS                                   | NHS  | HS                        | NHS  | HS                       | NHS  | HS                    | NHS  | HS                 | NHS  |
| Original Assignment | n 122                                | 106  | 112                       | 82   | 97                       | 70   | 123                   | 105  | 454                | 363  |
|                     | % 53.5                               | 46.5 | 57.7                      | 42.3 | 58.1                     | 41.9 | 53.9                  | 46.1 | 55.6               | 44.4 |
| Final Assignment    | n 127                                | 101  | 108                       | 86   | 106                      | 61   | 119                   | 109  | 460                | 357  |
|                     | % 55.7                               | 44.3 | 55.7                      | 44.3 | 63.5                     | 36.5 | 52.2                  | 47.8 | 56.3               | 43.7 |

Interviews were conducted with the Head Start staff. For the first time, a meeting was held with members of the health community in each of the sites. These discussions were particularly useful in formally introducing the data collection team to their counterparts in the community, facilitating the referral process for the children in need of services, and learning more about how health services are typically delivered to children of low-income families.

#### Follow-Up on Health Problems

After the completion of the posttest health evaluations, health status records and follow-up requirements for urgent health problems were managed similarly to pretest procedures. For all children summaries of the results were sent to the primary medical caregiver identified by the mother. For children in urgent need of medical attention, assistance in obtaining that service was provided. Head Start assumed the responsibility for follow-up of children enrolled in the program; evaluation assistants facilitated the follow-up for the non-Head Start children. (The children and the health problems which received this attention after posttest data collection are identified in an Appendix to Chapter Three.)

TECHNICAL APPENDIX 2B  
STATISTICS AND METHODOLOGY

Because of the varied types of data and the diverse forms that the general research questions take when particularized to the domains of the Head Start Health Evaluation, the analyses have drawn upon a variety of statistical techniques, as summarized in Exhibit 2B-1. This appendix reviews the major techniques employed and comments on technical features of the analysis that required special treatment. Specifically, it begins by discussing preliminary examination of the data, analyses of "continuous" response variables, and more specialized analysis and modeling of categorical response variables. Then, because the data on children's dental health and treatment pose nonstandard analytical problems, a separate section explains the techniques adopted to deal with these data. Finally, comparisons between anthropometric measurements of individual children and available reference data become more reliable after first applying a smoothing technique to the reference data. A description of this approach concludes this appendix.

Preliminary Examination of Data

Even after removing clearly invalid data values (those identified during data collection, data entry, or data cleaning), one must still face the possibility of anomalous observations that, although possible in theory, are unlikely in practice (or at best, represent unusual outcomes that are not consistent with the behavior of the bulk of the data). To identify any such observations, especially in the nutrition, hematology, and dental data, we used basic techniques of exploratory data analysis (Tukey, 1977; Velleman and Hoaglin, 1981) to examine the unbounded continuous and discrete numerical variables. Stem-and-leaf displays, schematic plots, and related graphical procedures revealed a modest number of distinctly outlying observations on some variables.

Two variables from the hematology data illustrate the basic approach. Exhibit 2B-2 shows a schematic plot of the free erythrocyte protoporphyrin (FEP) values for the Head Start and non-Head Start children of Sample A, Sample B, and Sample C in St. Clair County, Illinois. In the Sample C Head Start group, one value stands out clearly as higher than the rest. A scat-

Exhibit 2B-1

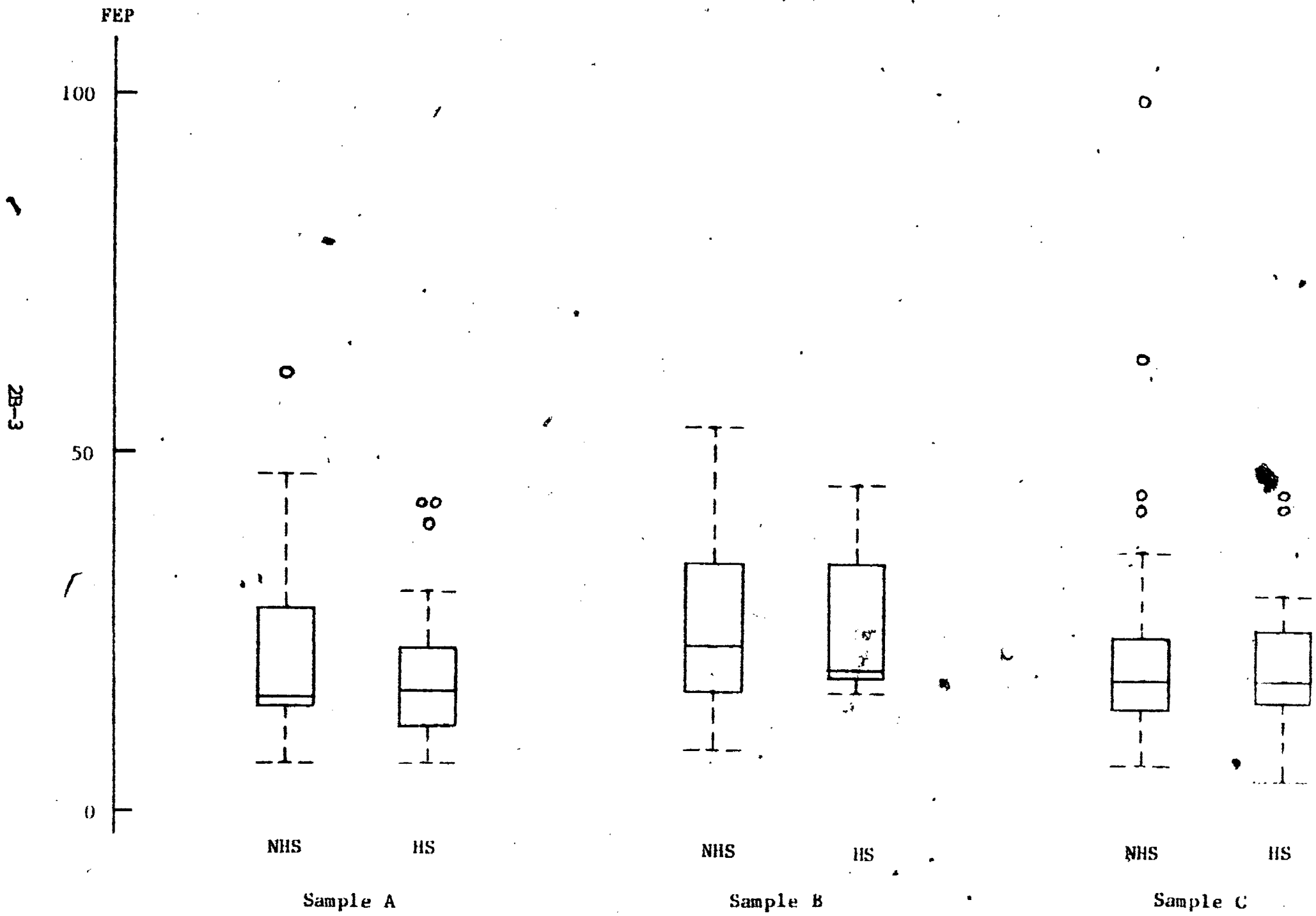
Summary of Major Statistical Techniques by Domain of Analysis

| Domain of Analysis | Statistical Technique  |
|--------------------|--|
| Attrition          | Contingency tables and analysis of variance                                  |
| Pediatric          | Contingency tables   |
| Dental             | Contingency tables and Poisson models  |
| Anthropometry      | Contingency tables, smoothing, regression, and analysis of covariance        |
| Diet/Nutrition     | Contingency tables, regression, and analysis of covariance                   |
| Hematology         | Contingency tables, regression, and analysis of covariance                   |
| Developmental      | Contingency tables, regression, and analysis of covariance                   |
| Speech             | Contingency tables, regression, and analysis of covariance                   |
| Vision             | Contingency tables, regression analysis, and discrete multi-variate analysis |
| Hearing            | Contingency tables and regression, and analysis of covariance                |

terplot of hematocrit against age for a group of 37 Hispanic Head Start children (in Maricopa County, Arizona), Exhibit 2B-3, shows one child whose hematocrit is noticeably low when viewed against the relationship between hematocrit and age. This value thus deserves further analytic attention.

A rule of thumb from exploratory data analysis provided an objective basis for designating data values as possibly outlying, so that they could receive further attention. This rule works with the ordered observations in a sample, as follows. After obtaining the lower fourth  $F'_L$  and the upper

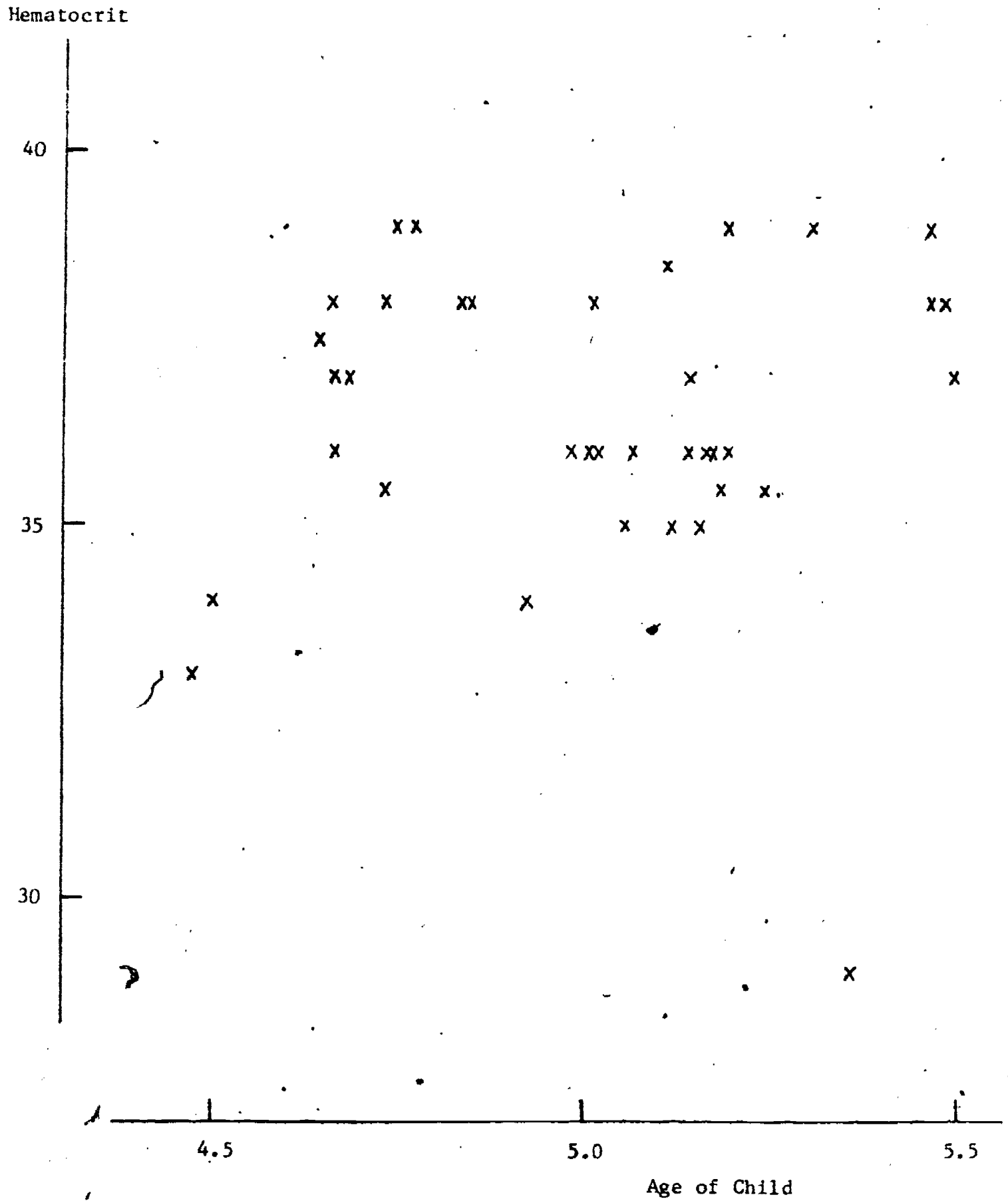
Schematic Plot of Free Erythrocyte Protoporphyrin for Head Start and non-Head Start Children in Three Samples



2B-3

Exhibit. 2B-3

Scatterplot of Hematocrit Against Age for  
a Group of 37 Hispanic Head Start Children



fourth  $F_U$  (essentially the lower quartile and the upper quartile, respectively) from the ordered sample, we define the fourth-spread  $d_F$  according to

$$d_F = F_U - F_L$$

and then calculate the "outside cutoffs" (lower and upper)

$$F_L - 1.5d_F$$

$$F_U + 1.5d_F$$

Any observations outside these limits deserve close scrutiny as possible outliers. Hoaglin (1983) discusses this rule in somewhat greater detail, and Hoaglin, Iglewicz, and Tukey (1981) have studied its behavior in small samples. Briefly, it is helpful to note that in a normal population (because the normal distribution often serves as a model for well-behaved data) the combined fraction of the distribution that lies below  $F_L - 1.5d_F$  or above  $F_U + 1.5d_F$  is 0.00698. Naturally, sampling variation in  $F_L$  and  $F_U$  and in the more extreme observations in a sample leads to higher rates of "outside values" in small samples. For example, the average fraction of outside values in samples of 5 from a normal distribution is about 0.08, but in samples of 10 it is roughly 0.02. The practical message of these results is that outside values are relatively rare in well-behaved data, so that it is appropriate to detect them and investigate them further.

After a more detailed examination of the characteristics and other measurements of children who had outside values on variables in the hematology or nutrition domains, we set aside a relatively small number of observations that remained anomalous.\* Specifically, we recoded them by changing the anomalous data value from a positive number to a negative number (we did not change any other variables that were not outlying for the child). Because the legitimate values of these variables are nonnegative, this procedure enabled us to treat the anomalous observations as missing while preserving them in the data base for examination in subsequent analyses (if desired).

\*These values are presented in the appendices to the hematology and nutrition chapters. Their exclusion from the analyses had no significant impact on the Head Start/non-Head Start comparisons.

The preliminary examination of data can also reveal systematic patterns of skewness in a variable that suggest the desirability of transforming it to another scale prior to analysis. A common step in careful analysis, this use of transformations aims at producing variables that are simpler to summarize and that more nearly satisfy the assumptions underlying most statistical procedures. For example, applying the logarithmic transformation to a variable whose data are substantially skewed to the right often yields a nearly symmetrical sample. At the same time, such a transformation often tends to promote homogeneity of variability, a characteristic usually assumed of univariate samples and, particularly, of the response variable in an analysis of variance or covariance. As it turned out, only a very few variables required transformation: We found it preferable to work with the logarithm of vitamin A intake, vitamin B<sub>12</sub> intake, vitamin A intake as a percent of the child's RDA, and vitamin B<sub>12</sub> as a percent of RDA in the nutrition data and with the logarithm of serum iron in the hematology data.

#### Analyses of "Continuous" Response Variables

The evaluation design involved random assignment of children in each of the four sites to a Head Start group and a non-Head Start comparison group. Further, within each of these groups, half of the children were randomly assigned to pretest data collection (with subsequent posttest data collection a year later), and the rest were assigned to the posttest (only) data collection.

In this designed structure the appropriate techniques for determining the effects of participation in Head Start, exposure to the pretest data collection, and site are those associated with the analysis of variance. One customarily assumes that the process of randomization has produced a reasonable degree of comparability among the groups on all relevant characteristics, so that the effects and sum of squares associated with the factor Head Start form the basis for judging whether the Head Start program had a significant impact on the response variable in question. Of course, the pattern of sample sizes in the groups constitutes an unbalanced design and requires attention to the order in which the factors enter the analysis-of-variance decomposition.



Even in such a randomized experiment, however, it is often advantageous to consider adjusting the response variable for possible contributions from plausible covariates, because the randomization process delivers comparability on the average but not necessarily in each individual realization. In the present analyses, one must also allow for the possibility that attrition between pretest and posttest (as discussed in Chapter Two) has weakened the comparability among the groups, and hence inclusion of covariates becomes even more attractive. The following discussion presents the major factors and basic models that guided the analyses.

### Analytic Framework

As a basis for discussion of the effects that can be estimated from the data (posttest as well as pretest), we use a simple statistical model in which  $Y$  represents the continuous response variable. For both the Head Start group and the non-Head Start group, the typical value of  $Y$  in the pretest data is given by

$$Y_1 = G$$

where  $G$  represents the general level of the response (for example, an overall mean). We do not include the error or fluctuation term often shown in such statistical models, and we also omit subscripts for the factors that we actually take into account.

In the posttest data three main influences may contribute to the typical value of  $Y$ : the passage of time (a proxy for development in the absence of any interventions or treatments), the screening and diagnosis involved in the pretest data collection, and participation in the Head Start program. We symbolize these effects by Time, Pre, and HS, respectively; and we use a subscripted "one" (for example,  $1_{HS}$ ) as an indicator variable, whose value is 1 for children in the corresponding group and 0 for all others. Thus, the posttest model takes the form

$$Y_2 = G + (\text{Time}) + (\text{Pre})1_{\text{Pre}} + (\text{HS})1_{\text{HS}}$$

For the Head Start and non-Head Start children in Samples A and B, this model yields the following typical values:

Non-Head Start, posttest only

$$Y_2 = G + (\text{Time})$$

Non-Head Start, pretest and posttest

$$Y_2 = G + (\text{Time}) + (\text{Pre})$$

$$Y_1 = G$$

Head Start, posttest only

$$Y_2 = G + (\text{Time}) + (\text{HS})$$

Head Start, pretest and posttest

$$Y_2 = G + (\text{Time}) + (\text{Pre}) + (\text{HS})$$

$$Y_1 = G$$

By forming the proper differences among these typical values, we can see how to arrive at estimates of the effects.

For the effect of time, we could look at the difference between  $Y_2$  in the non-Head Start, posttest-only group and  $Y_1$  in the non-Head Start, pretest-and-posttest group. Because this effect is not especially important, we do not discuss it in the reported analyses.

For the effect of pretest screening and diagnosis, we could look at the difference between  $Y_2$  in the non-Head Start, pretest-and-posttest group and  $Y_2$  in the non-Head Start, posttest-only group. Alternatively, we can use the corresponding difference between the Head Start groups. These two estimates of the pretest effect need not be the same, and the difference between them is an estimate of the interaction effect for the combination of the pretest examination and participation in the Head Start program. It would be reasonable to consider such an interaction, because the pretest screening and diagnosis may identify some health problems that the Head Start program would have found and corrected anyway. Neither the pretest effect nor this interaction assumes any special importance, however, and the reported analyses do not estimate or discuss them.

For the effect of participation in the Head Start program, which is often the focus of our analyses, we look at the difference between  $Y_2$  in the Head Start, posttest-only group and  $Y_2$  in the non-Head Start, posttest-only group. Alternatively, we could use the corresponding difference between the two pretest-and-posttest groups. These two estimates of the Head Start effect need not be the same, and the difference between them is simply the interaction effect mentioned above. In reality, it turned out that such interactions could be neglected.

The comparison of the Head Start and non-Head Start children in Sample C (the augmentation recruitment) also contributes to the estimate of the Head Start effect (only posttest data were collected on these two groups of children). We combined these two groups with Samples A and B (the pretest-and-posttest groups and the posttest-only groups, respectively) in order to obtain a more stable cross-sectional estimate of the Head Start effect.

As a way of focusing on the comparisons that are appropriate and on the effects that the design and the data allow us to estimate, this discussion has not mentioned the possibility of bringing covariates into the model. We touch on this below in an example.

Although the analyses generally focus on the four sites individually and separately, we recognize the need to make overall statements about the evaluation as a whole. Thus, in developing answers to some of the evaluation questions, we have attempted to aggregate data across sites whenever this step was justifiable in terms of the assumptions underlying the statistical procedures involved. For example, an initial description of the prevalence of chronic problems assesses the comparability between our samples and the more general Head Start-eligible population. Even when data can be aggregated across sites, the site-specific effects give an indication of the variation that one can expect to encounter among Head Start programs. Also, some questions specifically address the relationships between effects and the methods of service delivery (which may vary across sites).

### Cross-Sectional Analyses

The analyses have worked with the pretest data and the posttest data in several ways. The primary distinctions are among cross-sectional analyses and longitudinal analyses; crossed with descriptive and relational analyses

within and among domains of data. In general terms, the cross-sectional analyses of the posttest data parallel the analyses conducted earlier on the pretest data. Usually they summarize a variable in terms of such traditional measures as means, standard deviations, medians, interquartile ranges, and correlations. The cross-sectional relational analyses of the posttest data involve primarily comparisons among groups and relations among variables across domains.

### Longitudinal Analyses

To answer questions that involve the impact of Head Start, as measured in terms of change from pretest to posttest, our analyses generally treat the posttest value of the relevant variable as the response and the corresponding pretest value as a covariate. (Other covariates are also appropriate in specific analyses.)

In addition to the response variable and covariate mentioned above, the models incorporate an effect for Head Start as well as other factors as required (for example, sex and age group in some instances) and other covariates. Symbolically, these models take the form:

$$Y = (\text{common}) + (\text{HS}) + (\text{effects for other factors}) + b * (\text{pretest value}) + (\text{terms for other covariates}) + (\text{fluctuation}).$$

For simplicity, this equation omits the subscripts that identify individual children within the groups defined by Head Start and the other factors. In some instances we have analyzed the data for the four sites separately because we encountered different patterns of effects (and interactions) from site to site. Also, when different sites yield different slopes (such as  $b$  in the above equation) for the covariate(s), trying to combine the data across sites would violate a key assumption of the analysis of covariance.

### Example

To facilitate discussion of major analyses and the technical issues that arise, we consider a specific example, taken from the nutrition evaluation. To determine the impact of the Head Start program on children's total

24-hour caloric intake, we use cross-sectional posttest data on this dietary variable. Here the factor Head Start has three levels: Head Start children who were in school on the day when the meal observations were taken, Head Start children who were absent on that day, and non-Head Start children. In addition to Head Start, the factors include site (because we are able to combine the data from the four sites in this analysis) and subsidy (Food Stamps only, WIC only, Food Stamps and WIC, or none). The appropriate covariates are the posttest age of the child, the gender of the child, and whether any member of the child's household was employed (one indicator of the family's socio-economic status).

In bringing the variables into the model one may begin with the covariates, take site and subsidy next, and finally include Head Start. (The order of entry does not affect the estimates of the effects for the factors or the coefficients for the covariates, but it does matter in assessing the contribution of a factor or covariate in terms of its sum of squares and mean square.) Alternatively, one may bring in the covariates and the factors simultaneously. We have generally followed this second strategy, and hence the F-statistics treat the particular factor or covariate as the last one to enter the model. This is essential for Head Start because we want to attribute to the program only variation that cannot be accounted for by the covariates or by differences among sites (or on other factors). The unbalanced statistical design employed requires that, in order to gain proper control over the order of entry of the factors and covariates, we must express the analysis-of-covariance model as a multiple-regression model and then specify the order in which the variables enter.

Exhibit 2B-4 shows an analysis-of-variance table for this model, and Exhibit 2B-5 gives the estimates of the effects and the coefficients. Except for the subsidy factor (to which we return shortly), all factors and covariates are highly significant statistically. This outcome, however, must be tempered by the realization that, in terms of  $R^2$ , the model accounts for only 18 percent of the variation in 24-hour caloric intake; a great deal of child-to-child variation remains unexplained by this model.

In the effects for the Head Start factor we notice that Head Start children who were absent that day had lower caloric intakes than did non-Head Start children. (Because a variety of interpretations may be appropriate for this pattern of effects, we leave discussion of them to the nutrition evaluation, Chapter Six.)

Exhibit 2B-4

Analysis-of-Variance Table for 24-hour Caloric Intake

| Source                    | Sum of Squares | DF  | MS      | F      |
|---------------------------|----------------|-----|---------|--------|
| Head Start                | 6132403        | 2   | 3066201 | 14.184 |
| Site                      | 16448532       | 3   | 5482844 | 25.363 |
| Subsidy                   | 260072         | 3   | 86691   | 0.401  |
| Age of child              | 2570268        | 1   | 2570268 | 11.890 |
| Gender of child           | 2996996        | 1   | 2996996 | 13.864 |
| Household Member employed | 1163026        | 1   | 1163026 | 5.380  |
| Model                     | 33080640       | 11  | 3007330 | 13.912 |
| Residual                  | 150239648      | 695 | 216172  |        |
| Total                     | 183320288      | 706 |         |        |

$R^2 = 0.180$

Exhibit 2B-5

Estimated Values of Coefficients in Analysis-of-Covariance Model for 24-hour Caloric Intake

| Coefficient               | Value  |
|---------------------------|--------|
| Head Start                |        |
| Present in program        | 136.7  |
| Absent from program       | -100.3 |
| Non-Head Start            | -36.4  |
| Site                      |        |
| Greene and Humphreys      | -87.6  |
| St. Clair                 | 273.6  |
| Maricopa                  | -220.3 |
| Mingo                     | 34.2   |
| Subsidy                   |        |
| Food Stamps               | -19.5  |
| WIC                       | 9.9    |
| Food Stamps and WIC       | -20.2  |
| None                      | 29.8   |
| Posttest age of child     | 96.4   |
| Target child male         | 130.7  |
| Household member employed | -93.1  |
| Constant                  | 1185.6 |

Among the site effects, children in St. Clair County had higher caloric intakes, children in Maricopa County had lower caloric intakes, and those in the other sites fell in between. Here, as for all the other effects and coefficients, the interpretation must take into consideration the fact that the model has incorporated allowances for simultaneous linear change in all the other variables. Thus, the site differences reflect those adjustments.

The effects for the subsidy factor are chance fluctuations and do not lead to any interpretation. If 24-hour caloric intake were the only dietary variable being analyzed, we would customarily remove this factor from the model. However, because other dietary variables show significant effects for the subsidy factor, we have adopted the procedure of leaving it in the model. Thus, we gain the simplicity of applying the same model to all the dietary variables and being able to think about the effects and interpretations of all the variables in this single framework, rather than having to contend with somewhat different models for the different response variables.

The coefficients for the three covariates are the values that arose in adjusting for the contributions of these variables: 96.4 (calories per year of age) for "Posttest age of child," 130.7 calories for "Target child male," and -93.1 for "Household member employed." We interpret these coefficients with the same caution needed to interpret the coefficients in any multiple-regression model (see, for example, Mosteller and Tukey, 1977 Chapter 13). The first two coefficients seem plausible when we consider what relationship we would expect to observe between caloric intake and age and between caloric intake and sex of the child in the absence of other explanatory variables. The coefficient for "Household member employed" seems to have the opposite sign from what one would expect. However, when we examine the simple correlation between caloric intake and employment (and income) the sign remains the same. That is, the two variables are negatively correlated, though the magnitude of this correlation is not high. Thus, this instance does not accord with intuition, and the results would lead us to examine more closely what this relationship might signify. (We must keep in mind that this coefficient tells how caloric intake changes in response to employment status, after allowing for simultaneous [linear] change in all the other explanatory variables in the model.) One could speculate that this relationship is similar to the "Medicaid effect" (Kowar, 1982) where children

just above the Medicaid eligibility level receive the least amount of health care. In this instance, it is plausible that children whose parent(s) are employed and therefore are not eligible for Food Stamps or WIC have the lowest caloric intakes. In any event, our interest primarily centers on Head Start effects and site effects, so that discussions of the fitted models in the body of the report only occasionally need to devote attention to the values of coefficients associated with the covariates.

#### Coding Schemes for Sets of Indicator Variables

A number of important technical details arise in choosing an appropriate coding of the Head Start factor (and other factors, such as site and subsidy in Exhibit 2B-5) in some models. In the data base for the evaluation, the variable that records the Head Start/non-Head Start status of each child is simply coded as 0 for non-Head Start and 1 for Head Start. The usual analysis-of-covariance models treat this variable as categorical, defining the levels of the factor Head Start, so that the actual numerical values do not matter. For some models, however, in which the analysis must distinguish only between the Head Start group and the non-Head Start group (and not additionally, as in Exhibit 2B-5, between Head Start children who were present and those who were absent) but must also be formulated as a multiple-regression model in order to incorporate a particular interaction structure, the Head Start indicator enters the model directly with an associated coefficient. In these instances the fitted coefficient measures the size of the Head Start effect (that is, the difference between Head Start and non-Head Start, after allowing for the contributions of the other variables), and the constant term in the model summarizes the level of the response variable in the non-Head Start group. We could have handled this technical detail by allowing the constant term to summarize the overall level for all children and using an explanatory variable coded +1 for Head Start and -1 for non-Head Start, so that the difference between the Head Start group and the non-Head Start group would be twice the value of the effect for the Head Start group, but it was more straightforward to retain the 0-1 coding, with its easier interpretation.

For categorical variables that have more than two levels (such as site--and Head Start when we must distinguish between children who were



present and those who were absent, as in Exhibit 2B-5), the details of coding involve more choices. We had to face these because of the need to work with analysis-of-covariance models in multiple regression form. For site, it was appropriate to use what is known as effects coding (Cohen and Cohen, 1975, Section 5.4). This scheme explicitly implements the customary constraint that the effects for a factor sum to zero (as we see numerically for site in Exhibit 2B-5). Ordinarily, we handle this by defining the effect for the last level of the factor to be the negative of the sum of the effects for the other levels. This means that, in setting up the explanatory variables for the multiple regression model, we create one explanatory variable for each level except the last. In this coding scheme, each such explanatory variable takes the value 1 for the level to which it corresponds and the value -1 for the last level. Thus, for example, the three explanatory variables for site are as follows. The one for Greene and Humphreys Counties has a 1 for each child in that site and a -1 for each child in Mingo County. The variable for St. Clair County has a 1 for each child in that site and a -1 for each child in Mingo County. Finally, the explanatory variable for Maricopa County has a 1 for each child there and a -1 for each child in Mingo County. The choice of which factor to code as the "last" can be made arbitrarily. From the regression output one can easily calculate the effect for the "last" level of a factor coded in this fashion. The standard error for this last effect, however, cannot be calculated from those for the other effects unless the regression program provides the full covariance matrix or correlation matrix for the estimated coefficient. Because we used SPSS, which gives the user no way to obtain this important information, our tables generally show no standard error for the last level of an effects-coded factor. (In some instances we have obtained these standard errors by rerunning the regression with another level of the factor as the "last" level in the coding.)

A similar technical problem affects factors for which we wish to test the significance of a difference between two levels, as in Head Start-present versus Head Start-absent. To make such tests, we rewrite the multiple regression model so that the difference of interest becomes the coefficient of one of the explanatory variables (and thus is accompanied by the requisite standard error in the regression output). Technically, such differences between effects are a special case of the more general statistical notion of contrasts, and the appropriate approach is to use contrast

coding (Cohen and Cohen, 1975, Section 5.5). By definition, a contrast is a linear combination of effects in which the coefficients of the linear combination sum to zero; for example,  $L = a_1 e_1 + \dots + a_k e_k$ , where  $e_1, \dots, e_k$  are the effects and the coefficients  $a_1, \dots, a_k$  satisfy  $a_1 + \dots + a_k = 0$ . The simplest case, with which we are most concerned, sets one of the  $a_i$  equal to +1, another to -1, and the rest equal to 0. For technical reasons, contrast coding requires that the explanatory variables for the factor comprise a set of orthogonal contrasts; the number of these equals the number of degrees of freedom associated with the factor. Two contrasts are orthogonal when their coefficients, say  $a_1, \dots, a_k$  and  $b_1, \dots, b_k$  satisfy  $a_1 b_1 + \dots + a_k b_k = 0$ . Thus, to obtain the desired comparison between Head Start-present and Head Start-absent, we constructed the contrast-coded variable that has +1 for Head Start-present and -1 for Head Start-absent (and 0 for non-Head Start). Because the set of possible contrasts for a three-level factor is two-dimensional, choosing one contrast essentially determines the remaining one. In this instance, the second contrast has +1 for Head Start-present, +1 for Head Start-absent, and -2 for non-Head Start.

### Analysis and Modeling of Categorical Response Variables

The numerous categorical outcome or response variables required a variety of choices in analysis and modeling. These included the treatment of two-by-two tables, the assessment of goodness of fit, the overall approach for higher-way tables, the sampling models underlying the data, log-linear models for higher-way contingency tables, the treatment of structural zeros, and the examination of residuals. We briefly discuss these issues in the subsections that follow.

#### Two-by-Two Tables

Many of the research questions lead to an analysis based on a two-by-two contingency table. Examples include (1) the presence or absence of a particular deficiency in the vision, speech, or hearing domain by Head Start and non-Head Start and (2) receipt of a certain health service by Head Start and non-Head Start. The analysis compares the proportion in the Head Start group with that in the non-Head Start group and looks for a significant

departure from equality. We judge the extent and significance of such departures by using a chi-squared test (discussed further below under "Goodness of Fit").

### Goodness of Fit

To assess the adequacy of a model or models that we hypothesize for a contingency table, we use the ordinary (Pearson) chi-squared statistic,

$$\chi^2 = \sum_{\text{all cells}} \frac{(\text{observed-expected})^2}{\text{expected}}$$

which approximately follows the chi-squared distribution when the total number of observations in the table,  $N$ , is large. One rule of thumb for "large enough" is that  $N$  should be at least ten times the number of cells in the table. A related issue that affects the adequacy of using the theoretical chi-squared distribution to approximate the distribution of  $\chi^2$  is the possible presence of small expected counts in some of the cells in the table. One classical rule (far too conservative) requires that all expected counts be at least 5. A more reasonable rule, supported by considerable research, requires only that all expected counts be at least 1.0. We followed this latter rule.

Testing goodness of fit in a two-by-two table offers some further choices. A common recommendation is to use the corrected chi-squared statistic, obtained by taking the absolute value of (observed-expected) in each cell and reducing it by 1/2 before squaring and proceeding with the rest of the calculations in the above formula for  $\chi^2$ . (This recommendation applies only to two-by-two tables; that is, to situations with only 1 degree of freedom.) The correction aims at making the significance level right in the sampling situation where both the row margin and the column margin of the table are fixed. Fienberg<sup>a</sup> (1980) points out that using the corrected chi-squared test results in an overly conservative test; that is, the test rejects substantially less often than the intended significance level would indicate. For two-by-two tables, we used the uncorrected chi-squared statistic.

When the total sample size,  $N$ , is quite small, no large-sample approximation can be expected to do very well, and neither  $\chi^2$  nor its cor-

rected version is adequately accurate. In this situation, one generally uses Fisher's exact test. The values of N for two-by-two tables in most of our analyses were large enough that we did not have to employ this procedure.

### Higher-Way Contingency Tables

To investigate the relationship between a categorical (or dichotomous) response variable and two or more categorical explanatory variables, we have generally followed the approach of fitting log-linear models to the observed contingency table. Without going into the technical details, which are available in such books as Bishop, Fienberg, and Holland (1975) and Fienberg (1980), we mention that this approach works with the probabilities associated with the cells defined by the combinations of values on the explanatory variables and the response variable. By transforming to a logarithmic scale (for the purpose of the theory), it is possible to develop models that are entirely parallel to the usual analysis-of-variance models for continuous data and that lead easily to interpretation and understanding of the structure of the observed contingency table. For further exposition we use a concrete example from the dental domain.

A Dental Example. At posttest we asked whether the child had ever been to a dentist. To see whether this response variable is related to Head Start participation and the wave of recruitment, we form the crosstab of these three variables within each of the four sites. Exhibit 2B-6 shows the numbers of children in each of the eight cells in each site.

We can get a rough idea of how this variable behaves by calculating the percentage of children who have ever visited a dentist, within each of the four cells corresponding to the two factors: Head Start/non-Head Start and Wave 1/Wave 2. Exhibit 2B-7 shows these percentages by site. Greene and Humphreys Counties seem to have some effects for both Head Start and wave. St. Clair County has a big Head Start effect but probably no wave effect. Maricopa County probably has both effects, and so does Mingus County. In some sites the deeper question is whether we have an interaction between Head Start and wave.

We pursue such questions in more detail and attach significance levels to them via fitting various log-linear models to see how simple a model may be adequate. The primary concerns are whether we need the Head

Exhibit 2B-6

Cross-tabulation of Children in Each Site According to Wave of Recruitment<sup>a</sup>, Head Start/Non-Head Start, and Whether Parent Reported at Posttest that Child Had Ever Visited a Dentist

| Site                        | Wave | Head Start Group | Ever been to dentist? |     |
|-----------------------------|------|------------------|-----------------------|-----|
|                             |      |                  | No                    | Yes |
| Greene & Humphreys Counties | 1    | HS               | 44                    | 31  |
|                             |      | NHS              | 35                    | 17  |
|                             | 2    | HS               | 32                    | 17  |
|                             |      | NHS              | 40                    | 7   |
| St. Clair County            | 1    | HS               | 6                     | 31  |
|                             |      | NHS              | 25                    | 20  |
|                             | 2    | HS               | 11                    | 60  |
|                             |      | NHS              | 25                    | 14  |
| Maricopa County             | 1    | HS               | 3                     | 47  |
|                             |      | NHS              | 4                     | 12  |
|                             | 2    | HS               | 6                     | 50  |
|                             |      | NHS              | 28                    | 15  |
| Mingo County                | 1    | HS               | 6                     | 29  |
|                             |      | NHS              | 20                    | 12  |
|                             | 2    | HS               | 27                    | 54  |
|                             |      | NHS              | 65                    | 12  |

<sup>a</sup> Wave = 1 for the recruitment prior to pretest; and Wave = 2 for the augmentation recruitment prior to posttest.

Exhibit 2B-7

Percentages of Children in Each Site  
Who Have Ever Visited a Dentist, by Wave and Head Start/  
non-Head Start

| Site                           | Wave | Head Start | non-Head Start |
|--------------------------------|------|------------|----------------|
| Greene & Humphreys<br>Counties | 1    | 41.3       | 32.7           |
|                                | 2    | 34.7       | 14.9           |
| St. Clair<br>County            | 1    | 83.8       | 44.4           |
|                                | 2    | 84.5       | 35.9           |
| Maricopa<br>County             | 1    | 94.0       | 75.0           |
|                                | 2    | 89.3       | 34.9           |
| Mingo<br>County                | 1    | 82.9       | 37.5           |
|                                | 2    | 66.7       | 15.6           |

Start effect, the wave effect, or the interaction term. Before we fit the log-linear models, however, we must give some attention to how the data came about.

Sampling Models

In principle, we can fit some eight hierarchical models to a 3-variable contingency table (complete independence, three versions of partial independence, three versions of conditional independence, and no three-factor interaction). We would expect to consider all these models if all three variables were responses (for example, "Has child ever visited a dentist?" "Does child brush teeth daily?" "Does child eat sweet snacks?"); but when one or more of the variables are factors, we must give careful attention to the way in which we obtained the sample--this may tell us that some models make no sense.

Without going into technical detail, we point out that the only sensible models relating "Ever been to dentist" to Head Start and wave are those that exactly fit the two-way margin formed by the two factors, Head Start and wave. The reason is simple: The design essentially fixed the number of children in each of the four cells defined by the combination of Head Start and wave. Thus, we obtained a separate sample in each cell. In Wave 1 we deliberately randomized between Head Start and non-Head Start. We certainly did not take a big sample of children and then ask whether each was participating in Head Start or to which wave each belonged. Thus, our log-linear models must contain the two-factor interaction between wave and Head Start, so that they fit the corresponding margin of the data exactly. As a result, looking at the percentages in Exhibit 2B-7 brought us reasonably close to the right analysis.

#### The Log-Linear Models

In order to work through the log-linear models that still make sense for the dental example, we need a notation. We number the variables as follows:

- 1 Wave
- 2 Head Start
- 3 Has child ever been to dentist?

One compact notation lists the faces of the contingency table that the model must fit exactly, using a slash (/) to separate the variable numbers involved in specifying one face from those involved in specifying another. Thus "1 2 / 3" denotes the model that exactly fits the two-way margin for Variables 1 and 2 and the one-way margin for Variable 3.

Because all our models must exactly fit the margin for wave and Head Start, the ones that make sense are as follows:

|                 |   |
|-----------------|---|
| 1 2 / 3         | Dentist independent of wave and Head Start    |
| 1 2 / 1 3       | Dentist independent of Head Start, given wave |
| 1 2 / 2 3       | Dentist independent of wave, given Head Start |
| 1 2 / 1 3 / 2 3 | No three-factor interaction                   |

Because the 1-2 interaction must be present, we can interpret these four models in a more nearly two-way fashion: neither wave nor Head Start effects, wave effect but not Head Start effect, Head Start effect but not wave effect, and both wave and Head Start effects, respectively.

Exhibit 2B-8 shows the results of fitting the four models to the data for each site. At this level we concentrate on the (Pearson) chi-squared statistic and its degrees of freedom. A large value of  $X^2$  indicates that the model does not fit the data adequately. Thus, we would like to adopt the simplest model for which  $X^2$  is not significant (say, at the usual .05 level). For chi-squared on 2 degrees of freedom, the critical value at the .05 level is 5.99. Thus, we find that Greene and Humphreys Counties and St. Clair County have a Head Start effect but no Wave effect,

Exhibit 2B-8

Pearson Chi-Squared Statistics for Each of the Four Hierarchical Log-Linear Models in Each Site

| Model           | Degrees of Freedom | Greene & Humphreys Counties | St. Clair County | Maricopa County | Mingo County |
|-----------------|--------------------|-----------------------------|------------------|-----------------|--------------|
| 1 2 / 3         | 3                  | 9.44                        | 40.55            | 52.84           | 62.21        |
| 1 2 / 1 3       | 2                  | 5.99                        | 40.38            | 36.54           | 56.83        |
| 1 2 / 2 3       | 2                  | 4.81                        | 0.64             | 8.32            | 9.47         |
| 1 2 / 1 3 / 2 3 | 1                  | 1.37                        | 0.33             | 1.26            | 0.18         |



whereas Maricopa County and Mingo County have both a Head Start effect and a wave effect, (Although the value of  $X^2$  for the "1 2 / 14 3" model in Greene and Humphreys Counties coincides with the critical value to two decimal places, it falls just short of being significant. Thus, either "wave effect but no Head Start effect" or "Head Start effect but no wave effect" would be an adequate description of the data. The latter description, corresponding to the "1 2 / 2 3" model, provides a somewhat closer fit.) With this assessment of significance out of the way, we may return to Exhibit 2B-7 to see the direction and size of the effects.

Having analyzed the data separately for each site, we can note that models which treat site as a further factor would have to include the three-factor interaction for Head Start and wave and site, as a consequence of the design. In addition, they would probably (in order to fit adequately) need the effects for both Head Start and wave and would thus tend to obscure the fact that the picture is simpler in two sites.

#### Structural Zeros and Related Problems

Some contingency tables contain one or more cells in which it is impossible to observe any count other than zero. If, hypothetically, we cross-tabulated the pretest and posttest responses to the question "Has the child ever visited a dentist?" the combination of a "Yes" at pretest and a "No" at posttest is invalid. In the terminology of log-linear models, this is a structural zero, rather than an observed zero (where we could, in principle, have gotten some positive count).

It is straightforward for the fitting of log-linear models to accommodate the constraint of a structural zero, but we have generally tried to avoid such situations. Among other problems, each structural zero costs a degree of freedom in the chi-squared test. Because data involving dichotomous variables often have relatively few degrees of freedom, the consequence would be a smaller set of models that we would be able to consider.

## Residuals

A chi-squared test statistic summarizes the overall goodness of fit of a model to the observed contingency table, but often one needs to examine the differences between the data and the model cell by cell, in order to determine whether an unsatisfactory fit reflects general inadequacy of the model or simply isolated unusual behavior in only a few cells. The simple differences (observed count minus fitted count) provide some help for this purpose, but they have the drawback of not being homogeneous in their variability.

A useful form of residuals for fits to counted data is the Freeman-Tukey deviates (see, for example, Bishop, Fienberg, and Holland 1975), one for each cell,

$$\sqrt{x} + \sqrt{x+1} - \sqrt{4m+1}$$

where  $x$  is the observed count in the cell and  $m$  is the fitted count calculated according to the model. When the model is correct, so that only chance variation separates the observed cell counts from the fitted cell counts, it is appropriate to think of the individual Freeman-Tukey deviates as observations from a standard normal distribution. (The average value and variance are correct to a close approximation, but the set of Freeman-Tukey deviates for a whole table departs from resembling a random sample because the individual deviates are not independent.)

### Special Problems of Prevalence and Incidence Variables in the Dental Data

Among the dental variables, some seem especially unruly: many zero values, many small to moderate values, and a fair number of rather large values. Prime examples are the number of decayed and filled teeth per child and the number of decayed and filled surfaces per child (each tooth has five surfaces). Diligent and creative exploration suggested a more basic effort to develop a plausible model for the behavior underlying these data.

For such counted data (that is, data that take only whole-number values like 0, 1, 2, and so on) one frequent statistical model is the Poisson distribution. Most often applied to "rare" events, such as the number of decays by a quantity of radioactive substance in time intervals of fixed length, this model has also been applied to a wide variety of other processes in many fields. For a given value of the parameter,  $m$ , the Poisson distribution assigns probabilities according to the formula

$$p_m(k) = e^{-m} \frac{m^k}{k!}, \quad k = 0, 1, 2, \dots$$

(for typographical convenience,  $m$  replaces the more common Greek lambda). Ideally, to apply such a model to the prevalence of decay, we would need data on the number of cavities and fillings, but the actual data indicate only whether a surface has either a cavity or a filling, and not the number of each in the surface. Still, when we work with surfaces, rather than teeth, this limitation seems not to be serious.

To be reasonably realistic in applying a Poisson model to data on decayed and filled surfaces, we need to recognize that the parameter (thought of as an underlying average decay intensity) almost surely varies from child to child. Relevant factors in the variation among children are likely to include heredity, diet, oral hygiene, and fluoride intake. Thus, it is probably plausible to expect data that are Poisson, but not with a single underlying value of  $m$ . The theoretical approach to modeling this sort of situation is to treat the individual underlying values of  $m$  as if they come from some statistical distribution. The result is known as a compound Poisson model.

Before embracing a compound Poisson model so eagerly, however, we should try to learn whether it is at all reasonable for our data. The easy thing to do is to ask how closely the frequency distributions for the number of decayed and filled surfaces follow a simple Poisson distribution. For checking this, a graphical technique devised by Hoaglin (1980) works as follows. We denote the frequency of  $k$  in the sample by  $f_k$  (that is, the number of children who had  $k$  decayed and filled surfaces), and we plot

$\log_e(f_k) + \log_e(k!)$  against  $k$ .

In the ideal situation in which the data are perfectly Poisson with parameter  $m$  and the  $f_k$  exactly equal the values that we would expect in a sample of  $n = f_1 + f_2 + \dots$ , namely  $f_k = n \times p_m(k)$ , the plot yields a straight line with slope  $\log_e(m)$ . If the data are compound Poisson, we might expect a plot that is not too far from having a small number of straight segments.

Exhibits 2B-9 through 2B-12 are the Poissonness plots for the number of decayed and filled surfaces in children who had 20 teeth in the four sites. The restriction to 20 teeth avoids some minor confusion from variation in the number of teeth; it is convenient at this exploratory stage but does not apply to the actual analyses. About 85 percent of the children in the overall sample had 20 teeth. Each of the samples has a number of large values of  $k$ ; but, after a certain point, these contribute little to the plot and are not shown.

Although both the vertical and horizontal scales vary from plot to plot, a look at the four plots indicates that they are generally not far from straight for reasonably long stretches, when one makes a little allowance for the inherent variability in the data (the observed frequencies,  $f_k$ , do not exactly coincide with their expected values, even under the assumed simple Poisson model on which the plot is based). In all four plots one notices a concentration of values at zero, especially in St. Clair County, Mariopa County, and Mingo County (where the plot is based on only the data from children whose homes have well water, because only 40 children have municipal water at home--too few for a satisfactory plot). This concentration could easily reflect a component in the compound Poisson model that has a small value of  $m$ .

On the whole, a small number of components, say three or four, would provide an adequate fit to the data in these sites. It seems plausible, however, that the distribution of values of  $m$  among children is actually continuous, rather than concentrated at a few values.

Poissonness Plot for Number of Decayed and Filled  
Surfaces Among Children in the Mississippi Site(s)

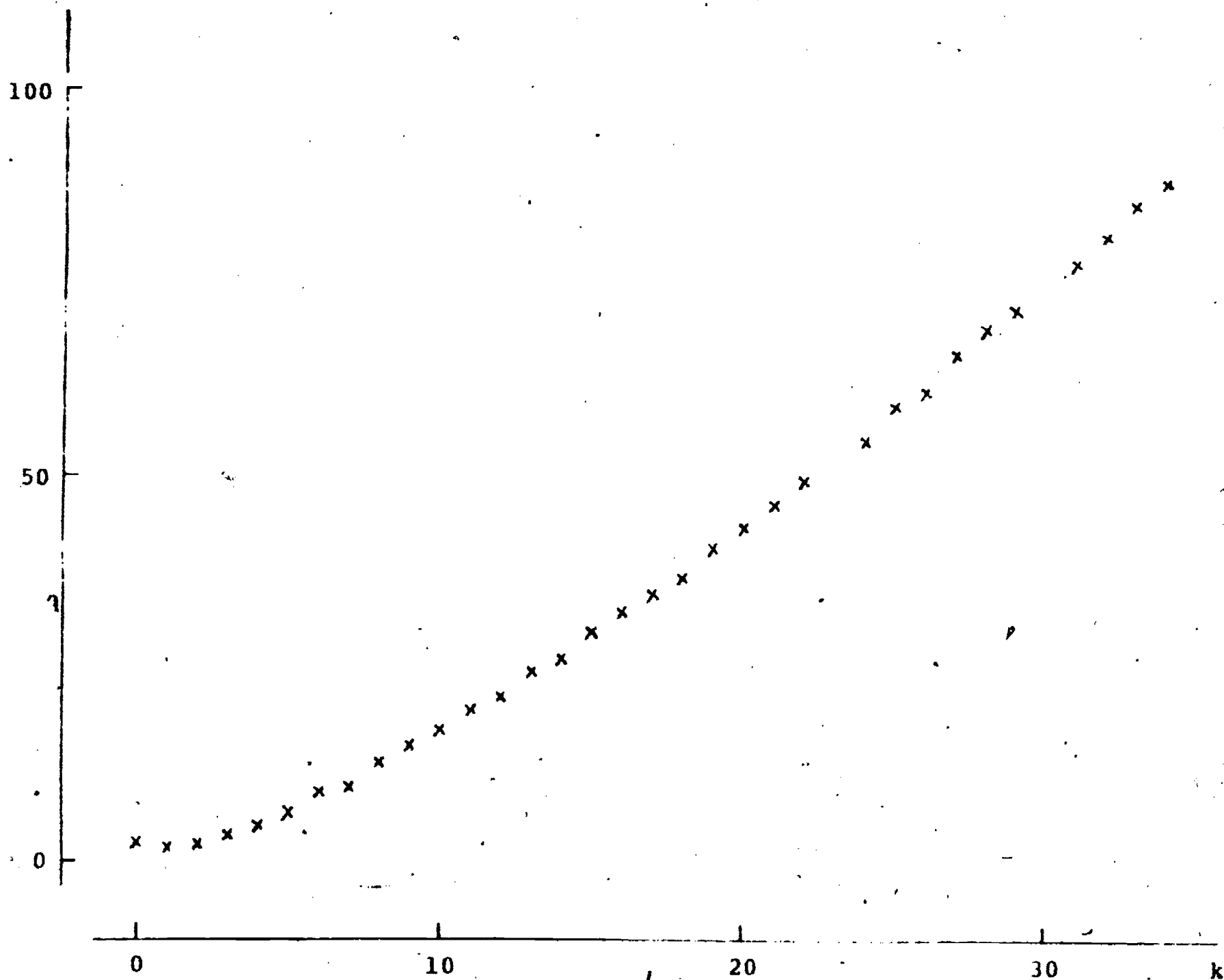
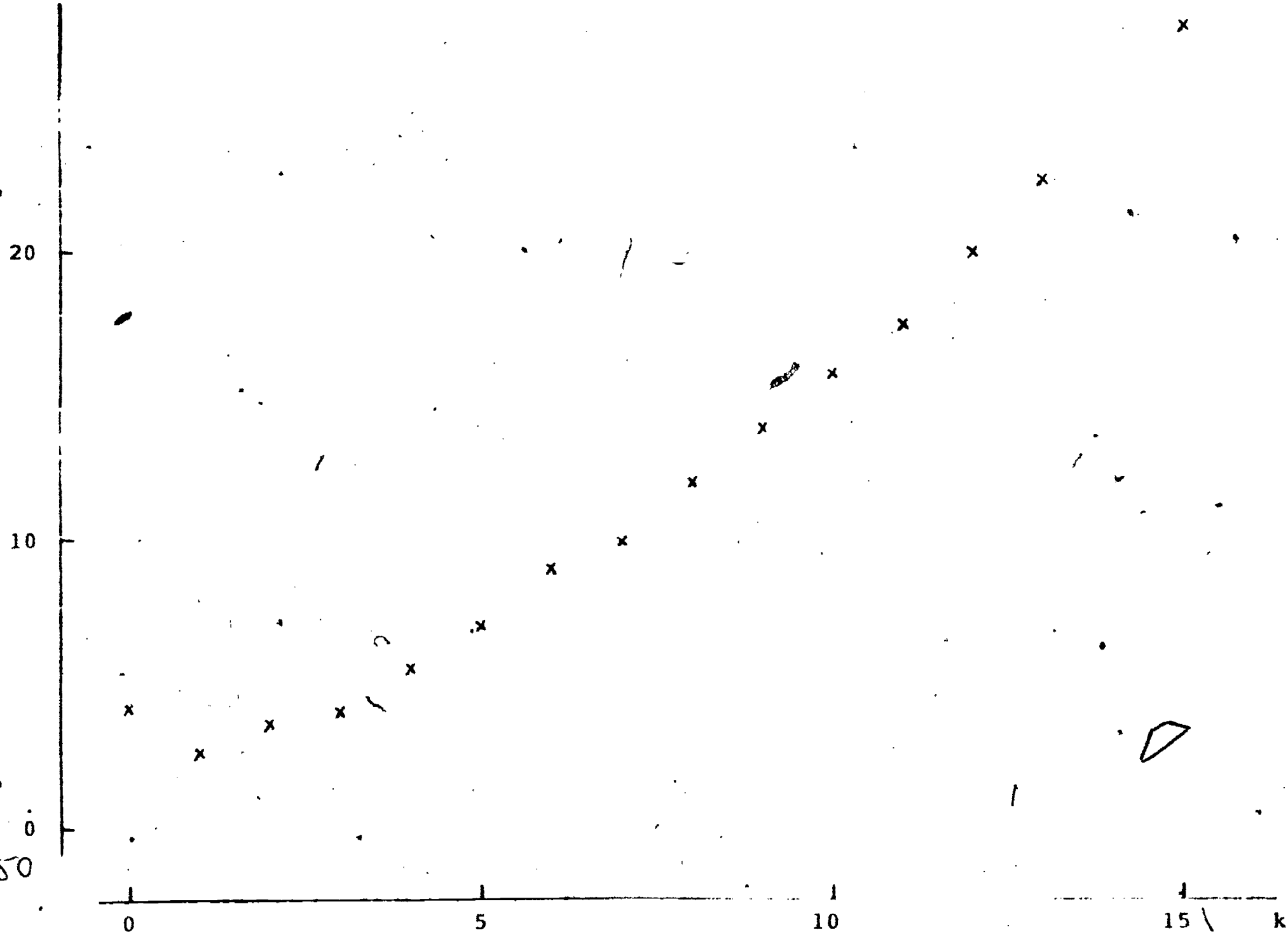
 $\log(f_k) + \log(k!)$ 


Exhibit 2B-10

Poissonness Plot for Number of Decayed and Filled Surfaces Among Children in the East St. Louis Site

$\log(f_k) + \log(k!)$



551

Poissonness Plot for Number of Decayed and Filled  
Surfaces Among Children in the Phoenix Site

$\log(f_k) + \log(k!)$

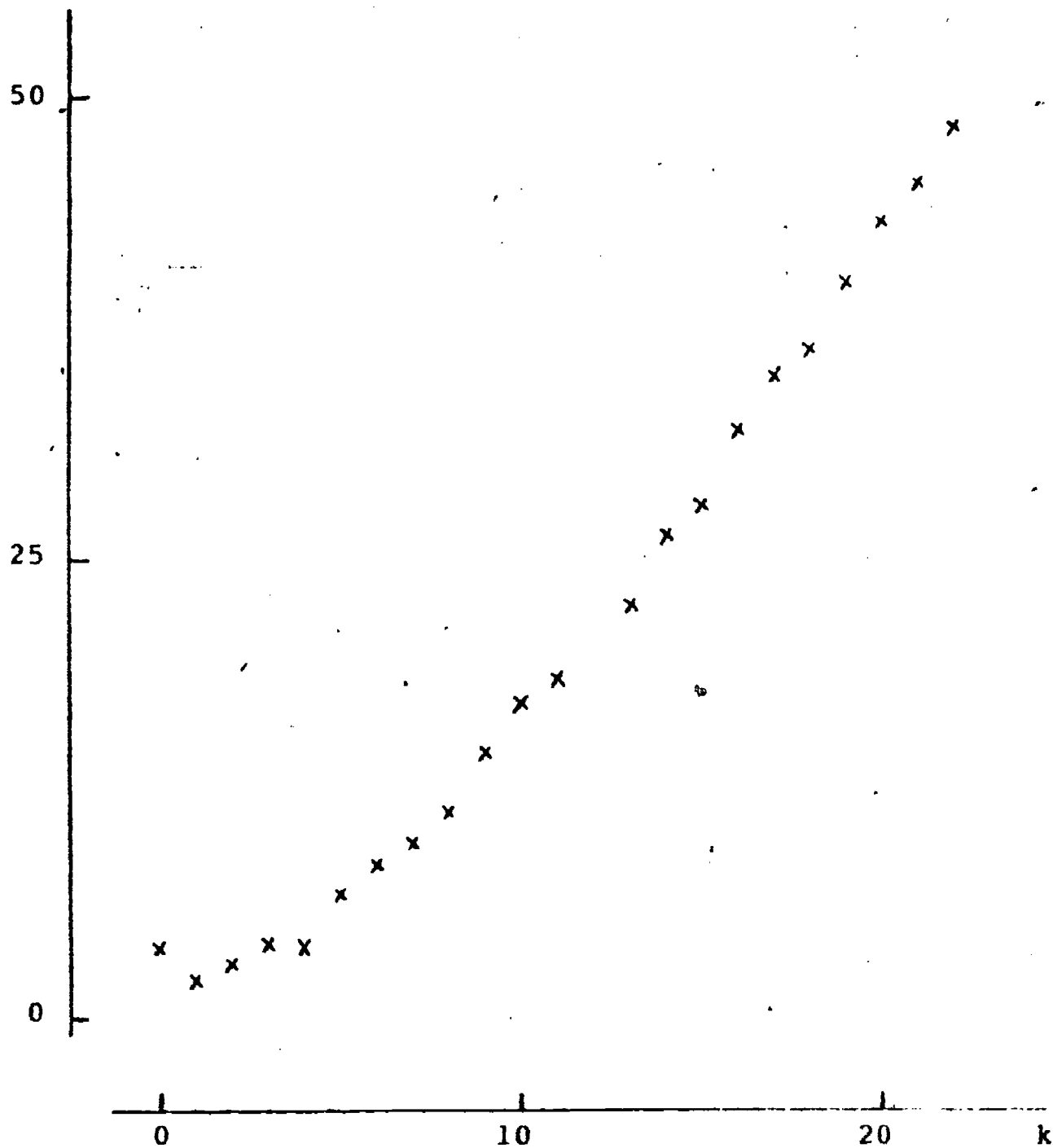
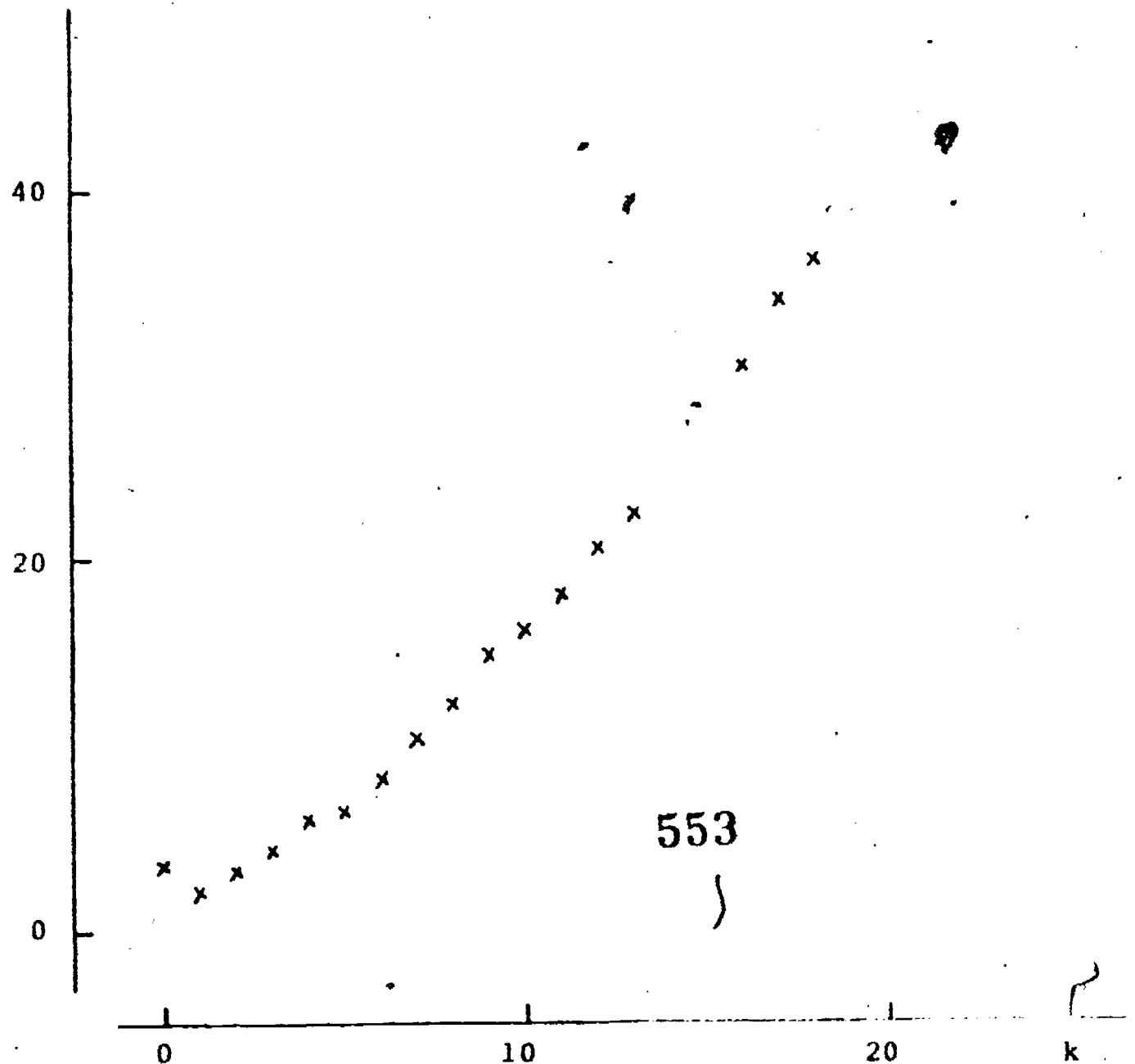


Exhibit 2B-12

Poissonness Plot for Number of Decayed and Filled  
Surfaces Among Mingo County Children Whose Homes  
are Served by Well Water

$\log(f_k) + \log(k!)$





Although getting at the compounding distribution could offer some interesting theoretical possibilities (and, one would hope, some useful findings about the distribution of decay intensity in children), our basic comparisons do not require this step. Ultimately, we need to compare the decay history of the Head Start group and that of the non-Head Start group in each site. If we can accept a Poisson model at the level of the individual child, then we can use the fact that a sum of Poisson variables still has a Poisson distribution (the parameters add). To compare two groups, we simply add up all the decayed and filled surfaces in each group. For this approach to be valid, however, we must be able to believe that the children in one group do not have a greater disposition to tooth decay than those in the other group (at least we need this sort of comparability if we are to draw any conclusions about a Head Start effect). Fortunately, we randomly assigned Wave 1 children to the two groups, and so we have some basis for attributing any difference to the children's participation in Head Start.

For analyses of the incidence of decay and fillings (as measured between the pretest and the posttest), we are able to follow the same general approach as for the data on prevalence. Similar Poissonness plots for the incidence data in each site (not reproduced here) revealed that a compound Poisson model is again plausible.

Consequently, we based comparisons between groups on the total numbers of decayed and filled surfaces for all children in the groups. Because these totals behave as observations from Poisson distributions with large enough parameters, it is reasonable to approximate them by normal distributions that have the same means and variances. That is, if the respective Poisson parameters for the totals are  $m_{HS}$  for the Head Start group and  $m_{NHS}$  for the non-Head Start group, we approximate the distribution of the Head Start total by a normal distribution with mean  $m_{HS}$  and variance  $m_{HS}$ , and we approximate the distribution of the non-Head Start total by a normal distribution with mean  $m_{NHS}$  and variance  $m_{NHS}$ . In view of the different numbers of children in the groups, the null hypothesis of no difference between the Head Start group and the non-Head Start group must be stated in

terms of the average numbers of decayed and filled surfaces per child in the groups. If there are  $n_{HS}$  children in the Head Start group and  $n_{NHS}$  children in the non-Head Start group, the hypothesis states that  $m_{HS}/n_{HS}$  equals  $m_{NHS}/n_{NHS}$ . We test this by comparing the observed group means,  $\bar{x}_{HS}$  and  $\bar{x}_{NHS}$ , so that we need to determine the appropriate standard error. In general, the variance of  $\bar{x}_{HS} - \bar{x}_{NHS}$  is

$$\frac{m_{HS}}{(n_{HS})^2} + \frac{m_{NHS}}{(n_{NHS})^2}$$

and under the null hypothesis this becomes

$$\frac{m_{HS}}{n_{HS}} \left[ \frac{1}{n_{HS}} + \frac{1}{n_{NHS}} \right]$$

To obtain a suitable pooled estimate, we observe that  $n_{HS}\bar{x}_{HS} + n_{NHS}\bar{x}_{NHS}$  estimates  $m_{HS} + m_{NHS}$  and that this in turn equals  $(n_{HS} + n_{NHS}) (m_{HS}/n_{HS})$ . Then the normal approximations yield the test statistic

$$z = \frac{\bar{x}_{HS} - \bar{x}_{NHS}}{\sqrt{\frac{n_{HS}\bar{x}_{HS} + n_{NHS}\bar{x}_{NHS}}{n_{HS} + n_{NHS}} \left[ \frac{1}{n_{HS}} + \frac{1}{n_{NHS}} \right]}}$$

The foregoing derivation represents a straightforward generalization of the normal approximation described by Brownlee (1960, Section 4.9). The null hypothesis that the average numbers of decayed and filled surfaces per child are the same in the two groups is equivalent to assuming that the Poisson parameters for the totals in the two groups are in a given hypothetical ratio. An exact test derived by Brownlee (Section 4.10) for this case is an alternative to the z-statistic developed above; the two approaches will generally yield similar results.

Finally, the z-statistic derived above can be applied to the numbers of missing teeth among children in the two groups. The change from counting surfaces to counting teeth arises because an entire tooth is the basic unit that can be missing. Thus, a Poisson or compound Poisson model would be concerned with variability at the level of the tooth.

#### Comparison of Anthropometric Measurements to Reference Data\*

Age-specific reference data, representing the normal course of development, allow us to assess the status of the individuals in a sample. Operationally, we may often use the reference data to obtain a mean and standard deviation for each age, and we then score each individual in terms of departure from the reference mean, measured in units of the reference standard deviation. (One might use the corresponding percentile for each individual, but the scores provide a more suitable scale for analysis.)

Even when the (population) reference data are based on a substantial national sample, the number of observations at each age (for definiteness, each year of age) may not be large enough to overcome the greater variability associated with estimates of more extreme percentiles. In comparing an individual to the reference data, the straightforward procedure uses only the percentiles for the individual's age, but we would naturally prefer greater stability. The growth processes are continuous, so we would expect the true 100p-th percentile at a given age to fit in smoothly with the true 100p-th percentiles at nearby ages. Thus, it is reasonable to consider smoothing the age-specific percentiles across ages.

Anthropometric measurements of the upper arm provide a basis for determining a person's nutritional status. Frisancho (1981) has derived norms for such measurements from the data collected by the First Health and Nutrition Examination Survey (NHANES-I). Although the NHANES-I cross-sectional sample contains 19,097 white subjects from age 1 year to age 74, only about 220 males and a little more than 200 females fall into each year of age from 2 years to 6 years (the appropriate age range for Head Start and Head Start-eligible children).

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\*Much of this section is adapted from the paper by Hoaglin (1982).

The reference data give the 5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles; and it would not be surprising to see substantial fluctuations in the more extreme percentiles. For illustration, Exhibit 2B-13 gives the age-specific percentiles of upper arm circumference (in millimeters) for white males aged 1 to 18 (the range over which Frisancho gives results by single years of age). Exhibit 2B-14 plots these percentiles, connecting adjacent ages with straight line segments. Although the overall pattern is clear--a somewhat curved increase in level and a regular increase in variability--we see noticeable bumps and wiggles, even in the traces for the 25th and 75th percentiles.

Exhibit 2B-13

Percentiles of Upper Arm Circumference by Age Group  
for White Males in the First Health and Nutrition  
Examination Survey

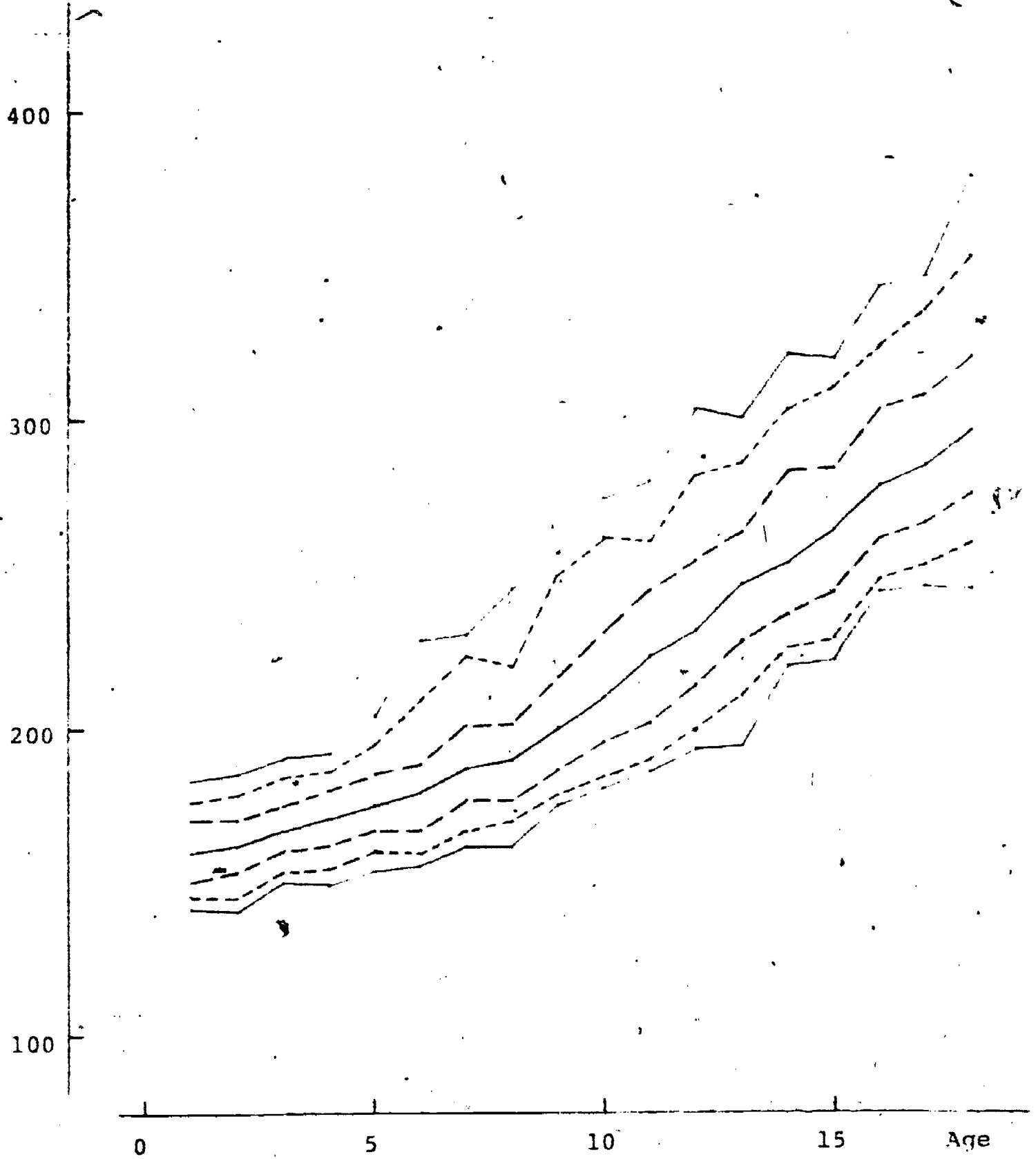
| Age group | Arm circumference (mm) |     |     |     |     |     |     |
|-----------|------------------------|-----|-----|-----|-----|-----|-----|
|           | 5                      | 10  | 25  | 50  | 75  | 90  | 95  |
| 1-1.9     | 142                    | 146 | 150 | 159 | 170 | 176 | 183 |
| 2-2.9     | 141                    | 145 | 153 | 162 | 170 | 178 | 185 |
| 3-3.9     | 150                    | 153 | 160 | 167 | 175 | 184 | 190 |
| 4-4.9     | 149                    | 154 | 162 | 171 | 180 | 186 | 192 |
| 5-5.9     | 153                    | 160 | 167 | 175 | 185 | 195 | 204 |
| 6-6.9     | 155                    | 159 | 167 | 179 | 188 | 209 | 228 |
| 7-7.9     | 162                    | 167 | 177 | 187 | 201 | 223 | 230 |
| 8-8.9     | 162                    | 170 | 177 | 190 | 202 | 220 | 245 |
| 9-9.9     | 175                    | 178 | 187 | 200 | 217 | 249 | 257 |
| 10-10.9   | 181                    | 184 | 196 | 210 | 231 | 262 | 274 |
| 11-11.9   | 186                    | 190 | 202 | 223 | 244 | 261 | 280 |
| 12-12.9   | 193                    | 200 | 214 | 232 | 254 | 282 | 303 |
| 13-13.9   | 194                    | 211 | 228 | 247 | 263 | 286 | 301 |
| 14-14.9   | 220                    | 226 | 237 | 253 | 283 | 303 | 322 |
| 15-15.9   | 222                    | 229 | 244 | 264 | 284 | 311 | 320 |
| 16-16.9   | 244                    | 248 | 262 | 278 | 303 | 324 | 343 |
| 17-17.9   | 246                    | 253 | 267 | 285 | 308 | 336 | 347 |
| 18-18.9   | 245                    | 260 | 276 | 297 | 321 | 353 | 379 |

Source: Frisancho (1981), Table 2 on page 2542.

Exhibit 2B-14

Percentiles of Upper Arm Circumference versus Age

Upper Arm  
Circumference



## Smoothing and Delineation

To obtain more stable estimates, especially for the more extreme percentiles, we smooth across ages. For protection--in principle and here, to some degree, in practice--against isolated unusual behavior, we gain by using a resistant nonlinear smoothing procedure. The basic ideas and motivation come from Tukey (1977), and the actual smoother is the one known as "4253H,twice", described in detail by Velleman and Hoaglin (1981) and studied by Velleman (1980).

The most direct approach for smoothing the age-specific percentiles across ages considers each percentile as a separate sequence. Thus, we would apply our resistant nonlinear smoother to each of the seven columns of data in Exhibit 2B-13.

Treating the percentiles separately in this way, however, ignores the constraint of order that the resulting smoothed sequences must satisfy. That is, for each year of age, the smoothed 10th percentile must not be less than the smoothed 5th percentile and so on. This is equivalent to requiring that the difference between the smoothed 10th percentile and the smoothed 5th percentile (for example) be nonnegative at each age.

The age-specific differences between successive percentiles in the data satisfy this order relationship, and the resistant nonlinear smoother will produce a nonnegative smooth sequence when the data sequence is nonnegative, so we can smooth across ages and preserve the order relationship by working with the sequences of differences. The model for this approach is the "delineation" in exploratory data analysis (Tukey, 1977, Chapter 9).

As originally developed, the delineation applies to batches of  $(x,y)$  data in which the  $x$ -values have not already been grouped into a regular set of intervals. Customarily, the amount of data will be far smaller--perhaps only a couple of hundred observations. Thus, one begins by slicing the data, parallel to the  $y$ -axis, at the  $x$ -median, the lower and upper  $x$ -hinges, the lower and upper  $x$ -eighths, and so on (until the data become too thin). Within each of the groups thus formed, one concentrates on the  $y$ -values, calculating their median, hinges, and so on. One then forms differences between these  $y$ -summaries, working outward from the median, smooths the sequence of medians and the sequences of differences, and recombines the smoothed sequences.

## Application to Age-Specific Percentiles

In the present situation we are given a set of percentiles, and we have the advantage of being given equally spaced x-values (the ages)--the preferred form of sequence for smoothing.

In this form of delineation, we form differences, working outward from the median. If we denote the percentiles of upper arm circumference by  $C_5$  through  $C_{95}$ , the process goes as follows.

- o Extract the age-specific medians,  $C_{50}$ . Exhibit 2B-15 plots these against age. This sequence already appears quite smooth, the main reason that it serves as the base in building the smoothed age-specific percentiles.
- o Calculate differences between successive age-specific percentiles:  $C_{10} - C_5$ ,  $C_{25} - C_{10}$ ,  $C_{50} - C_{25}$ ,  $C_{75} - C_{50}$ ,  $C_{90} - C_{75}$ ,  $C_{95} - C_{90}$ . Exhibit 2B-16 plots these six sequences of differences. A fair amount of irregular behavior stands out--more clearly here than in Exhibit 2B-14.
- o Smooth the sequence of age-specific medians. The result for the data on upper arm circumference appears in Exhibit 2B-17, which differs only slightly in appearance from Exhibit 2B-15.
- o Smooth the sequences of differences,  $C_{10} - C_5, \dots, C_{95} - C_{90}$ . As Exhibit 2B-18 shows, the smoothed sequences look satisfactorily regular, even though not all are strictly increasing.
- o Recombine the sequences of smoothed differences and the sequence of smoothed medians, as in ("Sm" indicates smoothed)

$$\text{Sm}(C_{50}) + \text{Sm}(C_{75} - C_{50})$$

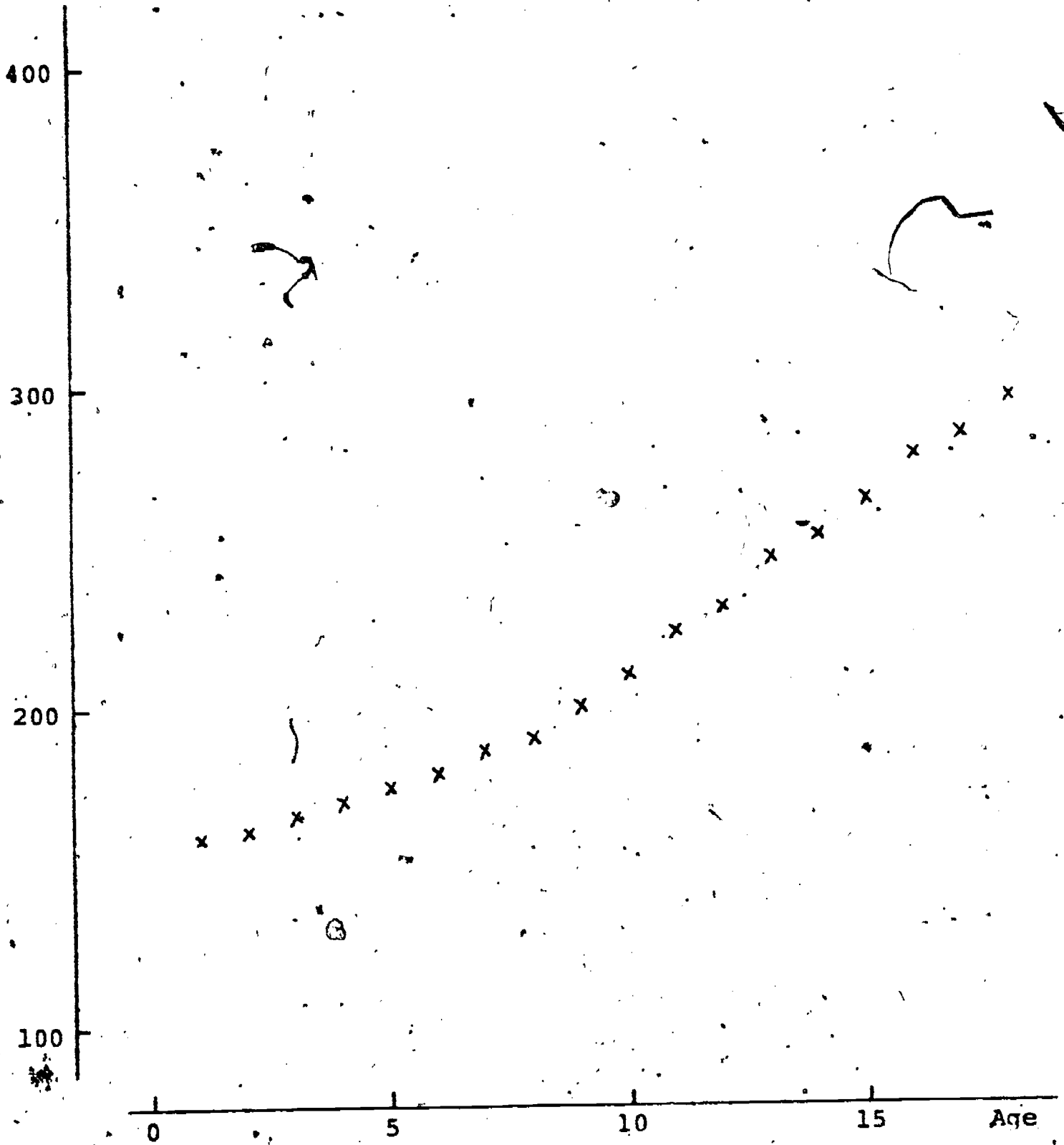
and

$$\text{Sm}(C_{50}) - \text{Sm}(C_{50} - C_{25}).$$

The resulting sequences are the cross-age smoothed estimates of the age-specific percentiles. Exhibit 2B-19 suggests that, in the example, the smoothed version provides a more plausible and more satisfactory description of the relationship between upper arm circumference and age.

Median of Upper Arm Circumference,  $C_{50}$ , versus Age

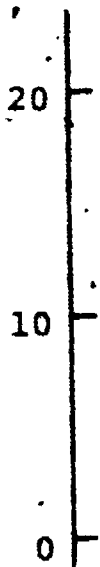
Upper Arm  
Circumference



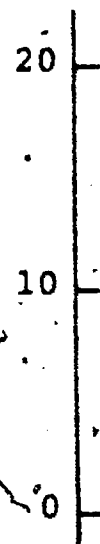


Inter-percentile Differences versus Age

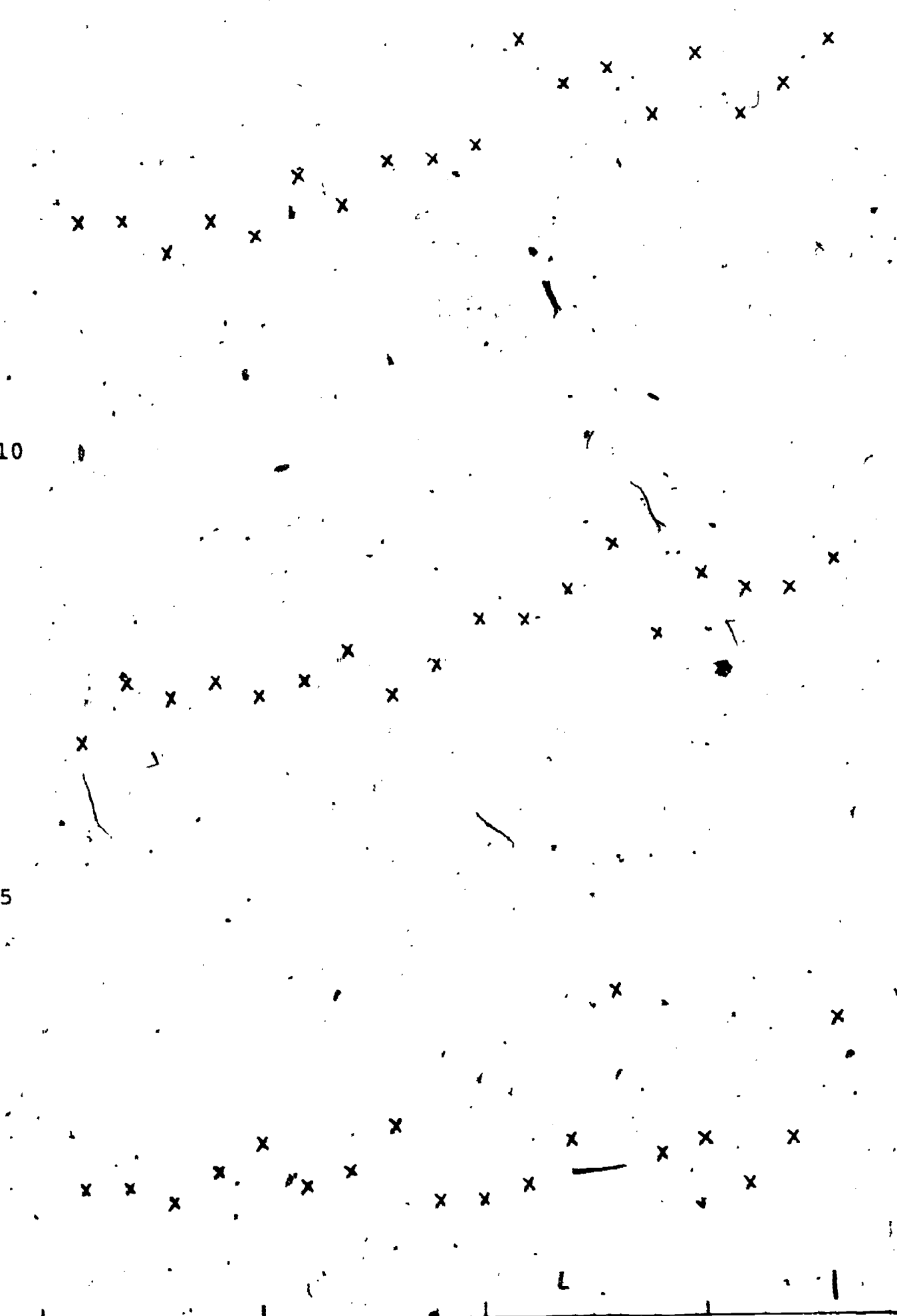
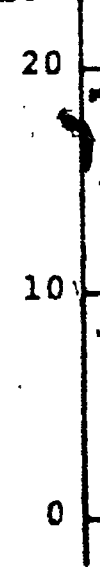
$C_{50} - C_{25}$



$C_{25} - C_{10}$



$C_{10} - C_5$



(continued)

C<sub>95</sub> - C<sub>90</sub>

20

10

C<sub>90</sub> - C<sub>75</sub>

30

20

10

C<sub>75</sub> - C<sub>50</sub>

30

20

10

0

5

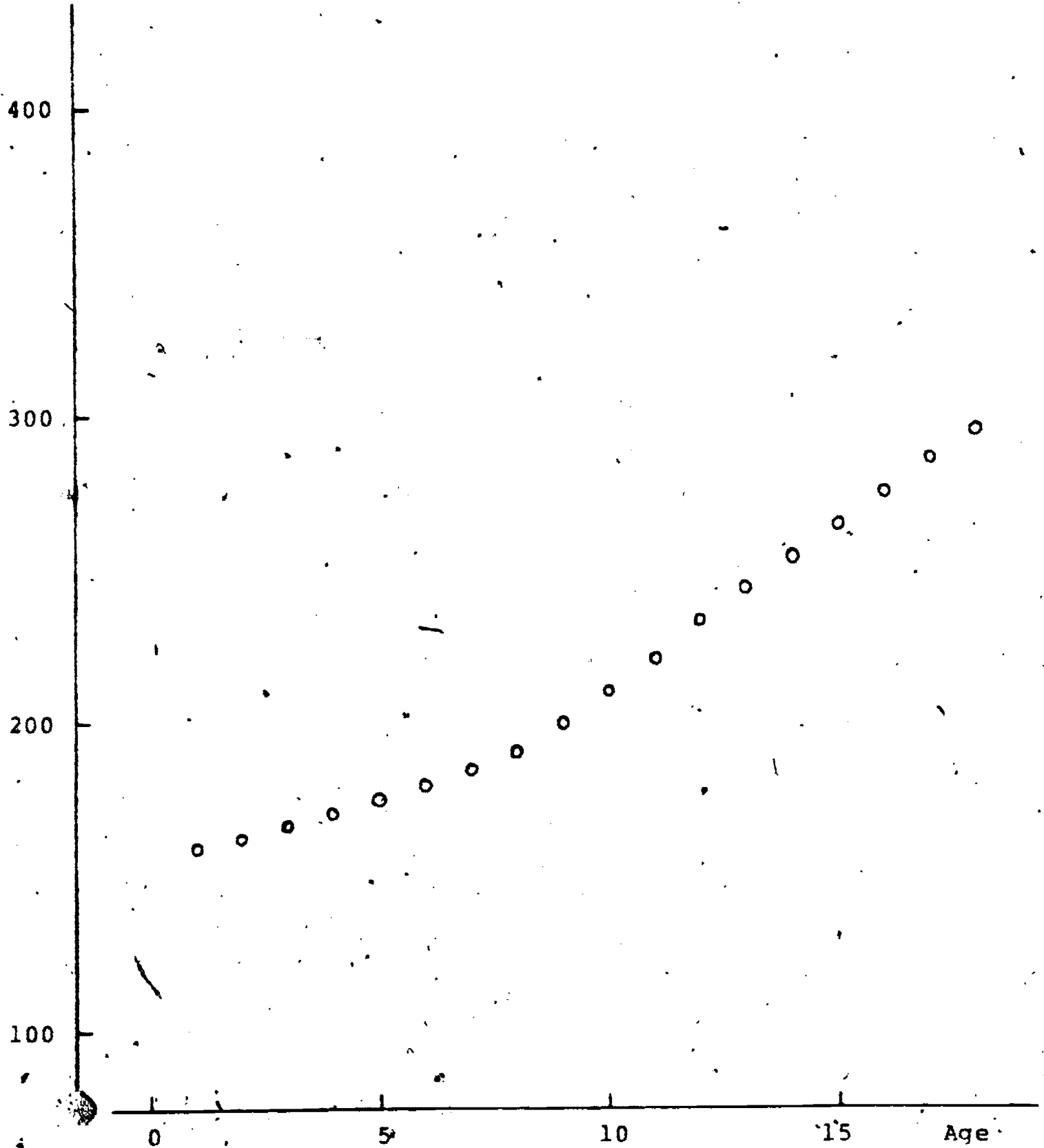
10

15

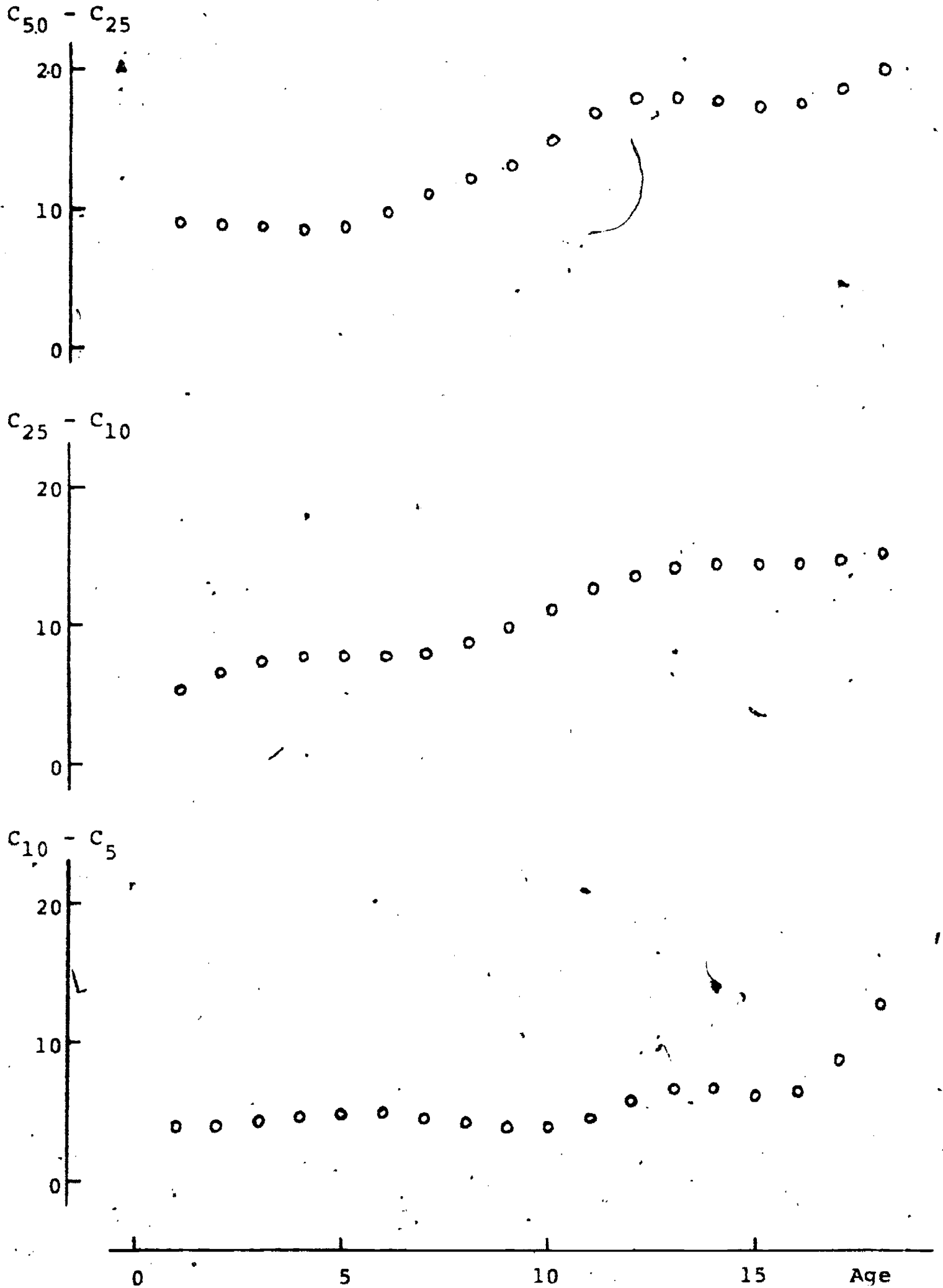
Age

Smoothed Median Upper Arm Circumference versus Age

Upper Arm  
Circumference

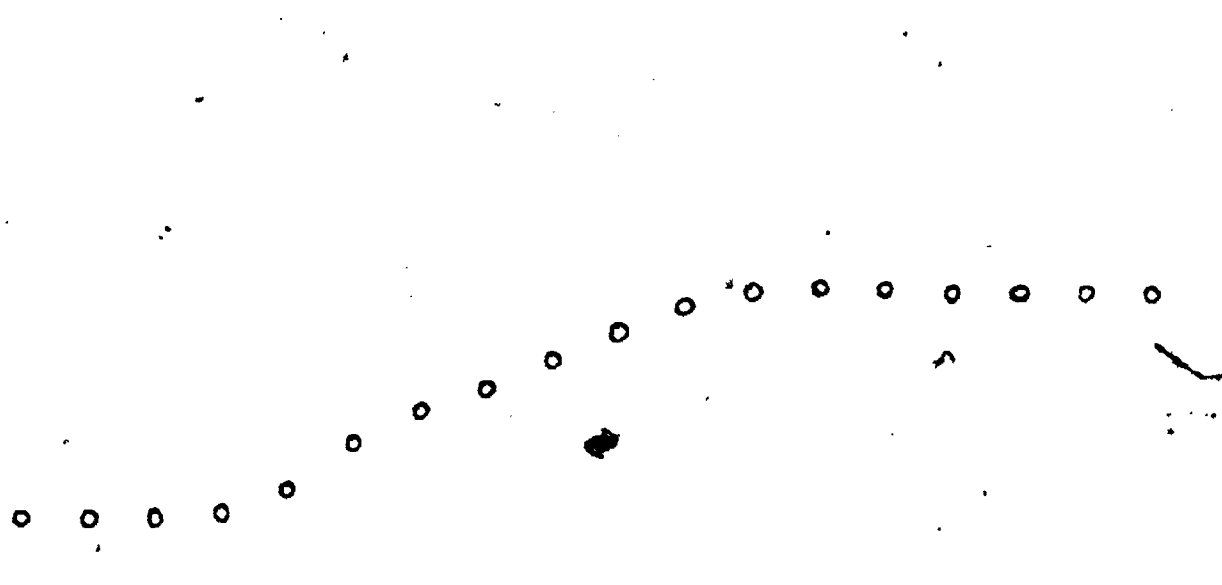


Smoothed Inter-percentile Differences versus Age

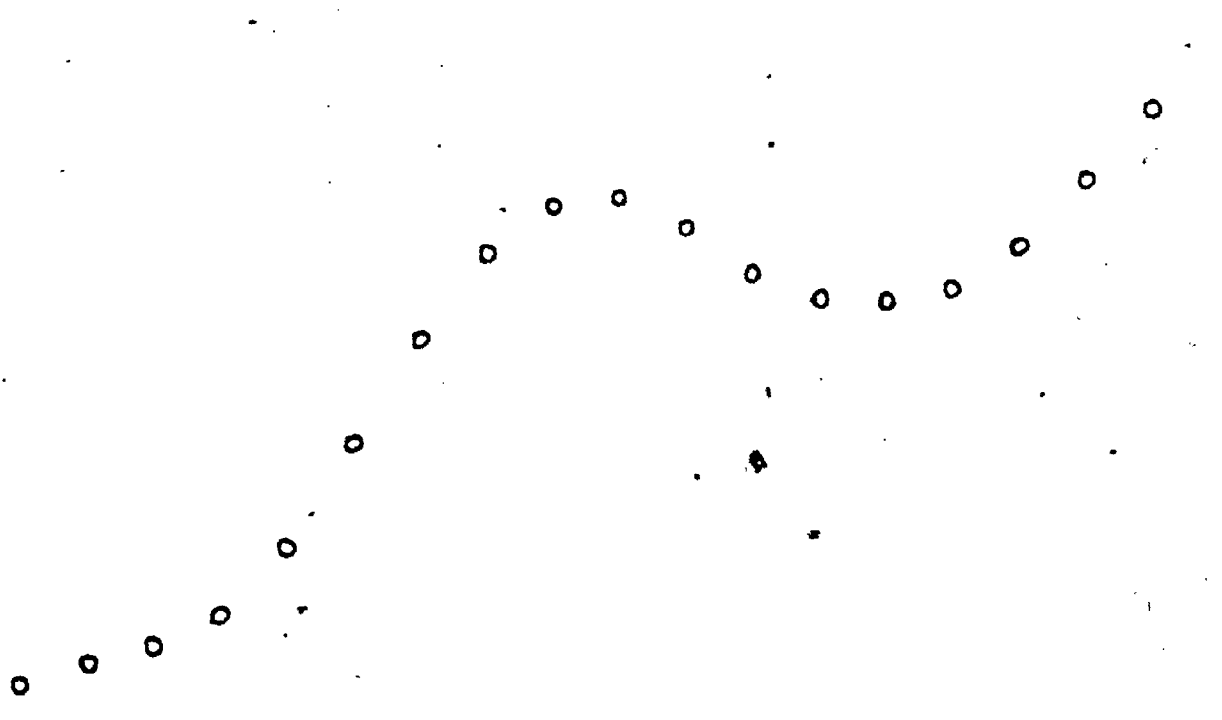
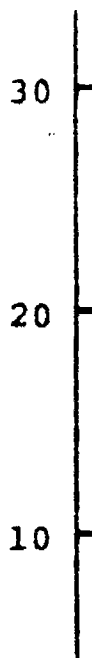


(continued)

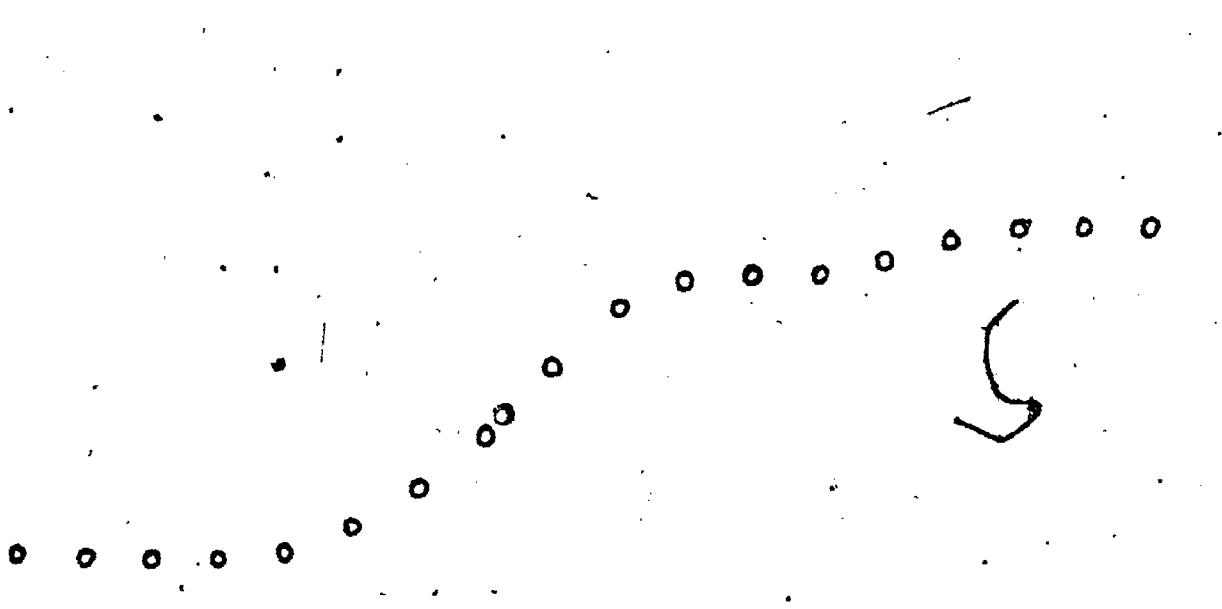
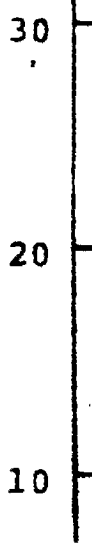
$C_{95} - C_{90}$



$C_{90} - C_{75}$



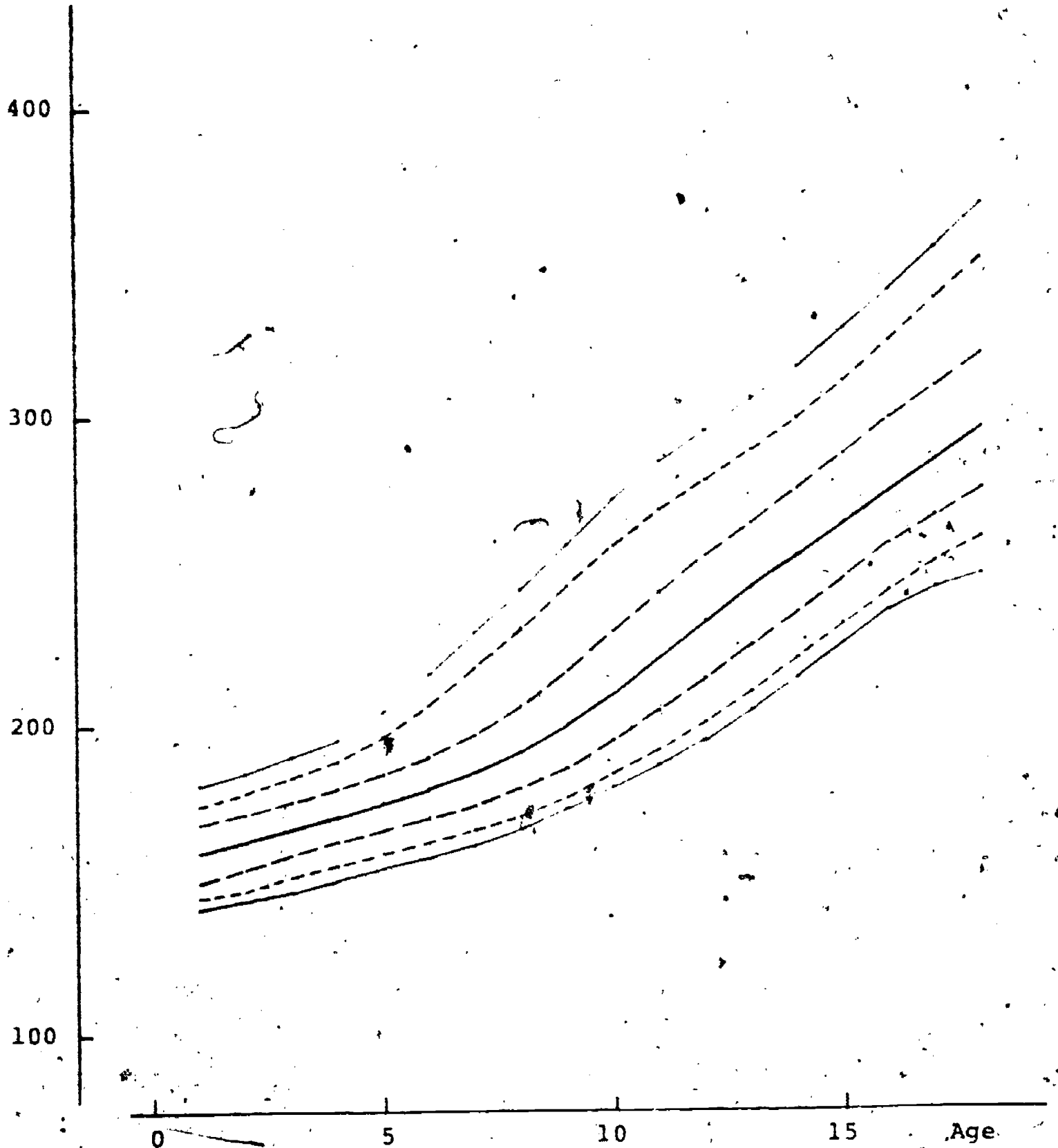
$C_{75} - C_{50}$



0 5 10 15 Age

Smoothed Percentiles of Upper Arm Circumference versus Age

Upper Arm  
Circumference



Superimposing Exhibit 2B-19 on Exhibit 2B-14 would reveal that the smoothed percentiles adequately capture the behavior of the raw percentiles and merely remove the wiggles, some of which are troublesome.

#### Age-Specific Means and Standard Deviations

In analyzing the anthropometry data, we assigned each child a score of the form

$$\frac{(\text{child's measurement}) - (\text{age-and-sex-specific mean})}{(\text{age-and-sex-specific standard deviation})}$$

on each of three variables: triceps skinfold, upper arm circumference, and arm muscle circumference. To obtain the age-and-sex-specific means and standard deviations, we applied the smoothing technique described earlier in the present section to the reference data published by Frisancho (1981), taking the age-and-sex-specific percentiles for ages 1 through 10 years (in part to avoid some end effects that can propagate when smoothing short sequences). After calculating the smoothed age-and-sex-specific percentiles, we made quantile-quantile plots (Wilk and Gnanadesikan, 1968) to refer those percentiles to the normal distribution. Although these plots did not show perfect agreement, they did indicate that normal distributions adequately approximate the age-and-sex specific distributions of the three variables over the range of ages that one encounters in Head Start and Head Start-eligible children. Thus, the mean and standard deviation are sufficient to describe the distribution and can be used in calculating scores for the individual children. Exhibit 2B-20 records the means and standard deviations that emerged from this process of fitting normal distributions to the three anthropometry variables.

Exhibit 2B-20

Age-and-Sex-Specific Means and Standard Deviations Obtained  
by Fitting Normal Distributions to Smoothed Percentiles  
of Triceps Skinfold, Upper Arm Circumference, and Arm  
Muscle Circumference

|                               | Age Group | Males |           | Females |           |
|-------------------------------|-----------|-------|-----------|---------|-----------|
|                               |           | mean  | std. dev. | mean    | std. dev. |
| Triceps skinfold (mm)         | 1-1.9     | 10.3  | 2.9       | 10.4    | 2.9       |
|                               | 2-2.9     | 10.2  | 2.9       | 10.4    | 2.9       |
|                               | 3-3.9     | 10.0  | 2.8       | 10.4    | 2.9       |
|                               | 4-4.9     | 9.8   | 2.7       | 10.4    | 2.9       |
|                               | 5-5.9     | 9.6   | 2.8       | 10.5    | 3.0       |
|                               | 6-6.9     | 9.5   | 2.9       | 10.7    | 3.2       |
| Upper arm circumference (mm)  | 1-1.9     | 159.8 | 12.5      | 156.6   | 11.7      |
|                               | 2-2.9     | 162.7 | 12.5      | 161.0   | 12.0      |
|                               | 3-3.9     | 166.8 | 13.0      | 166.0   | 12.9      |
|                               | 4-4.9     | 171.7 | 13.3      | 170.6   | 13.9      |
|                               | 5-5.9     | 177.4 | 14.7      | 174.9   | 15.7      |
|                               | 6-6.9     | 182.1 | 17.2      | 180.6   | 18.2      |
| Arm muscle circumference (mm) | 1-1.9     | 126.9 | 11.5      | 124.4   | 11.4      |
|                               | 2-2.9     | 131.3 | 11.4      | 127.8   | 11.6      |
|                               | 3-3.9     | 136.2 | 11.4      | 132.0   | 11.8      |
|                               | 4-4.9     | 141.4 | 11.6      | 137.0   | 12.0      |
|                               | 5-5.9     | 146.5 | 12.0      | 142.0   | 12.2      |
|                               | 6-6.9     | 152.5 | 12.6      | 148.0   | 12.9      |



## TECHNICAL APPENDIX 2C

### DESCRIPTIONS OF THE HEAD START PROGRAM SITES AND SAMPLES OF CHILDREN

#### Head Start Site and Program Characteristics

The Head Start programs selected for the Head Start Health Evaluation were chosen according to site characteristics such as county-wide population characteristics and specific program characteristics. In general, site was synonymous with the geographic area of the county served by the Head Start program grantee. There were exceptions; the Head Start grantee selected in Mississippi (Friends of Children) served children in four counties when chosen, but added 11 more counties during the 1980-1981 program year. The most medically underserved counties, Greene and Humphreys Counties, had small Head Start programs, too small for inclusion in the evaluation. Consequently, both medically underserved counties, although they were geographically remote, were selected.\* Another exception to the definition of site as the county served by the Head Start program grantee was the Head Start grantee in Arizona. Maricopa County is very large, nearly 100 miles by 100 miles. To provide better service to the children, three Head Start grantees serve the county's children: the City of Phoenix grantee for children within the city limits, an Indian and Migrant grantee for migrant children and those on Indian reservations, generally on the outer perimeter of the county, and the Maricopa County Community Services Department grantee program for children in the suburban communities surrounding Phoenix. The latter was the program included in the evaluation.

In general, the two remaining sites, St. Clair County (Illinois) and Mingo County (West Virginia) were represented by children from the entire county. Whereas, in theory, the Head Start program in each of these sites served children from the entire county, in practice the catchment area was more restricted and depended on availability of transportation and distribution of the Head Start centers. Exhibit 2C-1 provides the characteristics of the population in each of the sites (five

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\*Analyses of the data from both of these counties demonstrated that the characteristics of the children were very similar and could be combined into one "site."

Exhibit 2C-1

Demographic Characteristics According to 1980 Census  
Data of Sites in Head Start Health Evaluation

| Demographic Characteristics     | Greene County | Hampshire County | St. Clair County | Maricopa County | Mingo County |
|---------------------------------|---------------|------------------|------------------|-----------------|--------------|
| Total Population                |               |                  |                  |                 |              |
| 1960                            | 8,466         | 19,093           | 262,509          | 663,407         | 39,742       |
| 1970                            | 8,545         | 14,601           | 285,176          | 971,228         | 32,780       |
| 1980                            | 9,827         | 13,931           | 265,469          | 1,508,030       | 37,336       |
| Percent Change                  |               |                  |                  |                 |              |
| 1960-1970                       | 2.1           | -23.5            | 8.8              | 46.4            | -17.5        |
| 1970-1980                       | 15.0          | -4.6             | -6.9             | 55.3            | 13.9         |
| Land Area, Sq. Mi.              | 728           | 421              | 673              | 9,155           | 423          |
| Population Density <sup>a</sup> | 13.5          | 33.1             | 394.5            | 164.7           | 88.3         |
| Largest Community               | Leakesville   | Belzoni          | East. St. Louis  | Phoenix         | Williamson   |
| Population                      | 1,090         | 3,146            | 69,996           | 581,573         | 5,831        |
| Area, Sq. Mi.                   | -             | 4,494            | 5,036            | 2,346           | 2,011        |
| Pop. Density <sup>a</sup>       | -             | 0.7              | 13.9             | 247.9           | 2.9          |
| Population by Community Size    |               |                  |                  |                 |              |
| Percent Rural                   | 100.0         | 78.5             | 16.8             | 6.6             | 82.1         |
| <1000                           | 87.2          | 78.5             | 13.2             | 6.6             | 78.7         |
| 1000-2500                       | 12.8          | -                | 3.6              | -               | 3.4          |
| Percent Urban                   | -             | 21.5             | 82.2             | 93.4            | 17.9         |
| Low Density                     | -             | 21.5             | 5.8              | -               | 17.9         |
| High Density                    | -             | -                | 77.4             | 93.4            | -            |
| Ethnic Distribution             |               |                  |                  |                 |              |
| White                           | 79.7          | 33.9             | 71.2             | 86.6            | 96.9         |
| Black                           | 20.1          | 65.6             | 27.7             | 3.2             | 2.9          |
| Other                           | .2            | .5               | 1.1              | 10.2            | .2           |
| Health                          |               |                  |                  |                 |              |
| Number Physicians               | 3             | 5                | 216              | 2341            | 31           |
| Rate/100,000                    | 34            | 35               | 77               | 199             | 90           |
| Number Hospitals                | 1             | 2                | 6                | 29              | 1            |
| Beds/100,000                    | 524           | 699              | 595              | 516             | 294          |
| Education: Adult Woman          |               |                  |                  |                 |              |
| Median Years                    | 10.4          | 8.5              | 9.3              | 12.7            | 8.7          |
| Percent Completed High School   | 37.5          | 24.5             | 35.9             | 58.4            | 25.3         |

<sup>a</sup> Population Density = Persons per square mile.

counties) included in the evaluation. A description of the demographic characteristics of each county and its Head Start Program follows.

Greene (Leakesville) and Humphreys (Belzoni) Counties, Mississippi. The Mississippi site provided a unique blend of characteristics. Unlike the other three sites, this site encompassed two counties which are geographically distinct and separated by a distance of over 200 miles.

Greene County is located in the southeast corner of the state, bordering Alabama. It is predominantly rural. In 1970, 43 percent of the work force was employed in lumbering or manufacturing in several large garment factories located in or near the principal communities. According to the 1980 census Greene County had a population of 9,827, of whom 80 percent were white and 20 percent were black. The population was relatively stable, although, according to the county clerk, "There is hardly enough industry in the county to keep high school graduates here once they graduate." In 1970 the unemployment rate was 6.0 percent, and 49 percent of the family incomes were below 125 percent of the poverty level. The median family income was \$4,565. Greene County also suffered from inadequate medical services. There was a shortage of physicians and accessible hospital care in the area. Until recently, there was no dentist in the whole of Greene County.

Humphreys County, situated in north central Mississippi, is largely agricultural; only 21.5 percent of the population lives in a non-rural setting. Humphreys County, 66 percent black and 34 percent white, had a population of 13,931 in 1980, a decrease of 4.6 percent since 1970. Most of the population was employed in farming or other agricultural trades; the unemployment situation was slightly better than in Greene County, with only 4.6 percent of the labor force out of work in 1970. Sixty-one percent of all families in Humphreys County had incomes below 125 percent of the poverty level. The median family income in 1969 was \$3,331.

Although Humphreys County was somewhat better served medically than Greene County, inadequate medical care was still a problem. The majority of the residents travel to Belzoni, a distance as far as 20 miles, to use the limited services available there; the poorest segment of

the population used them least. Dental problems, poor eating habits and inadequate dental hygiene were considered the greatest health problems in the county. Other common characteristics of Greene and Humphreys Counties included the following: substantial percentages of the population were below the poverty level (39% and 54%); many of the families were receiving Aid for Dependent Children (26% and 83%); and the median years of education of adult women was low (10.4 and 8.5 years).

The Head Start grantee is Friends of Children; offices are located in central Mississippi in Jackson. After the beginning of the evaluation, Friends of Children expanded its Head Start program. In addition to the centers in Greene and Humphreys Counties, Friends of Children presently operates centers in 11 other counties and is funded to serve 3,700 children. In the 1980-1981 program year, the actual enrollment, including dropouts, was 4,278 children. The administrative staff of each county Head Start program worked out of separate county offices under the direction of the central office in Jackson.

Five centers in Greene County served approximately 230 children in a three-year program. Seventy percent of the children were black and 30 percent white, although this varied from center to center. For example, two centers with a combined enrollment of 79 served only three white children. In contrast, one center serving 40 children was entirely white. These numbers are indicative of persistent residential segregation in the county and disproportionate utilization of Head Start by the black community. The Humphreys County program operated three centers. Less than one percent of the 390 children served by these centers were white.

Children in both counties attended Head Start five days each week, six and one-half hours per day. In both Greene and Humphreys Counties, there was a great awareness that many children needed medical services. A common sentiment expressed by staff of the health departments in both counties was that the most crucial step in improving the health of the children was parent education. A staff member of the Greene County Health Department, for example, explained that the health department examined and referred many children with dental problems, but that these recommendations frequently were not followed up by parents.

St. Clair County (East St. Louis), Illinois. St. Clair County, located in southwestern Illinois, is a predominantly urban county, just

across the Mississippi River from St. Louis, Missouri. In 1970, the major industries in the area were manufacturing (metal products), construction (highway, civil), and railroads and railway express services. According to the 1980 Census, St. Clair County had a population of 265,469, of whom 28 percent were black and six percent were unemployed (in 1970).

East St. Louis, the county's largest city, was densely populated and 70 percent black. Thirty-eight percent of all black families in East St. Louis had incomes below 125 percent of the poverty level. Median annual income for black families (according to the 1970 Census) was \$5,255, well below the median income of \$6,857 for families of other racial backgrounds.

East St. Louis showed many signs of a city experiencing a serious decline. Unemployment was high; by 1970, 11.5 percent of the work force was unemployed. The city had a high crime rate: 14,007 serious or violent crimes per 100,000 persons per year. Many of the residents lived in housing projects, generally considered to be in ill repair. This combination of high unemployment, high crime rate and poor housing accounted for the decrease in the city's population over recent years. Between 1960 and 1970 the population declined by 14.7 percent. This decline accelerated between 1970 and 1980 to a 21 percent decrease. Evidence of this exodus could be seen in numerous abandoned businesses, residential buildings, and entire shopping areas. The streets were generally deserted, and many areas of the city had an almost "ghost town" atmosphere.

The Head Start grantee was the Economic Opportunity Commission of St. Clair County, which is actively involved in attempting to increase training and job opportunities in the area and to provide adult education. The main offices for the Head Start program are located in East St. Louis. Approximately 90 percent of the Head Start children came from this community. The Head Start staff was composed of five administrators and 80 teachers or assistant teachers. Ninety percent of the staff were black, nine percent were white, and one percent was Hispanic. In the 1980-81 school year, the program was funded for 650 children between three years and five years of age, in a two- to three-year program. Including drop-outs and enrollments, the program served 899 children. There were 13 Head Start centers, with a total of 26 classrooms. Centers were open four days a week. Children attended either two-day or four-day sessions and were

generally in class six hours per day. The racial composition of the 1980-81 enrollment was approximately 80 percent black, 19 percent white, and one percent other.

Five of the program's 13 centers were located in small towns around East St. Louis; the remaining eight were located within East St. Louis proper. The five outlying centers were located in the towns of Lovejoy (with two centers), Cahokia, Belleville and Lebanon, and accounted for 25 percent of the enrolled children. These centers ranged from approximately 5 miles from East St. Louis (Lovejoy) to 50 miles (Lebanon).

Although parent involvement in Head Start was one of the program's goals, public transportation was poor in East St. Louis proper, and thereby created a huge barrier to achieving this goal. Most of the families served by the program did not have cars, and therefore transportation services had to be provided. The program found it difficult to support an adequate transportation staff with available funds. Head Start staff expressed strong feelings that the high crime rate and transportation difficulties made many women afraid to leave their homes after dark. Since many Head Start families were single-parent families headed by women, this reluctance greatly limited parent participation in evening activities.

Maricopa County (Phoenix), Arizona. Maricopa County sprawls out on the flood plain of the Salt River. The center of the county is Phoenix, the capital of Arizona. According to the 1980 Census, the county had a population of over 1,508,030 people, predominantly urban. Agriculture, possible year-round with the advent of sophisticated irrigation techniques, and manufacturing were the major employers in the area. Unemployment was not then an enormous problem. In 1970, 3.9 percent of the labor force was unemployed, and only 13 percent of all families had incomes below 125 percent of the poverty level. The median family income in 1974 was \$9853 and the median years of education of adult women was 12.7 years--high compared to the other three sites. In general, the usual sources of income were migrant farm work, mining and unskilled labor.

Arizona had no Medicaid system, but provided state health care through primary care centers of the county health department located in Phoenix and various suburban towns. The towns without such centers, El Mirage and Guadalupe, were medically underserved, with few or no private doctors.

The Head Start grantee, Maricopa County Community Services Department, served eligible children outside the city limits of Phoenix and not within the catchment of the Indian and Migrant Program. Main offices are located in the outskirts of Phoenix. The program grantee, the Maricopa County Board of Supervisors, operated 18 classes in 12 centers, each located in a different town. Some of the centers were up to 50 miles from the main offices. (The evaluation focused on children residing in suburban communities to the northwest and southeast of Phoenix, rather than on the entire county.) The Head Start staff was composed of four administrators and 71 teachers and classroom staff and home visitors. Funded for 419 children, the program served 458 children at some time during the 1980-81 school year. Children attended school three-and-one-half to four hours per day, four days each week. Some centers operated two half-day programs each day. Approximately 68 percent of the children were Hispanic, 20 percent were white, and the remainder were black, Native American or Asian.

The Head Start center program was a one-year program for four-year olds. In addition, a home-based component served approximately 88 three-year-old children. Until recently, transportation was a barrier to Head Start participation. Previously, families were required to provide their own transportation. However, during the 1980-81 program year, Head Start received funding for an experimental busing program that both Head Start staff and parents feel had greatly increased participation.

Some migrant and undocumented workers' children are served by the Maricopa County Head Start Program. Families of farm workers must constantly move around this large county as certain crops are grown and harvested. This rotation caused the classrooms to constantly shift enrollment, but most of the children remained in Maricopa County Head Start even though they changed classrooms over the year. Remaining in the Head Start program is important for many of these children since Head Start is frequently the only means of access to health services. Any child enrolled in Head Start is eligible for health services through a contractual agreement with the Maricopa County Health Department, irrespective of eligibility for other public assistance. Otherwise, families without the green (eligibility) card cannot receive services at the health department unless they pay for the health services themselves.

Mingo County (Williamson), West Virginia. Mingo County, West Virginia describes itself as "the Heart of the Billion Dollar Coal Field." According to the 1980 Census, the county's population was 97 percent white and three percent black. The county is located in southwestern West Virginia, bordered on one side by Logan and McDowell Counties and on the other by the Tug Fork of the Big Sandy River. Across the river is Pike County, Kentucky. These two counties, separated by the river, were the setting for the historic feud between the Hatfields and the McCoys.

The county is predominantly rural, and much of its character stems from the terrain and the mining industry on which it depends. The land is mountainous, with "flat lands" few and far between. Consequently, these flat lands were densely populated and the "hollers" less so. Roads are narrow and twisting and in winter often become impassable. For this reason, mountain families lived in real isolation, especially in winter. Even in ideal weather it was a two-hour drive from the southern end of the county to the northern end. One community in Mingo County, Dingess, is geographically isolated: to reach it, one must travel through a one-mile, single-lane tunnel.

Deep mining was the major industry in the area. The associated railroad industry was the next largest employer. Employment and the standard of living in the area were greatly influenced by the vicissitudes of the coal industry. When a miner was working, his standard of living was relatively high, and his family was eligible for services provided using the coal company's health card. Even so, the threat to a miner's health was ever-present. And when a miner was not working, he was without other resources. Few other sources of employment existed, and most of these were short-term.

Many young people who cannot find work in the mines or in the poverty programs (including Head Start) must leave the county. Between 1960 and 1970 there was an 18 percent decrease in the population. The County Clerk's office suggested that the "boom" in the coal industry in recent years may limit this emigration. This was evidenced by more recent information. Between 1970 and 1980 the population increased by 14 percent, a substantial change in direction from the 1960-1970 decline. Although family incomes varied greatly according to season and the status of coal mining operations, in 1970 45 percent of the population was living below 125 percent of the poverty level. The median family income in 1974 was \$5,127.



Access to medical services was a problem. In 1970 there were only 31 physicians and one hospital serving the entire county. Most medical and health resources were concentrated in central locations, often difficult for the more geographically isolated families to reach. Families often had to travel 30 to 50 miles over mountain roads to obtain medical care. Specialized care requires a trip to Huntington or Charleston, each more than two hours away.

The Mingo County Head Start grantee's program began as a summer Head Start program in 1965 under the sponsorship of the Mingo County Economic Opportunity Commission. It has since become a full-year program, operating four days a week, six hours per day.

In the 1980-1981 school year, the program was funded for 300 children and served 345 children in 12 centers. Ninety-one percent of the Head Start children were white; nine percent were black. Black children were concentrated in two centers that were situated in predominantly black areas of Williamson. The 12 centers were widely dispersed throughout the county, in 11 communities. Some centers were over an hour's drive from the main Head Start offices in Williamson. Transportation for most children was provided by the program, or by a group of parent volunteers. Parent involvement and participation in Head Start activities was reportedly very high. Most problems of nonparticipation were found in the more isolated communities, where children's attendance was often problematic.

#### Sample Description

The design of the Head Start Health Evaluation, as shown previously in Table 1A-1 stipulated recruitment of approximately 300 Head Start-eligible children, assignment to the Head Start group or the non-Head Start group, and assignment to a condition of either pretest or no pretest. From this ideal design two samples would emerge--one containing those children who received both the pretest and the posttest of the evaluation, and a second containing those children who received the posttest only. Allowing for attrition of approximately 50 children per site, the final samples per site were projected to be approximately 250 children. The actual attrition rates vastly exceeded those estimates.

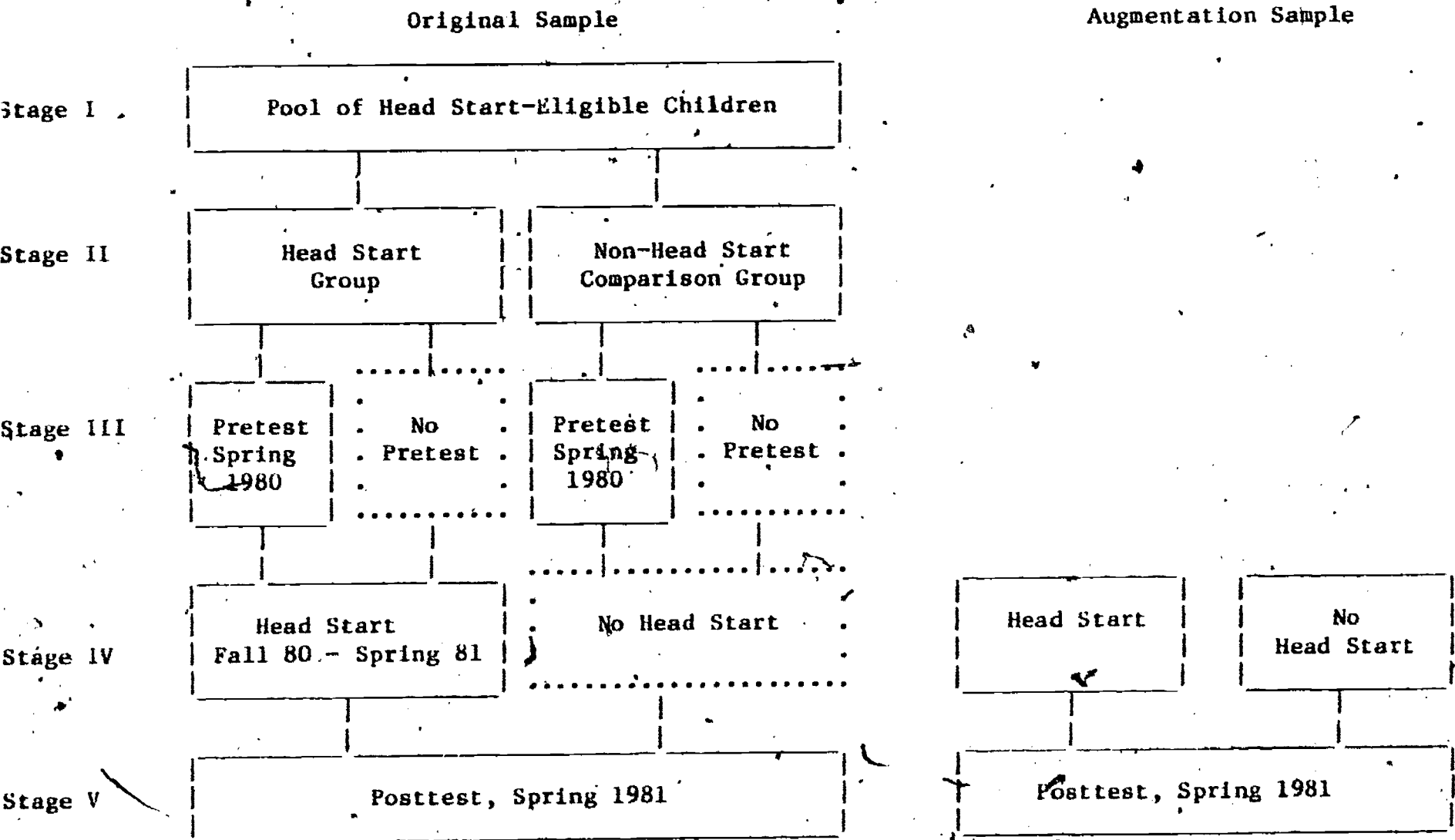
Because of attrition we modified the evaluation design and recruited an additional group of both Head Start and non-Head Start comparison children for the posttest examination. This augmentation sample is shown in Exhibit 2C-2 at Stage IV. Hence, although the children in the longitudinal sample were randomly assigned, implementation of the evaluation design resulted in modifications to some features of that design. For example, the children in the augmentation sample were not randomly assigned because they were recruited after the Head Start treatment began.

A total of 2364 children were actually recruited for the evaluation as shown in Exhibit 2C-3. However, although many parents of these low-income and Head Start-eligible children were willing to "sign-up" for the evaluation, only thirty-five percent followed through with the parent interviews and health examinations of their children. This experience of severe attrition, depicted graphically in Table 1A-3, reflected the Head Start program's own experience with recruitment and turnover among their eligible population: Greene and Humphreys Counties generally experienced the lowest rates of attrition and turnover while St. Clair County experienced a very high rate of attrition from the program. (Although the attrition rate in Maricopa County was very high among the children recruited for the evaluation, the Head Start program's added requirement that the family provide transportation for their child greatly delimited the children who participated in the program and reduced the numbers of children lost by attrition.) Hence the evaluation team's difficulties in retaining the families who had initially agreed to participate in the Head Start Health Evaluation was very similar to that of the Head Start program in each site with respect to recruitment and attendance of the children in the program.

Such modification in the samples of children ultimately required five classifications of children to distinguish among those who remained in the study, those who dropped out, and those who were added after the pretest. These have been defined as separate samples of children in this report. Exhibit 2C-4 depicts these samples' participation in the pretest and posttest of the evaluation.

Exhibit 2C-2

Evaluation Design and Implementation Stages for Original and Augmentation Samples



## Exhibit 2C-3

### Number of Children Recruited for the Evaluation

| Sample <sup>a</sup> | Recruited vs. Examined                 | Greene & Humphreys Counties |      | St. Clair County |      | Maricopa County |      | Mingo County |      | All Sites |      |
|---------------------|--|-----------------------------|------|------------------|------|-----------------|------|--------------|------|-----------|------|
|                     |  | n                           | Z    | n                | Z    | n               | Z    | n            | Z    | n         | Z    |
| A                   | Rostered Prior to Pretest              | 267                         | 64.3 | 298              | 42.8 | 353             | 53.4 | 300          | 50.7 | 1218      | 51.5 |
|                     | Pretested                              | 95                          | 35.6 | 113              | 38.0 | 95              | 26.9 | 73           | 24.3 | 376       | 10.9 |
|                     | & Posttested                           | 74                          | 77.9 | 42               | 37.2 | 56              | 58.9 | 36           | 49.3 | 208       | 55.3 |
|                     | & Lost by Attrition <sup>b</sup>       | 21                          | 22.1 | 71               | 62.8 | 39              | 41.1 | 37           | 50.7 | 168       | 44.7 |
|                     | Assigned to Posttest Only & Posttested | 85                          | 31.8 | 164              | 55.0 | 35              | 9.9  | 97           | 32.3 | 381       | 31.3 |
| B                   | & Posttested                           | 56                          | 65.9 | 41               | 25.0 | 11              | 31.4 | 31           | 32.0 | 139       | 36.5 |
|                     | & Lost by Attrition <sup>b</sup>       | 29                          | 34.1 | 123              | 75.0 | 24              | 68.6 | 66           | 68.0 | 242       | 63.5 |
|                     | Lost without Interview                 | 87                          | 32.6 | 21               | 7.0  | 223             | 63.2 | 130          | 43.4 | 461       | 37.8 |
| C                   | Rostered Prior to Posttest             | 148                         | 35.7 | 398              | 57.2 | 308             | 46.6 | 292          | 49.3 | 1146      | 48.5 |
|                     | Posttested                             | 98                          | 66.2 | 111              | 27.8 | 100             | 32.5 | 161          | 55.1 | 470       | 41.0 |
|                     | Lost by Attrition <sup>b</sup>         | 50                          | 33.8 | 287              | 72.2 | 208             | 67.5 | 131          | 44.9 | 676       | 59.0 |
|                     | Total Recruited                        | 415                         |      | 690              |      | 661             |      | 592          |      | 2364      |      |
|                     | Total Attrition                        | 187                         | 45.1 | 502              | 72.1 | 494             | 74.7 | 364          | 61.5 | 1547      | 65.4 |

**Key to Samples:**

- A Initial recruitment sample: received both pretest and posttest (longitudinal sample).
- B Initial recruitment sample: received posttest only.
- C Augmentation sample recruited prior to posttest: received posttest only.
- D Initial recruitment/attrition sample: received pretest only.
- E Initial recruitment/attrition sample: received neither pretest nor posttest.
- Others Rostered and signed consent to participate only, never completed the family background questionnaire.

<sup>b</sup> Groups of children lost due to attrition.

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Exhibit 2C-4

Samples of Children Recruited for the Head Start Health Evaluation  
by Participation in Pretest and Posttest

| Description                                 | Pretest           | Posttest          |
|---|-------------------|-------------------|
| Original Recruitment                        |                   |                   |
| Pretest-Posttest Longitudinal Sample        | Sample A          | Sample A          |
| Posttest-Only Sample                        |                   | Sample B          |
| Pretest-Only, Attrition Sample              | Sample D          |                   |
| Neither Test, Attrition Sample <sup>a</sup> | .....<br>Sample E | .....<br>Sample E |
| Augmentation Recruitment                    |                   |                   |
| Posttest Only, Augmentation Sample          |                   | Sample C          |

<sup>a</sup> Although the evaluation collected no health measures on children in this sample, it did conduct the parent interview on family background characteristics.

Sample A is the longitudinal sample. These children received both the pretest and posttest. In Exhibit 2C-2, these are the children who were recruited in Stage I and examined at both Stages III and V. Sample B is the group of children who were recruited in Stage I and assigned to participate only in the posttest at Stage V. Sample C is the augmentation sample which was recruited during Stage IV of the evaluation and posttested at Stage V.

Two additional samples were recruited at Stage I prior to the pretest along with Samples A and B. Sample D comprises those children who (with Sample A) received the pretest at Stage III and should have been part of the longitudinal sample, but were lost through attrition. The fifth classification, Sample E is the group of children who were recruited at Stage I and received neither the pretest nor the posttest. They were lost sometime between their recruitment and the posttest. Sample E received only the parent interview for family background characteristics.

This report treats these samples separately and in specific combinations because of varying amounts of information on the children (e.g., both pretest and posttest data for the longitudinal evaluation), and the potential for misinterpretation of findings because not all of the children were randomly assigned as follows:

- Longitudinal sample (Sample A);
- Cross-sectional pretest sample (Samples A and D);
- Cross-sectional posttest sample (Samples A, B, and C);
- Cross-sectional randomly assigned posttest sample (Samples A and B).

Exhibit 2C-5 shows the sample sizes of children for each of the sites in the Head Start Health Evaluation and for each of the specified samples. The column percentages indicate, within each site, the contribution of each sample from A to E to the total sample size. This exhibit demonstrates that rates of attrition (Samples D and E) varied considerably among the sites: 50 percent in St. Clair County, 31 percent in Mingo County, 27 percent in Maricopa County, and 18 percent in Greene and Humphreys Counties. In all sites except St. Clair County, Sample C amply replaced the children lost from the study through attrition.

Exhibit 2C-5

Number of Children in Evaluation by Sample and Site

| Sample |   | Greene & Humphreys Counties | St. Clair County | Maricopa County | Mingo County | All  |
|--------|---|-----------------------------|------------------|-----------------|--------------|------|
| A      | n | 74                          | 42               | 56              | 36           | 208  |
|        | % | 26.6                        | 10.8             | 24.3            | 10.9         | 17.0 |
| B      | n | 56                          | 41               | 11              | 31           | 139  |
|        | % | 20.1                        | 10.6             | 4.8             | 9.4          | 11.3 |
| C      | n | 98                          | 111              | 100             | 161          | 470  |
|        | % | 35.3                        | 28.6             | 43.5            | 48.6         | 38.3 |
| D      | n | 21                          | 71               | 39              | 37           | 168  |
|        | % | 7.6                         | 18.3             | 17.0            | 11.2         | 13.7 |
| E      | n | 29                          | 123              | 24              | 66           | 242  |
|        | % | 10.4                        | 31.7             | 10.4            | 19.9         | 19.7 |
| TOTAL  |   | 278                         | 388              | 230             | 331          | 1227 |

As mentioned previously in Technical Appendix 2A, various difficulties in maintaining the original random assignment occurred. For example, the Head Start program inadvertently recruited from the non-Head Start sample and some children who were assigned to the Head Start group refused to "go to school." Exhibit 2C-6 shows the shifts which occurred in Samples A and B.

Because of the substantial changes in the original sample from attrition and augmentation, the evaluation conducted an extensive investigation of the possible implications of these sample changes. These investigations occurred at two points in time, in the fall after the Head Start children entered the program and after the posttest data collection as part of the analysis. In general, the first investigation indicated that minor differences existed between the Head Start and non-Head Start samples, but none were statistically significant. The more intensive investigation after the posttest produced a similar result; no consistent statistically significant differences among the samples in either their health or personal characteristics.

Number of Children Assigned to Head Start and Non-Head Start Groups by Sample with Numbers of Children Who Switched Group After Random Assignment to Samples A and B

| Sample         | Posttest Children (Samples A,B,C) in: |                 |                  |     |                 |     |              |                 |           |     |
|----------------|---------------------------------------|-----------------|------------------|-----|-----------------|-----|--------------|-----------------|-----------|-----|
|                | Greene & Humphreys Counties           |                 | St. Clair County |     | Maricopa County |     | Mingo County |                 | All Sites |     |
|                | HS                                    | NHS             | HS               | NHS | HS              | NHS | HS           | NHS             | HS        | NHS |
| Sample A       |                                       |                 |                  |     |                 |     |              |                 |           |     |
| Original       | 38                                    | 36              | 29               | 13  | 31              | 25  | 22           | 14              | 120       | 88  |
| HS -> NHS      | -4                                    | 4               | -7               | 7   | -5              | 5   | -5           | 5               | -21       | 21  |
| HS <- NHS      | 9                                     | -9              | 3                | -3  | 14              | -14 | 1            | -1              | 27        | -27 |
| Final          | 43                                    | 31              | 25               | 17  | 40              | 16  | 18           | 18              | 126       | 82  |
| Sample B       |                                       |                 |                  |     |                 |     |              |                 |           |     |
| Original       | 30 <sup>a</sup>                       | 26 <sup>a</sup> | 21               | 20  | 2               | 9   | 9            | 22 <sup>b</sup> | 62        | 77  |
| HS -> NHS      | -8                                    | 8               | -13              | 13  | -1              | 1   | -3           | 3               | -25       | 25  |
| HS <- NHS      | 12                                    | -12             | 4                | -4  | 9               | -9  | 11           | -11             | 36        | -36 |
| Final          | 34                                    | 22              | 12               | 29  | 10              | 1   | 17           | 14              | 73        | 66  |
| Sample C       | 50                                    | 48              | 71               | 40  | 56              | 44  | 84           | 77              | 261       | 209 |
| Sample D       | 9                                     | 12              | 36               | 35  | 22              | 17  | 22           | 15              | 89        | 79  |
| Sample E       | 12                                    | 17              | 63               | 60  | 9               | 15  | 33           | 33              | 117       | 125 |
| Sample A,B,C   | 127                                   | 101             | 108              | 86  | 106             | 61  | 119          | 109             | 460       | 357 |
| Sample A,B,D,E | 98                                    | 82              | 136              | 141 | 81              | 49  | 90           | 80              | 405       | 352 |

<sup>a</sup> One case does not have Pretest Parent Interview

<sup>b</sup> Four cases do not have Pretest Parent Interview

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## Effects of Augmentation and Attrition

Demographic Differences - In general, after analyses to examine differences among the total samples and between the Head Start and non-Head Start children within samples, the results of these analyses, summarized in Exhibits 2C-7 through 2C-10 indicate that there are significant differences which needed to be checked against all dependent measures and used as covariates in the analysis, if necessary. Importantly, none of the analyses indicated that the augmentation sample was ever different from all of the randomly assigned samples, despite fluctuations among them. (Tables 2C-1 through 2C-4 present detailed results of these tests of sample differences.)

Differences in Health Characteristics. Since the attrition and augmentation of the samples could affect the health characteristics, we examined those of the two pretested samples (A and D) and the longitudinal versus the augmentation sample (A and G). As shown in Tables 2C-5 and 2C-6, there were no differences in the health characteristics of these groups of children.

On the basis of these analyses, there was no reason to decide that changes in the original samples altered the health characteristics of the children in the evaluation. Moreover, the demographic differences existing between the two samples of Head Start and non-Head Start samples varied among sites and were therefore likely to be needed in some sites and not others, or among sites but not within sites.

Children in Most Need. Various groups of children (who because of low per capita income, low mother's education or age, lack of medical insurance or Medicaid, lack of benefits from WIC or Food Stamps, and difficulty of access to medical services) were considered at risk in terms of demographic characteristics. The evaluation examined the possibility that Head Start was targeting these children for services. The results, summarized in Exhibit 2C-11 indicate that Head Start children in Maricopa County receive services regardless of special need. No special group of children were more or less likely to receive services. Children without medical insurance or Medicaid were more likely to receive vision and hearing screens (in Greene and Humphreys Counties and St. Clair County) but less likely to receive dental treatments (in St. Clair County). Children in Mingo County who were not receiving Food Stamps or WIC were less likely to receive hearing and

Summary of Significant Comparisons of the Demographic Characteristics of Samples A, B, C, D, E on Continuous Measures for the Total Samples of Children in Each Site<sup>a</sup>

| Demographic Characteristics    | Greene & Humphreys Counties | St. Clair County       | Maricopa County        | Mingo County           | All Sites              |
|--------------------------------|-----------------------------|------------------------|------------------------|------------------------|------------------------|
|                                | Different Samples Sig.      | Different Samples Sig. | Different Samples Sig. | Different Samples Sig. | Different Samples Sig. |
| Family Income                  |                             | D vs. C *              |                        | E, D vs. B, C ***      | E, D, A vs. C ***      |
| Per Capita Income              |                             | D vs. C *              |                        | E, D vs. A, B, C ***   |                        |
| Household Size                 |                             |                        | C vs. D *              |                        |                        |
| Years at Current Address       |                             | D vs. B, A ***         |                        | C vs. B *              | D vs. B ***            |
| Child's Age                    |                             | C, B, A vs. D, E ***   |                        |                        | B, C, A, vs. D, E ***  |
| Mother's Age at Birth of Child |                             |                        |                        |                        |                        |
| Mother's Education             |                             | D vs. A, E, C, B **    | E, D vs. C, B **       | E, D vs. C, B ***      | D vs. A, E, C, B **    |

<sup>a</sup>Significance indicated as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

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Summary of Significant Comparisons of the Demographic Characteristics of Samples A, B, C, D, E  
on Categorical Measures for the Total Samples of Children in Each Site

| Demographic Characteristics                | Greene & Humphreys Counties | St. Clair County         | Maricopa County          | Mingo County             | All Sites                |
|--|-----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|  | Chi-squared Significance    | Chi-squared Significance | Chi-squared Significance | Chi-squared Significance | Chi-squared Significance |
| Previous Head Start Experience             |                             |                          |                          | **                       | ***                      |
| Two-Parent Family                          |                             | *                        |                          |                          | ***                      |
| Sex of Child                               |                             |                          |                          |                          |                          |
| Prior Day Care Experience of Child         |                             | ***                      |                          |                          | ***                      |
| Medical Insurance                          |                             | **                       |                          |                          | ***                      |
| Dental Insurance                           |                             | ***                      |                          |                          | ***                      |
| Anyone in household employed               |                             | **                       |                          |                          | **                       |
| Unemployment Benefits                      |                             |                          |                          |                          |                          |
| Welfare Benefits                           |                             | **                       |                          | *                        | ***                      |
| Birth Order                                |                             |                          |                          |                          |                          |
| Ethnicity                                  |                             |                          |                          |                          | ***                      |
| Participation in a Food Assistance Program |                             |                          |                          |                          | **                       |

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\*p < .05  
\*\*p < .01  
\*\*\*p < .001



Exhibit 2C-9

Summary of Significant Comparisons of the Demographic Characteristics for Head Start and Non-Head Start Children Within Samples A, B, C, D, E on Continuous Measures<sup>a</sup>

| Demographic Characteristics | Greene & Humphreys Counties |      | St. Clair County |      | Maricopa County |      | Mingo County |      |
|-----------------------------|-----------------------------|------|------------------|------|-----------------|------|--------------|------|
|                             | Sample                      | Sig. | Sample           | Sig. | Sample          | Sig. | Sample       | Sig. |
| Family Income               |                             |      | D                | +    |                 |      | C            | ---  |
| Per Capita Income           |                             |      |                  |      |                 |      | C            | ---  |
| Household Size              |                             |      | D                | +    |                 |      | A            | +    |
|                             |                             |      |                  |      |                 |      | C            | +    |
| Years at Address            |                             |      |                  |      |                 |      |              |      |
| Child's Age                 | C                           | +++  | C                | +    |                 |      | C            | +++  |
| Mom's Age                   |                             |      |                  |      |                 |      |              |      |
| Mother's Education          | E                           | --   | B                | +    |                 |      |              |      |

<sup>a</sup>Significance indicated (+ for Head Start higher and - for non-Head Start higher) as:

- + p < .05
- ++ p < .01
- +++ p < .001

Exhibit 2C-10

Summary of Significant Comparisons of the Demographic Characteristics for Head Start and Non-Head Start Children within Samples A, B, C, D, E on Categorical Measures<sup>a</sup>

| Demographic Characteristics                | Greene & Humphreys Counties |      | St. Clair County |      | Maricopa County |      | Mingo County |      |
|--|-----------------------------|------|------------------|------|-----------------|------|--------------|------|
|  | Sample                      | Sig. | Sample           | Sig. | Sample          | Sig. | Sample       | Sig. |
| Previous Head Start Experience             |                             |      | C                | *    |                 |      | C            | **   |
| Two Parent Family                          |                             |      |                  |      | C               | *    |              |      |
| Sex of Child                               | E                           | *    |                  |      | C               | ***  |              |      |
| Medical Insurance                          |                             |      | C                | ***  | E               | **   |              |      |
|  |                             |      | D                | *    |                 |      |              |      |
| Dental Insurance                           |                             |      | C                | *    | D               | *    |              |      |
| Anyone in household employed               | C                           | **   |                  |      |                 |      | D            | *    |
| Unemployed Benefits                        | A                           | *    |                  |      |                 |      |              |      |
|  | B                           | *    |                  |      |                 |      |              |      |
| Welfare Benefits                           | C                           | *    |                  |      |                 |      | C            | ***  |
| Birth Order                                |                             |      |                  |      |                 |      |              |      |
| Ethnicity                                  | B                           | *    |                  |      | C               | *    |              |      |
| Participation in a food assistance program |                             |      | C                | ***  |                 |      |              |      |

<sup>a</sup>Significance indicated (+ for Head Start higher and - for non-Head Start higher) as:

\* p < .05

\*\* p < .01

\*\*\* p < .001

Exhibit 2C-11

Special Groups of Children Who Were More (or Less) Likely to Receive Head Start Services

| Head Start Services   | Posttested Head Start Children (Samples A, B, C) in:       |  |                 |   |
|---|--|--|-----------------|---|
|   | Greene/Humphreys Counties                                  | St. Clair County   | Maricopa County | Mingo County                                    |
| <b>Medical</b><br>More Screens<br>Fewer Findings<br>More Treatment<br><br>Fewer Screens<br>More Findings<br>Fewer Treatment     | <12 yrs. educ.   |  |                 |   |
| <b>Dental</b><br>More Screens<br>Fewer Findings<br>More Treatment<br><br>Fewer Screens<br>More Findings<br>Fewer Treatment      | Teenaged mothers;<br>Difficult access                      | <\$1295 per capita<br><br>No medical insurance;<br>No Medicaid |                 | <12 yrs. educ.                                  |
| <b>Vision</b><br>More Screens<br>Fewer Findings<br>More Treatment<br><br>Fewer Screens<br>More Findings<br>Fewer Treatment      | No medical insurance;<br>No Medicaid<br><br><12 yrs. educ. | No medical insurance;<br>No Medicaid                           |                 |   |
| <b>Hearing</b><br>More Screens<br><br>Fewer Findings<br>More Treatment<br><br>Fewer Screens<br>More Findings<br>Fewer Treatment | No medical insurance<br><br>Teenaged mothers               | No medical insurance;<br>No Medicaid                           |                 | <\$1295 per capita<br><br>No WIC or Food Stamps |
| <b>Hematology</b><br>More Screens<br>Fewer Findings<br>More Treatment<br><br>Fewer Screens<br>More Findings<br>Fewer Treatment  | No Medicaid  |  |                 | No WIC or Food Stamps                           |

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hematology screens. Hence, overall, it does not appear that Head Start made health screening and delivery decisions based on whether or not the child was a member of the above special groups.

Children with One or More Health Problems

Another way to examine the impact of Head Start on the children "most in need" is to look at those with the most health problems in various health domains (e.g., speech, hearing, and hematology) according to the Head Start health records, to determine whether children with multiple problems were more likely than children with single problems to be treated. According to information in Exhibit 2C-12, only in St. Clair County were children with multiple problems significantly more likely to receive treatment for those

Exhibit 2C-12

Proportion of Problems Treated According to Pretest Evaluation Findings for Head Start Children<sup>a</sup>

| Number of Problems Per Child | Longitudinal Head Start Children (Sample A), in: |                  |                 |              |           |
|------------------------------|--|------------------|-----------------|--------------|-----------|
|                              | Greene & Humphreys Counties                      | St. Clair County | Maricopa County | Mingo County | All Sites |
| One Problem                  | 43   | 34               | 37              | 45           | 59        |
| Mean                         | .33  | .18              | .57             | .27          | .33       |
| St. Dev.                     | .47  | .39              | .50             | .45          | .47       |
| Two or More Problems         | 49   | 43               | 50              | 53           | 195       |
| Mean                         | .26  | .33 <sup>a</sup> | .56             | .42          | .39       |
| St. Dev.                     | .25  | .22              | .28             | .30          | .29       |

<sup>a</sup> Average of each child's number of domains with problems divided by the number of domains with treatment.

<sup>b</sup> Statistically significant at  $p < .05$

problems than if they had a single problem. (There was a similar, but not significant trend in Mingo County.)

#### Children with Health Problems at Posttest

At posttest, the Head Start children who had health problems in a particular domain were also examined to determine whether Head Start had screened them at a higher rate than children with no problems. As shown in Exhibit 2C-13, children in Maricopa County with language problems were more likely to be screened. A similar trend (though not statistically significant) occurred for children with language problems in Mingo County and overall for children with vision problems. Hence, it appeared that children with chronic vision and language problems were more likely to be screened by Head Start. Other health problems were not treated similarly.



Percent of Head Start Children with Findings from Evaluation According to Whether or Not They Received Head Start Screens<sup>a</sup>

| Head Start Health Evaluation Findings | Posttested Children (Samples A,B,C) in: |                |                  |                |                 |                |                |                |                 |                 |                 |
|---------------------------------------|---|----------------|------------------|----------------|-----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|
|                                       | Greene & Humphreys Counties             |                | St. Clair County |                | Maricopa County |                | Mingo County   |                | All Sites       |                 |                 |
|                                       | Screened                                | Not Screened   | Screened         | Not Screened   | Screened        | Not Screened   | Screened       | Not Screened   | Screened        | Not Screened    |                 |
| Medical Examination                   | n<br>Z                                  | 53/ 94<br>56.4 | 18/ 33<br>54.5   | 43/102<br>42.2 | 2/ 6<br>33.3    | 46/102<br>41.1 | 0/ 0<br>0.0    | 28/ 83<br>33.7 | 8/ 29<br>41.2   | 170/381<br>44.6 | 28/ 68<br>41.2  |
| Dental Evaluation (Urgents and decay) | n<br>Z                                  | 80/ 84<br>95.2 | 40/ 43<br>9.30   | 59/102<br>57.8 | 6/ 6<br>100.0*  | 52/102<br>51.0 | 0/ 0           | 56/ 73<br>76.7 | 21/ 39<br>53.8* | 247/361<br>68.4 | 67/ 88<br>76.1  |
| Dental Evaluation (Urgents)           | n<br>Z                                  | 9/ 84<br>10.7  | 2/ 43<br>4.7     | 10/102<br>9.8  | 0/ 6<br>0.0     | 10/102<br>9.8  | 0/ 0           | 18/ 71<br>25.4 | 6/ 39<br>15.4   | 47/359<br>13.1  | 8/ 88<br>9.1    |
| Vision Examination                    | n<br>Z                                  | 5/ 52<br>9.6   | 2/ 75<br>2.7     | 2/ 50<br>4.0   | 5/ 56<br>8.7    | 16/101<br>15.8 | 0/ 1<br>0.0    | 3/ 36<br>8.3   | 5/ 76<br>6.6    | 26/239<br>10.9  | 12/208<br>5.8   |
| Hearing Examination                   | n<br>Z                                  | 3/ 45<br>6.7   | 10/ 80<br>12.5   | 3/ 45<br>6.7   | 11/ 61<br>18.0  | 13/100<br>13.0 | 0/ 1<br>0.0    | 16/ 84<br>19.0 | 7/ 28<br>25.0   | 35/274<br>12.8  | 28/170<br>16.5  |
| Speech and Language Evaluation        | n<br>Z                                  | 21/ 50<br>42.0 | 34/ 77<br>44.2   | 34/ 70<br>48.6 | 18/ 38<br>47.4  | 9/ 14<br>64.3  | 17/67<br>25.4* | 2/ 3<br>66.7   | 56/109<br>51.4  | 66/137<br>48.2  | 125/291<br>43.0 |
| Speech Evaluation                     | n<br>Z                                  | 16/ 49<br>32.7 | 22/ 73<br>30.1   | 22/ 70<br>31.4 | 14/ 38<br>36.8  | 5/ 14<br>35.7  | 12/ 64<br>18.8 | 1/ 2<br>50.0   | 43/103<br>41.7  | 44/135<br>32.6  | 91/278<br>32.7  |
| Language Evaluation                   | n<br>Z                                  | 13/ 50<br>26.0 | 19/ 77<br>24.7   | 21/ 70<br>30.0 | 11/ 38<br>28.9  | 7/ 14<br>50.0  | 9/ 67<br>13.4* | 2/ 3<br>66.7   | 22/109<br>20.2  | 43/137<br>31.4  | 61/291<br>21.0* |

<sup>a</sup>Significance  $p < .05$  indicated as \*.

Table 2C-1

SELECTED FAMILY BACKGROUND CHARACTERISTICS FOR COMBINED GROUPS  
OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS AMONG SAMPLES WITHIN SITE

|                               | Greene/Humphreys |         |         | St. Clair |         |         | Maricopa |         |         | Mingo |         |         |
|-------------------------------|------------------|---------|---------|-----------|---------|---------|----------|---------|---------|-------|---------|---------|
|                               | N                | MEAN    | SD      | N         | MEAN    | SD      | N        | MEAN    | SD      | N     | MEAN    | SD      |
| <b>FAMILY INCOME (\$)</b>     |                  |         |         |           |         |         |          |         |         |       |         |         |
| Sample A                      | 72               | 4694.44 | 4572.23 | 41        | 5445.12 | 3256.01 | 53       | 6481.13 | 3385.13 | 33    | 6295.45 | 4741.96 |
| Sample B                      | 53               | 5433.96 | 5478.58 | 37        | 4547.30 | 2784.40 | 10       | 7675.00 | 4686.05 | 28    | 7571.43 | 5557.30 |
| Sample C                      | 97               | 4113.40 | 3367.86 | 101       | 6042.08 | 3976.03 | 100      | 7002.50 | 5472.55 | 156   | 8491.99 | 5816.44 |
| Sample D                      | 21               | 4964.29 | 4496.03 | 69        | 4409.42 | 1756.28 | 39       | 6788.46 | 4859.04 | 37    | 4425.67 | 2038.57 |
| Sample E                      | 29               | 4732.76 | 3655.92 | 120       | 5204.58 | 3723.48 | 24       | 5145.83 | 2877.87 | 64    | 4062.50 | 1897.16 |
|                               | F=               | P=      |         | F=        | P=      |         | F=       | P=      |         | F=    | P=      |         |
|                               | 0.85             | 0.492   |         | 2.89      | 0.022   |         | 0.76     | 0.551   |         | 12.65 | 0.000   |         |
| <b>PER CAPITA INCOME (\$)</b> |                  |         |         |           |         |         |          |         |         |       |         |         |
| Sample A                      | 71               | 942.35  | 1096.54 | 41        | 1029.19 | 641.10  | 53       | 1160.07 | 786.30  | 33    | 1413.33 | 1391.99 |
| Sample B                      | 52               | 1125.68 | 1122.03 | 36        | 952.08  | 671.60  | 10       | 1403.75 | 1076.34 | 28    | 1728.31 | 1372.34 |
| Sample C                      | 97               | 839.18  | 692.44  | 100       | 1267.27 | 994.98  | 100      | 1467.86 | 1517.07 | 156   | 1879.62 | 1397.58 |
| Sample D                      | 21               | 927.49  | 973.43  | 69        | 884.84  | 319.73  | 39       | 1051.16 | 656.44  | 37    | 965.80  | 421.49  |
| Sample E                      | 29               | 1016.08 | 1068.34 | 120       | 1071.48 | 858.39  | 24       | 978.51  | 486.35  | 64    | 936.89  | 399.55  |
|                               | F=               | P=      |         | F=        | P=      |         | F=       | P=      |         | F=    | P=      |         |
|                               | 0.79             | 0.531   |         | 2.74      | 0.028   |         | 1.63     | 0.167   |         | 9.94  | 0.000   |         |
| <b>HOUSEHOLD SIZE</b>         |                  |         |         |           |         |         |          |         |         |       |         |         |
| Sample A                      | 73               | 5.70    | 2.76    | 42        | 6.10    | 2.99    | 56       | 5.61    | 2.01    | 35    | 4.89    | 1.57    |
| Sample B                      | 55               | 5.60    | 2.61    | 39        | 5.67    | 2.48    | 11       | 5.82    | 1.78    | 31    | 4.74    | 1.59    |
| Sample C                      | 98               | 5.60    | 2.29    | 109       | 5.33    | 2.10    | 100      | 5.30    | 1.89    | 161   | 4.94    | 2.01    |
| Sample D                      | 21               | 6.05    | 2.58    | 70        | 5.44    | 2.31    | 39       | 6.46    | 1.96    | 37    | 4.78    | 1.58    |
| Sample E                      | 29               | 6.41    | 3.83    | 123       | 5.72    | 2.53    | 24       | 5.71    | 2.25    | 66    | 4.64    | 2.16    |
|                               | F=               | P=      |         | F=        | P=      |         | F=       | P=      |         | F=    | P=      |         |
|                               | 0.63             | 0.644   |         | 0.93      | 0.447   |         | 2.48     | 0.045   |         | 0.32  | 0.862   |         |

Table 2C-1 (continued)

SELECTED FAMILY BACKGROUND CHARACTERISTICS FOR COMBINED GROUPS  
OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS AMONG SAMPLES WITHIN SITE

|                                       | Greene/Humphreys |       |          | St. Clair |       |          | Maricopa |       |          | Mingo   |       |          |
|---------------------------------------|------------------|-------|----------|-----------|-------|----------|----------|-------|----------|---------|-------|----------|
|                                       | N                | MEAN  | SD       | N         | MEAN  | SD       | N        | MEAN  | SD       | N       | MEAN  | SD       |
| <b>CHILD'S AGE</b>                    |                  |       |          |           |       |          |          |       |          |         |       |          |
| Sample A                              | 74               | 4.29  | 0.54     | 42        | 4.43  | 0.68     | 56       | 5.09  | 0.25     | 36      | 4.30  | 0.58     |
| Sample B                              | 56               | 4.33  | 0.62     | 41        | 4.24  | 0.59     | 11       | 5.01  | 0.27     | 31      | 4.32  | 0.59     |
| Sample C                              | 98               | 4.33  | 0.95     | 111       | 4.20  | 0.67     | 100      | 5.05  | 0.31     | 161     | 4.21  | 0.78     |
| Sample D                              | 21               | 4.57  | 0.61     | 70        | 4.80  | 0.85     | 39       | 4.99  | 0.30     | 37      | 4.33  | 0.75     |
| Sample E                              | 29               | 4.51  | 0.80     | 123       | 4.97  | 0.93     | 24       | 5.02  | 0.32     | 66      | 4.37  | 0.61     |
|                                       | F= 0.95          |       | P= 0.437 | F= 17.55  |       | P= 0.000 | F= 0.86  |       | P= 0.485 | F= 0.78 |       | P= 0.535 |
| <b>MOTHER'S AGE AT BIRTH OF CHILD</b> |                  |       |          |           |       |          |          |       |          |         |       |          |
| Sample A                              | 73               | 21.97 | 5.64     | 40        | 20.76 | 4.43     | 56       | 23.57 | 6.14     | 35      | 23.31 | 5.43     |
| Sample B                              | 56               | 24.01 | 6.30     | 38        | 22.01 | 7.59     | 10       | 23.01 | 6.00     | 30      | 24.74 | 5.56     |
| Sample C                              | 95               | 23.38 | 6.15     | 107       | 22.63 | 5.50     | 100      | 23.96 | 5.49     | 156     | 23.81 | 5.59     |
| Sample D                              | 19               | 20.45 | 4.29     | 69        | 21.20 | 3.52     | 38       | 24.89 | 6.94     | 37      | 23.66 | 6.40     |
| Sample E                              | 26               | 24.58 | 7.90     | 119       | 21.97 | 5.88     | 22       | 21.76 | 4.46     | 63      | 22.58 | 5.48     |
|                                       | F= 2.24          |       | P= 0.065 | F= 1.20   |       | P= 0.310 | F= 1.08  |       | P= 0.366 | F= 0.95 |       | P= 0.433 |
| <b>MOTHER'S EDUCATION (YEARS)</b>     |                  |       |          |           |       |          |          |       |          |         |       |          |
| Sample A                              | 74               | 10.77 | 2.73     | 42        | 11.26 | 1.86     | 56       | 9.38  | 2.78     | 36      | 9.94  | 2.08     |
| Sample B                              | 56               | 11.23 | 2.46     | 40        | 11.60 | 1.68     | 11       | 8.00  | 2.24     | 31      | 10.87 | 1.93     |
| Sample C                              | 98               | 10.42 | 2.20     | 110       | 11.51 | 1.75     | 99       | 10.37 | 2.71     | 161     | 10.61 | 2.24     |
| Sample D                              | 21               | 10.95 | 2.29     | 70        | 10.56 | 1.51     | 39       | 8.28  | 4.23     | 37      | 9.41  | 2.73     |
| Sample E                              | 29               | 10.41 | 2.24     | 121       | 11.26 | 1.94     | 24       | 9.38  | 2.14     | 66      | 9.29  | 1.99     |
|                                       | F= 1.18          |       | P= 0.318 | F= 3.62   |       | P= 0.007 | F= 4.49  |       | P= 0.002 | F= 6.18 |       | P= 0.000 |

Table 2C-1 (continued)

SELECTED FAMILY BACKGROUND CHARACTERISTICS FOR COMBINED GROUPS  
OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS AMONG SAMPLES WITHIN SITE

| YEARS AT CURRENT ADDRESS | Greene/Humphreys |       |       | St. Clair |      |       | Maricopa |      |       | Mingo |      |       |
|--------------------------|------------------|-------|-------|-----------|------|-------|----------|------|-------|-------|------|-------|
|                          | N                | MEAN  | SD    | N         | MEAN | SD    | N        | MEAN | SD    | N     | MEAN | SD    |
| Sample A                 | 73               | 6.94  | 8.58  | 42        | 6.92 | 9.15  | 55       | 4.36 | 7.65  | 34    | 6.45 | 7.05  |
| Sample B                 | 56               | 8.77  | 10.08 | 41        | 5.41 | 4.97  | 11       | 5.20 | 4.62  | 29    | 9.42 | 13.38 |
| Sample C                 | 94               | 7.19  | 7.89  | 110       | 4.09 | 4.47  | 100      | 3.70 | 4.15  | 147   | 5.07 | 5.26  |
| Sample D                 | 21               | 6.23  | 7.28  | 70        | 2.63 | 4.43  | 39       | 3.19 | 3.78  | 37    | 5.08 | 6.94  |
| Sample E                 | 29               | 10.70 | 16.19 | 123       | 3.42 | 4.72  | 24       | 1.93 | 4.19  | 66    | 5.78 | 7.06  |
|                          |                  | F=    | P=    |           | F=   | P=    |          | F=   | P=    |       | F=   | P=    |
|                          |                  | 1.16  | 0.326 |           | 5.45 | 0.000 |          | 1.25 | 0.292 |       | 2.42 | 0.049 |

Table 2C-2

FAMILY INCOME FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLE BY SITE

|                         | HEAD START |      |      |       |      |      | NON-HEAD START |       |      |       |       |       | T     | P     |
|-------------------------|------------|------|------|-------|------|------|----------------|-------|------|-------|-------|-------|-------|-------|
|                         | N          | Q1   | MED  | Q3    | MEAN | SD   | N              | Q1    | MED  | Q3    | MEAN  | SD    |       |       |
| <b>Greene/Humphreys</b> |            |      |      |       |      |      |                |       |      |       |       |       |       |       |
| Sample A                | 41         | 1250 | 3750 | 8250  | 5134 | 4240 | 31             | 1750  | 2250 | 4750  | 4113  | 4989  | 0.92  | 0.363 |
| Sample B                | 31         | 1250 | 3750 | 6750  | 4661 | 4517 | 22             | 1250  | 4250 | 10500 | 6523  | 6561  | -1.15 | 0.258 |
| Sample C                | 49         | 2250 | 3250 | 5250  | 4138 | 3433 | 48             | 1250  | 3750 | 5250  | 4088  | 3336  | 0.07  | 0.943 |
| Sample D                | 9          | 3750 | 4250 | 5750  | 5472 | 4617 | 12             | 1500  | 2500 | 6500  | 4583  | 4569  | 0.44  | 0.667 |
| Sample E                | 12         | 2750 | 3750 | 6000  | 5375 | 4457 | 17             | 2250  | 4250 | 6250  | 4279  | 3034  | 0.74  | 0.469 |
| <b>St. Clair</b>        |            |      |      |       |      |      |                |       |      |       |       |       |       |       |
| Sample A                | 25         | 3250 | 4250 | 5750  | 4930 | 2211 | 16             | 3250  | 4500 | 9375  | 6250  | 4395  | -1.11 | 0.278 |
| Sample B                | 10         | 3250 | 3250 | 4250  | 3925 | 2500 | 27             | 3250  | 4250 | 4500  | 4778  | 2893  | -0.88 | 0.389 |
| Sample C                | 67         | 3250 | 4750 | 6250  | 6123 | 4285 | 34             | 3250  | 4750 | 7250  | 5882  | 3338  | 0.31  | 0.757 |
| Sample D                | 35         | 3500 | 4750 | 5250  | 4836 | 1857 | 34             | 3250  | 3750 | 4750  | 3971  | 1553  | 2.10  | 0.039 |
| Sample E                | 61         | 3250 | 4250 | 5750  | 5656 | 4664 | 59             | 3250  | 3750 | 6250  | 4738  | 2346  | 1.37  | 0.174 |
| <b>Maricopa</b>         |            |      |      |       |      |      |                |       |      |       |       |       |       |       |
| Sample A                | 37         | 3250 | 4750 | 8250  | 6838 | 5808 | 16             | 2500  | 3750 | 9375  | 5656  | 4304  | 0.82  | 0.417 |
| Sample B                | 9          | 4750 | 7250 | 10500 | 8278 | 4541 | 1              | ----- | 2250 | ----- | 2250  | ----- | 3.98  | 0.004 |
| Sample C                | 56         | 2250 | 6750 | 10500 | 7696 | 6652 | 44             | 3000  | 6250 | 9375  | 6119  | 3307  | 1.55  | 0.125 |
| Sample D                | 22         | 3250 | 6000 | 8250  | 6750 | 5085 | 17             | 3250  | 5750 | 9750  | 6838  | 4705  | -0.06 | 0.956 |
| Sample E                | 9          | 2750 | 4250 | 6250  | 5139 | 3008 | 15             | 2750  | 4750 | 7000  | 5150  | 2804  | -0.01 | 0.993 |
| <b>Mingo</b>            |            |      |      |       |      |      |                |       |      |       |       |       |       |       |
| Sample A                | 17         | 2250 | 6250 | 8250  | 6515 | 4911 | 16             | 3250  | 4250 | 8250  | 6062  | 4705  | 0.27  | 0.789 |
| Sample B                | 14         | 3250 | 5250 | 7250  | 5893 | 3224 | 14             | 4750  | 8250 | 13500 | 9250  | 6905  | -1.65 | 0.117 |
| Sample C                | 81         | 2750 | 4750 | 10500 | 6768 | 5080 | 75             | 6000  | 8250 | 13500 | 10353 | 6017  | -4.00 | 0.000 |
| Sample D                | 22         | 2750 | 4500 | 6250  | 4386 | 1995 | 15             | 3250  | 4750 | 6250  | 4483  | 2170  | -0.14 | 0.891 |
| Sample E                | 33         | 2750 | 3250 | 5750  | 3962 | 1728 | 31             | 2500  | 3750 | 5250  | 4169  | 2086  | -0.43 | 0.668 |

Table 2C-2 (continued)

PER CAPITA INCOME FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLE BY SITE

|                         | HEAD START |     |      |      |      |      | NON-HEAD START |      |      |      |      |      | T     | P     |
|-------------------------|------------|-----|------|------|------|------|----------------|------|------|------|------|------|-------|-------|
|                         | N          | Q1  | MED  | Q3   | MEAN | SD   | N              | Q1   | MED  | Q3   | MEAN | SD   |       |       |
| <b>Greene/Humphreys</b> |            |     |      |      |      |      |                |      |      |      |      |      |       |       |
| Sample A                | 41         | 312 | 562  | 1500 | 962  | 982  | 30             | 250  | 562  | 1125 | 916  | 1253 | 0.17  | 0.869 |
| Sample B                | 31         | 312 | 417  | 1688 | 1026 | 1133 | 21             | 188  | 1250 | 2100 | 1272 | 1116 | -0.77 | 0.443 |
| Sample C                | 49         | 375 | 708  | 1150 | 850  | 675  | 48             | 250  | 672  | 1198 | 829  | 717  | 0.15  | 0.883 |
| Sample D                | 9          | 523 | 536  | 1062 | 1080 | 1240 | 12             | 229  | 500  | 1397 | 813  | 756  | 0.57  | 0.578 |
| Sample E                | 12         | 306 | 574  | 2438 | 1258 | 1373 | 17             | 250  | 688  | 1050 | 845  | 791  | 0.94  | 0.362 |
| <b>St. Clair</b>        |            |     |      |      |      |      |                |      |      |      |      |      |       |       |
| Sample A                | 25         | 575 | 1050 | 1062 | 894  | 372  | 16             | 650  | 1073 | 1312 | 1240 | 893  | -1.47 | 0.159 |
| Sample B                | 10         | 607 | 1073 | 1083 | 947  | 528  | 26             | 458  | 800  | 1062 | 954  | 729  | -0.03 | 0.977 |
| Sample C                | 66         | 792 | 950  | 1083 | 1234 | 1059 | 34             | 844  | 1083 | 1583 | 1332 | 869  | -0.50 | 0.621 |
| Sample D                | 35         | 729 | 875  | 950  | 861  | 305  | 34             | 812  | 938  | 1083 | 909  | 325  | -0.64 | 0.527 |
| Sample E                | 61         | 688 | 875  | 964  | 1139 | 1031 | 59             | 594  | 812  | 1083 | 1001 | 634  | 0.89  | 0.378 |
| <b>Maricopa</b>         |            |     |      |      |      |      |                |      |      |      |      |      |       |       |
| Sample A                | 37         | 688 | 1050 | 1438 | 1140 | 670  | 16             | 562  | 812  | 1438 | 1208 | 1030 | -0.24 | 0.810 |
| Sample B                | 9          | 906 | 1375 | 1750 | 1497 | 1098 | 1              | ---  | 562  | ---  | 562  | ---  | 2.55  | 0.034 |
| Sample C                | 56         | 583 | 1094 | 1750 | 1572 | 1908 | 44             | 831  | 1229 | 1781 | 1336 | 781  | 0.84  | 0.404 |
| Sample D                | 22         | 562 | 970  | 1375 | 1093 | 749  | 17             | 650  | 850  | 1375 | 996  | 530  | 0.47  | 0.639 |
| Sample E                | 9          | 850 | 917  | 1125 | 1050 | 347  | 15             | 556  | 958  | 1281 | 936  | 561  | 0.61  | 0.545 |
| <b>Mingo</b>            |            |     |      |      |      |      |                |      |      |      |      |      |       |       |
| Sample A                | 17         | 750 | 950  | 1562 | 1309 | 1227 | 16             | 638  | 1073 | 1650 | 1524 | 1582 | -0.43 | 0.667 |
| Sample B                | 14         | 950 | 1135 | 1650 | 1302 | 566  | 14             | 1031 | 1667 | 2700 | 2154 | 1789 | -1.70 | 0.108 |
| Sample C                | 81         | 675 | 1083 | 1750 | 1346 | 940  | 75             | 1164 | 2375 | 3438 | 2456 | 1577 | -5.28 | 0.000 |
| Sample D                | 22         | 750 | 944  | 1188 | 991  | 386  | 15             | 615  | 812  | 1269 | 930  | 480  | 0.41  | 0.685 |
| Sample E                | 33         | 583 | 812  | 1179 | 902  | 400  | 31             | 672  | 875  | 1250 | 974  | 402  | -0.71 | 0.479 |

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Table 2C-2 (continued)

HOUSEHOLD SIZE FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLE BY SITE

|                         | HEAD START |      |      |       |      |      | NON-HEAD START |      |      |      |      |      | T     | P     |
|-------------------------|------------|------|------|-------|------|------|----------------|------|------|------|------|------|-------|-------|
|                         | N          | Q1   | MED  | Q3    | MEAN | SD   | N              | Q1   | MED  | Q3   | MEAN | SD   |       |       |
| <b>Greene/Humphreys</b> |            |      |      |       |      |      |                |      |      |      |      |      |       |       |
| Sample A                | 43         | 4.00 | 5.00 | 7.00  | 6.12 | 3.22 | 30             | 4.00 | 5.00 | 6.00 | 5.10 | 1.81 | 1.72  | 0.091 |
| Sample B                | 34         | 4.00 | 5.00 | 7.00  | 5.44 | 2.45 | 21             | 4.00 | 5.00 | 8.00 | 5.86 | 2.90 | -0.55 | 0.588 |
| Sample C                | 50         | 4.00 | 5.00 | 6.00  | 5.28 | 1.95 | 48             | 4.00 | 5.00 | 8.00 | 5.94 | 2.57 | -1.42 | 0.158 |
| Sample D                | 9          | 4.00 | 5.00 | 9.00  | 6.33 | 3.28 | 12             | 4.00 | 6.00 | 7.50 | 5.83 | 2.04 | 0.40  | 0.694 |
| Sample E                | 12         | 4.00 | 5.50 | 10.00 | 7.42 | 4.66 | 17             | 4.00 | 5.00 | 6.00 | 5.71 | 3.08 | 1.11  | 0.281 |
| <b>St. Clair</b>        |            |      |      |       |      |      |                |      |      |      |      |      |       |       |
| Sample A                | 25         | 4.00 | 5.00 | 10.00 | 6.48 | 3.42 | 17             | 4.00 | 5.00 | 6.00 | 5.53 | 2.18 | 1.10  | 0.278 |
| Sample B                | 12         | 3.00 | 4.50 | 7.00  | 5.00 | 2.00 | 27             | 4.00 | 5.00 | 8.50 | 5.96 | 2.61 | -1.26 | 0.219 |
| Sample C                | 70         | 4.00 | 5.00 | 7.00  | 5.30 | 1.72 | 39             | 3.50 | 5.00 | 6.00 | 5.38 | 2.66 | -0.18 | 0.859 |
| Sample D                | 36         | 4.00 | 5.50 | 6.50  | 6.06 | 2.41 | 34             | 4.00 | 4.00 | 5.00 | 4.79 | 2.03 | 2.37  | 0.021 |
| Sample E                | 63         | 4.00 | 5.00 | 7.00  | 5.79 | 2.50 | 60             | 4.00 | 5.00 | 7.00 | 5.63 | 2.57 | 0.35  | 0.727 |
| <b>Maricopa</b>         |            |      |      |       |      |      |                |      |      |      |      |      |       |       |
| Sample A                | 40         | 4.00 | 6.00 | 7.00  | 5.85 | 2.15 | 16             | 4.00 | 4.00 | 6.00 | 5.00 | 1.46 | 1.70  | 0.096 |
| Sample B                | 10         | 5.00 | 5.50 | 8.00  | 6.00 | 1.76 | 1              | ---- | 4.00 | ---- | 4.00 | ---- | 3.59  | 0.006 |
| Sample C                | 56         | 4.00 | 5.00 | 7.00  | 5.59 | 2.03 | 44             | 4.00 | 5.00 | 6.00 | 4.93 | 1.65 | 1.79  | 0.077 |
| Sample D                | 22         | 5.00 | 6.00 | 7.00  | 6.41 | 2.17 | 17             | 5.00 | 6.00 | 7.00 | 6.53 | 1.70 | -0.19 | 0.847 |
| Sample E                | 9          | 3.00 | 5.00 | 6.00  | 4.89 | 2.20 | 15             | 4.50 | 6.00 | 7.00 | 6.20 | 2.21 | -1.41 | 0.177 |
| <b>Mingo</b>            |            |      |      |       |      |      |                |      |      |      |      |      |       |       |
| Sample A                | 18         | 4.00 | 5.00 | 7.00  | 5.39 | 1.79 | 17             | 4.00 | 4.00 | 5.00 | 4.35 | 1.11 | 2.07  | 0.047 |
| Sample B                | 17         | 4.00 | 5.00 | 5.00  | 4.53 | 1.18 | 14             | 3.00 | 5.00 | 6.00 | 5.00 | 2.00 | -0.78 | 0.447 |
| Sample C                | 84         | 4.00 | 4.50 | 6.00  | 5.25 | 2.33 | 77             | 4.00 | 4.00 | 5.00 | 4.60 | 1.53 | 2.12  | 0.036 |
| Sample D                | 22         | 4.00 | 4.00 | 5.00  | 4.41 | 1.05 | 15             | 4.00 | 5.00 | 6.00 | 5.33 | 2.06 | -1.60 | 0.126 |
| Sample E                | 33         | 3.00 | 4.00 | 6.00  | 4.70 | 1.81 | 33             | 3.00 | 4.00 | 5.00 | 4.58 | 2.49 | 0.23  | 0.822 |

Table 2C-2 (continued)

CHILD'S AGE FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLE BY SITE

|                         | HEAD START |      |      |      |      |      | NON-HEAD START |       |      |       |      |       | T     | P     |
|-------------------------|------------|------|------|------|------|------|----------------|-------|------|-------|------|-------|-------|-------|
|                         | N          | Q1   | MED  | Q3   | MEAN | SD   | N              | Q1    | MED  | Q3    | MEAN | SD    |       |       |
| <b>Greene/Humphreys</b> |            |      |      |      |      |      |                |       |      |       |      |       |       |       |
| Sample A                | 43         | 3.88 | 4.31 | 4.79 | 4.37 | 0.61 | 31             | 3.81  | 4.17 | 4.41  | 4.17 | 0.40  | 1.77  | 0.081 |
| Sample B                | 34         | 3.79 | 4.26 | 4.53 | 4.31 | 0.64 | 22             | 4.06  | 4.28 | 4.41  | 4.36 | 0.60  | -0.27 | 0.790 |
| Sample C                | 50         | 3.86 | 4.49 | 5.31 | 4.68 | 0.88 | 48             | 3.40  | 3.56 | 4.22  | 3.96 | 0.88  | 4.03  | 0.000 |
| Sample D                | 9          | 4.24 | 4.28 | 4.50 | 4.48 | 0.52 | 12             | 4.28  | 4.53 | 4.94  | 4.64 | 0.68  | -0.61 | 0.550 |
| Sample E                | 12         | 3.77 | 4.15 | 4.73 | 4.36 | 0.69 | 17             | 4.00  | 4.31 | 5.22  | 4.62 | 0.88  | -0.89 | 0.383 |
| <b>St. Clair</b>        |            |      |      |      |      |      |                |       |      |       |      |       |       |       |
| Sample A                | 25         | 3.94 | 4.25 | 4.83 | 4.42 | 0.64 | 17             | 4.04  | 4.43 | 4.77  | 4.45 | 0.75  | -0.16 | 0.871 |
| Sample B                | 12         | 3.99 | 4.31 | 4.75 | 4.37 | 0.52 | 29             | 3.78  | 4.22 | 4.44  | 4.19 | 0.62  | 0.97  | 0.342 |
| Sample C                | 71         | 3.85 | 4.31 | 4.82 | 4.32 | 0.60 | 40             | 3.46  | 3.92 | 4.43  | 3.98 | 0.73  | 2.46  | 0.016 |
| Sample D                | 36         | 4.11 | 4.71 | 5.48 | 4.78 | 0.88 | 34             | 4.16  | 4.89 | 5.44  | 4.82 | 0.84  | -0.20 | 0.840 |
| Sample E                | 63         | 4.15 | 4.83 | 5.51 | 4.88 | 0.94 | 60             | 4.33  | 5.00 | 5.80  | 5.05 | 0.92  | -1.00 | 0.321 |
| <b>Maricopa</b>         |            |      |      |      |      |      |                |       |      |       |      |       |       |       |
| Sample A                | 40         | 4.82 | 5.06 | 5.30 | 5.06 | 0.25 | 16             | 5.11  | 5.21 | 5.35  | 5.17 | 0.24  | -1.55 | 0.133 |
| Sample B                | 10         | 4.81 | 4.96 | 5.24 | 5.02 | 0.28 | 1              | ----- | 4.92 | ----- | 4.92 | ----- | -1.03 | 0.329 |
| Sample C                | 56         | 4.81 | 5.10 | 5.29 | 5.06 | 0.30 | 44             | 4.80  | 5.07 | 5.23  | 5.04 | 0.31  | 0.37  | 0.710 |
| Sample D                | 22         | 4.72 | 4.97 | 5.19 | 4.99 | 0.27 | 17             | 4.78  | 4.97 | 5.17  | 4.99 | 0.34  | 0.02  | 0.981 |
| Sample E                | 9          | 4.72 | 5.29 | 5.38 | 5.12 | 0.34 | 15             | 4.67  | 4.97 | 5.21  | 4.96 | 0.31  | 1.19  | 0.251 |
| <b>Mingo</b>            |            |      |      |      |      |      |                |       |      |       |      |       |       |       |
| Sample A                | 18         | 4.01 | 4.28 | 4.71 | 4.33 | 0.48 | 18             | 3.75  | 4.21 | 4.58  | 4.27 | 0.67  | 0.33  | 0.744 |
| Sample B                | 17         | 3.91 | 4.41 | 4.62 | 4.31 | 0.62 | 14             | 3.88  | 4.34 | 4.71  | 4.33 | 0.58  | -0.05 | 0.961 |
| Sample C                | 84         | 4.00 | 4.59 | 5.16 | 4.52 | 0.70 | 77             | 3.38  | 3.77 | 4.39  | 3.87 | 0.72  | 5.75  | 0.000 |
| Sample D                | 22         | 3.77 | 4.26 | 4.87 | 4.31 | 0.75 | 15             | 3.75  | 4.25 | 4.76  | 4.36 | 0.78  | -0.20 | 0.841 |
| Sample E                | 33         | 3.83 | 4.49 | 4.85 | 4.33 | 0.62 | 33             | 4.05  | 4.35 | 5.02  | 4.42 | 0.60  | -0.57 | 0.569 |

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Table 2C-2 (continued)

MOTHER'S AGE AT BIRTH OF CHILD FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLE BY SITE

|                         | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|-------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                         | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>Greene/Humphreys</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Sample A                | 43         | 17.81 | 21.26 | 24.93 | 22.23 | 5.74 | 30             | 17.56 | 20.49 | 23.32 | 21.60 | 5.56 | 0.47  | 0.637 |
| Sample B                | 34         | 18.13 | 21.41 | 28.57 | 23.63 | 6.79 | 22             | 19.14 | 25.61 | 29.03 | 24.61 | 5.57 | -0.59 | 0.559 |
| Sample C                | 48         | 20.53 | 22.81 | 25.65 | 24.35 | 6.05 | 47             | 18.63 | 20.77 | 24.81 | 22.39 | 6.15 | 1.56  | 0.121 |
| Sample D                | 7          | 16.84 | 19.20 | 20.63 | 19.14 | 2.87 | 12             | 17.78 | 20.39 | 22.95 | 21.21 | 4.89 | -1.16 | 0.262 |
| Sample E                | 10         | 17.93 | 21.36 | 29.99 | 24.03 | 7.67 | 16             | 19.74 | 21.55 | 26.59 | 24.91 | 8.27 | -0.28 | 0.786 |
| <b>St. Clair</b>        |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Sample A                | 24         | 18.06 | 20.15 | 23.78 | 21.06 | 4.48 | 16             | 17.09 | 18.85 | 22.34 | 20.29 | 4.46 | 0.53  | 0.597 |
| Sample B                | 12         | 17.10 | 18.93 | 22.55 | 19.99 | 3.80 | 26             | 18.38 | 19.57 | 21.09 | 22.93 | 8.72 | -1.45 | 0.156 |
| Sample C                | 68         | 18.53 | 21.38 | 25.05 | 22.57 | 5.67 | 39             | 18.55 | 21.65 | 26.57 | 22.74 | 5.25 | -0.16 | 0.876 |
| Sample D                | 35         | 17.99 | 20.30 | 22.68 | 20.43 | 3.10 | 34             | 19.60 | 21.19 | 24.33 | 22.00 | 3.79 | -1.89 | 0.064 |
| Sample E                | 63         | 18.28 | 20.91 | 24.81 | 22.00 | 5.57 | 56             | 17.78 | 20.79 | 23.63 | 21.94 | 6.27 | 0.05  | 0.958 |
| <b>Maricopa</b>         |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Sample A                | 40         | 19.27 | 23.84 | 28.43 | 24.40 | 6.23 | 16             | 18.41 | 21.15 | 22.58 | 21.48 | 5.53 | 1.72  | 0.096 |
| Sample B                | 9          | 19.13 | 23.15 | 29.53 | 23.79 | 5.80 | 1              | ----  | 15.96 | ----  | 15.96 | ---- | 4.05  | 0.004 |
| Sample C                | 56         | 19.47 | 23.28 | 26.30 | 23.81 | 5.48 | 44             | 19.65 | 23.61 | 27.31 | 24.15 | 5.56 | -0.31 | 0.758 |
| Sample D                | 21         | 20.00 | 21.23 | 27.30 | 24.93 | 7.39 | 17             | 21.00 | 24.00 | 26.51 | 24.84 | 6.56 | 0.04  | 0.968 |
| Sample E                | 8          | 18.38 | 19.91 | 21.57 | 19.91 | 2.69 | 14             | 19.61 | 22.68 | 24.93 | 22.81 | 4.99 | -1.77 | 0.092 |
| <b>Mingo</b>            |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Sample A                | 18         | 18.42 | 21.22 | 24.11 | 22.12 | 4.31 | 17             | 18.95 | 23.16 | 27.85 | 24.57 | 6.30 | -1.34 | 0.192 |
| Sample B                | 16         | 20.80 | 21.90 | 28.41 | 23.85 | 4.80 | 14             | 19.52 | 26.89 | 28.62 | 25.76 | 6.35 | -0.92 | 0.368 |
| Sample C                | 81         | 19.50 | 22.13 | 26.92 | 23.79 | 5.84 | 75             | 19.94 | 22.73 | 27.22 | 24.03 | 5.34 | -0.27 | 0.786 |
| Sample D                | 22         | 19.72 | 21.80 | 26.33 | 23.52 | 5.56 | 15             | 18.59 | 20.17 | 29.63 | 23.85 | 7.67 | -0.14 | 0.889 |
| Sample E                | 31         | 18.63 | 21.73 | 27.79 | 23.65 | 6.09 | 32             | 18.62 | 20.21 | 23.25 | 21.55 | 4.68 | 1.53  | 0.133 |

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Table 2C-2 (continued)

YEARS OF MOTHER'S EDUCATION FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLE BY SITE

|                         | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |       | T     | P     |
|-------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|-------|-------|-------|
|                         | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD    |       |       |
| <b>Greene/Humphreys</b> |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Sample A                | 43         | 10.00 | 11.00 | 12.00 | 11.05 | 2.36 | 31             | 9.00  | 11.00 | 12.00 | 10.39 | 3.17  | 0.98  | 0.332 |
| Sample B                | 34         | 10.00 | 12.00 | 12.00 | 11.56 | 2.49 | 22             | 9.00  | 11.00 | 12.00 | 10.73 | 2.39  | 1.25  | 0.218 |
| Sample C                | 50         | 9.00  | 11.50 | 12.00 | 10.68 | 1.94 | 48             | 9.00  | 11.00 | 12.00 | 10.15 | 2.43  | 1.20  | 0.234 |
| Sample D                | 9          | 10.00 | 11.00 | 12.00 | 11.22 | 2.28 | 12             | 9.50  | 11.00 | 12.00 | 10.75 | 2.38  | 0.46  | 0.650 |
| Sample E                | 12         | 7.50  | 9.00  | 10.50 | 9.00  | 2.30 | 17             | 11.00 | 12.00 | 12.00 | 11.41 | 1.62  | -3.13 | 0.006 |
| <b>St. Clair</b>        |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Sample A                | 25         | 10.00 | 12.00 | 12.00 | 11.16 | 2.12 | 17             | 11.00 | 12.00 | 12.00 | 11.41 | 1.46  | -0.46 | 0.651 |
| Sample B                | 12         | 12.00 | 12.00 | 12.50 | 12.25 | 0.96 | 28             | 11.00 | 12.00 | 12.00 | 11.32 | 1.85  | 2.08  | 0.045 |
| Sample C                | 71         | 11.00 | 12.00 | 12.00 | 11.51 | 1.80 | 39             | 10.50 | 12.00 | 12.00 | 11.51 | 1.68  | -0.02 | 0.987 |
| Sample D                | 36         | 9.50  | 11.00 | 11.00 | 10.33 | 1.62 | 34             | 10.00 | 11.00 | 11.00 | 10.79 | 1.37  | -1.29 | 0.202 |
| Sample E                | 62         | 10.00 | 12.00 | 12.00 | 11.18 | 1.99 | 59             | 11.00 | 12.00 | 12.00 | 11.36 | 1.91  | -0.50 | 0.615 |
| <b>Maricopa</b>         |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Sample A                | 40         | 8.00  | 11.00 | 12.00 | 9.75  | 2.95 | 16             | 8.00  | 8.00  | 10.00 | 8.44  | 2.10  | 1.87  | 0.069 |
| Sample B                | 10         | 7.00  | 8.00  | 10.00 | 8.20  | 2.25 | 1              | ----- | 6.00  | ----- | 6.00  | ----- | 3.09  | 0.013 |
| Sample C                | 56         | 8.00  | 11.00 | 12.00 | 10.59 | 2.14 | 43             | 8.00  | 12.00 | 12.00 | 10.09 | 3.32  | 0.85  | 0.396 |
| Sample D                | 22         | 6.00  | 8.00  | 12.00 | 8.45  | 4.16 | 17             | 4.00  | 8.00  | 11.00 | 8.06  | 4.44  | 0.28  | 0.778 |
| Sample E                | 9          | 8.00  | 10.00 | 11.00 | 9.44  | 2.19 | 15             | 8.00  | 9.00  | 10.50 | 9.33  | 2.19  | 0.12  | 0.906 |
| <b>Mingo</b>            |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Sample A                | 18         | 9.00  | 10.00 | 12.00 | 10.44 | 1.54 | 18             | 7.00  | 9.00  | 12.00 | 9.44  | 2.45  | 1.46  | 0.154 |
| Sample B                | 17         | 11.00 | 12.00 | 12.00 | 11.18 | 2.07 | 14             | 9.00  | 11.50 | 12.00 | 10.50 | 1.74  | 0.99  | 0.331 |
| Sample C                | 84         | 8.50  | 11.00 | 12.00 | 10.33 | 2.38 | 77             | 9.00  | 12.00 | 12.00 | 10.91 | 2.06  | -1.64 | 0.102 |
| Sample D                | 22         | 8.00  | 10.00 | 12.00 | 10.09 | 2.16 | 15             | 7.00  | 8.00  | 11.00 | 8.40  | 3.22  | 1.78  | 0.089 |
| Sample E                | 33         | 7.00  | 9.00  | 10.00 | 9.06  | 2.18 | 33             | 8.00  | 9.00  | 11.00 | 9.52  | 1.79  | -0.93 | 0.358 |

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Table 2C-2 (continued)

YEARS AT CURRENT ADDRESS FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLE BY SITE

|                         | HEAD START |      |      |       |       |       | NON-HEAD START |      |      |       |       |       | T     | P     |
|-------------------------|------------|------|------|-------|-------|-------|----------------|------|------|-------|-------|-------|-------|-------|
|                         | N          | Q1   | MED  | Q3    | MEAN  | SD    | N              | Q1   | MED  | Q3    | MEAN  | SD    |       |       |
| <b>Greene/Humphreys</b> |            |      |      |       |       |       |                |      |      |       |       |       |       |       |
| Sample A                | 43         | 1.75 | 4.01 | 10.00 | 6.36  | 6.68  | 30             | 1.00 | 3.00 | 8.00  | 7.77  | 10.80 | -0.64 | 0.526 |
| Sample B                | 34         | 2.00 | 4.08 | 9.00  | 7.47  | 8.85  | 22             | 3.00 | 6.00 | 13.00 | 10.77 | 11.70 | -1.13 | 0.265 |
| Sample C                | 48         | 2.00 | 4.66 | 9.00  | 7.64  | 8.62  | 46             | 2.00 | 3.00 | 10.00 | 6.71  | 7.12  | 0.57  | 0.569 |
| Sample D                | 9          | 5.00 | 5.00 | 9.00  | 8.67  | 8.06  | 12             | 0.75 | 1.91 | 5.50  | 4.41  | 6.38  | 1.31  | 0.211 |
| Sample E                | 12         | 1.00 | 3.08 | 5.50  | 9.29  | 15.90 | 17             | 1.33 | 2.00 | 12.00 | 11.69 | 16.80 | -0.39 | 0.699 |
| <b>St. Clair</b>        |            |      |      |       |       |       |                |      |      |       |       |       |       |       |
| Sample A                | 25         | 3.00 | 4.00 | 8.00  | 7.19  | 10.50 | 17             | 2.00 | 3.92 | 8.00  | 6.52  | 7.00  | 0.25  | 0.804 |
| Sample B                | 12         | 3.16 | 4.54 | 10.13 | 6.74  | 5.44  | 29             | 1.50 | 2.50 | 7.33  | 4.87  | 4.76  | 1.04  | 0.313 |
| Sample C                | 71         | 1.00 | 3.00 | 6.00  | 4.61  | 4.92  | 39             | 0.75 | 2.00 | 4.08  | 3.13  | 3.37  | 1.87  | 0.064 |
| Sample D                | 36         | 0.63 | 1.29 | 3.16  | 3.61  | 5.74  | 34             | 0.42 | 1.00 | 2.00  | 1.60  | 1.99  | 1.98  | 0.054 |
| Sample E                | 63         | 0.33 | 1.50 | 3.66  | 3.19  | 4.71  | 60             | 0.50 | 2.17 | 4.58  | 3.66  | 4.77  | -0.55 | 0.584 |
| <b>Maricopa</b>         |            |      |      |       |       |       |                |      |      |       |       |       |       |       |
| Sample A                | 40         | 0.79 | 2.00 | 4.00  | 4.83  | 8.45  | 15             | 0.29 | 2.00 | 3.00  | 3.11  | 4.96  | 0.93  | 0.357 |
| Sample B                | 10         | 2.00 | 3.00 | 8.00  | 5.52  | 4.74  | 1              | ---- | 2.00 | ----  | 2.00  | ----  | 2.35  | 0.043 |
| Sample C                | 56         | 1.00 | 2.00 | 6.50  | 4.36  | 4.98  | 44             | 0.63 | 2.50 | 4.50  | 2.87  | 2.57  | 1.94  | 0.056 |
| Sample D                | 22         | 0.50 | 1.08 | 3.00  | 2.59  | 3.35  | 17             | 0.58 | 2.50 | 8.00  | 3.95  | 4.25  | -1.08 | 0.288 |
| Sample E                | 9          | 0.25 | 0.50 | 1.00  | 0.93  | 1.24  | 15             | 0.17 | 0.33 | 2.71  | 2.53  | 5.19  | -1.14 | 0.270 |
| <b>Mingo</b>            |            |      |      |       |       |       |                |      |      |       |       |       |       |       |
| Sample A                | 17         | 1.00 | 2.00 | 10.00 | 6.44  | 7.01  | 17             | 2.00 | 3.50 | 7.00  | 6.47  | 7.31  | -0.01 | 0.992 |
| Sample B                | 15         | 2.25 | 5.00 | 9.50  | 10.62 | 15.60 | 14             | 2.00 | 4.00 | 12.00 | 8.14  | 11.00 | 0.50  | 0.623 |
| Sample C                | 79         | 1.13 | 3.00 | 6.00  | 4.79  | 5.06  | 68             | 1.25 | 4.00 | 7.00  | 5.40  | 5.50  | -0.69 | 0.493 |
| Sample D                | 22         | 1.17 | 1.75 | 3.50  | 4.50  | 6.68  | 15             | 0.75 | 1.42 | 7.08  | 5.92  | 7.45  | -0.59 | 0.558 |
| Sample E                | 33         | 1.25 | 3.08 | 6.00  | 5.59  | 6.50  | 33             | 0.92 | 3.00 | 7.00  | 5.96  | 7.67  | -0.21 | 0.833 |

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Table 2C-3

SELECTED FAMILY BACKGROUND CHARACTERISTICS FOR COMBINED GROUPS  
OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS AMONG SAMPLES WITHIN SITE

| FAMILY HAS PREVIOUS<br>HEAD START EXPERIENCE | Greene/Humphreys |        |        | St. Clair       |        |        | Maricopa       |        |        | Mingo           |        |        |
|--|------------------|--------|--------|-----------------|--------|--------|----------------|--------|--------|-----------------|--------|--------|
|  | N                | n Yes  | % Yes  | N               | n Yes  | % Yes  | N              | n Yes  | % Yes  | N               | n Yes  | % Yes  |
| Sample A                                     | 73               | 39     | 53.4   | 41              | 14     | 34.1   | 56             | 20     | 35.7   | 33              | 15     | 45.5   |
| Sample B                                     | 55               | 35     | 63.6   | 41              | 11     | 26.8   | 11             | 5      | 45.5   | 30              | 12     | 40.0   |
| Sample C                                     | 97               | 47     | 48.5   | 107             | 45     | 42.1   | 98             | 27     | 27.6   | 158             | 76     | 48.1   |
| Sample D                                     | 17               | 10     | 58.8   | 67              | 19     | 28.4   | 35             | 11     | 31.4   | 34              | 10     | 29.4   |
| Sample E                                     | 23               | 18     | 78.3   | 107             | 29     | 27.1   | 20             | 5      | 25.0   | 57              | 13     | 22.8   |
|  | CHI SQ = 8.425   |        |        | CHI SQ = 7.050  |        |        | CHI SQ = 2.544 |        |        | CHI SQ = 13.278 |        |        |
|  | DF = 4           |        |        | DF = 4          |        |        | DF = 4         |        |        | DF = 4          |        |        |
|  | P = 0.077        |        |        | P = 0.133       |        |        | P = 0.637      |        |        | P = 0.010       |        |        |
| TWO-PARENT FAMILY                            | Greene/Humphreys |        |        | St. Clair       |        |        | Maricopa       |        |        | Mingo           |        |        |
|  | N                | n Yes  | % Yes  | N               | n Yes  | % Yes  | N              | n Yes  | % Yes  | N               | n Yes  | % Yes  |
| Sample A                                     | 74               | 38     | 51.4   | 42              | 4      | 9.5    | 56             | 38     | 67.9   | 36              | 27     | 75.0   |
| Sample B                                     | 56               | 34     | 60.7   | 41              | 11     | 26.8   | 11             | 8      | 72.7   | 31              | 26     | 83.9   |
| Sample C                                     | 98               | 63     | 64.3   | 111             | 33     | 29.7   | 100            | 69     | 69.0   | 164             | 133    | 82.6   |
| Sample D                                     | 21               | 10     | 47.6   | 70              | 9      | 12.9   | 39             | 29     | 74.4   | 37              | 29     | 78.4   |
| Sample E                                     | 29               | 17     | 58.6   | 123             | 30     | 24.4   | 24             | 12     | 50.0   | 66              | 48     | 72.7   |
|  | CHI SQ = 4.034   |        |        | CHI SQ = 11.815 |        |        | CHI SQ = 4.442 |        |        | CHI SQ = 3.645  |        |        |
|  | DF = 4           |        |        | DF = 4          |        |        | DF = 4         |        |        | DF = 4          |        |        |
|  | P = 0.401        |        |        | P = 0.019       |        |        | P = 0.350      |        |        | P = 0.456       |        |        |
| SEX OF TARGET CHILD                          | Greene/Humphreys |        |        | St. Clair       |        |        | Maricopa       |        |        | Mingo           |        |        |
|  | N                | n Male | % Male | N               | n Male | % Male | N              | n Male | % Male | N               | n Male | % Male |
| Sample A                                     | 74               | 37     | 50.0   | 42              | 26     | 61.9   | 56             | 27     | 48.2   | 36              | 19     | 52.8   |
| Sample B                                     | 56               | 28     | 50.0   | 41              | 23     | 56.1   | 11             | 4      | 36.4   | 31              | 20     | 64.5   |
| Sample C                                     | 98               | 47     | 48.0   | 111             | 54     | 48.6   | 100            | 50     | 50.0   | 161             | 80     | 49.7   |
| Sample D                                     | 21               | 9      | 42.9   | 71              | 32     | 45.1   | 39             | 23     | 59.0   | 37              | 15     | 40.5   |
| Sample E                                     | 29               | 15     | 51.7   | 123             | 65     | 52.8   | 24             | 13     | 54.2   | 66              | 32     | 48.5   |
|  | CHI SQ = 0.497   |        |        | CHI SQ = 4.457  |        |        | CHI SQ = 2.24  |        |        | CHI SQ = 4.001  |        |        |
|  | DF = 4           |        |        | DF = 4          |        |        | DF = 4         |        |        | DF = 4          |        |        |
|  | P = 0.974        |        |        | P = 0.348       |        |        | P = 0.691      |        |        | P = 0.406       |        |        |

Table 2C-3 (continued)

SELECTED FAMILY BACKGROUND CHARACTERISTICS FOR COMBINED GROUPS  
OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS AMONG SAMPLES WITHIN SITE

| TARGET CHILD HAS BEEN IN DAYCARE | Greene/Humphreys |       |       | St. Clair       |       |       | Maricopa       |       |       | Mingo          |       |       |
|----------------------------------|------------------|-------|-------|-----------------|-------|-------|----------------|-------|-------|----------------|-------|-------|
|                                  | N                | n Yes | % Yes | N               | n Yes | % Yes | N              | n Yes | % Yes | N              | n Yes | % Yes |
| Sample A                         | 73               | 5     | 6.8   | 35              | 8     | 22.9  | 47             | 9     | 19.1  | 35             | 0     | 0.0   |
| Sample B                         | 55               | 2     | 3.6   | 31              | 1     | 3.2   | 10             | 2     | 20.0  | 30             | 0     | 0.0   |
| Sample C                         | 95               | 13    | 13.7  | 101             | 9     | 8.9   | 81             | 20    | 24.7  | 158            | 1     | 0.6   |
| Sample D                         | 21               | 2     | 9.5   | 70              | 16    | 22.9  | 38             | 13    | 34.2  | 37             | 0     | 0.0   |
| Sample E                         | 29               | 5     | 17.2  | 123             | 34    | 27.6  | 24             | 9     | 37.5  | 66             | 0     | 0.0   |
|                                  | CHI SQ = 6.467   |       |       | CHI SQ = 18.758 |       |       | CHI SQ = 4.308 |       |       | CHI SQ = 1.067 |       |       |
|                                  | DF = 4           |       |       | DF = 4          |       |       | DF = 4         |       |       | DF = 4         |       |       |
|                                  | P = 0.167        |       |       | P = 0.001       |       |       | P = 0.366      |       |       | P = 0.900      |       |       |
| FAMILY HAS MEDICAL INSURANCE     | N                | n Yes | % Yes | N               | n Yes | % Yes | N              | n Yes | % Yes | N              | n Yes | % Yes |
| Sample A                         | 67               | 47    | 70.1  | 42              | 30    | 71.4  | 55             | 10    | 18.2  | 33             | 25    | 75.8  |
| Sample B                         | 45               | 30    | 66.7  | 40              | 30    | 75.0  | 11             | 3     | 27.3  | 28             | 17    | 60.7  |
| Sample C                         | 92               | 47    | 51.1  | 108             | 86    | 79.6  | 98             | 29    | 29.6  | 155            | 89    | 57.4  |
| Sample D                         | 21               | 15    | 71.4  | 70              | 66    | 94.3  | 39             | 9     | 23.1  | 37             | 24    | 64.9  |
| Sample E                         | 29               | 16    | 55.2  | 123             | 110   | 89.4  | 24             | 4     | 16.7  | 66             | 50    | 75.8  |
|                                  | CHI SQ = 8.141   |       |       | CHI SQ = 17.156 |       |       | CHI SQ = 3.462 |       |       | CHI SQ = 9.016 |       |       |
|                                  | DF = 4           |       |       | DF = 4          |       |       | DF = 4         |       |       | DF = 4         |       |       |
|                                  | P = 0.087        |       |       | P = 0.002       |       |       | P = 0.484      |       |       | P = 0.061      |       |       |
| FAMILY HAS DENTAL INSURANCE      | N                | n Yes | % Yes | N               | n Yes | % Yes | N              | n Yes | % Yes | N              | n Yes | % Yes |
| Sample A                         | 74               | 43    | 58.1  | 42              | 25    | 59.5  | 56             | 6     | 10.7  | 36             | 16    | 44.4  |
| Sample B                         | 56               | 24    | 42.9  | 41              | 28    | 68.3  | 11             | 2     | 18.2  | 31             | 9     | 29.0  |
| Sample C                         | 98               | 36    | 36.7  | 110             | 78    | 70.9  | 100            | 18    | 18.0  | 161            | 45    | 28.0  |
| Sample D                         | 21               | 11    | 52.4  | 70              | 67    | 95.7  | 39             | 8     | 20.5  | 37             | 9     | 24.3  |
| Sample E                         | 29               | 12    | 41.4  | 122             | 105   | 86.1  | 24             | 1     | 4.2   | 65             | 26    | 40.0  |
|                                  | CHI SQ = 8.539   |       |       | CHI SQ = 31.884 |       |       | CHI SQ = 4.675 |       |       | CHI SQ = 6.830 |       |       |
|                                  | DF = 4           |       |       | DF = 4          |       |       | DF = 4         |       |       | DF = 4         |       |       |
|                                  | P = 0.074        |       |       | P = 0.000       |       |       | P = 0.322      |       |       | P = 0.145      |       |       |

Table 2C-3 (continued)

SELECTED FAMILY BACKGROUND CHARACTERISTICS FOR COMBINED GROUPS  
OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS AMONG SAMPLES WITHIN SITE

|   | Greene/Humphreys |       |       | St. Clair       |       |       | Maricopa       |       |       | Mingo          |       |       |
|---|------------------|-------|-------|-----------------|-------|-------|----------------|-------|-------|----------------|-------|-------|
|   | N                | n Yes | % Yes | N               | n Yes | % Yes | N              | n Yes | % Yes | N              | n Yes | % Yes |
| <b>ANYONE IN HOUSEHOLD EMPLOYED</b>             |                  |       |       |                 |       |       |                |       |       |                |       |       |
| Sample A  | 74               | 37    | 50.0  | 42              | 11    | 26.2  | 56             | 36    | 64.3  | 36             | 18    | 50.0  |
| Sample B  | 56               | 39    | 69.6  | 41              | 10    | 24.4  | 11             | 8     | 72.7  | 31             | 11    | 35.5  |
| Sample C  | 98               | 56    | 57.1  | 111             | 34    | 30.6  | 100            | 82    | 82.0  | 161            | 66    | 41.0  |
| Sample D  | 21               | 12    | 57.1  | 69              | 7     | 10.1  | 39             | 26    | 66.7  | 37             | 16    | 43.2  |
| Sample E  | 29               | 21    | 72.4  | 122             | 41    | 33.6  | 23             | 16    | 69.6  | 65             | 18    | 27.7  |
|   | CHI SQ = 7.432   |       |       | CHI SQ = 13.612 |       |       | CHI SQ = 7.245 |       |       | CHI SQ = 6.029 |       |       |
|   | DF = 4           |       |       | DF = 4          |       |       | DF = 4         |       |       | DF = 4         |       |       |
|   | P = 0.115        |       |       | P = 0.009       |       |       | P = 0.124      |       |       | P = 0.197      |       |       |
| <b>HOUSEHOLD RECEIVES UNEMPLOYMENT BENEFITS</b> |                  |       |       |                 |       |       |                |       |       |                |       |       |
| Sample A  | 73               | 4     | 5.5   | 42              | 1     | 2.4   | 55             | 3     | 5.5   | 36             | 1     | 2.8   |
| Sample B  | 55               | 3     | 5.5   | 40              | 2     | 5.0   | 11             | 0     | 0.0   | 31             | 0     | 0.0   |
| Sample C  | 98               | 5     | 5.1   | 109             | 5     | 4.6   | 97             | 0     | 0.0   | 158            | 15    | 9.5   |
| Sample D  | 20               | 2     | 10.0  | 70              | 0     | 0.0   | 39             | 3     | 7.7   | 36             | 1     | 2.8   |
| Sample E  | 29               | 0     | 0.0   | 122             | 7     | 5.7   | 24             | 1     | 4.2   | 66             | 4     | 6.1   |
|   | CHI SQ = 2.591   |       |       | CHI SQ = 4.446  |       |       | CHI SQ = 7.305 |       |       | CHI SQ = 6.214 |       |       |
|   | DF = 4           |       |       | DF = 4          |       |       | DF = 4         |       |       | DF = 4         |       |       |
|   | P = 0.628        |       |       | P = 0.349       |       |       | P = 0.121      |       |       | P = 0.184      |       |       |
| <b>HOUSEHOLD RECEIVES WELFARE BENEFITS</b>      |                  |       |       |                 |       |       |                |       |       |                |       |       |
| Sample A  | 74               | 38    | 51.4  | 42              | 35    | 83.3  | 56             | 19    | 33.9  | 36             | 17    | 47.2  |
| Sample B  | 56               | 22    | 39.3  | 41              | 35    | 85.4  | 11             | 4     | 36.4  | 31             | 21    | 67.7  |
| Sample C  | 98               | 33    | 33.7  | 111             | 83    | 74.8  | 100            | 24    | 24.0  | 161            | 73    | 45.3  |
| Sample D  | 21               | 10    | 47.6  | 70              | 66    | 94.3  | 39             | 10    | 25.6  | 37             | 14    | 37.8  |
| Sample E  | 29               | 15    | 51.7  | 123             | 91    | 74.0  | 24             | 6     | 25.0  | 66             | 39    | 59.1  |
|   | CHI SQ = 6.970   |       |       | CHI SQ = 14.689 |       |       | CHI SQ = 2.356 |       |       | CHI SQ = 9.756 |       |       |
|   | DF = 4           |       |       | DF = 4          |       |       | DF = 4         |       |       | DF = 4         |       |       |
|   | P = 0.138        |       |       | P = 0.005       |       |       | P = 0.671      |       |       | P = 0.045      |       |       |

Table 2C-4

FAMILIES WITH PREVIOUS HEAD START EXPERIENCE FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|          |   | Greene/Humphreys    |      | St. Clair      |      | Maricopa            |      | Mingo           |      |
|----------|---|---------------------|------|----------------|------|---------------------|------|-----------------|------|
|          |   | HS                  | NHS  | HS             | NHS  | HS                  | NHS  | HS              | NHS  |
| Sample A | N | 43                  | 39   | 25             | 16   | 40                  | 16   | 17              | 16   |
|          | n | 23                  | 16   | 9              | 5    | 16                  | 4    | 9               | 6    |
|          | % | 53.5                | 53.3 | 36.0           | 31.3 | 40.0                | 25.0 | 52.9            | 37.5 |
|          |   | CHI SQ = 0.000      |      | CHI SQ = 0.098 |      | CHI SQ = 1.120      |      | CHI SQ = 0.793  |      |
|          |   | DF = 1              |      | DF = 1         |      | DF = 1              |      | DF = 1          |      |
|          |   | P = 0.990           |      | P = 0.754      |      | P = 0.290           |      | P = 0.373       |      |
| Sample B | N | 34                  | 21   | 12             | 29   | 10                  | 1    | 17              | 13   |
|          | n | 22                  | 13   | 5              | 6    | 5                   | 0    | 9               | 3    |
|          | % | 64.7                | 61.9 | 41.7           | 20.7 | 50.0                | 0.0  | 52.9            | 23.1 |
|          |   | CHI SQ = 0.044      |      | CHI SQ = 1.903 |      | FISHER'S EXACT TEST |      | CHI SQ = 2.738  |      |
|          |   | DF = 1              |      | DF = 1         |      | DF = 1              |      | DF = 1          |      |
|          |   | P = 0.834           |      | P = 0.168      |      | P = 0.545           |      | P = 0.098       |      |
| Sample C | N | 50                  | 47   | 70             | 37   | 55                  | 43   | 82              | 76   |
|          | n | 27                  | 20   | 35             | 10   | 17                  | 10   | 50              | 26   |
|          | % | 54.0                | 42.6 | 50.0           | 27.0 | 30.9                | 23.3 | 61.0            | 34.2 |
|          |   | CHI SQ = 1.271      |      | CHI SQ = 5.242 |      | CHI SQ = 0.708      |      | CHI SQ = 11.319 |      |
|          |   | DF = 1              |      | DF = 1         |      | DF = 1              |      | DF = 1          |      |
|          |   | P = 0.260           |      | P = 0.022      |      | P = 0.400           |      | P = 0.001       |      |
| Sample D | N | 7                   | 10   | 33             | 34   | 18                  | 17   | 21              | 13   |
|          | n | 5                   | 5    | 8              | 11   | 5                   | 6    | 7               | 3    |
|          | % | 71.4                | 50.0 | 24.2           | 32.4 | 27.8                | 35.3 | 33.3            | 23.1 |
|          |   | FISHER'S EXACT TEST |      | CHI SQ = 0.542 |      | CHI SQ = 0.229      |      | CHI SQ = 0.407  |      |
|          |   | DF = 1              |      | DF = 1         |      | DF = 1              |      | DF = 1          |      |
|          |   | P = 0.354           |      | P = 0.461      |      | P = 0.632           |      | P = 0.524       |      |
| Sample E | N | 10                  | 13   | 57             | 50   | 7                   | 13   | 29              | 28   |
|          | n | 7                   | 11   | 16             | 13   | 2                   | 3    | 6               | 7    |
|          | % | 70.0                | 84.6 | 28.1           | 26.0 | 28.6                | 23.1 | 20.7            | 25.0 |
|          |   | CHI SQ = 0.710      |      | CHI SQ = 0.058 |      | FISHER'S EXACT TEST |      | CHI SQ = 0.150  |      |
|          |   | DF = 1              |      | DF = 1         |      | DF = 1              |      | DF = 1          |      |
|          |   | P = 0.400           |      | P = 0.810      |      | P = 0.594           |      | P = 0.698       |      |

Table 2C-4 (continued)

TWO-PARENT FAMILIES FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|          |   | Greene/Humphreys |      | St. Clair      |      | Maricopa            |      | Mingo          |      |
|----------|---|------------------|------|----------------|------|---------------------|------|----------------|------|
|          |   | HS               | NHS  | HS             | NHS  | HS                  | NHS  | HS             | NHS  |
| Sample A | N | 43               | 31   | 25             | 17   | 40                  | 16   | 18             | 18   |
|          | n | 23               | 15   | 1              | 3    | 25                  | 13   | 15             | 12   |
|          | % | 53.5             | 48.4 | 4.0            | 17.6 | 62.5                | 81.3 | 83.3           | 66.7 |
|          |   | CHI SQ = 0.188   |      | CHI SQ = 2.187 |      | CHI SQ = 1.842      |      | CHI SQ = 1.333 |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.665        |      | P = 0.139      |      | P = 0.175           |      | P = 0.248      |      |
| Sample B | N | 34               | 22   | 12             | 29   | 10                  | 1    | 17             | 14   |
|          | n | 19               | 15   | 4              | 7    | 8                   | 0    | 13             | 13   |
|          | % | 55.9             | 68.2 | 33.3           | 24.1 | 80.0                | 0.0  | 76.5           | 92.9 |
|          |   | CHI SQ = 0.847   |      | CHI SQ = 0.366 |      | FISHER'S EXACT TEST |      | CHI SQ = 1.524 |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.357        |      | P = 0.545      |      | P = 0.273           |      | P = 0.217      |      |
| Sample C | N | 50               | 48   | 71             | 40   | 56                  | 44   | 84             | 77   |
|          | n | 35               | 28   | 21             | 12   | 44                  | 25   | 66             | 67   |
|          | % | 70.0             | 58.3 | 29.6           | 30.0 | 78.6                | 56.8 | 78.6           | 87.0 |
|          |   | CHI SQ = 1.452   |      | CHI SQ = 0.002 |      | CHI SQ = 5.451      |      | CHI SQ = 1.993 |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.228        |      | P = 0.963      |      | P = 0.020           |      | P = 0.158      |      |
| Sample D | N | 9                | 12   | 36             | 34   | 22                  | 17   | 22             | 15   |
|          | n | 6                | 4    | 5              | 4    | 16                  | 13   | 16             | 13   |
|          | % | 66.7             | 33.3 | 13.9           | 11.8 | 72.7                | 76.5 | 72.7           | 86.7 |
|          |   | CHI SQ = 2.291   |      | CHI SQ = 0.070 |      | CHI SQ = 0.070      |      | CHI SQ = 1.023 |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.130        |      | P = 0.791      |      | P = 0.791           |      | P = 0.312      |      |
| Sample E | N | 12               | 17   | 63             | 60   | 9                   | 15   | 33             | 33   |
|          | n | 7                | 10   | 15             | 15   | 4                   | 8    | 26             | 22   |
|          | % | 58.3             | 58.8 | 23.8           | 25.0 | 44.4                | 53.3 | 78.8           | 66.7 |
|          |   | CHI SQ = 0.001   |      | CHI SQ = 0.024 |      | CHI SQ = 0.178      |      | CHI SQ = 1.222 |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.979        |      | P = 0.878      |      | P = 0.673           |      | P = 0.269      |      |



Table 2C-4 (continued)

MALE CHILDREN FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|          |   | Greene/Humphreys |      | St. Clair      |      | Maricopa            |       | Mingo          |      |
|----------|---|------------------|------|----------------|------|---------------------|-------|----------------|------|
|          |   | HS               | NHS  | HS             | NHS  | HS                  | NHS   | HS             | NHS  |
| Sample A | N | 43               | 31   | 25             | 17   | 40                  | 16    | 18             | 18   |
|          | n | 18               | 19   | 15             | 11   | 17                  | 10    | 10             | 9    |
|          | % | 41.9             | 61.3 | 60.0           | 64.7 | 42.5                | 62.5  | 55.6           | 50.0 |
|          |   | CHI SQ = 2.720   |      | CHI SQ = 0.002 |      | CHI SQ = 1.831      |       | CHI SQ = 0.444 |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |       | DF = 1         |      |
|          |   | P = 0.099        |      | P = 0.963      |      | P = 0.176           |       | P = 0.505      |      |
| Sample B | N | 34               | 22   | 12             | 29   | 10                  | 1     | 17             | 14   |
|          | n | 18               | 10   | 8              | 15   | 3                   | 1     | 11             | 9    |
|          | % | 52.9             | 45.5 | 66.7           | 51.7 | 30.0                | 100.0 | 64.7           | 64.3 |
|          |   | CHI SQ = 0.299   |      | CHI SQ = 0.769 |      | FISHER'S EXACT TEST |       | CHI SQ = 0.001 |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |       | DF = 1         |      |
|          |   | P = 0.584        |      | P = 0.380      |      | P = 0.364           |       | P = 0.981      |      |
| Sample C | N | 50               | 48   | 71             | 40   | 56                  | 44    | 84             | 77   |
|          | n | 21               | 26   | 34             | 20   | 36                  | 14    | 44             | 36   |
|          | % | 42.0             | 54.2 | 47.9           | 50.0 | 64.3                | 31.8  | 52.4           | 46.8 |
|          |   | CHI SQ = 1.452   |      | CHI SQ = 0.046 |      | CHI SQ = 10.390     |       | CHI SQ = 0.509 |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |       | DF = 1         |      |
|          |   | P = 0.228        |      | P = 0.831      |      | P = 0.001           |       | P = 0.475      |      |
| Sample D | N | 9                | 12   | 36             | 35   | 22                  | 17    | 22             | 15   |
|          | n | 3                | 6    | 17             | 15   | 16                  | 7     | 9              | 6    |
|          | % | 33.3             | 50.0 | 47.2           | 42.9 | 72.7                | 41.2  | 40.9           | 40.0 |
|          |   | CHI SQ = 0.583   |      | CHI SQ = 0.068 |      | CHI SQ = 3.946      |       | CHI SQ = 0.003 |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |       | DF = 1         |      |
|          |   | P = 0.445        |      | P = 0.794      |      | P = 0.047           |       | P = 0.956      |      |
| Sample E | N | 12               | 17   | 63             | 60   | 9                   | 15    | 33             | 33   |
|          | n | 9                | 6    | 34             | 31   | 4                   | 9     | 17             | 15   |
|          | % | 75.0             | 35.3 | 54.0           | 51.7 | 44.4                | 60.0  | 51.5           | 45.5 |
|          |   | CHI SQ = 4.441   |      | CHI SQ = 0.065 |      | CHI SQ = 0.548      |       | CHI SQ = 0.243 |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |       | DF = 1         |      |
|          |   | P = 0.035        |      | P = 0.798      |      | P = 0.459           |       | P = 0.622      |      |

Table 2C-4 (continued)

CHILDREN IN DAYCARE FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|          |   | Greene/Humphreys |      | St. Clair      |      | Maricopa            |      | Mingo          |     |
|----------|---|------------------|------|----------------|------|---------------------|------|----------------|-----|
|          |   | HS               | NHS  | HS             | NHS  | HS                  | NHS  | HS             | NHS |
| Sample A | N | 43               | 30   | 19             | 16   | 34                  | 13   | 17             | 18  |
|          | n | 2                | 3    | 2              | 6    | 7                   | 2    | 0              | 0   |
|          | % | 4.7              | 10.0 | 10.5           | 37.5 | 20.6                | 15.4 | 0.0            | 0.0 |
|          |   | CHI SQ = 0.792   |      | CHI SQ = 3.584 |      | CHI SQ = 0.164      |      |                |     |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |      |                |     |
|          |   | P = 0.373        |      | P = 0.058      |      | P = 0.685           |      |                |     |
| Sample B | N | 33               | 22   | 9              | 22   | 9                   | 1    | 16             | 14  |
|          | n | 1                | 1    | 1              | 0    | 2                   | 0    | 0              | 0   |
|          | % | 3.0              | 4.5  | 11.1           | 0.0  | 22.2                | 0.0  | 0.0            | 0.0 |
|          |   | CHI SQ = 0.086   |      | CHI SQ = 2.526 |      | FISHER'S EXACT TEST |      |                |     |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |      |                |     |
|          |   | P = 0.769        |      | P = 0.112      |      | P = 0.800           |      |                |     |
| Sample C | N | 50               | 45   | 65             | 36   | 51                  | 30   | 84             | 74  |
|          | n | 9                | 4    | 4              | 5    | 11                  | 9    | 0              | 1   |
|          | % | 18.0             | 8.9  | 6.2            | 13.9 | 21.6                | 30.0 | 0.0            | 1.4 |
|          |   | CHI SQ = 1.665   |      | CHI SQ = 1.708 |      | CHI SQ = 0.722      |      | CHI SQ = 1.142 |     |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |      | DF = 1         |     |
|          |   | P = 0.197        |      | P = 0.191      |      | P = 0.395           |      | P = 0.285      |     |
| Sample D | N | 9                | 12   | 36             | 34   | 21                  | 17   | 22             | 15  |
|          | n | 1                | 1    | 7              | 9    | 8                   | 5    | 0              | 0   |
|          | % | 11.1             | 8.3  | 19.4           | 26.5 | 38.1                | 29.4 | 0.0            | 0.0 |
|          |   | CHI SQ = 0.046   |      | CHI SQ = 0.490 |      | CHI SQ = 0.315      |      |                |     |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |      |                |     |
|          |   | P = 0.830        |      | P = 0.484      |      | P = 0.575           |      |                |     |
| Sample E | N | 12               | 17   | 63             | 60   | 9                   | 15   | 33             | 33  |
|          | n | 1                | 4    | 16             | 18   | 3                   | 6    | 0              | 0   |
|          | % | 8.3              | 23.5 | 25.4           | 30.0 | 33.3                | 40.0 | 0.0            | 0.0 |
|          |   | CHI SQ = 1.138   |      | CHI SQ = 0.326 |      | CHI SQ = 0.107      |      |                |     |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |      |                |     |
|          |   | P = 0.286        |      | P = 0.568      |      | P = 0.744           |      |                |     |

Table 2C-4 (continued)

FAMILIES WITH MEDICAL INSURANCE FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|          |   | Greene/Humphreys |      | St. Clair       |       | Maricopa            |      | Mingo          |      |
|----------|---|------------------|------|-----------------|-------|---------------------|------|----------------|------|
|          |   | HS               | NHS  | HS              | NHS   | HS                  | NHS  | HS             | NHS  |
| Sample A | N | 41               | 26   | 25              | 17    | 39                  | 16   | 17             | 16   |
|          | n | 32               | 15   | 16              | 14    | 8                   | 2    | 14             | 11   |
|          | % | 78.0             | 57.7 | 64.0            | 82.4  | 20.5                | 12.5 | 82.4           | 68.8 |
|          |   | CHI SQ = 3.149   |      | CHI SQ = 1.670  |       | CHI SQ = 0.490      |      | CHI SQ = 0.830 |      |
|          |   | DF = 1           |      | DF = 1          |       | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.076        |      | P = 0.196       |       | P = 0.484           |      | P = 0.362      |      |
| Sample B | N | 28               | 17   | 12              | 28    | 10                  | 1    | 15             | 13   |
|          | n | 20               | 10   | 9               | 21    | 3                   | 0    | 9              | 8    |
|          | % | 71.4             | 58.8 | 75.0            | 75.0  | 30.0                | 0.0  | 60.0           | 61.5 |
|          |   | CHI SQ = 0.756   |      | CHI SQ = 0.000  |       | FISHER'S EXACT TEST |      | CHI SQ = 0.007 |      |
|          |   | DF = 1           |      | DF = 1          |       | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.384        |      | P = 1.000       |       | P = 0.727           |      | P = 0.934      |      |
| Sample C | N | 44               | 48   | 69              | 39    | 55                  | 43   | 82             | 73   |
|          | n | 20               | 27   | 62              | 24    | 18                  | 11   | 47             | 42   |
|          | % | 45.5             | 56.3 | 89.9            | 61.5  | 32.7                | 25.6 | 57.3           | 57.5 |
|          |   | CHI SQ = 1.071   |      | CHI SQ = 12.317 |       | CHI SQ = 0.591      |      | CHI SQ = 0.001 |      |
|          |   | DF = 1           |      | DF = 1          |       | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.301        |      | P = 0.000       |       | P = 0.442           |      | P = 0.978      |      |
| Sample D | N | 9                | 12   | 36              | 34    | 22                  | 17   | 22             | 15   |
|          | n | 7                | 8    | 32              | 34    | 4                   | 5    | 15             | 9    |
|          | % | 77.8             | 66.7 | 88.9            | 100.0 | 18.2                | 29.4 | 68.2           | 60.0 |
|          |   | CHI SQ = 0.311   |      | CHI SQ = 4.007  |       | CHI SQ = 0.681      |      | CHI SQ = 0.262 |      |
|          |   | DF = 1           |      | DF = 1          |       | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.577        |      | P = 0.045       |       | P = 0.409           |      | P = 0.609      |      |
| Sample E | N | 12               | 17   | 63              | 60    | 9                   | 15   | 33             | 33   |
|          | n | 6                | 10   | 57              | 53    | 4                   | 0    | 24             | 26   |
|          | % | 50.0             | 58.8 | 90.5            | 88.3  | 44.4                | 0.0  | 72.7           | 78.8 |
|          |   | CHI SQ = 0.221   |      | CHI SQ = 0.149  |       | CHI SQ = 8.000      |      | CHI SQ = 0.330 |      |
|          |   | DF = 1           |      | DF = 1          |       | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.638        |      | P = 0.699       |       | P = 0.005           |      | P = 0.566      |      |

Table 2C-4 (continued)

FAMILIES WITH DENTAL INSURANCE FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|          |   | Greene/Humphreys |      | St. Clair      |       | Maricopa            |      | Mingo          |      |
|----------|---|------------------|------|----------------|-------|---------------------|------|----------------|------|
|          |   | HS               | NHS  | HS             | NHS   | HS                  | NHS  | HS             | NHS  |
| Sample A | N | 43               | 31   | 25             | 17    | 40                  | 16   | 18             | 18   |
|          | n | 29               | 14   | 12             | 13    | 5                   | 1    | 9              | 7    |
|          | % | 67.4             | 45.2 | 48.0           | 76.5  | 12.5                | 6.3  | 50.0           | 38.9 |
|          |   | CHI SQ = 3.674   |      | CHI SQ = 3.404 |       | CHI SQ = 0.467      |      | CHI SQ = 0.450 |      |
|          |   | DF = 1           |      | DF = 1         |       | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.055        |      | P = 0.065      |       | P = 0.494           |      | P = 0.502      |      |
| Sample B | N | 34               | 22   | 12             | 29    | 10                  | 1    | 17             | 14   |
|          | n | 17               | 7    | 9              | 19    | 2                   | 0    | 6              | 3    |
|          | % | 50.0             | 31.8 | 75.0           | 65.5  | 20.0                | 0.0  | 35.3           | 21.4 |
|          |   | CHI SQ = 1.803   |      | CHI SQ = 0.352 |       | FISHER'S EXACT TEST |      | CHI SQ = 0.716 |      |
|          |   | DF = 1           |      | DF = 1         |       | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.179        |      | P = 0.553      |       | P = 0.818           |      | P = 0.397      |      |
| Sample C | N | 50               | 48   | 71             | 39    | 56                  | 44   | 84             | 77   |
|          | n | 16               | 20   | 55             | 23    | 10                  | 8    | 25             | 20   |
|          | % | 32.0             | 41.7 | 77.5           | 59.0  | 17.9                | 18.2 | 29.8           | 26.0 |
|          |   | CHI SQ = 0.985   |      | CHI SQ = 4.172 |       | CHI SQ = 0.002      |      | CHI SQ = 0.286 |      |
|          |   | DF = 1           |      | DF = 1         |       | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.321        |      | P = 0.041      |       | P = 0.966           |      | P = 0.593      |      |
| Sample D | N | 9                | 12   | 36             | 34    | 22                  | 17   | 22             | 15   |
|          | n | 5                | 6    | 33             | 34    | 2                   | 6    | 5              | 4    |
|          | % | 55.6             | 50.0 | 91.7           | 100.0 | 9.1                 | 35.3 | 22.7           | 26.7 |
|          |   | CHI SQ = 0.064   |      | CHI SQ = 2.960 |       | CHI SQ = 4.038      |      | CHI SQ = 0.075 |      |
|          |   | DF = 1           |      | DF = 1         |       | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.801        |      | P = 0.085      |       | P = 0.044           |      | P = 0.784      |      |
| Sample E | N | 12               | 17   | 63             | 59    | 9                   | 15   | 32             | 33   |
|          | n | 5                | 7    | 55             | 50    | 1                   | 0    | 11             | 15   |
|          | % | 41.7             | 41.2 | 87.3           | 84.7  | 11.1                | 0.0  | 34.4           | 45.5 |
|          |   | CHI SQ = 0.001   |      | CHI SQ = 0.166 |       | CHI SQ = 1.739      |      | CHI SQ = 0.831 |      |
|          |   | DF = 1           |      | DF = 1         |       | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.979        |      | P = 0.684      |       | P = 0.187           |      | P = 0.362      |      |

Table 2C-4 (continued)

SOMEONE IN HOUSEHOLD EMPLOYED FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|          |   | Greene/Humphreys |      | St. Clair      |      | Maricopa            |      | Mingo          |      |
|----------|---|------------------|------|----------------|------|---------------------|------|----------------|------|
|          |   | HS               | NHS  | HS             | NHS  | HS                  | NHS  | HS             | NHS  |
| Sample A | N | 43               | 31   | 25             | 17   | 40                  | 16   | 18             | 18   |
|          | n | 25               | 12   | 5              | 6    | 27                  | 9    | 9              | 9    |
|          | % | 58.1             | 38.7 | 20.0           | 35.3 | 67.5                | 56.3 | 50.0           | 50.0 |
|          |   | CHI SQ = 2.720   |      | CHI SQ = 1.224 |      | CHI SQ = 0.630      |      | CHI SQ = 4.000 |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.099        |      | P = 0.268      |      | P = 0.427           |      | P = 1.000      |      |
| Sample B | N | 34               | 22   | 12             | 29   | 10                  | 1    | 17             | 14   |
|          | n | 23               | 16   | 3              | 7    | 8                   | 0    | 6              | 5    |
|          | % | 67.6             | 72.7 | 25.0           | 24.1 | 80.0                | 0.0  | 35.3           | 35.7 |
|          |   | CHI SQ = 0.163   |      | CHI SQ = 0.003 |      | FISHER'S EXACT TEST |      | CHI SQ = 0.001 |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.686        |      | P = 0.953      |      | P = 0.273           |      | P = 0.981      |      |
| Sample C | N | 50               | 48   | 71             | 40   | 56                  | 44   | 84             | 77   |
|          | n | 35               | 21   | 19             | 15   | 46                  | 36   | 28             | 38   |
|          | % | 70.0             | 43.8 | 26.8           | 37.5 | 82.1                | 81.8 | 33.3           | 49.4 |
|          |   | CHI SQ = 6.891   |      | CHI SQ = 1.389 |      | CHI SQ = 0.002      |      | CHI SQ = 4.261 |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.009        |      | P = 0.239      |      | P = 0.966           |      | P = 0.039      |      |
| Sample D | N | 9                | 12   | 36             | 34   | 22                  | 17   | 22             | 15   |
|          | n | 5                | 7    | 4              | 3    | 15                  | 11   | 13             | 3    |
|          | % | 55.6             | 58.3 | 11.1           | 8.8  | 68.2                | 64.7 | 59.1           | 20.0 |
|          |   | CHI SQ = 0.016   |      | CHI SQ = 0.102 |      | CHI SQ = 0.052      |      | CHI SQ = 5.553 |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.899        |      | P = 0.750      |      | P = 0.819           |      | P = 0.018      |      |
| Sample E | N | 12               | 17   | 63             | 60   | 9                   | 15   | 33             | 33   |
|          | n | 9                | 12   | 22             | 19   | 6                   | 10   | 6              | 12   |
|          | % | 75.0             | 70.6 | 34.9           | 31.7 | 66.7                | 66.7 | 18.2           | 36.4 |
|          |   | CHI SQ = 0.069   |      | CHI SQ = 0.146 |      | CHI SQ = 0.000      |      | CHI SQ = 2.750 |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |      | DF = 1         |      |
|          |   | P = 0.793        |      | P = 0.702      |      | P = 1.000           |      | P = 0.097      |      |

Table 2C-4 (continued)

HOUSEHOLDS RECEIVING UNEMPLOYMENT BENEFITS FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|          |   | Greene/Humphreys    |      | St. Clair      |     | Maricopa       |      | Mingo          |      |
|----------|---|---------------------|------|----------------|-----|----------------|------|----------------|------|
|          |   | HS                  | NHS  | HS             | NHS | HS             | NHS  | HS             | NHS  |
| Sample A | N | 43                  | 30   | 25             | 17  | 40             | 15   | 18             | 18   |
|          | n | 0                   | 4    | 1              | 0   | 3              | 0    | 0              | 1    |
|          | % | 0.0                 | 13.3 | 4.0            | 0.0 | 7.5            | 0.0  | 0.0            | 5.6  |
|          |   | CHI SQ = 6.066      |      | CHI SQ = 0.697 |     | CHI SQ = 1.190 |      | CHI SQ = 1.029 |      |
|          |   | DF = 1              |      | DF = 1         |     | DF = 1         |      | DF = 1         |      |
|          |   | P = 0.014           |      | P = 0.404      |     | P = 0.275      |      | P = 0.310      |      |
| Sample B | N | 33                  | 22   | 12             | 28  | 10             | 1    | 17             | 14   |
|          | n | 0                   | 3    | 0              | 2   | 0              | 0    | 0              | 0    |
|          | % | 0.0                 | 13.6 | 0.0            | 7.1 | 0.0            | 0.0  | 0.0            | 0.0  |
|          |   | CHI SQ = 4.760      |      | CHI SQ = 0.902 |     |                |      |                |      |
|          |   | DF = 1              |      | DF = 1         |     |                |      |                |      |
|          |   | P = 0.029           |      | P = 0.342      |     |                |      |                |      |
| Sample C | N | 50                  | 48   | 70             | 39  | 54             | 43   | 82             | 76   |
|          | n | 4                   | 1    | 3              | 2   | 0              | 0    | 5              | 10   |
|          | % | 8.0                 | 2.1  | 4.3            | 5.1 | 0.0            | 0.0  | 6.1            | 13.2 |
|          |   | CHI SQ = 1.771      |      | CHI SQ = 0.041 |     |                |      | CHI SQ = 2.288 |      |
|          |   | DF = 1              |      | DF = 1         |     |                |      | DF = 1         |      |
|          |   | P = 0.183           |      | P = 0.840      |     |                |      | P = 0.130      |      |
| Sample D | N | 8                   | 12   | 36             | 34  | 22             | 17   | 22             | 14   |
|          | n | 1                   | 1    | 0              | 0   | 1              | 2    | 0              | 1    |
|          | % | 12.5                | 8.3  | 0.0            | 0.0 | 4.5            | 11.8 | 0.0            | 7.1  |
|          |   | FISHER'S EXACT TEST |      |                |     | CHI SQ = 0.704 |      | CHI SQ = 1.616 |      |
|          |   | DF = 1              |      |                |     | DF = 1         |      | DF = 1         |      |
|          |   | P = 0.653           |      |                |     | P = 0.401      |      | P = 0.204      |      |
| Sample E | N | 12                  | 17   | 62             | 60  | 9              | 15   | 33             | 33   |
|          | n | 0                   | 0    | 4              | 3   | 1              | 0    | 3              | 1    |
|          | % | 0.0                 | 0.0  | 6.5            | 5.0 | 11.1           | 0.0  | 9.1            | 3.0  |
|          |   |                     |      | CHI SQ = 0.119 |     | CHI SQ = 1.739 |      | CHI SQ = 1.065 |      |
|          |   |                     |      | DF = 1         |     | DF = 1         |      | DF = 1         |      |
|          |   |                     |      | P = 0.730      |     | P = 0.187      |      | P = 0.302      |      |

Table 2C-4 (continued)

HOUSEHOLDS RECEIVING WELFARE BENEFITS FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|          |   | Greene/Humphreys |      | St. Clair      |      | Maricopa            |       | Mingo           |      |
|----------|---|------------------|------|----------------|------|---------------------|-------|-----------------|------|
|          |   | HS               | NHS  | HS             | NHS  | HS                  | NHS   | HS              | NHS  |
| Sample A | N | 43               | 31   | 25             | 17   | 40                  | 16    | 18              | 18   |
|          | n | 22               | 16   | 19             | 16   | 12                  | 7     | 10              | 7    |
|          | % | 51.2             | 51.6 | 76.0           | 94.1 | 30.0                | 43.8  | 55.6            | 38.9 |
|          |   | CHI SQ = 0.001   |      | CHI SQ = 2.392 |      | CHI SQ = 0.964      |       | CHI SQ = 1.003  |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |       | DF = 1          |      |
|          |   | P = 0.969        |      | P = 0.122      |      | P = 0.326           |       | P = 0.317       |      |
| Sample B | N | 34               | 22   | 12             | 29   | 10                  | 1     | 17              | 14   |
|          | n | 14               | 8    | 9              | 26   | 3                   | 1     | 10              | 11   |
|          | % | 41.2             | 36.4 | 75.0           | 89.7 | 30.0                | 100.0 | 58.8            | 78.6 |
|          |   | CHI SQ = 0.130   |      | CHI SQ = 1.459 |      | FISHER'S EXACT TEST |       | CHI SQ = 1.370  |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |       | DF = 1          |      |
|          |   | P = 0.719        |      | P = 0.227      |      | P = 0.364           |       | P = 0.242       |      |
| Sample C | N | 50               | 48   | 71             | 40   | 56                  | 44    | 84              | 77   |
|          | n | 12               | 21   | 54             | 29   | 16                  | 8     | 51              | 22   |
|          | % | 24.0             | 43.8 | 76.1           | 72.5 | 28.6                | 18.2  | 60.7            | 28.6 |
|          |   | CHI SQ = 4.277   |      | CHI SQ = 0.172 |      | CHI SQ = 1.458      |       | CHI SQ = 16.748 |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |       | DF = 1          |      |
|          |   | P = 0.039        |      | P = 0.679      |      | P = 0.227           |       | P = 0.000       |      |
| Sample D | N | 9                | 12   | 36             | 34   | 22                  | 17    | 22              | 15   |
|          | n | 4                | 6    | 34             | 32   | 6                   | 4     | 8               | 6    |
|          | % | 44.4             | 50.0 | 94.4           | 94.1 | 27.3                | 23.5  | 36.4            | 40.0 |
|          |   | CHI SQ = 0.064   |      | CHI SQ = 0.003 |      | CHI SQ = 0.070      |       | CHI SQ = 0.050  |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |       | DF = 1          |      |
|          |   | P = 0.801        |      | P = 0.953      |      | P = 0.791           |       | P = 0.823       |      |
| Sample E | N | 12               | 17   | 63             | 60   | 9                   | 15    | 33              | 33   |
|          | n | 6                | 9    | 46             | 45   | 1                   | 5     | 19              | 20   |
|          | % | 50.0             | 52.9 | 73.0           | 75.0 | 11.1                | 33.3  | 57.6            | 60.6 |
|          |   | CHI SQ = 0.024   |      | CHI SQ = 0.063 |      | CHI SQ = 1.481      |       | CHI SQ = 0.063  |      |
|          |   | DF = 1           |      | DF = 1         |      | DF = 1              |       | DF = 1          |      |
|          |   | P = 0.876        |      | P = 0.802      |      | P = 0.223           |       | P = 0.802       |      |

Table 2C-4 (continued)

BIRTH ORDER OF TARGET CHILD FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|             |   | Greene/Humphreys |      | St. Clair      |      | Maricopa       |       | Mingo          |      |
|-------------|---|------------------|------|----------------|------|----------------|-------|----------------|------|
|             |   | HS               | NHS  | HS             | NHS  | HS             | NHS   | HS             | NHS  |
| Sample A    | N | 41               | 30   | 25             | 17   | 40             | 16    | 17             | 17   |
| First Born  | n | 12               | 13   | 7              | 8    | 13             | 6     | 6              | 7    |
|             | % | 29.3             | 43.3 | 28.0           | 47.1 | 32.5           | 37.5  | 35.3           | 41.2 |
| Second Born | n | 12               | 6    | 10             | 5    | 8              | 4     | 2              | 4    |
|             | % | 29.3             | 20.0 | 40.0           | 29.4 | 20.0           | 25.0  | 11.8           | 23.5 |
| Third Born  | n | 9                | 6    | 4              | 0    | 6              | 4     | 3              | 3    |
|             | % | 22.0             | 20.0 | 16.0           | 0.0  | 15.0           | 25.0  | 17.6           | 17.6 |
| Fourth Born | n | 6                | 3    | 2              | 1    | 5              | 1     | 3              | 2    |
|             | % | 14.6             | 10.0 | 8.0            | 5.9  | 12.5           | 6.3   | 17.6           | 11.8 |
| Over Fourth | n | 2                | 2    | 2              | 3    | 7              | 1     | 3              | 1    |
|             | % | 4.9              | 6.7  | 8.0            | 17.6 | 20.0           | 6.3   | 17.6           | 5.9  |
|             |   | CHI SQ = 1.983   |      | CHI SQ = 4.921 |      | CHI SQ = 2.619 |       | CHI SQ = 1.944 |      |
|             |   | DF = 4           |      | DF = 4         |      | DF = 4         |       | DF = 4         |      |
|             |   | P = 0.739        |      | P = 0.296      |      | P = 0.624      |       | P = 0.746      |      |
| Sample B    | N | 34               | 22   | 12             | 29   | 10             | 1     | 17             | 14   |
| First Born  | n | 12               | 6    | 5              | 14   | 4              | 1     | 7              | 5    |
|             | % | 35.3             | 27.3 | 41.7           | 48.3 | 40.0           | 100.0 | 41.2           | 35.7 |
| Second Born | n | 11               | 5    | 5              | 7    | 2              | 0     | 7              | 2    |
|             | % | 32.4             | 22.7 | 41.7           | 24.1 | 20.0           | 0.0   | 41.2           | 14.3 |
| Third Born  | n | 5                | 3    | 1              | 1    | 1              | 0     | 1              | 2    |
|             | % | 14.7             | 13.6 | 8.3            | 3.4  | 10.0           | 0.0   | 5.9            | 14.3 |
| Fourth Born | n | 2                | 3    | 0              | 2    | 3              | 0     | 1              | 2    |
|             | % | 5.9              | 13.6 | 0.0            | 6.9  | 30.0           | 0.0   | 5.9            | 14.3 |
| Over Fourth | n | 4                | 5    | 1              | 5    | 0              | 0     | 1              | 3    |
|             | % | 11.8             | 22.7 | 8.3            | 17.2 | 0.0            | 0.0   | 5.9            | 21.4 |
|             |   | CHI SQ = 2.610   |      | CHI SQ = 2.674 |      | CHI SQ = 1.320 |       | CHI SQ = 4.530 |      |
|             |   | DF = 4           |      | DF = 4         |      | DF = 3         |       | DF = 4         |      |
|             |   | P = 0.625        |      | P = 0.614      |      | P = 0.724      |       | P = 0.339      |      |



Table 2C-4 (continued)

BIRTH ORDER OF TARGET CHILD FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|             |   | Greene/Humphreys |      | St. Clair      |      | Maricopa       |      | Mingo          |      |
|-------------|---|------------------|------|----------------|------|----------------|------|----------------|------|
|             |   | HS               | NHS  | HS             | NHS  | HS             | NHS  | HS             | NHS  |
| Sample C    | N | 50               | 48   | 70             | 40   | 54             | 44   | 83             | 75   |
| First Born  | n | 18               | 17   | 21             | 18   | 15             | 15   | 26             | 26   |
|             | % | 36.0             | 35.4 | 30.0           | 45.0 | 29.6           | 34.1 | 31.3           | 34.7 |
| Second Born | n | 14               | 10   | 19             | 7    | 16             | 15   | 22             | 23   |
|             | % | 28.0             | 20.8 | 27.1           | 17.5 | 29.6           | 34.1 | 26.5           | 30.7 |
| Third Born  | n | 4                | 10   | 17             | 8    | 10             | 6    | 16             | 9    |
|             | % | 8.0              | 20.8 | 24.3           | 20.0 | 18.5           | 13.6 | 19.3           | 12.0 |
| Fourth Born | n | 3                | 2    | 6              | 3    | 4              | 5    | 7              | 9    |
|             | % | 6.0              | 4.2  | 8.6            | 7.5  | 7.4            | 11.4 | 8.4            | 12.0 |
| Over Fourth | n | 11               | 9    | 7              | 4    | 8              | 3    | 12             | 8    |
|             | % | 22.0             | 18.8 | 10.0           | 10.0 | 14.8           | 6.8  | 14.5           | 10.7 |
|             |   | CHI SQ = 3.627   |      | CHI SQ = 2.858 |      | CHI SQ = 2.453 |      | CHI SQ = 2.634 |      |
|             |   | DF = 4           |      | DF = 4         |      | DF = 4         |      | DF = 4         |      |
|             |   | P = 0.459        |      | P = 0.582      |      | P = 0.653      |      | P = 0.621      |      |
| Sample D    | N | 9                | 10   | 36             | 33   | 21             | 17   | 22             | 14   |
| First Born  | n | 5                | 2    | 12             | 7    | 2              | 3    | 9              | 4    |
|             | % | 55.6             | 20.0 | 33.3           | 21.2 | 9.5            | 17.6 | 40.9           | 28.6 |
| Second Born | n | 3                | 4    | 10             | 8    | 6              | 1    | 5              | 5    |
|             | % | 33.3             | 40.0 | 27.8           | 24.2 | 28.6           | 5.9  | 22.7           | 35.7 |
| Third Born  | n | 1                | 2    | 5              | 11   | 4              | 5    | 4              | 1    |
|             | % | 11.1             | 20.0 | 13.9           | 33.3 | 19.0           | 29.4 | 18.2           | 7.1  |
| Fourth Born | n | 0                | 0    | 5              | 3    | 5              | 3    | 2              | 1    |
|             | % | 0.0              | 0.0  | 13.9           | 9.1  | 23.8           | 17.6 | 9.1            | 7.1  |
| Over Fourth | n | 0                | 2    | 4              | 4    | 4              | 5    | 2              | 3    |
|             | % | 0.0              | 20.0 | 11.1           | 12.1 | 19.0           | 29.4 | 9.1            | 21.4 |
|             |   | CHI SQ = 3.720   |      | CHI SQ = 4.165 |      | CHI SQ = 4.118 |      | CHI SQ = 2.607 |      |
|             |   | DF = 3           |      | DF = 4         |      | DF = 4         |      | DF = 4         |      |
|             |   | P = 0.293        |      | P = 0.384      |      | P = 0.390      |      | P = 0.626      |      |

Table 2C-4 (continued)

BIRTH ORDER OF TARGET CHILD FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|             |   | Greene/Humphreys |      | St. Clair      |      | Maricopa       |      | Mingo          |      |
|-------------|---|------------------|------|----------------|------|----------------|------|----------------|------|
|             |   | HS               | NHS  | HS             | NHS  | HS             | NHS  | HS             | NHS  |
| Sample E    | N | 11               | 17   | 60             | 59   | 9              | 14   | 32             | 33   |
| First Born  | n | 4                | 5    | 22             | 26   | 4              | 3    | 10             | 18   |
|             | % | 36.4             | 29.4 | 36.7           | 44.1 | 44.4           | 21.4 | 31.3           | 54.5 |
| Second Born | n | 4                | 4    | 14             | 17   | 4              | 5    | 10             | 2    |
|             | % | 36.4             | 23.5 | 23.3           | 28.8 | 44.4           | 35.7 | 31.3           | 6.1  |
| Third Born  | n | 0                | 1    | 11             | 9    | 0              | 2    | 3              | 5    |
|             | % | 0.0              | 5.9  | 18.3           | 15.3 | 0.0            | 14.3 | 9.4            | 15.2 |
| Fourth Born | n | 0                | 4    | 6              | 2    | 1              | 3    | 4              | 3    |
|             | % | 0.0              | 23.5 | 10.0           | 3.4  | 11.1           | 21.4 | 12.5           | 9.1  |
| Over Fourth | n | 3                | 3    | 7              | 5    | 0              | 1    | 5              | 5    |
|             | % | 27.3             | 17.6 | 11.7           | 8.5  | 0.0            | 7.1  | 15.6           | 15.2 |
|             |   | CHI SQ = 4.010   |      | CHI SQ = 3.149 |      | CHI SQ = 3.324 |      | CHI SQ = 8.248 |      |
|             |   | DF = 4           |      | DF = 4         |      | DF = 4         |      | DF = 4         |      |
|             |   | P = 0.405        |      | P = 0.533      |      | P = 0.505      |      | P = 0.083      |      |

Table 2C-4 (continued)

ETHNICITY OF TARGET CHILD FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|          | N | Greene/Humphreys |      | St. Clair |       | Maricopa            |       | Mingo |       |
|----------|---|------------------|------|-----------|-------|---------------------|-------|-------|-------|
|          |   | HS               | NHS  | HS        | NHS   | HS                  | NHS   | HS    | NHS   |
| Sample A |   | 43               | 31   | 25        | 17    | 40                  | 16    | 18    | 18    |
| White    | n | 1                | 2    | 0         | 0     | 4                   | 2     | 18    | 18    |
|          | % | 2.3              | 6.5  | 0.0       | 0.0   | 10.0                | 12.5  | 100.0 | 100.0 |
| Black    | n | 42               | 29   | 25        | 17    | 1                   | 0     | 0     | 0     |
|          | % | 97.7             | 93.5 | 100.0     | 100.0 | 2.5                 | 0.0   | 0.0   | 0.0   |
| Hispanic | n | 0                | 0    | 0         | 0     | 34                  | 13    | 0     | 0     |
|          | % | 0.0              | 0.0  | 0.0       | 0.0   | 85.0                | 81.3  | 0.0   | 0.0   |
| Other    | n | 0                | 0    | 0         | 0     | 1                   | 1     | 0     | 0     |
|          | % | 0.0              | 0.0  | 0.0       | 0.0   | 2.5                 | 6.3   | 0.0   | 0.0   |
|          |   | CHI SQ = 0.788   |      |           |       | CHI SQ = 0.936      |       |       |       |
|          |   | DF = 1           |      |           |       | DF = 3              |       |       |       |
|          |   | P = 0.375        |      |           |       | P = 0.817           |       |       |       |
| Sample B |   | 34               | 22   | 12        | 29    | 10                  | 1     | 17    | 14    |
| White    | n | 4                | 8    | 0         | 0     | 1                   | 0     | 16    | 14    |
|          | % | 11.8             | 36.4 | 0.0       | 0.0   | 10.0                | 0.0   | 94.1  | 100.0 |
| Black    | n | 30               | 14   | 12        | 29    | 0                   | 0     | 1     | 0     |
|          | % | 88.2             | 63.6 | 100.0     | 100.0 | 0.0                 | 0.0   | 5.9   | 0.0   |
| Hispanic | n | 0                | 0    | 0         | 0     | 9                   | 1     | 0     | 0     |
|          | % | 0.0              | 0.0  | 0.0       | 0.0   | 90.0                | 100.0 | 0.0   | 0.0   |
|          |   | CHI SQ = 4.801   |      |           |       | FISHER'S EXACT TEST |       |       |       |
|          |   | DF = 1           |      |           |       | DF = 1              |       |       |       |
|          |   | P = 0.028        |      |           |       | P = 0.909           |       |       |       |
|          |   |                  |      |           |       | CHI SQ = 0.851      |       |       |       |
|          |   |                  |      |           |       | DF = 1              |       |       |       |
|          |   |                  |      |           |       | P = 0.356           |       |       |       |

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Table 2C-4 (continued)

ETHNICITY OF TARGET CHILD FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|          |   | Greene/Humphreys |      | St. Clair      |       | Maricopa       |      | Mingo          |       |
|----------|---|------------------|------|----------------|-------|----------------|------|----------------|-------|
|          |   | HS               | NHS  | HS             | NHS   | HS             | NHS  | HS             | NHS   |
| Sample C | N | 50               | 48   | 71             | 40    | 56             | 44   | 84             | 77    |
| White    | n | 18               | 12   | 0              | 0     | 23             | 9    | 73             | 76    |
|          | % | 36.0             | 25.0 | 0.0            | 0.0   | 41.1           | 20.5 | 86.9           | 98.7  |
| Black    | n | 32               | 36   | 67             | 39    | 4              | 2    | 10             | 1     |
|          | % | 64.0             | 75.0 | 94.4           | 97.5  | 7.1            | 4.5  | 11.9           | 1.3   |
| Hispanic | n | 0                | 0    | 0              | 1     | 22             | 30   | 0              | 0     |
|          | % | 0.0              | 0.0  | 0.0            | 2.5   | 39.3           | 68.2 | 0.0            | 0.0   |
| Other    | n | 0                | 0    | 4              | 0     | 7              | 3    | 1              | 0     |
|          | % | 0.0              | 0.0  | 5.6            | 0.0   | 12.5           | 6.8  | 1.2            | 0.0   |
|          |   | CHI SQ = 1.395   |      | CHI SQ = 4.055 |       | CHI SQ = 8.302 |      | CHI SQ = 8.135 |       |
|          |   | DF = 1           |      | DF = 2         |       | DF = 3         |      | DF = 2         |       |
|          |   | P = 0.238        |      | P = 0.132      |       | P = 0.040      |      | P = 0.017      |       |
| Sample D | N | 9                | 12   | 36             | 34    | 22             | 17   | 22             | 15    |
| White    | n | 1                | 3    | 0              | 0     | 6              | 6    | 22             | 15    |
|          | % | 11.1             | 25.0 | 0.0            | 0.0   | 27.3           | 35.3 | 100.0          | 100.0 |
| Black    | n | 8                | 9    | 36             | 34    | 0              | 1    | 0              | 0     |
|          | % | 88.9             | 75.0 | 100.0          | 100.0 | 0.0            | 5.9  | 0.0            | 0.0   |
| Hispanic | n | 0                | 0    | 0              | 0     | 16             | 9    | 0              | 0     |
|          | % | 0.0              | 0.0  | 0.0            | 0.0   | 72.7           | 52.9 | 0.0            | 0.0   |
| Other    | n | 0                | 0    | 0              | 0     | 0              | 1    | 0              | 0     |
|          | % | 0.0              | 0.0  | 0.0            | 0.0   | 0.0            | 5.9  | 0.0            | 0.0   |
|          |   | CHI SQ = 0.643   |      |                |       | CHI SQ = 3.374 |      |                |       |
|          |   | DF = 1           |      |                |       | DF = 3         |      |                |       |
|          |   | P = 0.422        |      |                |       | P = 0.337      |      |                |       |

Table 2C-4 (continued)

ETHNICITY OF TARGET CHILD FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|          |   | Greene/Humphreys |      | St. Clair      |      | Martins        |      | Wingo          |      |
|----------|---|------------------|------|----------------|------|----------------|------|----------------|------|
|          |   | HS               | NHS  | HS             | NHS  | HS             | NHS  | HS             | NHS  |
| Sample E | N | 12               | 17   | 63             | 60   | 9              | 15   | 33             | 33   |
| White    | n | 1                | 4    | 0              | 3    | 3              | 4    | 33             | 32   |
|          | % | 8.3              | 23.5 | 0.0            | 5.0  | 33.3           | 26.7 | 100.0          | 97.0 |
| Black    | n | 11               | 13   | 62             | 55   | 0              | 1    | 0              | 1    |
|          | % | 91.7             | 76.5 | 98.4           | 91.7 | 0.0            | 6.7  | 0.0            | 3.0  |
| Hispanic | n | 0                | 0    | 0              | 1    | 4              | 9    | 0              | 0    |
|          | % | 0.0              | 0.0  | 0.0            | 1.7  | 44.4           | 60.0 | 0.0            | 0.0  |
| Other    | n | 0                | 0    | 1              | 1    | 2              | 1    | 0              | 0    |
|          | % | 0.0              | 0.0  | 1.6            | 1.7  | 22.2           | 6.7  | 0.0            | 0.0  |
|          |   | CHI SQ = 1.138   |      | CHI SQ = 4.348 |      | CHI SQ = 2.026 |      | CHI SQ = 1.015 |      |
|          |   | DF = 1           |      | DF = 3         |      | DF = 3         |      | DF = 1         |      |
|          |   | P = 0.286        |      | P = 0.226      |      | P = 0.567      |      | P = 0.314      |      |

Table 2C-4 (continued)

PARTICIPATION IN FOOD ASSISTANCE PROGRAMS FOR HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|            |   | Greene/Humphreys |      | St. Clair      |      | Maricopa       |       | Mingo          |      |
|------------|---|------------------|------|----------------|------|----------------|-------|----------------|------|
|            |   | HS               | NHS  | HS             | NHS  | HS             | NHS   | HS             | NHS  |
| Sample A   | N | 43               | 31   | 25             | 17   | 40             | 16    | 18             | 18   |
| None       | n | 6                | 5    | 1              | 0    | 13             | 8     | 6              | 10   |
|            | % | 14.0             | 16.1 | 4.0            | 0.0  | 32.5           | 50.0  | 33.3           | 55.6 |
| Foodstamps | n | 10               | 7    | 10             | 8    | 18             | 5     | 5              | 2    |
|            | % | 23.3             | 22.6 | 40.0           | 47.1 | 45.0           | 31.3  | 27.8           | 11.1 |
| Wic        | n | 7                | 4    | 2              | 3    | 2              | 0     | 0              | 0    |
|            | % | 16.3             | 12.9 | 8.0            | 17.6 | 5.0            | 0.0   | 0.0            | 0.0  |
| Both       | n | 20               | 15   | 12             | 6    | 7              | 3     | 7              | 6    |
|            | % | 46.5             | 48.4 | 48.0           | 35.3 | 17.5           | 18.8  | 38.9           | 33.3 |
|            |   | CHI SQ = 0.212   |      | CHI SQ = 1.970 |      | CHI SQ = 2.269 |       | CHI SQ = 2.363 |      |
|            |   | DF = 3           |      | DF = 3         |      | DF = 3         |       | DF = 2         |      |
|            |   | P = 0.976        |      | P = 0.579      |      | P = 0.518      |       | P = 0.307      |      |
| Sample B   | N | 34               | 22   | 12             | 29   | 10             | 1     | 17             | 14   |
| None       | n | 10               | 6    | 2              | 4    | 4              | 0     | 4              | 1    |
|            | % | 29.4             | 27.3 | 16.7           | 13.8 | 40.0           | 0.0   | 23.5           | 7.1  |
| Foodstamps | n | 3                | 6    | 1              | 9    | 4              | 0     | 3              | 7    |
|            | % | 8.8              | 27.3 | 8.3            | 31.0 | 40.0           | 0.0   | 17.6           | 50.0 |
| Wic        | n | 6                | 5    | 1              | 1    | 0              | 0     | 2              | 1    |
|            | % | 17.6             | 22.7 | 8.3            | 3.4  | 0.0            | 0.0   | 11.8           | 7.1  |
| Both       | n | 15               | 5    | 8              | 15   | 2              | 1     | 8              | 5    |
|            | % | 44.1             | 22.7 | 66.7           | 51.7 | 20.0           | 100.0 | 47.1           | 35.7 |
|            |   | CHI SQ = 4.737   |      | CHI SQ = 2.594 |      | CHI SQ = 2.933 |       | CHI SQ = 4.174 |      |
|            |   | DF = 3           |      | DF = 3         |      | DF = 2         |       | DF = 3         |      |
|            |   | P = 0.192        |      | P = 0.458      |      | P = 0.231      |       | P = 0.243      |      |

Table 2C-4 (continued)

PARTICIPATION IN FOOD ASSISTANCE PROGRAMS FOR HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|          |            | Greene/Humphreys |        | St. Clair |        | Maricopa |        | Mingo   |        |
|----------|------------|------------------|--------|-----------|--------|----------|--------|---------|--------|
|          |            | HS               | NHS    | HS        | NHS    | HS       | NHS    | HS      | NHS    |
| Sample C | N          | 50               | 48     | 71        | 40     | 56       | 44     | 84      | 77     |
|          | None       | n = 9            | n = 5  | n = 3     | n = 10 | n = 25   | n = 23 | n = 34  | n = 41 |
|          | %          | 18.0             | 10.4   | 4.2       | 25.0   | 44.6     | 52.3   | 40.5    | 53.2   |
|          | Foodstamps | n = 11           | n = 10 | n = 11    | n = 13 | n = 20   | n = 18 | n = 24  | n = 20 |
|          | %          | 22.0             | 20.8   | 15.5      | 32.5   | 35.7     | 40.9   | 28.6    | 26.0   |
|          | Wic        | n = 8            | n = 9  | n = 14    | n = 1  | n = 1    | n = 1  | n = 5   | n = 4  |
|          | %          | 16.0             | 18.8   | 19.7      | 2.5    | 1.8      | 2.3    | 6.0     | 5.2    |
|          | Both       | n = 22           | n = 24 | n = 43    | n = 16 | n = 10   | n = 2  | n = 21  | n = 12 |
|          | %          | 44.0             | 50.0   | 60.6      | 40.0   | 17.9     | 4.5    | 25.0    | 15.6   |
|          | CHI SQ     | = 1.296          |        | = 20.500  |        | = 4.142  |        | = 3.284 |        |
|          | DF         | = 3              |        | = 3       |        | = 3      |        | = 3     |        |
|          | P          | = 0.730          |        | = 0.000   |        | = 0.247  |        | = 0.350 |        |
| Sample D | N          | 9                | 12     | 36        | 34     | 22       | 17     | 22      | 15     |
|          | None       | n = 2            | n = 3  | n = 3     | n = 3  | n = 11   | n = 6  | n = 11  | n = 7  |
|          | %          | 22.2             | 25.0   | 8.3       | 8.8    | 50.0     | 35.3   | 50.0    | 46.7   |
|          | Foodstamps | n = 2            | n = 3  | n = 10    | n = 17 | n = 8    | n = 8  | n = 6   | n = 4  |
|          | %          | 22.2             | 25.0   | 27.8      | 50.0   | 36.4     | 47.1   | 27.3    | 26.7   |
|          | Wic        | n = 2            | n = 1  | n = 2     | n = 1  | n = 1    | n = 2  | n = 0   | n = 2  |
|          | %          | 22.2             | 8.3    | 5.6       | 2.9    | 4.5      | 11.8   | 0.0     | 13.3   |
|          | Both       | n = 3            | n = 5  | n = 21    | n = 13 | n = 2    | n = 1  | n = 5   | n = 2  |
|          | %          | 33.3             | 41.7   | 58.3      | 38.2   | 9.1      | 5.9    | 22.7    | 13.3   |
|          | CHI SQ     | = 0.822          |        | = 3.977   |        | = 1.521  |        | = 3.371 |        |
|          | DF         | = 3              |        | = 3       |        | = 3      |        | = 3     |        |
|          | P          | = 0.844          |        | = 0.264   |        | = 0.677  |        | = 0.338 |        |

Table 2C-4 (continued)

PARTICIPATION IN FOOD ASSISTANCE PROGRAMS FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLES BY SITE

|          |            | Greene/Humphreys |       | St. Clair      |        | Maricopa       |       | Mingo          |        |
|----------|------------|------------------|-------|----------------|--------|----------------|-------|----------------|--------|
|          |            | HS               | NHS   | HS             | NHS    | HS             | NHS   | HS             | NHS    |
| Sample E | N          | 12               | 17    | 63             | 60     | 9              | 15    | 33             | 33     |
|          | None       | n = 3            | n = 3 | n = 13         | n = 17 | n = 3          | n = 5 | n = 10         | n = 14 |
|          | %          | 25.0             | 17.6  | 20.6           | 28.3   | 33.3           | 33.3  | 30.3           | 42.4   |
|          | Foodstamps | n = 4            | n = 7 | n = 19         | n = 8  | n = 3          | n = 7 | n = 11         | n = 10 |
|          | %          | 33.3             | 41.2  | 30.2           | 13.3   | 33.3           | 46.7  | 33.3           | 30.3   |
|          | Wic        | n = 1            | n = 3 | n = 8          | n = 6  | n = 0          | n = 2 | n = 1          | n = 2  |
|          | %          | 8.3              | 17.6  | 12.7           | 10.0   | 0.0            | 13.3  | 3.0            | 6.1    |
|          | Both       | n = 4            | n = 4 | n = 23         | n = 29 | n = 3          | n = 1 | n = 11         | n = 7  |
|          | %          | 33.3             | 23.5  | 36.5           | 48.3   | 33.3           | 6.7   | 33.3           | 21.2   |
|          |            | CHI SQ = 0.985   |       | CHI SQ = 5.923 |        | CHI SQ = 3.840 |       | CHI SQ = 1.937 |        |
|          |            | DF = 3           |       | DF = 3         |        | DF = 3         |       | DF = 3         |        |
|          |            | P = 0.805        |       | P = 0.115      |        | P = 0.279      |       | P = 0.586      |        |

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Table 2C-5

Health Status Comparison of  
Longitudinal and Pretest Attrition Sample

|   |   | Sample A<br>(n=208) | Sample D<br>(n=167) | Chi-Squared<br>Significance |
|---|---|---------------------|---------------------|-----------------------------|
| <b>Number of problems per child<br/>from medical examination<br/>(excluding pica)</b> |   |                     |                     |                             |
| 0   | n | 93/208              | 84/167              |                             |
|   | % | 44.7                | 50.3                |                             |
| 1   | n | 74/208              | 54/167              |                             |
|   | % | 35.6                | 32.3                |                             |
| 2   | n | 32/208              | 20/167              |                             |
|   | % | 15.4                | 12.0                |                             |
| 3   | n | 5/208               | 6/167               |                             |
|   | % | 2.4                 | 3.6                 |                             |
| 4   | n | 3/208               | 3/167               |                             |
|   | % | 1.4                 | 1.8                 |                             |
| 6   | n | 1/208               |                     |                             |
|   | % | 0.5                 |                     | 0.70                        |
| <b>Severity of<br/>Medical Problems</b>   |   |                     |                     |                             |
| Mild  | n | 108/158             | 77/114              |                             |
|   | % | 68.4                | 67.5                |                             |
| Moderate  | n | 49/158              | 33/114              |                             |
|   | % | 31.0                | 28.9                |                             |
| Severe  | n | 1/158               | 4/114               |                             |
|   | % | 0.6                 | 3.5                 | 0.21                        |
| Mean  |   | 1.65                | 1.72                |                             |
| St. Dev.  |   | 0.96                | 1.10                |                             |
|   | n | 158                 | 114                 |                             |

Table 2C-5 (continued)

Health Status Comparison of  
Longitudinal and Pretest Attrition Sample

|                                  |        | Sample A<br>(n=208) | Sample D<br>(n=167) | Chi-Squared<br>Significance |
|----------------------------------|--------|---------------------|---------------------|-----------------------------|
| <b>Specific Medical Problems</b> |        |                     |                     |                             |
| Recurrent Otitis Media           | n<br>% | 9/208<br>4.3        | 10/167<br>6.0       | 0.62                        |
| Serous Otitis Media              | n<br>% | 23/208<br>11.1      | 11/167<br>6.6       | 0.19                        |
| Acute Otitis Media               | n<br>% | 3/208<br>1.4        | 2/167<br>1.2        | 1.00                        |
| Urinary Tract Infection          | n<br>% | 7/208<br>3.4        |                     | 0.04                        |
| Asthma                           | n<br>% | 12/208<br>5.8       | 10/167<br>6.0       | 1.00                        |
| Eczema                           | n<br>% | 4/208<br>1.9        | 2/167<br>1.2        | 0.89                        |
| Congenital Cardiac               | n<br>% | 5/208<br>2.4        | 4/167<br>2.4        | 1.00                        |
| Rheumatic Fever                  | n<br>% |                     |                     |                             |
| Hypertension                     | n<br>% | 2/208<br>1.0        | 1/167<br>0.6        | 1.00                        |
| Any Cardiovascular               | n<br>% | 7/208<br>3.4        | 5/167<br>3.0        | 1.00                        |
| Seizures                         | n<br>% | 4/208<br>1.9        | 5/167<br>3.0        | 0.74                        |
| Secondary to Head Trauma         | n<br>% | 1/208<br>0.5        |                     |                             |
| Febrile Seizures                 | n<br>% | 1/208<br>0.5        |                     |                             |
| Neurologic                       | n<br>% | 6/208<br>2.9        | 5/167<br>3.0        | 1.00                        |

Table 2C-5 (continued)

Health Status Comparison of  
Longitudinal and Pretest Attrition Sample

| Specific Medical Problems   |        | Sample A<br>(n=208) | Sample D<br>(n=167) | Chi-Squared<br>Significance |
|-----------------------------|--------|---------------------|---------------------|-----------------------------|
| Inguinal Hernias<br>Media   | n<br>% | 3/208<br>1.4        |                     |                             |
| Undescended Testes<br>Media | n<br>% | 3/208<br>1.4        |                     |                             |
| Umbilical Hernia            | n<br>% | 3/208<br>1.4        | 3/167<br>1.8        | 1.00                        |
| Femoral Hernia              | n<br>% |                     | 1/167<br>0.6        |                             |
| Surgical                    | n<br>% | 9/208<br>4.3        | 4/167<br>2.4        | 0.46                        |
| Not toilet trained          | n<br>% | 6/208<br>2.9        | 2/167<br>1.2        | 0.44                        |
| Enuresis                    | n<br>% | 4/208<br>1.9        | 4/167<br>6.8        | 0.74                        |
| Toilet Problems             | n<br>% | 10/208<br>4.8       | 7/167<br>4.2        | 0.97                        |
| Underweight                 | n<br>% | 1/208<br>0.5        |                     | 1.00                        |
| Obesity                     | n<br>% | 7/208<br>3.4        | 2/167<br>1.2        | 0.31                        |
| Nutritional Problems        | n<br>% | 8/208<br>3.8        | 2/167<br>1.2        | 0.21                        |
| Breath Holding              | n<br>% | 3/208<br>1.4        |                     |                             |
| Self-Induced<br>Vomiting    | n<br>% |                     | 1/167<br>0.6        |                             |

Table 2C-5 (continued)

Health Status Comparison of  
Longitudinal and Pretest Attrition Sample

|   |   | Sample A<br>(n=208) | Sample D<br>(n=167) | Chi-Squared<br>Significance |
|---|---|---------------------|---------------------|-----------------------------|
| <b>Specific Medical Problems</b>                  |   |                     |                     |                             |
| Undifferentiated                                  | n | 2/208               | 2/167               | 1.00                        |
|   | X | 1.0                 | 1.2                 |                             |
| Hyperactive                                       | n | 2/208               | 1/167               | 1.00                        |
|   | X | 1.0                 | 0.6                 |                             |
| Depressed Mother                                  | n | 1/208               | 1/167               | 1.00                        |
|   | X | 0.5                 | 0.6                 |                             |
| Psychosocial                                      | n | 7/208               | 5/167               | 1.00                        |
|   | X | 3.4                 | 3.0                 |                             |
| Sickle Cell Anemia                                | n | 2/208               |                     |                             |
|   | X | 1.0                 |                     |                             |
| Congenital Anomalies                              | n | 1/208               |                     |                             |
|   | X | 0.5                 |                     |                             |
| Allergies   | n | 19/208              | 10/167              | 0.35                        |
|   | X | 9.1                 | 6.0                 |                             |
| Dermatologic                                      | n | 9/208               | 9/167               | 0.81                        |
|   | X | 4.3                 | 5.4                 |                             |
| Chronic   | n | 13/208              | 9/167               | 0.90                        |
|   | X | 6.3                 | 5.4                 |                             |
| <b>Total Number of Summary Problems Per Child</b> |   |                     |                     |                             |
| 0   | n | 113/208             | 102/167             |                             |
|   | X | 54.3                | 61.1                |                             |
| 1   | n | 42/208              | 32/167              |                             |
|   | X | 20.2                | 19.2                |                             |
| 2   | n | 26/208              | 17/167              |                             |
|   | X | 12.5                | 10.2                |                             |
| 3   | n | 17/208              | 12/167              |                             |
|   | X | 8.2                 | 7.2                 |                             |
| 4   | n | 4/208               | 1/167               |                             |
|   | X | 1.9                 | 0.6                 |                             |
| 5   | n | 1/208               | 1/167               |                             |
|   | X | 0.5                 | 0.6                 |                             |
| 6   | n | 4/208               | 1/167               |                             |
|   | X | 1.9                 | 0.6                 |                             |
| 7   | n | 1/208               |                     | 0.71                        |
|   | X | 0.5                 |                     |                             |
| Total Number of Summary Problems                  | n | 187/208             | 107/167             |                             |
|   | X | 89.9                | 64.1                |                             |

Table 2C-5 (continued)

Health Status Comparison of  
Longitudinal and Pretest Attrition Sample

|   |          | Sample A<br>(n=208) | Sample D<br>(n=168) | Chi-Squared<br>Significance |
|---|----------|---------------------|---------------------|-----------------------------|
| Physical Examination Referrals for Urgent Problems                    | n        | 7/206               | 6/167               | 1.00                        |
|   | X        | 3.4                 | 3.6                 |                             |
| Vision Referrals-<br>Number of Problems<br>Per Child                  | 0        | n 175/208<br>X 84.1 | 139/168<br>82.7     | 0.75                        |
|   | 1        | n 20/208<br>X 9.6   | 19/168<br>11.3      |                             |
|   | 2        | n 8/208<br>X 3.8    | 8/168<br>4.8        |                             |
|   | 3        | n 5/208<br>X 2.4    | 2/168<br>1.2        |                             |
| Total Number of<br>Vision Referrals                                   | n        | 51/208              | 41/168              | 0.79                        |
|   | X        | 24.5                | 24.4                |                             |
| Total Number of<br>Speech Referrals                                   | n        | 57/208              | 49/168              | 0.79                        |
|   | X        | 27.4                | 29.2                |                             |
| Dental Referrals-<br>Number of Urgent<br>Problems per Child           | 0        | n 176/208<br>X 84.6 | 136/168<br>81.0     |                             |
|   | 1        | n 24/208<br>X 11.5  | 19/168<br>11.3      |                             |
|   | 2        | n 2/208<br>X 1.0    | 8/168<br>4.8        |                             |
|   | 3        | n 6/208<br>X 2.9    | 5/168<br>3.0        | 0.16                        |
| Total Number of<br>Dental Referrals<br>For Urgent Problems            | n        | 46/208              | 50/168              |                             |
|   | X        | 22.1                | 29.8                |                             |
| Hearing Examination-<br>Failed 500, 1000, or<br>2000 HZ in Either Ear | n        | 54/208              | 42/168              | 0.93                        |
|   | X        | 26.0                | 25.0                |                             |
| McCarthy Motor<br>Scale Percentile                                    | Mean     | 26.42               | 19.07               |                             |
|   | St. Dev. | 25.84               | 22.58               |                             |
|   | n        | 203                 | 165                 |                             |
| McCarthy<br>Refusals  | Mean     | 6.49                | 7.24                |                             |
|   | St. Dev. | 14.13               | 14.53               |                             |
|   | n        | 208                 | 168                 |                             |
| Height Percentile   | Mean     | 45.61               | 42.94               |                             |
|   | St. Dev. | 24.44               | 26.71               |                             |
|   | n        | 191                 | 154                 |                             |
| Weight Percentile   | Mean     | 51.62               | 48.26               |                             |
|   | St. Dev. | 24.94               | 25.40               |                             |
|   | n        | 190                 | 154                 |                             |

Table 2C-6

Health Status Comparison of  
Longitudinal and Augmentation Sample

|   |   | Sample A<br>(n=208) | Sample C<br>(n=470) | Chi-Squared<br>Significance |
|---|---|---------------------|---------------------|-----------------------------|
| <b>Number of problems per child<br/>from medical examination<br/>(excluding pica)</b> |   |                     |                     |                             |
| 0   | n | 113/208             | 273/470             |                             |
|   | % | 54.3                | 58.1                |                             |
| 1   | n | 65/208              | 131/470             |                             |
|   | % | 31.3                | 27.9                |                             |
| 2   | n | 21/208              | 44/470              |                             |
|   | % | 10.1                | 9.4                 |                             |
| 3   | n | 8/208               | 18/470              |                             |
|   | % | 3.8                 | 3.8                 |                             |
| 4   | n | 1/208               | 4/470               |                             |
|   | % | 0.5                 | 0.9                 |                             |
|   |   |                     |                     | 0.7                         |
| <b>Severity of<br/>Medical Problems</b>   |   |                     |                     |                             |
| Mild  | n | 52/101              | 83/191              |                             |
|   | % | 51.5                | 43.5                |                             |
| Moderate  | n | 48/101              | 103/191             |                             |
|   | % | 47.5                | 53.9                |                             |
| Severe  | n | 1/101               | 5/191               |                             |
|   | % | 1.0                 | 2.6                 | 0.4                         |
| Mean  |   | 1.99                | 2.18                |                             |
| St. Dev.  |   | 1.04                | 1.09                |                             |
|   | n | 101                 | 191                 |                             |

Table 2C-6 (continued)  
 Health Status Comparison of  
 Longitudinal and Augmentation Sample

|   |   | Sample A<br>(n=208) | Sample C<br>(n=470) | Chi-Squared<br>Significance |
|---|---|---------------------|---------------------|-----------------------------|
| <b>Total Number of Summary Problems Per Child</b> |   |                     |                     |                             |
| 0   | n | 125/207             | 310/468             |                             |
|   | % | 60.4                | 66.2                |                             |
| 1   | n | 25/207              | 77/468              |                             |
|   | % | 12.1                | 16.5                |                             |
| 2   | n | 29/207              | 44/468              |                             |
|   | % | 14.0                | 9.4                 |                             |
| 3   | n | 20/207              | 26/468              |                             |
|   | % | 9.7                 | 5.6                 |                             |
| 4   | n | 3/207               | 8/468               |                             |
|   | % | 1.4                 | 1.7                 |                             |
| 5   | n | 4/207               | 2/468               |                             |
|   | % | 1.9                 | 0.4                 |                             |
| 6   | n | 1/207               | 1/468               |                             |
|   | % | 0.5                 | 0.2                 |                             |
| 7   | n | 1/208               |                     | 0.70                        |
|   | % | 0.5                 |                     |                             |
| <b>Total Number of Summary Problems</b>           |   | n                   | 181/207             | 291/468                     |
|   |   | %                   | 87.4                | 62.2                        |
| <b>Percentile Ranks for McCarthy Index</b>        |   | Mean                | 35.82               | 37.10                       |
|   |   | St. Dev.            | 27.44               | 28.65                       |
|   |   | n                   | 208                 | 470                         |
| <b>Height Percentile</b>                          |   | Mean                | 43.31               | 46.93                       |
|   |   | St. Dev.            | 24.39               | 24.94                       |
|   |   | n                   | 206                 | 456                         |
| <b>Weight Percentile</b>                          |   | Mean                | 47.18               | 50.22                       |
|   |   | St. Dev.            | 25.59               | 25.34                       |
|   |   | n                   | 205                 | 463                         |
| <b>Total Developmental Refusals</b>               |   | Mean                | 1.57                | 2.11                        |
|   |   | St. Dev.            | 4.14                | 5.25                        |
|   |   | n                   | 208                 | 470                         |

Table 2C-6 (continued)  
 Health Status Comparison of  
 Longitudinal and Augmentation Sample

|   |        | Sample A<br>(n=208) | Sample C<br>(n=470) | Chi-Squared<br>Significance |
|---|--------|---------------------|---------------------|-----------------------------|
| Physical Examination<br>Referrals for Urgent<br>Problems              | n<br>% | 4/207<br>1.9        | 13/468<br>2.8       | 0.79                        |
| Vision Referrals-<br>Number of Problems<br>Per Child                  | 0      | n 153/208<br>%      | 341/470<br>72.6     |                             |
|   | 1      | n 30/208<br>%       | 68/470<br>14.5      |                             |
|   | 2      | n 24/208<br>%       | 54/470<br>11.5      |                             |
|   | 3      | n 1/208<br>%        | 7/470<br>1.5        | 0.28                        |
| Total Number of<br>Vision Referrals                                   | n<br>% | 81/208<br>38.9      | 191/470<br>40.6     |                             |
| Total Number of<br>Speech Referrals                                   | n<br>% | 67/208<br>32.2      | 128/470<br>27.2     | 0.40                        |
| Dental Referrals-<br>Number of Urgent<br>Problems per Child           | 0      | n 183/208<br>%      | 401/470<br>85.3     |                             |
|   | 1      | n 17/208<br>%       | 41/470<br>8.7       |                             |
|   | 2      | n 5/208<br>%        | 16/470<br>3.4       |                             |
|   | 3      | n 3/208<br>%        | 11/470<br>3.4       | 0.82                        |
| Total Number of<br>Dental Referrals<br>For Urgent Problems            | n<br>% | 36/208<br>17.3      | 116/470<br>24.7     |                             |
| Hearing Examination-<br>Failed 500, 1000, or<br>2000 HZ in Either Ear | n<br>% | 21/208<br>10.1      | 55/470<br>11.7      | 0.31                        |



**CHAPTER THREE**

**APPENDIX TABLES**

Table 3-1

Listing of Children Referred for Urgent Medical Needs  
Based on the Pretest for Samples A and D<sup>a, b</sup>

| Head Start, Sample A |   |
|----------------------|---|
| ID Number            | Health Problem                                  |
| 421033               | DENTAL  |
| 421034               | DENTAL  |
| 421046               | EARS - HIGH PEP                                 |
| 421035               | DENTAL  |
| 421036               | HIGH PEP  |
| 421036               | DENTAL  |
| 421076               | DENTAL  |
| 421088               | EARS  |
| 421132               | HIGH PEP  |
| 421114               | SUBCONJUNCTIVAL HEMORRHAGE                      |
| 421174               | DENTAL  |
| 421239               | HEART MURMUR                                    |
| 321092               | PICA-NO LEAD TEST                               |
| 321104               | PICA-NO LEAD TEST                               |
| 321110               | EARS  |
| 321118               | PICA-NO LEAD TEST                               |
| 321148               | ALLERGY-POLLENOSIS - PICA-NO LEAD TEST          |
| 321194               | PICA  |
| 621101               | HEART MURMUR                                    |
| 621103               | BREATH HOLDING - HEART MURMUR - LYMPHADENOPATHY |
| 721032               | INGUINAL HERNIA                                 |
| 721074               | DENTAL  |
| 721094               | DENTAL  |
| 721178               | VISION  |
| 721289               | DENTAL  |

| Head Start, Sample D |  |
|----------------------|--|
| ID Number            | Health Problem                         |
| 421139               | HIGH PEP                               |
| 421191               | DENTAL                                 |
| 321178               | SEIZURE WITH FEVER - PICA-NO LEAD TEST |
| 321179               | PICA-NO LEAD TEST                      |
| 621077               | CHRONIC EAR INFECTION                  |
| 621105               | HEART MURMUR                           |
| 621127               | HEART MURMUR - SMALL STATURE           |
| 621145               | NITS                                   |
| 621149               | DENTAL - NITS                          |
| 621539               | DENTAL                                 |
| 721007               | EARS                                   |
| 721109               | NUTRITION - VISION                     |
| 721240               | DENTAL                                 |
| 721270               | DENTAL - NUTRITION                     |
| 721279               | MEDICAL - NUTRITION                    |

| Non-Head Start, Sample A |  |
|--------------------------|--|
| ID Number                | Health Problem   |
| 421001                   | DENTAL   |
| 421070                   | DENTAL   |
| 421075                   | DENTAL   |
| 421098                   | DENTAL   |
| 421107                   | DENTAL   |
| 421146                   | DENTAL   |
| 421173                   | DENTAL   |
| 421192                   | DENTAL   |
| 521012                   | HIGH PEP   |
| 521013                   | HIGH PEP   |
| 521014                   | HIGH PEP   |
| 521108                   | HIGH PEP   |
| 521109                   | PICA-NO LEAD TEST  |
| 521133                   | INFECTED SCALP AND THIGH - HYPERACTIVE<br>- BREATH HOLDING-CONVULSIONS - PICA-NO LEAD TEST<br>NO LEAD TEST |
| 521199                   | NO LEAD TEST   |
| 621089                   | CYST ON PENIS  |
| 621128                   | BRAIN INJURY - SMALL STATURE - DEVELOPMENTAL DELAY   |
| 621438                   | NITS   |
| 721004                   | JUVENILE DIABETES - EARS   |
| 721076                   | DENTAL - VISION - NUTRITION  |
| 721230                   | VISION   |
| 721280                   | VISION   |
| 721289                   | DENTAL - NUTRITION   |

<sup>a</sup>See Table 2A-7 for the syntax of the ID number.

<sup>b</sup>Sample A is the randomly assigned longitudinal sample. Sample V is the randomly assigned attrition sample which was pretested.

Table 3-1 (continued)

Listing of Children Referred for Urgent Medical Needs  
Based on the Pretest for Samples A and D<sup>a, b</sup>

| Non-Head Start, Sample D<br>ID Number | Health Problem                                       |
|---------------------------------------|--|
| 621077                                | HEART MURMUR   |
| 621081                                | DENTAL   |
| 621100                                | HIGH FEP   |
| 621101                                | HIGH FEP   |
| 621102                                | HIGH FEP   |
| 621103                                | HIGH FEP   |
| 621104                                | LEAD-CONSTIPATION                                    |
| 621105                                | PICA-NO LEAD TEST                                    |
| 621106                                | PICA-NO LEAD TEST                                    |
| 621107                                | HIGH FEP   |
| 621108                                | NO LEAD TEST   |
| 621109                                | PICA-NO LEAD TEST                                    |
| 621110                                | NO LEAD TEST   |
| 621111                                | NO LEAD TEST   |
| 621112                                | PICA-NO LEAD TEST                                    |
| 621113                                | HEARD RUMBS RETRACTED, LEFT AND RIGHT - NO LEAD TEST |
| 621114                                | PICA-NO LEAD TEST                                    |
| 621115                                | HIGH FEP   |
| 621116                                | NO LEAD TEST   |
| 621117                                | PICA-NO LEAD TEST                                    |
| 621118                                | HYPERPIGMENTATION-IMPETIGO LIKELY - NO LEAD TEST     |
| 621119                                | PICA-NO LEAD TEST - ANEMIA                           |
| 621120                                | SEIZURE WITH FEVER - ANEMIA - PICA                   |
| 621121                                | NAY FEVER  |
| 621122                                | PICA NO LEAD TEST - ANEMIA                           |
| 621123                                | HIGH FEP   |
| 621124                                | HIGH FEP   |
| 621161                                | ELEVATED BLOOD PRESSURE - OBESITY                    |
| 621162                                | ACUTE OYITIS MEDIA                                   |
| 621163                                | NITS   |
| 621164                                | NITS   |
| 621165                                | BURN ON EAR-UNSUPERVISED AT HOME                     |
| 721029                                | DENTAL   |
| 721030                                | DENTAL - EARS - HIGH FEP                             |
| 721031                                | NUTRITION  |
| 721032                                | DENTAL   |
| 721033                                | DENTAL   |
| 721034                                | EARS   |
| 721035                                | DENTAL   |
| 721036                                | VISION - NUTRITION                                   |
| 721037                                | MEDICAL  |
| 721038                                | HIGH FEP   |
| 721039                                | DENTAL   |
| 721040                                | DENTAL   |

<sup>a</sup> See Table 2A-7 for the syntax of the ID number.

<sup>b</sup> Sample A is the randomly assigned longitudinal sample. Sample V is the randomly assigned attrition sample which was pretested.

Syntax of Six Digit Identification Number

| Site Code                                  | Book Code | Pre/Post Code | Case Code |
|--|-----------|---------------|-----------|
| A  | B         | C             | D         |
| A = 4 Greene and Humphreys Counties        |           |               |           |
| - 5 St. Clair County                       |           |               |           |
| - 6 Maricopa County                        |           |               |           |
| - 7 Mingo County                           |           |               |           |
| B = 2 Child examination book (constant)    |           |               |           |
| C = 1 Pretest                              |           |               |           |
| - 3 Posttest                               |           |               |           |
| D = 001 Child Identification number to 905 |           |               |           |



Table 3-2

Listing of Children Referred for Urgent Medical Needs  
Based on the Posttest for Samples A, B, and C<sup>a</sup>

| Head Start, Sample A |                                     |
|----------------------|-------------------------------------|
| ID Number            | Health Problem                      |
| 423064               | DENTAL                              |
| 423131               | VISION                              |
| 423174               | DENTAL                              |
| 523194               | SPEECH                              |
| 623103               | DENTAL                              |
| 723076               | DENTAL - SPEECH - HEARING - MEDICAL |
| 723094               | DENTAL - HEARING                    |
| 723278               | HEARING                             |
| 723280               | DENTAL                              |

| Head Start, Sample B |                |
|----------------------|----------------|
| ID Number            | Health Problem |
| 423062               | DENTAL         |
| 423167               | DENTAL         |
| 423193               | DENTAL         |
| 423198               | VISION         |
| 423287               | VISION         |

| Head Start, Sample C |                |
|----------------------|----------------|
| ID Number            | Health Problem |
| 423402               | DENTAL         |
| 423407               | DENTAL         |
| 423411               | DENTAL         |
| 423417               | DENTAL         |
| 423417               | DENTAL         |
| 423419               | VISION         |
| 423435               | VISION         |

| Non-Head Start, Sample A |  |
|--------------------------|--|
| ID Number                | Health Problem   |
| 423019                   | DENTAL   |
| 423075                   | VISION   |
| 523017                   | HIGH PEP   |
| 523703                   | ENURESIS - PICA-NO LEAD TEST                                 |
| 623089                   | DENTAL - HYPERACTIVE - CYST ON PENIS - TB EXPOSURE - MEDICAL |
| 623148                   | DENTAL - HEARING   |
| 623436                   | DENTAL - SPEECH  |
| 723004                   | SPEECH   |
| 723016                   | DENTAL   |
| 723280                   | DENTAL   |

| Non-Head Start, Sample B |                |
|--------------------------|----------------|
| ID Number                | Health Problem |
| 423009                   | DENTAL         |
| 423094                   | DENTAL         |
| 423073                   | VISION         |
| 423164                   | HEARING        |
| 423161                   | DENTAL         |
| 423193                   | DENTAL         |
| 423308                   | VISION         |

| Non-Head Start, Sample C |                |
|--------------------------|----------------|
| ID Number                | Health Problem |
| 423359                   | DENTAL         |
| 423420                   | DENTAL         |
| 423369                   | DENTAL         |
| 423378                   | DENTAL         |
| 523901                   | HIGH PEP       |
| 523902                   | HIGH PEP       |

<sup>a</sup> See Table 2A-7 for the syntax of the ID number.

<sup>b</sup> Sample A is the longitudinal sample. Sample B is randomly assigned posttest only sample. Sample C is the non-randomly assigned posttest only sample.

Table 3-3

Characteristics of Types of Pediatric Problems  
(Excluding Pica) Reported at Pretest Across All Sites

| Characteristic of Problem           | Pretested Children (Samples A & D) |                  |                   |                 |                         |                |
|-------------------------------------|------------------------------------|------------------|-------------------|-----------------|-------------------------|----------------|
|                                     | Organic                            |                  | Psychosocial      |                 | Other Possible Problems |                |
|                                     | HS<br>n=215                        | NHS<br>n=161     | HS<br>n=215       | NHS<br>n=161    | HS<br>n=215             | NHS<br>n=161   |
| Number of Problems                  | 76                                 | 57               | 18                | 7               | 0                       | 4              |
| Infectious Problem:                 |                                    |                  |                   |                 |                         |                |
| Yes                                 | n<br>35/76<br>46                   | n<br>20/57<br>35 |                   |                 |                         | n<br>2/4<br>50 |
| No                                  | n<br>41/76<br>54                   | n<br>37/57<br>65 | n<br>18/18<br>100 | n<br>7/7<br>100 |                         | n<br>2/4<br>50 |
| Chronicity:                         |                                    |                  |                   |                 |                         |                |
| Acute                               | n<br>16/76<br>21                   | n<br>13/55<br>24 | n<br>2/17<br>12   | n<br>2/6<br>33  |                         | n<br>2/4<br>50 |
| Acute Exacerbation of Chronic       | n<br>8/76<br>11                    | n<br>1/55<br>2   |                   |                 |                         |                |
| Chronic Ongoing                     | n<br>44/76<br>58                   | n<br>39/55<br>71 | n<br>15/17<br>88  | n<br>4/6<br>67  |                         | n<br>1/4<br>25 |
| Past Chronic                        | n<br>7/76<br>9                     | n<br>2/55<br>4   |                   |                 |                         | n<br>1/4<br>25 |
| Problem Resulting from Past Problem | n<br>1/76<br>1                     |                  |                   |                 |                         |                |
| Severity:                           |                                    |                  |                   |                 |                         |                |
| Mild                                | n<br>41/74<br>55                   | n<br>38/56<br>68 | n<br>8/18<br>44   | n<br>2/6<br>33  |                         | n<br>1/3<br>33 |
| Moderate                            | n<br>30/74<br>41                   | n<br>18/56<br>32 | n<br>7/18<br>39   | n<br>3/6<br>50  |                         | n<br>2/3<br>67 |
| Severe                              | n<br>3/74<br>4                     |                  | n<br>3/18<br>17   | n<br>1/6<br>17  |                         |                |
| Urgency:                            |                                    |                  |                   |                 |                         |                |
| Attend Within 24 hr                 | n<br>5/76<br>7                     | n<br>2/57<br>4   |                   |                 |                         |                |
| Future Attention                    | n<br>36/76<br>47                   | n<br>23/57<br>40 | n<br>13/17<br>76  | n<br>7/7<br>100 |                         | n<br>2/4<br>50 |
| Attend at Routine Visits            | n<br>35/76<br>46                   | n<br>32/57<br>56 | n<br>4/17<br>24   |                 |                         | n<br>2/4<br>50 |

Table 3-4

Number of Problems Per Child Identified in the Pediatric Evaluation at Pretest by Gender<sup>a</sup>

| Number of Problems Per Child            | Pretested Children (Samples A & D) In: |                 |                  |                 |                 |                 |                 |                 |
|---|--|-----------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|   | Greene & Humphreys Counties            |                 | St. Clair County |                 | Maricopa County |                 | Mingo County    |                 |
|   | Male<br>n=46                           | Female<br>n=49  | Male<br>n=58     | Female<br>n=55  | Male<br>n=50    | Female<br>n=45  | Male<br>n=34    | Female<br>n=39  |
| 0                                       | n<br>20<br>43.5                        | n<br>21<br>42.9 | n<br>26<br>44.8  | n<br>38<br>69.1 | n<br>10<br>20.0 | n<br>18<br>40.0 | n<br>19<br>55.9 | n<br>25<br>64.1 |
| 1                                       | n<br>19<br>41.3                        | n<br>20<br>40.8 | n<br>22<br>37.9  | n<br>12<br>21.8 | n<br>16<br>32.0 | n<br>17<br>37.8 | n<br>11<br>32.4 | n<br>11<br>28.2 |
| 2                                       | n<br>6<br>13.0                         | n<br>6<br>12.2  | n<br>3<br>5.2    | n<br>2<br>3.6   | n<br>19<br>38.0 | n<br>10<br>22.2 | n<br>4<br>11.8  | n<br>3<br>7.7   |
| ≥ 3                                     | n<br>1<br>2.2                          | n<br>2<br>4.1   | n<br>7<br>12.1   | n<br>3<br>5.5   | n<br>5<br>10.0  | n<br>0<br>0.0   | n<br>0<br>0.0   | n<br>0<br>0.0   |
| Mean                                    | 0.76                                   | 0.78            | 0.95             | 0.45            | 1.40            | 0.82            | 0.56            | 0.44            |
| S.D.                                    | 0.85                                   | 0.82            | 1.23             | 0.81            | 0.97            | 0.78            | 0.70            | 0.64            |
| Signifi-<br>cance<br>between<br>genders |  |                 | *                |                 | **              |                 |                 |                 |

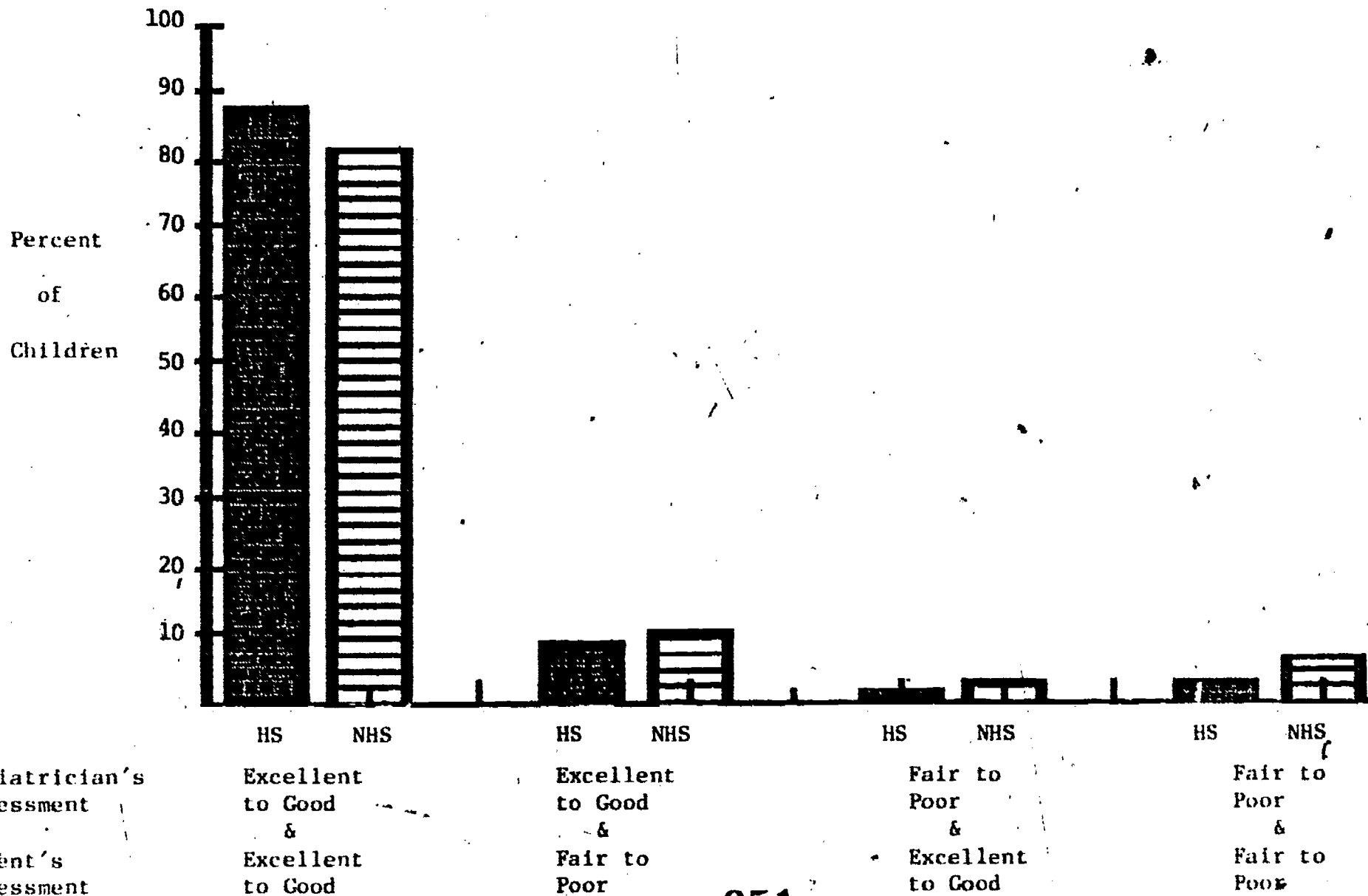
<sup>a</sup> Significance indicated as:

\* p < .05

\*\* p < .01

Table 3-5

Assessment of Child's General Health by  
the Pediatrician and the Parent Across All Sites



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Table 3-6

Assessment of Child's General Health by the  
Pediatrician and the Parent in Greene and Humphreys Counties

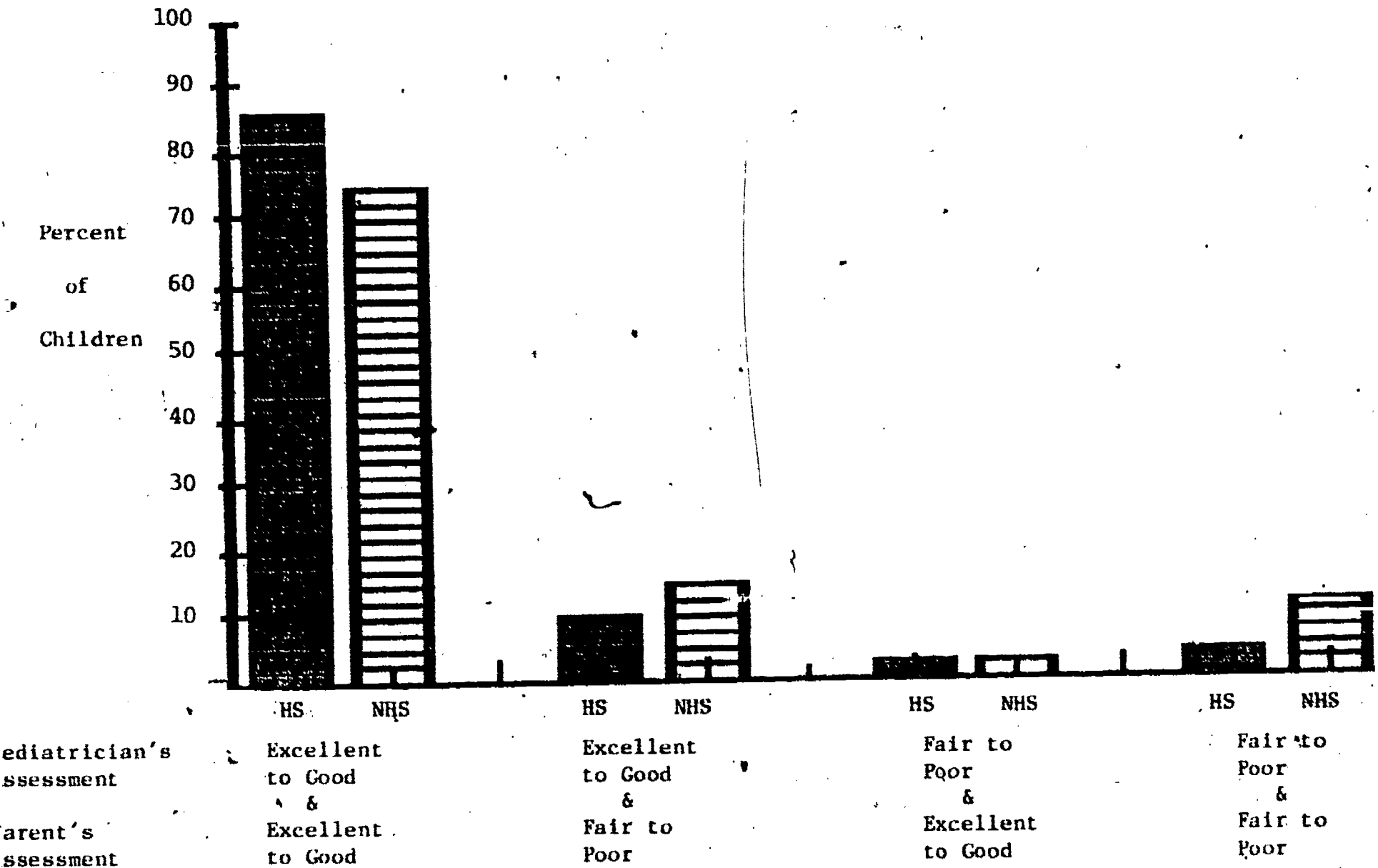




Table 3-7

Assessment of Child's General Health by the  
Pediatrician and the Parent in St. Clair County

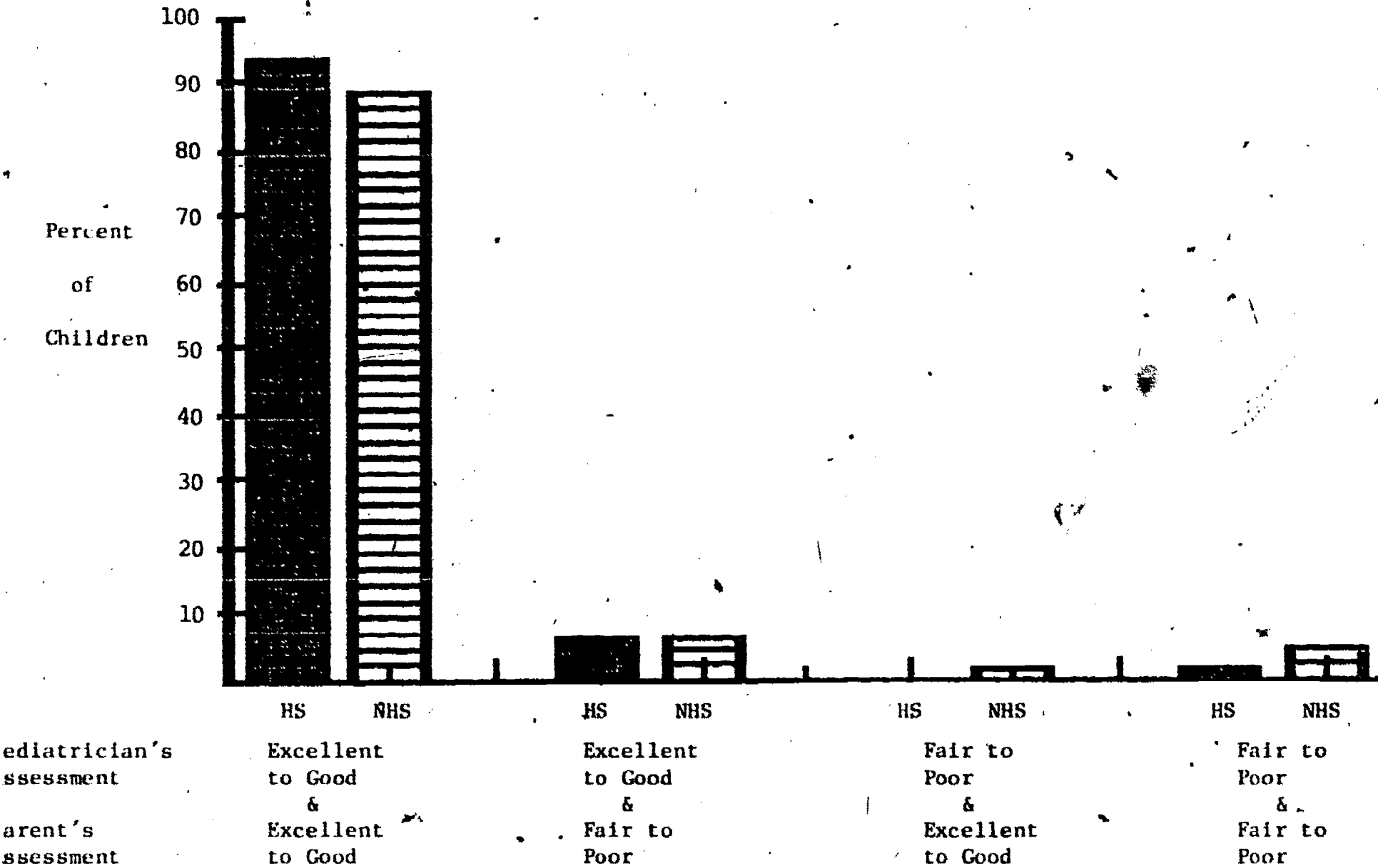


Table 3-8

Assessment of Child's General Health by the  
Pediatrician and the Parent in Maricopa County

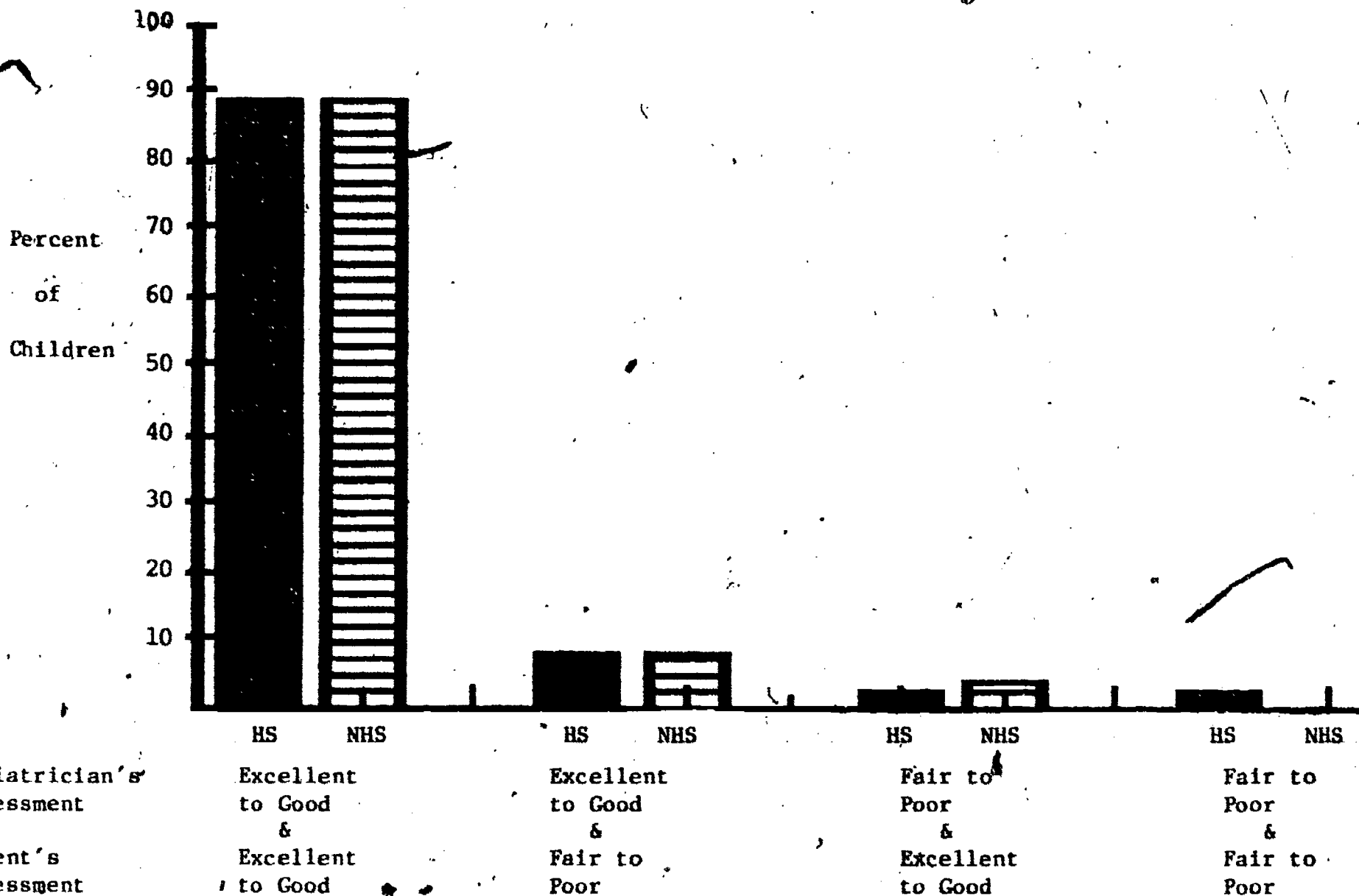


Table 3-9

Assessment of Child's General Health by the  
Pediatrician and the Parent in Mingo County

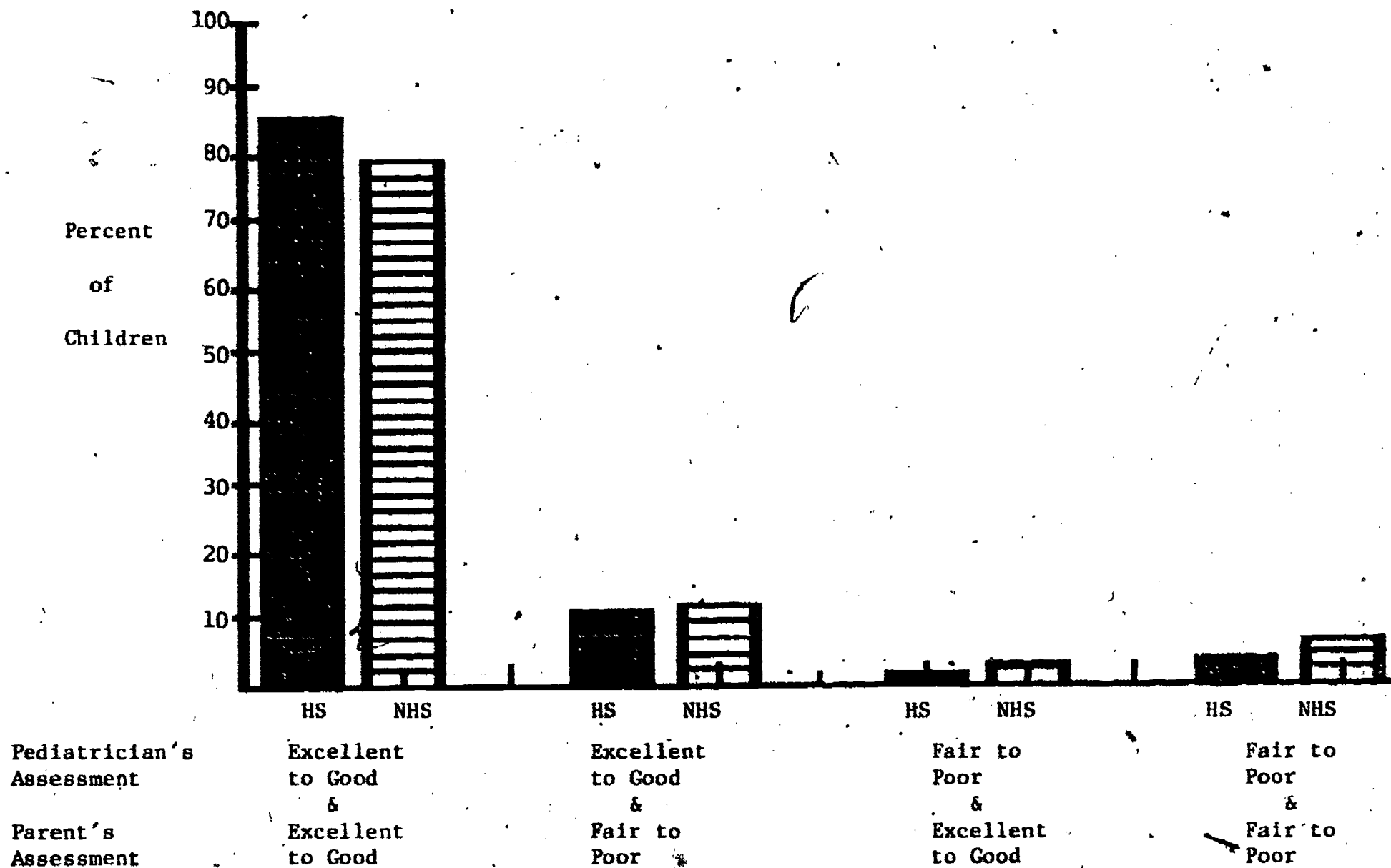


Table 3-10

## Mother's Age at Birth of Child

| Maternal Age<br>at Birth<br>of Child |   | Pretested Children (Samples A & D) In:    |                                 |                            |                         |                       |
|--------------------------------------|---|---|---------------------------------|----------------------------|-------------------------|-----------------------|
|                                      |   | Greene &<br>Humphreys<br>Counties<br>n=95 | St.<br>Clair<br>County<br>n=113 | Maricopa<br>County<br>n=95 | Mingo<br>County<br>n=73 | All<br>Sites<br>n=376 |
| < 15 years                           | n | 2/92                                      | 0/108                           | 2/93                       | 0/72                    | 4/365                 |
|                                      | % | 2.2                                       | 0.0                             | 2.2                        | 0.0                     | 1.1                   |
| 15-17 years                          | n | 25/92                                     | 22/108                          | 10/93                      | 10/72                   | 67/365                |
|                                      | % | 27.2                                      | 20.4                            | 10.8                       | 13.9                    | 18.4                  |
| 18-19 years                          | n | 13/92                                     | 27/108                          | 14/93                      | 15/72                   | 69/365                |
|                                      | % | 14.1                                      | 25.0                            | 15.1                       | 20.8                    | 18.9                  |
| > 19 years                           | n | 52/92                                     | 59/108                          | 67/93                      | 47/72                   | 225/365               |
|                                      | % | 56.5                                      | 54.6                            | 72.0                       | 65.3                    | 61.6                  |

<sup>a</sup> Source: National Center for Health Statistics: Health United States, 1980. #DHHS Pub. No (PHS) 81-1232, 1980.

Table 3-11

## Characteristics of Medical Examination Services for Checkups

| Medical Services for Checkups | Posttested Children (Samples A, B & C) In: |                           |                          |                       |                    |
|-------------------------------|--|---------------------------|--------------------------|-----------------------|--------------------|
|                               | Greene & Humphreys Counties<br>n=227       | St. Clair County<br>n=194 | Maricopa County<br>n=167 | Mingo County<br>n=228 | All Sites<br>n=816 |
| <u>Providers Used:</u>        |  |                           |                          |                       |                    |
| Pediatrician                  | n 13/224<br>% 5.8                          | 168/189<br>88.9           | 38/150<br>25.3           | 111/203<br>54.7       | 330/766<br>43.1    |
| General Practitioner          | n 160/224<br>% 71.4                        | 12/189<br>6.3             | 84/150<br>56.0           | 71/203<br>35.0        | 327/766<br>42.7    |
| Nurse or Nurse Practitioner   | n 15/224<br>% 6.7                          | 2/189<br>1.1              | 2/150<br>1.3             | 0<br>0.0              | 19/766<br>2.5      |
| Other Provider                | n 5/224<br>% 2.2                           | 5/189<br>2.6              | 3/150<br>2.0             | 4/203<br>2.0          | 17/766<br>2.2      |
| No Provider                   | n 31/224<br>% 13.8                         | 2/189<br>1.1              | 23/150<br>15.3           | 17/203<br>8.4         | 73/766<br>9.5      |
| <u>Location of Services</u>   |  |                           |                          |                       |                    |
| Community clinic              | n 31/223<br>% 13.9                         | 35/189<br>18.5            | 70/160<br>43.8           | 40/215<br>18.6        | 176/787<br>22.4    |
| Hospital clinic               | n 26/223<br>% 11.7                         | 4/189<br>2.1              | 7/160<br>4.4             | 82/215<br>38.1        | 119/787<br>15.1    |
| Private Physicians office     | n 84/223<br>% 37.7                         | 132/189<br>69.8           | 31/160<br>19.4           | 49/215<br>22.8        | 296/787<br>37.6    |
| Health Dept.                  | n 14/223<br>% 6.3                          | 3/189<br>1.6              | 15/160<br>9.4            | 7/215<br>3.3          | 52/787<br>6.6      |
| Other                         | n 37/223<br>% 16.6                         | 13/189<br>6.9             | 14/160<br>8.8            | 20/215<br>9.3         | 84/787<br>10.7     |
| No Provider                   | n 31/223<br>% 13.9                         | 2/189<br>1.1              | 23/160<br>14.4           | 17/215<br>7.9         | 73/787<br>9.3      |

Table 3-12

Characteristics of Medical Examination Services  
for Diagnosis and Treatment

| Medical Services<br>for Diagnosis<br>and Treatment | Posttested Children. (Samples A, B & C) In: |                              |                             |                          |                       |
|--|---|------------------------------|-----------------------------|--------------------------|-----------------------|
|  | Greene &<br>Humphreys<br>Counties<br>n=227  | St. Clair<br>County<br>n=194 | Maricopa<br>County<br>n=167 | Mingo<br>County<br>n=228 | All<br>Sites<br>n=816 |
| <u>Providers Used:</u>                             |   |                              |                             |                          |                       |
| Pediatrician                                       | n 12/226<br>% 5.3                           | 170/192<br>88.5              | 40/151<br>26.5              | 97/207<br>46.9           | 319/776<br>41.1       |
| General Prac-<br>titioner                          | n 177/226<br>% 78.3                         | 16/192<br>8.3                | 95/151<br>62.9              | 88/207<br>42.5           | 376/776<br>48.5       |
| Nurse or Nurse<br>Practitioner                     | n 6/226<br>% 2.7                            | 0<br>0.0                     | 2/151<br>1.3                | 0<br>0.0                 | 8/776<br>1.0          |
| Other Provider                                     | n 1/226<br>% 0.4                            | 4/192<br>2.1                 | 3/151<br>2.0                | 5/207<br>2.4             | 13/776<br>1.7         |
| No Provider  | n 30/226<br>% 13.3                          | 2/192<br>1.0                 | 11/151<br>7.3               | 17/207<br>8.2            | 60/776<br>7.7         |
| <u>Location of<br/>Services</u>                    |   |                              |                             |                          |                       |
| Community<br>clinic                                | n 34/225<br>% 15.1                          | 31/192<br>16.1               | 76/166<br>45.8              | 45/219<br>20.5           | 186/802<br>23.2       |
| Hospital<br>clinic                                 | n 27/225<br>% 12.0                          | 3/192<br>1.6                 | 9/166<br>5.4                | 82/219<br>37.4           | 121/802<br>15.1       |
| Private Physi-<br>cians office                     | n 94/225<br>% 41.8                          | 139/192<br>72.4              | 44/166<br>26.5              | 54/219<br>24.7           | 331/802<br>41.3       |
| Health Dept.                                       | n 5/225<br>% 2.2                            | 3/192<br>1.6                 | 11/166<br>6.6               | 6/219<br>2.7             | 25/802<br>3.1         |
| Other  | n 35/225<br>% 15.6                          | 14/192<br>7.3                | 15/166<br>9.0               | 15/219<br>6.8            | 79/802<br>9.8         |
| No Provider  | n 30/225<br>% 13.3                          | 2/192<br>1.0                 | 11/166<br>6.7               | 17/219<br>7.9            | 60/802<br>7.5         |

Table 3-13

## Characteristics of Medical Services Examination for Immunizations

| Medical Services for Immunizations | Posttested Children (Samples A, B & C) In: |                           |                          |                       |                    |                 |
|------------------------------------|--|---------------------------|--------------------------|-----------------------|--------------------|-----------------|
|                                    | Posttested Children (Samples A, B & C) In: |                           |                          |                       |                    |                 |
|                                    | Greene & Humphreys Counties<br>n=227       | St. Clair County<br>n=194 | Maricopa County<br>n=167 | Mingo County<br>n=228 | All Sites<br>n=816 |                 |
| <u>Providers Used:</u>             |  |                           |                          |                       |                    |                 |
| Pediatrician                       | n<br>%                                     | 2/224<br>0.9              | 162/185<br>87.6          | 36/148<br>24.3        | 49/187<br>26.2     | 249/744<br>33.5 |
| General Practitioner               | n<br>%                                     | 36/224<br>16.1            | 7/185<br>3.8             | 84/148<br>56.8        | 37/187<br>19.8     | 164/744<br>22.0 |
| Nurse or Nurse Practitioner        | n<br>%                                     | 154/224<br>68.8           | 9/185<br>4.9             | 15/148<br>10.1        | 76/187<br>40.6     | 254/744<br>34.1 |
| Other Provider                     | n<br>%                                     | 1/224<br>0.4              | 5/185<br>2.7             | 2/148<br>1.4          | 8/187<br>3.2       | 14/744<br>1.9   |
| No Provider                        | n<br>%                                     | 31/224<br>13.8            | 2/185<br>1.1             | 11/148<br>7.4         | 19/187<br>10.2     | 63/744<br>8.5   |
| <u>Location of Services</u>        |  |                           |                          |                       |                    |                 |
| Community clinic                   | n<br>%                                     | 20/224<br>8.9             | 38/187<br>20.3           | 82/166<br>49.4        | 23/219<br>10.5     | 163/796<br>20.5 |
| Hospital clinic                    | n<br>%                                     | 11/224<br>4.9             | 2/187<br>1.1             | 7/166<br>4.2          | 34/219<br>15.5     | 54/796<br>6.8   |
| Private Physicians office          | n<br>%                                     | 6/224<br>2.7              | 123/187<br>65.8          | 25/166<br>15.1        | 26/219<br>11.9     | 180/796<br>22.6 |
| Health Dept.                       | n<br>%                                     | 152/224<br>67.9           | 5/187<br>3.2             | 23/166<br>13.9        | 99/219<br>45.2     | 280/796<br>35.2 |
| Other                              | n<br>%                                     | 4/224<br>1.7              | 16/187<br>8.6            | 18/166<br>10.8        | 18/219<br>8.2      | 219/796<br>27.5 |
| No Provider                        | n<br>%                                     | 31/224<br>13.8            | 2/187<br>1.1             | 11/166<br>6.6         | 19/219<br>8.7      | 63/796<br>7.9   |

Table 3-14

Children with Health Problems at Pretest Who Have Health Problems Existing at Posttest (Excluding All Children Who Were Referred at Pretest for Specific Problems)

| Groups of Children |   | Longitudinal (Sample A Children)<br>Excluding All Children Who Were Referred<br>at Pretest for Specific Problems in: |                  |                 |              |           |
|--------------------|---|--|------------------|-----------------|--------------|-----------|
|                    |   | Greene & Humphreys Counties  | St. Clair County | Maricopa County | Mingo County | All Sites |
| Head Start         | n | 7/19   | 5/11             | 12/28           | 2/5          | 26/63     |
|                    | % | 36.8 <sup>a</sup>  | 45.4             | 42.9            | 40.0         | 41.3      |
| Non-Head Start     | n | 12/19  | 4/10             | 7/42            | 4/10         | 27/51     |
|                    | % | 63.2   | 40.0             | 58.3            | 40.0         | 52.9      |

| Groups of Children |   | Longitudinal (Sample A Children)<br>Including All Children Referred at Pretest in: |                  |                 |              |                   |
|--------------------|---|--|------------------|-----------------|--------------|-------------------|
|                    |   | Greene & Humphreys Counties  | St. Clair County | Maricopa County | Mingo County | All Sites         |
| Head Start         | n | 8/25   | 7/14             | 14/28           | 3/6          | 32/73             |
|                    | % | 32.0 <sup>a</sup>  | 50.0             | 50.0            | 50.0         | 43.8 <sup>a</sup> |
| Non-Head Start     | n | 12/18  | 5/7              | 8/10            | 4/8          | 29/43             |
|                    | % | 66.7   | 71.4             | 80.0            | 50.0         | 67.4              |

<sup>a</sup>Significant differences between Head Start and non-Head Start groups ( $p < .05$ ).



Table 3-15

Number of Problems Found at Pretest and Followed-up at Posttest by Head Start and Non-Head Start Group, Whether the Problem was Treated, and Whether the Problem was Present at Posttest for Children in Longitudinal Sample in Greene and Humphreys Counties

|  |  | Longitudinal Children (Sample A) in: |    |     |    |         |                |    |     |    |         |
|--|--|--------------------------------------|----|-----|----|---------|----------------|----|-----|----|---------|
|  |  | Greene and Humphreys Counties        |    |     |    |         |                |    |     |    |         |
| Head Start-Non Head Start                        |  | Head Start                           |    |     |    |         | Non-Head Start |    |     |    |         |
| Treatment after Pretest                          |  | Yes                                  |    | No  |    | Unknown | Yes            |    | No  |    | Unknown |
| Presence at Posttest                             |  | Yes                                  | No | Yes | No | Unknown | Yes            | No | Yes | No | Unknown |
| Problem at Pretest                               |  |                                      |    |     |    |         |                |    |     |    |         |
| Otitis Media                                     |  |                                      |    |     |    |         |                |    |     |    |         |
| Acute  |  | 1                                    |    | 1   |    | 1       |                |    |     |    |         |
| Serous   |  |                                      | 3  | 1   |    |         |                | 1  |     |    | 2       |
| Recurrent  |  |                                      |    | 1   |    | 1       |                |    |     |    | 1       |
| Urinary Tract Infection                          |  | 1                                    |    |     |    | 1       |                |    |     |    |         |
| Asthma   |  | 1                                    |    |     |    |         |                |    | 2   |    |         |
| Allergy (not asthma)                             |  |                                      |    |     |    |         |                |    |     |    |         |
| Rhinitis   |  | 2                                    | 1  |     | 1  | 1       |                |    | 4   | 3  | 2       |
| Dogs   |  |                                      |    |     |    |         |                |    |     |    |         |
| Dermatologic                                     |  |                                      |    |     |    |         |                |    |     |    |         |
| Eczema   |  | 1                                    |    |     |    |         |                |    |     |    |         |
| Seborrhea  |  |                                      |    |     |    |         |                |    |     |    |         |
| Nits   |  |                                      |    |     |    |         |                |    |     |    |         |
| Impetigo   |  |                                      |    |     |    |         |                |    |     |    |         |
| Dry skin   |  |                                      |    |     |    |         |                |    |     |    |         |
| Fungal infection                                 |  |                                      |    |     |    |         |                |    |     |    |         |
| Infected skin                                    |  |                                      |    |     |    |         |                |    |     |    |         |
| Cardiac  |  |                                      |    |     |    |         |                |    |     |    |         |
| Congenital                                       |  |                                      | 1  |     |    |         |                |    |     |    |         |
| Hypertension                                     |  |                                      |    |     |    | 1       |                |    |     |    |         |
| Urogenital                                       |  |                                      |    |     |    |         |                |    |     |    |         |
| Cyst on penis                                    |  |                                      |    |     |    |         |                |    |     |    |         |
| Neurologic                                       |  |                                      |    |     |    |         |                |    |     |    |         |
| Seizures   |  |                                      |    |     |    | 1       |                |    |     |    |         |
| Secondary to head trauma                         |  |                                      |    |     |    |         |                |    |     |    |         |
| Ophthalmologic                                   |  |                                      |    |     |    |         |                |    |     |    |         |
| Trauma   |  |                                      | 1  |     |    |         |                |    |     |    |         |
| Strabismus                                       |  |                                      |    |     |    |         |                |    |     |    |         |
| Surgical   |  |                                      |    |     |    |         |                |    |     |    |         |
| Inguinal hernia                                  |  |                                      |    |     |    | 1       |                |    |     |    |         |
| Undescended testes                               |  |                                      | 1  |     |    |         |                |    | 2   |    |         |
| Umbilical hernia                                 |  |                                      |    | 1   |    |         |                |    | 1   |    |         |
| Ear-Nose-Throat                                  |  |                                      |    |     |    |         |                |    |     |    |         |
| Profound tonsillar hypertropia                   |  |                                      |    |     |    |         |                |    |     |    |         |
| Injured tympanic membrane secondary to infection |  |                                      |    |     |    |         |                |    |     |    |         |
| TOTAL  |  | 6                                    | 7  | 3   | 1  | 7       |                | 1  | 9   | 3  | 5       |

Table 3-15

Number of Problems Found at Pretest and Followed-up at Posttest by Head Start and Non-Head Start Group, Whether the Problem was Treated, and Whether the Problem was Present at Posttest for Children in Longitudinal Sample in Greene and Humphreys Counties

|  | Longitudinal Children (Sample A) in: |          |          |          |          |                |    |          |    |         |
|--|--------------------------------------|----------|----------|----------|----------|----------------|----|----------|----|---------|
|  | Greene and Humphreys Counties        |          |          |          |          |                |    |          |    |         |
| Head Start-Non Head Start                                  | Head Start                           |          |          |          |          | Non-Head Start |    |          |    |         |
| Treatment after Pretest                                    | Yes                                  |          | No       |          | Unknown  | Yes            |    | No       |    | Unknown |
| Presence at Posttest                                       | Yes                                  | No       | Yes      | No       | Unknown  | Yes            | No | Yes      | No | Unknown |
| <b>Problem at Pretest</b>                                  |                                      |          |          |          |          |                |    |          |    |         |
| Developmental Pattern<br>Not toilet trained<br>Enuresis    | 1                                    |          |          |          |          |                |    |          |    |         |
| Nutritional<br>Obesity                                     |                                      |          |          |          |          |                |    |          |    |         |
| Growth<br>Unspecified<br>Short stature                     |                                      |          |          |          |          |                |    | 1        |    |         |
| Pica   |                                      | 1        | 2        |          |          |                |    |          |    |         |
| Child abuse & neglect                                      |                                      |          |          |          |          |                |    |          |    |         |
| Psychosocial<br>Breath holding<br>Self-induced<br>vomiting |                                      |          | 1        |          |          |                |    |          |    |         |
| Undifferentiated<br>Hyperactive<br>Depressed mother        | 1                                    | 1        |          | 1        |          |                |    |          |    | 1       |
| Gingival tonsillitis                                       |                                      |          |          |          |          |                |    |          |    |         |
| TB exposure  |                                      |          |          |          |          |                |    |          |    |         |
| Wardenburg's syndrome                                      |                                      |          |          | 1        |          |                |    |          |    |         |
| Sickle cell anemia   | 1                                    |          |          |          |          |                |    |          |    |         |
| Congenital abnormality                                     | 1                                    |          |          |          |          |                |    |          |    |         |
| Pneumonia<br>Recurrent                                     |                                      |          |          |          |          |                |    |          |    |         |
| Failure to thrive  |                                      |          |          |          |          |                |    |          |    |         |
| <b>TOTAL</b>   | <b>4</b>                             | <b>2</b> | <b>4</b> | <b>1</b> | <b>1</b> | <b>2</b>       |    | <b>3</b> |    |         |

Table 3-15 (continued)

Number of Problems Found at Pretest and Followed-up at Posttest by Head Start and Non-Head Start Group, Whether the Problem was Treated, and Whether the Problem was Present at Posttest for Children in Longitudinal Sample in St. Clair County

| Head Start-Non Head Start                        | Longitudinal Children (Sample A) in: |    |     |    |         |                |    |     |    |         |
|--|--------------------------------------|----|-----|----|---------|----------------|----|-----|----|---------|
|  | St. Clair County                     |    |     |    |         |                |    |     |    |         |
|  | Head Start                           |    |     |    |         | Non-Head Start |    |     |    |         |
| Treatment after Pretest                          | Yes                                  |    | No  |    | Unknown | Yes            |    | No  |    | Unknown |
| Presence at Posttest                             | Yes                                  | No | Yes | No | Unknown | Yes            | No | Yes | No | Unknown |
| <b>Problem at Pretest</b>                        |                                      |    |     |    |         |                |    |     |    |         |
| Otitis Media                                     |                                      |    |     |    |         |                |    |     |    |         |
| Acute  |                                      |    | 1   | 1  |         |                |    |     |    |         |
| Serous   |                                      | 2  | 1   | 2  |         |                |    |     |    |         |
| Recurrent  |                                      |    |     |    |         |                |    |     |    |         |
| Urinary Tract Infection                          |                                      |    |     |    |         |                |    |     |    |         |
| Asthma   |                                      |    |     | 1  | 1       | 1              |    |     |    | 1       |
| Allergy (not asthma)                             |                                      |    |     |    |         |                |    |     |    |         |
| Rhinitis   |                                      |    |     | 1  |         |                |    |     |    |         |
| Dogs   |                                      |    |     |    |         |                |    |     |    |         |
| Dermatologic                                     |                                      |    |     |    |         |                |    |     |    |         |
| Eczema   |                                      |    |     |    |         |                |    |     |    |         |
| Seborrhea  |                                      |    |     |    |         |                |    |     |    |         |
| Nits   |                                      |    |     |    |         |                |    |     |    |         |
| Impetigo   |                                      |    |     |    |         |                |    |     |    |         |
| Dry skin   |                                      |    |     |    |         |                |    |     |    |         |
| Fungal infection                                 |                                      |    |     |    |         |                |    |     |    | 1       |
| Infected skin                                    |                                      |    |     |    |         |                |    |     |    | 1       |
| Cardiac  |                                      |    |     |    |         |                |    |     |    |         |
| Congenital                                       |                                      |    | 1   |    |         |                |    |     |    |         |
| Hypertension                                     |                                      |    |     |    |         |                |    |     |    |         |
| Urogenital                                       |                                      |    |     |    |         |                |    |     |    |         |
| Cyst on penis                                    |                                      |    |     |    |         |                |    |     |    |         |
| Neurologic                                       |                                      |    |     |    |         |                |    |     |    |         |
| Seizures   |                                      |    |     |    |         |                | 1  |     |    |         |
| Secondary to head trauma                         |                                      |    |     |    |         |                |    |     |    |         |
| Ophthalmologic                                   |                                      |    |     |    |         |                |    |     |    |         |
| Trauma   |                                      |    |     |    |         |                |    |     |    |         |
| Strabismus                                       |                                      |    |     |    |         |                |    |     |    |         |
| Surgical   |                                      |    |     |    |         |                |    |     |    |         |
| Inguinal hernia                                  |                                      |    |     |    |         |                |    |     |    |         |
| Undescended testes                               |                                      |    |     |    |         |                |    |     |    |         |
| Umbilical hernia                                 |                                      |    |     |    |         |                |    |     |    |         |
| Ear-Nose-Throat                                  |                                      |    |     |    |         |                |    |     |    |         |
| Profound tonsillar hypertropia                   |                                      |    |     |    |         |                |    |     |    |         |
| Injured tympanic membrane secondary to infection |                                      |    |     |    |         |                |    |     |    |         |
| <b>TOTAL</b>                                     |                                      | 2  | 3   | 5  | 1       | 2              |    | 1   |    | 4       |

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Table 3-15 (continued)

Number of Problems Found at Pretest and Followed-up at Posttest by Head Start and Non-Head Start Group, Whether the Problem was Treated, and Whether the Problem was Present at Posttest for Children in Longitudinal Sample in St. Clair County

|   | Longitudinal Children (Sample A) in: |    |     |    |         |                |    |     |    |         |
|---|--------------------------------------|----|-----|----|---------|----------------|----|-----|----|---------|
|   | St. Clair County                     |    |     |    |         |                |    |     |    |         |
| Head Start-Non Head Start   | Head Start                           |    |     |    |         | Non-Head Start |    |     |    |         |
| Treatment after Pretest   | Yes                                  |    | No  |    | Unknown | Yes            |    | No  |    | Unknown |
| Presence at Posttest  | Yes                                  | No | Yes | No | Unknown | Yes            | No | Yes | No | Unknown |
| <b>Problem at Pretest</b>   |                                      |    |     |    |         |                |    |     |    |         |
| Developmental Pattern<br>Not toilet trained<br>Enuresis   |                                      |    |     |    |         |                |    | 1   |    | 1       |
| Nutritional<br>Obesity  |                                      |    | 1   |    |         |                |    |     |    |         |
| Growth<br>Unspecified<br>Short stature  |                                      |    |     |    |         |                |    |     |    | 1       |
| Pica  |                                      |    | 1   |    |         | 1              |    |     |    |         |
| Child abuse & neglect   | 1                                    |    |     |    |         |                |    |     |    |         |
| Psychosocial<br>Breath holding<br>Self-induced<br>vomiting<br>Undifferentiated<br>Hyperactive<br>Depressed mother |                                      |    |     |    |         |                |    |     |    | 1       |
| Gingival tonsillitis  |                                      |    |     |    |         |                |    |     |    | 1       |
| TB exposure   |                                      | 1  |     |    |         |                |    |     |    | 1       |
| Wardenburg's syndrome   |                                      |    |     |    |         |                |    |     |    | 1       |
| Sickle cell anemia  |                                      |    |     |    |         |                |    |     |    | 1       |
| Congenital abnormality  |                                      |    |     |    |         |                |    |     |    |         |
| Pneumonia<br>Recurrent  |                                      |    |     |    |         |                |    |     |    |         |
| Failure to thrive   |                                      |    |     |    |         |                |    |     |    |         |
| <b>TOTAL</b>  | 1                                    | 1  | 3   | 1  |         | 1              |    | 1   |    | 6       |

Table 3-15 (continued)

Number of Problems Found at Pretest and Followed-up at Posttest by Head Start and Non-Head Start Group, Whether the Problem was Treated, and Whether the Problem was Present at Posttest for Children in Longitudinal Sample in Maricopa County

|  | Longitudinal Children (Sample A) in: |    |     |    |         |                |    |     |    |         |
|--|--------------------------------------|----|-----|----|---------|----------------|----|-----|----|---------|
|  | Maricopa County                      |    |     |    |         |                |    |     |    |         |
|  | Head Start                           |    |     |    |         | Non-Head Start |    |     |    |         |
| Head Start-Non Head Start                        | Yes                                  |    | No  |    | Unknown | Yes            |    | No  |    | Unknown |
| Treatment after Pretest                          |                                      |    |     |    |         |                |    |     |    |         |
| Presence at Posttest                             | Yes                                  | No | Yes | No | Unknown | Yes            | No | Yes | No | Unknown |
| Problem at Pretest                               |                                      |    |     |    |         |                |    |     |    |         |
| Otitis Media                                     |                                      |    |     |    |         |                |    |     |    |         |
| Acute  |                                      |    |     |    |         |                |    |     |    |         |
| Serous   |                                      |    |     |    |         |                |    |     |    |         |
| Recurrent  |                                      | 1  | 1   | 4  |         |                |    | 1   |    | 2       |
| Urinary Tract Infection                          |                                      |    |     |    |         |                |    |     |    |         |
| Asthma   |                                      |    |     | 3  |         |                |    |     |    | 1       |
| Allergy (not asthma)                             |                                      |    |     |    |         |                |    |     |    |         |
| Rhinitis   |                                      |    | 1   |    |         |                |    | 1   |    |         |
| Dogs   |                                      |    |     |    |         |                |    |     |    |         |
| Dermatologic                                     |                                      |    |     |    |         |                |    |     |    |         |
| Eczema   |                                      |    |     | 1  |         |                |    |     |    | 1       |
| Seborrhea  |                                      | 1  |     |    |         | 1              |    |     |    |         |
| Nits   |                                      |    |     |    |         |                |    |     |    |         |
| Impetigo   |                                      |    |     |    |         |                |    |     |    |         |
| Dry skin   |                                      |    |     |    |         |                |    |     |    |         |
| Fungal infection                                 |                                      |    |     |    |         |                |    |     |    |         |
| Infected skin                                    |                                      |    |     |    |         |                |    |     |    |         |
| Cardiac  |                                      |    |     |    |         |                |    |     |    |         |
| Congenital                                       |                                      |    |     | 1  |         |                |    |     |    |         |
| Hypertension                                     |                                      |    |     |    |         |                |    |     |    |         |
| Urogenital                                       |                                      |    |     |    |         |                |    |     |    |         |
| Cyst on penis                                    |                                      |    |     |    |         |                |    | 1   |    |         |
| Neurologic                                       |                                      |    |     |    |         |                |    |     |    |         |
| Seizures   |                                      |    |     |    |         |                |    |     |    | 1       |
| Secondary to head trauma                         |                                      |    |     |    |         |                |    |     |    | 1       |
| Ophthalmologic                                   |                                      |    |     |    |         |                |    |     |    |         |
| Trauma   |                                      |    |     |    |         |                |    |     |    |         |
| Strabismus                                       |                                      |    |     |    |         |                |    |     |    |         |
| Surgical   |                                      |    |     |    |         |                |    |     |    |         |
| Inguinal hernia                                  |                                      |    |     |    |         |                |    |     |    |         |
| Undescended testes                               |                                      |    |     |    |         |                |    |     |    |         |
| Umbilical hernia                                 |                                      |    | 1   |    |         |                |    |     |    |         |
| Ear-Nose-Throat                                  |                                      |    |     |    |         |                |    |     |    |         |
| Profound tonsillar hypertropia                   |                                      |    |     |    |         | 1              | 1  |     |    |         |
| Injured tympanic membrane secondary to infection |                                      |    | 2   |    |         |                |    |     |    |         |
| TOTAL  |                                      | 2  | 5   | 9  |         | 2              | 1  | 3   |    | 6       |

Table 3-15 (continued)

Number of Problems Found at Pretest and Followed-up at Posttest by Head Start and Non-Head Start Group, Whether the Problem was Treated, and Whether the Problem was Present at Posttest for Children in Longitudinal Sample in Maricopa County

| Head Start-Non Head Start   | Longitudinal Children (Sample A) in: |    |     |    |         |                |    |     |    |         |
|---|--------------------------------------|----|-----|----|---------|----------------|----|-----|----|---------|
|   | Maricopa County:                     |    |     |    |         |                |    |     |    |         |
|   | Head Start                           |    |     |    |         | Non-Head Start |    |     |    |         |
| Treatment after Pretest   | Yes                                  |    | No  |    | Unknown | Yes            |    | No  |    | Unknown |
| Presence at Posttest  | Yes                                  | No | Yes | No | Unknown | Yes            | No | Yes | No | Unknown |
| Problem at Pretest  |                                      |    |     |    |         |                |    |     |    |         |
| Developmental Pattern<br>Not toilet trained<br>Enuresis   |                                      |    | 1   | 4  | 1       |                |    | 1   |    | 1       |
| Nutritional<br>Obesity  |                                      |    | 4   |    |         |                |    | 1   |    | 1       |
| Growth<br>Unspecified<br>Short stature  |                                      |    |     |    |         |                |    |     |    | 1       |
| Pica  |                                      |    | 1   |    |         |                |    |     |    |         |
| Child abuse & neglect   |                                      |    |     |    |         |                |    |     |    |         |
| Psychosocial<br>Breath holding<br>Self-induced<br>vomiting<br>Undifferentiated<br>Hyperactive<br>Depressed mother |                                      | 2  |     | 1  |         |                |    |     |    | 1       |
| Gingival tonsillitis  |                                      |    |     | 1  |         |                |    |     |    |         |
| TB exposure   | 2                                    | 1  | 2   | 1  |         | 1              |    |     | 1  |         |
| Wardourburg's syndrome  |                                      |    |     |    |         |                |    |     |    |         |
| Sickle cell anemia  |                                      |    |     |    |         |                |    |     |    |         |
| Congenital abnormality  |                                      |    |     |    |         |                |    |     |    |         |
| Pneumonia<br>Recurrent  |                                      |    |     | 1  |         |                |    |     |    |         |
| Failure to thrive   |                                      |    |     |    |         |                |    |     |    |         |
| TOTAL   | 2                                    | 4  | 8   | 9  | 1       | 1              |    | 3   | 2  | 3       |

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Table 3-15 (continued)

Number of Problems Found at Pretest and Followed-up at Posttest by Head Start and Non-Head Start Group, Whether the Problem was Treated, and Whether the Problem was Present at Posttest for Children in Longitudinal Sample in Mingo County

|  | Longitudinal Children (Sample A) in: |          |     |    |          |                |          |          |    |          |
|--|--------------------------------------|----------|-----|----|----------|----------------|----------|----------|----|----------|
|  | Mingo County                         |          |     |    |          |                |          |          |    |          |
|  | Head Start                           |          |     |    |          | Non-Head Start |          |          |    |          |
| Head Start-Non Head Start                        | Yes                                  |          | No  |    | Unknown  | Yes            |          | No       |    | Unknown  |
| Treatment after Pretest                          | Yes                                  |          | No  |    | Unknown  | Yes            |          | No       |    | Unknown  |
| Presence at Posttest                             | Yes                                  | No       | Yes | No | Unknown  | Yes            | No       | Yes      | No | Unknown  |
| Problem at Pretest                               |                                      |          |     |    |          |                |          |          |    |          |
| Otitis Media                                     |                                      |          |     |    |          |                |          |          |    |          |
| Acute  | 1                                    |          |     |    |          |                |          |          |    |          |
| Serous   |                                      |          |     |    |          |                | 1        |          |    | 2        |
| Recurrent  |                                      |          |     |    |          | 1              | 1        |          |    | 1        |
| Urinary Tract Infection                          | 1                                    |          |     |    | 1        | 1              |          |          |    | 1        |
| Asthma   |                                      |          |     |    | 1        |                |          |          |    |          |
| Allergy (not asthma)                             |                                      |          |     |    |          |                |          |          |    |          |
| Rhinitis   |                                      |          |     |    |          |                |          |          |    |          |
| Dogs   |                                      |          |     |    |          |                |          |          |    |          |
| Dermatologic                                     |                                      |          |     |    |          |                |          |          |    |          |
| Eczema   |                                      |          |     |    |          |                |          |          |    |          |
| Seborrhea  |                                      |          |     |    |          |                |          |          |    |          |
| Hits   |                                      |          |     |    |          |                |          |          |    |          |
| Impetigo   |                                      |          |     |    |          |                |          |          |    |          |
| Dry skin   |                                      |          |     |    |          |                |          |          |    |          |
| Fungal infection                                 |                                      |          |     |    |          |                |          |          |    |          |
| Infected skin                                    |                                      |          |     |    |          |                |          |          |    |          |
| Cardiac  |                                      |          |     |    |          |                |          |          |    |          |
| Congenital                                       | 1                                    |          |     |    |          |                |          |          |    |          |
| Hypertension                                     |                                      |          |     |    |          |                |          |          |    |          |
| Urogenital                                       |                                      |          |     |    |          |                |          |          |    |          |
| Cyst on penis                                    |                                      |          |     |    |          |                |          |          |    |          |
| Neurologic                                       |                                      |          |     |    |          |                |          |          |    |          |
| Seizures   |                                      |          |     |    |          |                |          |          |    |          |
| Secondary to head trauma                         |                                      |          |     |    |          |                |          |          |    |          |
| Ophthalmologic                                   |                                      |          |     |    |          |                |          |          |    |          |
| Trauma   |                                      |          |     |    |          |                |          |          |    |          |
| Strabismus                                       |                                      |          |     |    |          |                |          |          |    |          |
| Surgical   |                                      |          |     |    |          |                |          |          |    |          |
| Inguinal hernia                                  |                                      | 1        |     |    |          |                | 1        |          |    |          |
| Undescended testes                               |                                      |          |     |    |          |                |          |          |    |          |
| Umbilical hernia                                 |                                      |          |     |    |          |                |          |          |    |          |
| Ear-Nose-Throat                                  |                                      |          |     |    |          |                |          |          |    |          |
| Profound tonsillar hypertropia                   |                                      |          |     |    |          |                |          |          |    |          |
| Injured tympanic membrane secondary to infection |                                      |          |     |    |          |                |          |          |    |          |
| <b>TOTAL</b>                                     | <b>3</b>                             | <b>1</b> |     |    | <b>3</b> | <b>2</b>       | <b>2</b> | <b>1</b> |    | <b>5</b> |

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Table 3-15 (continued)

Number of Problems Found at Pretest and Followed-up at Posttest by Head Start and Non-Head Start Group, Whether the Problem was Treated, and Whether the Problem was Present at Posttest for Children in Longitudinal Sample in Mingo County

|                           | Longitudinal Children (Sample A) in: |    |     |    |         |                |    |     |    |         |
|---------------------------|--------------------------------------|----|-----|----|---------|----------------|----|-----|----|---------|
|                           | Mingo County                         |    |     |    |         |                |    |     |    |         |
| Head Start-Non Head Start | Head Start                           |    |     |    |         | Non-Head Start |    |     |    |         |
| Treatment after Pretest   | Yes                                  |    | No  |    | Unknown | Yes            |    | No  |    | Unknown |
| Presence at Posttest      | Yes                                  | No | Yes | No | Unknown | Yes            | No | Yes | No | Unknown |
| <b>Problem at Pretest</b> |                                      |    |     |    |         |                |    |     |    |         |
| Developmental Pattern     |                                      |    |     |    |         |                |    |     |    |         |
| Not toilet trained        |                                      |    |     |    |         |                |    |     |    |         |
| Enuresis                  |                                      |    |     |    |         |                |    |     |    |         |
| Nutritional               |                                      |    |     |    |         |                |    |     |    |         |
| Obesity                   |                                      |    |     |    |         |                |    |     |    |         |
| Growth                    |                                      |    |     |    |         |                |    |     |    |         |
| Unspecified               |                                      |    |     |    |         | 1              |    |     |    |         |
| Short stature             |                                      |    |     |    |         |                |    |     |    |         |
| Pica                      |                                      |    |     |    |         |                |    |     |    |         |
| Child abuse & neglect     |                                      |    |     |    |         |                |    |     |    |         |
| Psychosocial              |                                      |    |     |    |         |                |    |     |    |         |
| Breath holding            |                                      |    |     |    |         |                |    |     |    |         |
| Self-induced vomiting     |                                      |    |     |    |         |                |    |     |    |         |
| Undifferentiated          |                                      |    |     |    |         |                |    |     |    |         |
| Hyperactive               |                                      |    |     |    |         |                |    |     |    |         |
| Depressed mother          |                                      |    |     |    |         |                |    |     |    |         |
| Gingival tonsillitis      |                                      |    |     |    |         |                |    |     |    |         |
| TB exposure               |                                      |    |     |    |         |                |    |     |    |         |
| Werdnig's syndrome        |                                      |    |     |    |         |                |    |     | 1  |         |
| Sickle cell anemia        |                                      |    |     |    |         |                |    |     |    |         |
| Congenital abnormality    |                                      |    |     |    |         |                |    |     |    |         |
| Pneumonia                 |                                      |    |     |    |         |                |    |     |    |         |
| Recurrent                 |                                      |    |     |    |         |                |    |     |    |         |
| Failure to thrive         |                                      |    |     |    |         |                |    |     |    | 1       |
| <b>TOTAL</b>              |                                      |    |     |    |         | 1              |    |     | 1  | 1       |

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Table 3-16

Children with Problems at Pretest Who Received Treatment  
for At Least One of Their Problems Prior to Posttest

| Groups of Children | Pretested (Sample Children A) in:<br>(Excluding Children Referred at Pretest for Specific Problems) |                  |                 |              |               |
|--------------------|---|------------------|-----------------|--------------|---------------|
|                    | Greene & Humphreys Counties   | St. Clair County | Maricopa County | Mingo County | All Sites     |
| Head Start         | n<br>2/19<br>63.2 <sup>a</sup>  | 4/11<br>36.4     | 9/28<br>32.1    | 3/5<br>60.0  | 28/63<br>44.4 |
| Non-Head Start     | n<br>2/19<br>10.5   | 4/10<br>40.0     | 4/12<br>25.0    | 5/10<br>50.0 | 15/51<br>29.4 |

| Groups of Children | Pretested (Samples A & D) Children in:<br>(Including All Children Referred at Pretest) |                  |                 |              |               |
|--------------------|--|------------------|-----------------|--------------|---------------|
|                    | Greene & Humphreys Counties  | St. Clair County | Maricopa County | Mingo County | All Sites     |
| Head Start         | n<br>13/25<br>52.0 <sup>a</sup>  | 4/14<br>28.6     | 9/21<br>42.9    | 4/5<br>80.0  | 30/65<br>46.2 |
| Non-Head Start     | n<br>2/16<br>12.5  | 4/6<br>66.7      | 4/8<br>50.0     | 5/7<br>71.4  | 15/37<br>40.5 |

<sup>a</sup>Significant difference between Head Start and non-Head Start group ( $p < .05$ )

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Table 3-17

Number of Medical Problems, Percentage of Children with Single or Multiple Medical Problems Receiving Treatment, by Head Start and Non-Head Start

| Treatment of Children Found to Have Medical Problems at Pretest | Longitudinal Children (Sample A) in: |                   |                  |                 |                  |                 |                 |                 |                   |                   |
|---|--------------------------------------|-------------------|------------------|-----------------|------------------|-----------------|-----------------|-----------------|-------------------|-------------------|
|   | Greene & Humphreys Counties          |                   | St. Clair County |                 | Maricopa County  |                 | Mingo County    |                 | All Sites         |                   |
|   | HS<br>n=43                           | NHS<br>n=31       | HS<br>n=25       | NHS<br>n=17     | HS<br>n=40       | NHS<br>n=16     | HS<br>n=18      | NHS<br>n=18     | HS<br>n=126       | NHS<br>n=32       |
| Total Number of Medical Problems at Pretest                     | 36                                   | 23                | 17               | 17              | 40               | 21              | 7               | 13              | 100               | 74                |
| Children Treated for Single Problem                             | n=8/13<br>% 61.5                     | n=1/15<br>% 6.7** | n=3/8<br>% 37.5  | n=2/7<br>% 28.6 | n=4/16<br>% 25.0 | n=0/3<br>% 0.0  | n=3/4<br>% 75.0 | n=4/7<br>% 57.1 | n=18/41<br>% 43.9 | n=7/32<br>% 21.9* |
| Children Treated for Multiple Medical Problems                  | n=4/6<br>% 66.7                      | n=1/4<br>% 25.0   | n=1/3<br>% 33.3  | n=2/3<br>% 66.7 | n=5/12<br>% 41.7 | n=4/9<br>% 44.4 | n=0/1<br>% 0.0  | n=1/3<br>% 33.3 | n=10/22<br>% 45.5 | n=8/19<br>% 42.1  |

<sup>a</sup> Significant difference between Head Start and non-Head Start indicated as:

\*p < .05  
\*\*p < .01

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Table 3-18

Comparison of Per Capita Incomes of Families With and Without Medicaid Coverage  
(Sample A)

|                   |      | Children (Sample A) in:<br>Greene & Humphreys Counties |          |              |          | Children (Sample A) in:<br>St. Clair County |          |              |          | Children (Sample A) in:<br>Mingo County |          |              |          |
|-------------------|------|--|----------|--------------|----------|---|----------|--------------|----------|---|----------|--------------|----------|
|                   |      | Medicaid   |          | Non-Medicaid |          | Medicaid                                    |          | Non-Medicaid |          | Medicaid                                |          | Non-Medicaid |          |
|                   |      | Pretest  | Posttest | Pretest      | Posttest | Pretest                                     | Posttest | Pretest      | Posttest | Pretest                                 | Posttest | Pretest      | Posttest |
| Head<br>Start     | Mean | 719  | 643      | 1053         | 1410     | 806   | 735      | 1140         | 1133     | 1120                                    | 504      | 827          | 627      |
|                   | Min. | 281  | 102      | 138          | 321      | 250   | 250      | 875          | 791      | 638                                     | 178      | 541          | 583      |
|                   | Max. | 3125   | 2100     | 2812         | 4500     | 1375  | 1083     | 1583         | 1812     | 2250                                    | 1250     | 1687         | 650      |
| Non-head<br>Start | Mean | 432  | 390      | 935          | 1317     | 834   | 885      | 936          | 2775     | 1302                                    | 1747     | 1306         | 1837     |
|                   | Min. | 27   | 50       | 194          | 187      | 180   | 275      | 347          | 1650     | 812                                     | 812      | 650          | 607      |
|                   | Max. | 937  | 2100     | 3150         | 6750     | 1583  | 1312     | 1650         | 3375     | 1687                                    | 5500     | 1914         | 7000     |

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Table 3-19

Prevalences of Selected Problems from the Pediatric Examination at Posttest<sup>8</sup>

| Selected Pediatric Problems       | Posttreated Children (Samples A, B, C) in: |              |                  |             |                 |             |              |              |             |              |
|-----------------------------------|--|--------------|------------------|-------------|-----------------|-------------|--------------|--------------|-------------|--------------|
|                                   | Greene & Humphreys Counties                |              | St. Clair County |             | Maricopa County |             | Mingo County |              | All Sites   |              |
|                                   | HS<br>n=127                                | NHS<br>n=101 | HS<br>n=108      | NHS<br>n=86 | HS<br>n=106     | NHS<br>n=61 | HS<br>n=119  | NHS<br>n=109 | HS<br>n=460 | NHS<br>n=352 |
| Serous Otitis Media               | n   9                                      | 7            | 9                | 11          | 11              | 6           | 9            | 7            | 38          | 31           |
| Z                                 | 7.1  | 6.9          | 8.3              | 12.8        | 10.4            | 9.8         | 7.6          | 6.4          | 8.3         | 8.7          |
| Allergies                         | n   20                                     | 10           | 5                | 1           | 9               | 3           | 0            | 0            | 34          | 14           |
| Z                                 | 15.7                                       | 9.9          | 4.6              | 1.2         | 8.5             | 4.9         |              |              | 7.4         | 3.9          |
| Asthma                            | n   13                                     | 8            | 4                | 2           | 2               | 1           | 1            | 5            | 20          | 16           |
| Z                                 | 10.2                                       | 7.9          | 3.7              | 2.3         | 1.9             | 1.6         | 0.8          | 4.6          | 4.3         | 4.5          |
| All Chronic Illness               | n   13                                     | 2            | 5                | 7           | 3               | 4           | 3            | 3            | 24          | 16           |
| Z                                 | 10.2                                       | 2.0          | 4.6              | 8.1         | 2.8             | 6.6         | 2.5          | 2.8          | 5.2         | 4.5          |
| Enuresis (+ 4 yrs.)               | n   6/85                                   | 5/57         | 2/74             | 0/48        | 6/106           | 4/61        | 7/89         | 2/53         | 21/354      | 11/219       |
| Z                                 | 7.1  | 8.8          | 2.7              | 0.0         | 5.7             | 6.6         | 7.8          | 3.8          | 5.9         | 5.0          |
| Recurrent Otitis Media            | n   9                                      | 3            | 4                | 2           | 5               | 0           | 7            | 5            | 25          | 10           |
| Z                                 | 7.1  | 3.0          | 3.7              | 2.3         | 4.7             |             | 5.9          | 4.6          | 5.4         | 2.8          |
| Dermatologic <sup>b</sup>         | n   1                                      | 0            | 3                | 3           | 6               | 3           | 0            | 2            | 10          | 8            |
| Z                                 | 0.8  |              | 2.8              | 3.5         | 5.7             | 4.9         |              | 1.8          | 2.2         | 2.2          |
| Surgical Indications <sup>c</sup> | n   9                                      | 8            | 1                | 2           | 2               | 0           | 0            | 0            | 12          | 10           |
| Z                                 | 7.1  | 7.9          | 0.9              | 2.3         | 1.9             |             |              |              | 2.6         | 2.8          |
| Neurologic <sup>d</sup>           | n   7                                      | 1            | 1                | 2           | 2               | 2           | 0            | 1            | 10          | 6            |
| Z                                 | 5.5  | 1.0          | 0.9              | 2.3         | 1.9             | 3.3         |              | 0.9          | 2.2         | 1.7          |
| Seizures                          | n   3                                      | 1            | 1                | 2           | 0               | 1           | 0            | 0            | 4           | 4            |
| Z                                 | 2.4  | 1.0          | 0.9              | 2.3         |                 | 1.6         |              |              | 0.9         | 1.1          |
| Febrile Seizures                  | n   4                                      | 0            | 0                | 0           | 1               | 0           | 0            | 1            | 5           | 1            |
| Z                                 | 3.1  |              |                  |             | 0.9             |             |              | 0.9          | 1.1         | 0.3          |
| Psychosocial <sup>e</sup>         | n   1                                      | 0            | 4                | 0           | 2               | 3           | 3            | 2            | 10          | 5            |
| Z                                 | 0.8  |              | 3.7              |             | 1.9             | 4.9         | 2.5          | 1.8          | 2.2         | 1.4          |
| Congenital Cardiac                | n   4                                      | 1            | 4                | 3           | 1               | 2           | 3            | 0            | 12          | 6            |
| Z                                 | 3.1  | 1.0          | 3.7              | 3.5         | 0.9             | 3.3         | 2.5          |              | 2.6         | 1.7          |
| Urinary Infections                | n   6                                      | 5            | 1                | 0           | 3               | 0           | 5            | 7            | 15          | 12           |
| Z                                 | 4.7  | 5.0          | 0.9              |             | 2.8             |             | 4.2          | 6.4          | 3.3         | 3.4          |
| Acute Otitis Media                | n   1                                      | 2            | 0                | 0           | 0               | 1           | 2            | 0            | 3           | 1            |
| Z                                 | 0.8  | 2.0          |                  |             |                 | 1.6         | 1.7          |              | 0.7         | 0.8          |
| Congenital Anomalies              | n   1                                      | 0            | 0                | 1           | 0               | 0           | 0            | 1            | 1           | 2            |
| Z                                 | 0.8  |              |                  | 1.2         |                 |             |              | 0.9          | 0.2         | 0.6          |
| Pica                              | n   5                                      | 7            | 13               | 7           | 2               | 2           | 1            | 1            | 21          | 17           |
| Z                                 | 3.9  | 6.9          | 12.0             | 8.1         | 1.9             | 3.3         | 0.8          | 0.9          | 4.6         | 4.8          |
| None of the Above Problems        | n   62                                     | 62           | 75               | 65          | 72              | 43          | 84           | 82           | 293         | 252          |
| Z                                 | 48.8                                       | 61.4         | 69.4             | 75.6        | 67.8            | 70.5        | 70.6         | 75.2         | 63.7        | 70.6         |

<sup>a</sup>All chronic illness: congenital cardiac, urogenital anomaly, hypospadias, seizures, neurological problems secondary to head trauma, febrile seizures, and sickle cell anemia.

<sup>b</sup>Dermatologic problems: eczema, seborrhea, nits, alopecia areata, impetigo, dry skin, and fungal infection.

<sup>c</sup>Surgical problems: inguinal hernias, undescended testes, umbilical hernias, and femoral hernias.

<sup>d</sup>Neurologic problems: seizures, febrile seizures, and neurologic problems secondary to head trauma.

<sup>e</sup>Psychosocial problems: breath holding, self-induced vomiting, hyperactivity, depressed mother, and undifferentiated psychosocial problems.

<sup>f</sup>Congenital cardiac problems: mostly murmurs, thought to be non-functional.

<sup>8</sup>The significance of the  $\chi^2$  tests between Head Start and non-Head Start groups are  $p > .05$ —therefore not considered significant.

Table 3-20

Characteristics of Types of Pediatric Problems  
(Excluding Pica) Reported at Posttest Across All Sites

| Characteristic of Problem          | Posttested Children (Samples A, B, C) |                 |                 |               |                        |               |               |
|------------------------------------|---------------------------------------|-----------------|-----------------|---------------|------------------------|---------------|---------------|
|                                    | Organic                               |                 | Psychosocial    |               | Other Possible Problem |               |               |
|                                    | HS<br>n=460                           | NHS<br>n=357    | HS<br>n=460     | NHS<br>n=357  | HS<br>n=460            | NHS<br>n=357  |               |
| Number of Problems                 | 200                                   | 152             | 39              | 35            | 49                     | 22            |               |
| <b>Infectious Problem:</b>         |                                       |                 |                 |               |                        |               |               |
| Yes                                | n<br>Z                                | 55/200<br>27.8  | 42/152<br>27.8  |               |                        | 9/49<br>18.4  | 2/22<br>9.1   |
| No                                 | n<br>Z                                | 143/200<br>71.5 | 107/152<br>70.9 |               |                        | 38/49<br>77.6 | 18/22<br>81.8 |
| Uncertain                          | n<br>Z                                | 2/200<br>1.0    | 2/152<br>1.3    |               |                        | 2/49<br>4.1   | 2/22<br>9.1   |
| <b>Chronicity:</b>                 |                                       |                 |                 |               |                        |               |               |
| Acute                              | n<br>Z                                | 30/186<br>16.1  | 28/145<br>19.3  | 3/33<br>9.1   | 2/30<br>6.7            | 3/45<br>6.7   | 2/21<br>9.5   |
| Acute Exacerbation of Chronic      | n<br>Z                                | 7/186<br>3.8    | 6/145<br>4.1    |               | 1/30<br>3.3            | 1/45<br>2.2   | 1/21<br>4.8   |
| Chronic Ongoing                    | n<br>Z                                | 143/186<br>76.9 | 104/145<br>71.7 | 30/33<br>90.9 | 27/30<br>90.0          | 40/45<br>88.9 | 18/21<br>85.7 |
| Past Chronic, Overcome             | n<br>Z                                | 4/186<br>2.2    | 6/145<br>4.1    |               |                        | 1/45<br>2.2   |               |
| Problem Resulting From Past Insult | n<br>Z                                | 2/186<br>1.0    | 1/145<br>1.0    |               |                        |               |               |
| <b>Severity:</b>                   |                                       |                 |                 |               |                        |               |               |
| Mild                               | n<br>Z                                | 82/185<br>44.3  | 56/145<br>38.6  | 14/33<br>42.4 | 13/31<br>41.9          | 28/47<br>59.6 | 13/21<br>61.9 |
| Moderate                           | n<br>Z                                | 100/185<br>54.1 | 80/145<br>55.2  | 18/33<br>54.5 | 16/31<br>51.6          | 18/47<br>38.3 | 8/21<br>38.1  |
| Severe                             | n<br>Z                                | 3/185<br>1.6    | 3/145<br>2.1    | 1/33<br>3.0   | 2/31<br>6.5            | 1/47<br>2.1   |               |
| <b>Urgency:</b>                    |                                       |                 |                 |               |                        |               |               |
| Attend Within 24 hr                | n<br>Z                                | 5/185<br>2.7    | 10/145<br>6.9   | 5/33<br>15.1  | 5/31<br>16.1           | 1/47<br>2.1   |               |
| Future Attention                   | n<br>Z                                | 94/185<br>50.8  | 73/145<br>50.3  | 14/33<br>42.4 | 16/31<br>51.6          | 20/47<br>42.6 | 12/22<br>54.5 |
| Attend at Routine Visits           | n<br>Z                                | 86/185<br>46.5  | 62/145<br>42.7  | 14/33<br>42.4 | 10/31<br>32.2          | 26/47<br>55.3 | 10/22<br>45.4 |

Exhibit 3-21

Mother's Report of State of Child's Health  
at Posttest

| State of Child's Health |   | Posttested Children (Samples A, B, C) in: |                           |                          |                       |                    |
|-------------------------|---|---|---------------------------|--------------------------|-----------------------|--------------------|
|                         |   | Greene & Humphreys Counties<br>n=227      | St. Clair County<br>n=193 | Maricopa County<br>n=166 | Mingo County<br>n=228 | All Sites<br>n=814 |
| Excellent               | n | 42  | 31                        | 41                       | 49                    | 163                |
|                         | % | 18.5                                      | 16.1                      | 24.7                     | 21.5                  | 20.0               |
| Very Good               | n | 58  | 74                        | 63                       | 79                    | 274                |
|                         | % | 25.6                                      | 38.3                      | 38.0                     | 34.6                  | 33.7               |
| Good                    | n | 93  | 75                        | 46                       | 70                    | 284                |
|                         | % | 41.0                                      | 38.9                      | 27.7                     | 30.7                  | 34.9               |
| Fair                    | n | 30  | 13                        | 15                       | 29                    | 87                 |
|                         | % | 13.2                                      | 6.7                       | 9.0                      | 12.7                  | 10.7               |
| Poor                    | n | 4   | 0                         | 1                        | 1                     | 6                  |
|                         | % | 1.8                                       | 0.0                       | 0.6                      | 0.4                   | 0.7                |

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Table 3-22

Mothers Reported Problems During Pregnancy  
of Posttested Children

| Maternal Health Indicators During Pregnancy               | Posttested Children (Sample A, B, C) in: |                           |                          |                       |                     |
|---|--|---------------------------|--------------------------|-----------------------|---------------------|
|   | Greene & Humphreys Counties<br>n=227     | St. Clair County<br>n=194 | Maricopa County<br>n=167 | Mingo County<br>n=228 | All Sites<br>n=816  |
| First prenatal visit more than three months               | n 47/204<br>% 23.0                       | n 31/150<br>% 20.7        | n 50/149<br>% 33.6       | n 54/203<br>% 26.6    | n 182/706<br>% 25.8 |
| Health problems during pregnancy (other than weight gain) | n 45/207<br>% 21.7                       | n 28/153<br>% 18.3        | n 43/154<br>% 27.9       | n 56/211<br>% 26.5    | n 172/725<br>% 23.7 |
| Pregnancy weight loss or gain of more than 30 lbs.        | n 44/155<br>% 28.4                       | n 44/120<br>% 36.7        | n 48/123<br>% 39.0       | n 75/177<br>% 42.4    | n 211/575<br>% 36.7 |

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Table 3-23

Perinatal Health Problems of Posttested Children

| Perinatal Health Problems                                  |        | Posttested Children (Sample A, B, C) in: |                           |                          |                       |                    |
|--|--------|--|---------------------------|--------------------------|-----------------------|--------------------|
|  |        | Greene & Humphreys Counties<br>n=227     | St. Clair County<br>n=194 | Maricopa County<br>n=167 | Mingo County<br>n=228 | All Sites<br>n=816 |
| Gestation less than 38 weeks or greater than 42 weeks      | n<br>% | 16/209<br>7.7                            | 22/153<br>14.4            | 27/150<br>18.0           | 33/211<br>15.6        | 98/723<br>13.6     |
| Birthweight less than 5.5 pounds or greater than 10 pounds | n<br>% | 27/203<br>13.3                           | 26/148<br>17.6            | 26/149<br>17.4           | 20/208<br>9.6         | 99/708<br>14.0     |
| Hospital stay at birth longer than mothers                 | n<br>% | 10/210<br>4.8                            | 22/151<br>14.6            | 24/152<br>15.8           | 27/212<br>12.7        | 83/725<br>11.4     |
| Health problems at birth                                   | n<br>% | 45/207<br>21.7                           | 28/153<br>18.3            | 43/154<br>27.9           | 56/211<br>26.5        | 172/725<br>23.7    |
| Congenital problems  | n<br>% | 27/212<br>12.7                           | 14/153<br>9.2             | 29/153<br>19.0           | 39/214<br>18.2        | 109/732<br>14.9    |



Table 3-24

## Mother's Age at Birth of Child of Posttested Children

| Maternal Health Indicators During Pregnancy |   | Posttested Children (Sample A, B, C) in: |                           |                          |                       |                    |
|---|---|--|---------------------------|--------------------------|-----------------------|--------------------|
|   |   | Greene & Humphreys Counties<br>n=227     | St. Clair County<br>n=194 | Maricopa County<br>n=167 | Mingo County<br>n=228 | All Sites<br>n=816 |
| < 15 years                                  | n | 3/223                                    | 1/187                     | 1/166                    | 1/221                 | 6/797              |
|   | % | 1.3                                      | 0.5                       | 0.6                      | 0.5                   | 0.8                |
| 15-17 years                                 | n | 38/223                                   | 37/187                    | 22/166                   | 24/221                | 121/797            |
|   | % | 17.0                                     | 19.8                      | 13.3                     | 10.9                  | 15.2               |
| 18-19 years                                 | n | 35/223                                   | 46/187                    | 27/166                   | 38/221                | 146/797            |
|   | % | 15.7                                     | 24.6                      | 16.3                     | 17.2                  | 18.3               |
| > 19 years                                  | n | 147/223                                  | 103/187                   | 116/166                  | 158/221               | 524/797            |
|   | % | 65.9                                     | 55.1                      | 69.9                     | 71.5                  | 65.7               |

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Table 3-25

Medicaid Coverage for Head Start and Non-Head Start Children in Sample A With Unadjusted Comparisons Between Head Start and Non-Head Start Groups Within Site

|                  | HEAD START |    |      | NON-HEAD START |    |      | CHI SQ | DF | P     |
|------------------|------------|----|------|----------------|----|------|--------|----|-------|
|                  | N          | n  | %    | N              | n  | %    |        |    |       |
| Greene/Humphreys |            |    |      |                |    |      |        |    |       |
| Pretest          | 43         | 17 | 39.5 | 31             | 14 | 45.2 | 0.234  | 1  | 0.628 |
| Posttest         | 43         | 24 | 55.8 | 31             | 13 | 41.9 | 1.388  | 1  | 0.239 |
| St. Clair        |            |    |      |                |    |      |        |    |       |
| Pretest          | 25         | 22 | 88.0 | 17             | 14 | 82.4 | 0.264  | 1  | 0.608 |
| Posttest         | 25         | 15 | 60.0 | 17             | 13 | 76.5 | 1.235  | 1  | 0.266 |
| Maricopa         |            |    |      |                |    |      |        |    |       |
| Pretest          | 39         | 0  | 0.0  | 16             | 0  | 0.0  |        |    |       |
| Posttest         | 40         | 0  | 0.0  | 16             | 0  | 0.0  |        |    |       |
| Mingo            |            |    |      |                |    |      |        |    |       |
| Pretest          | 18         | 8  | 44.4 | 18             | 6  | 33.3 | 0.468  | 1  | 0.494 |
| Posttest         | 18         | 6  | 33.3 | 17             | 4  | 23.5 | 0.412  | 1  | 0.521 |

Table 3-25 (continued)

Medicaid Coverage for Head Start and Non-Head Start Children in Samples A,B,C,D With Unadjusted Comparisons Between Head Start and Non-Head Start Groups Within Site

|                  | HEAD START |    |      | NON-HEAD START |    |      | CHI SQ | DF | P     |
|------------------|------------|----|------|----------------|----|------|--------|----|-------|
|                  | N          | n  | %    | N              | n  | %    |        |    |       |
| Greene/Humphreys |            |    |      |                |    |      |        |    |       |
| Pretest          | 52         | 21 | 40.4 | 43             | 19 | 44.2 | 0.140  | 1  | 0.709 |
| Posttest         | 126        | 49 | 38.9 | 100            | 40 | 40.0 | 0.029  | 1  | 0.865 |
| St. Clair        |            |    |      |                |    |      |        |    |       |
| Pretest          | 61         | 51 | 83.6 | 51             | 44 | 86.3 | 0.154  | 1  | 0.695 |
| Posttest         | 107        | 73 | 68.2 | 84             | 55 | 65.5 | 0.161  | 1  | 0.688 |
| Maricopa         |            |    |      |                |    |      |        |    |       |
| Pretest          | 61         | 0  | 0.0  | 33             | 0  | 0.0  |        |    |       |
| Posttest         | 106        | 0  | 0.0  | 61             | 0  | 0.0  |        |    |       |
| Mingo            |            |    |      |                |    |      |        |    |       |
| Pretest          | 40         | 14 | 35.0 | 33             | 12 | 36.4 | 0.015  | 1  | 0.904 |
| Posttest         | 118        | 32 | 27.1 | 107            | 14 | 13.1 | 6.796  | 1  | 0.009 |

Table 3-26

Comparison of Per Capita Incomes of Families With and Without Medicaid Coverage  
(Samples A, D pretest and A, B, C posttest)

|                   |      | Children (Sample A) in:<br>Greene & Humphreys Counties |          |              |          | Children (Sample A) in:<br>St. Clair County |          |              |          | Children (Sample A) in:<br>Mingo County |          |              |          |
|-------------------|------|--|----------|--------------|----------|---|----------|--------------|----------|---|----------|--------------|----------|
|                   |      | Medicaid   |          | Non-Medicaid |          | Medicaid                                    |          | Non-Medicaid |          | Medicaid                                |          | Non-Medicaid |          |
|                   |      | Pretest  | Posttest | Pretest      | Posttest | Pretest                                     | Posttest | Pretest      | Posttest | Pretest                                 | Posttest | Pretest      | Posttest |
| Head<br>Start     | Mean | 702  | 610      | 1116         | 1112     | 830   | 821      | 894          | 1748     | 938                                     | 733      | 1178         | 1537     |
|                   | Min. | 281  | 50       | 137          | 50       | 250   | 93       | 479          | 607      | 541                                     | 178      | 62           | 104      |
|                   | Max. | 3125   | 2100     | 4312         | 5250     | 1625  | 1875     | 1583         | 7000     | 2250                                    | 1650     | 1687         | 5500     |
| Non-head<br>Start | Mean | 537  | 541      | 895          | 1243     | 873   | 824      | 994          | 1881     | 718                                     | 1787     | 1236         | 2435     |
|                   | Min. | 27   | 50       | 44           | 35       | 35  | 250      | 347          | 450      | 325                                     | 250      | 41           | 187      |
|                   | Max. | 1950   | 2100     | 3150         | 6750     | 1812  | 1650     | 1650         | 4500     | 1687                                    | 1583     | 1916         | 7000     |

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Table 3-27

Percentage of Head Start and Non-Head Start Children  
Who Have Had Accidents or Been Hospitalized by Site at Posttest

|                    | Greene & Humphreys Counties |               | St. Clair County |               | Maricopa County |               | Mingo County  |                | All Sites     |                |      |
|--------------------|-----------------------------|---------------|------------------|---------------|-----------------|---------------|---------------|----------------|---------------|----------------|------|
|                    | HS<br>(n=127)               | NHS<br>(n=99) | HS<br>(n=108)    | NHS<br>(n=86) | HS<br>(n=106)   | NHS<br>(n=61) | HS<br>(n=118) | NHS<br>(n=109) | HS<br>(n=459) | NHS<br>(n=355) |      |
| Had Accident       | n                           | 36            | 33               | 46            | 29              | 46            | 31            | 38             | 40            | 166            | 133  |
|                    | %                           | 28.3          | 33.3             | 42.5          | 33.7            | 43.3          | 50.8          | 32.2           | 36.7          | 36.2           | 37.5 |
| Hospitalization:   |                             |               |                  |               |                 |               |               |                |               |                |      |
| - Serious Accident | n                           | 8             | 5                | 6             | 10              | 4             | 6             | 2              | 1             | 20             | 22   |
|                    | %                           | 6.3           | 5.0              | 5.6           | 11.6            | 3.8           | 9.8           | 1.7            | 1.0           | 4.4            | 6.2  |
| - Surgery          | n                           | 1             | 5                | 10            | 5               | 4             | 3             | 8              | 10            | 24             | 23   |
|                    | %                           | 1.0           | 5.0              | 9.2           | 5.8             | 3.8           | 4.9           | 6.8            | 9.1           | 5.2            | 6.5  |

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Table 3-28

UNADJUSTED COMPARISONS BETWEEN THOSE WHO DID AND THOSE WHO DID NOT RECEIVE PHYSICAL EXAM SCREENS FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| SCREENED  | Greene/Humphreys |      | St. Clair      |      | Maricopa       |      | Mingo          |       |
|---|------------------|------|----------------|------|----------------|------|----------------|-------|
|   | YES              | NO   | YES            | NO   | YES            | NO   | YES            | NO    |
| PER CAPITA INCOME N<br>LESS THAN \$1295                   | 89               | 32   | 4              | 97   | 93             | 5    | 78             | 2     |
| N   | 66               | 26   | 2              | 82   | 55             | 4    | 48             | 2     |
| X   | 74.2             | 75.0 | 50.0           | 84.5 | 59.1           | 80.0 | 61.5           | 100.0 |
|   | CHI SQ = 0.009   |      | CHI SQ = 3.273 |      | CHI SQ = 0.862 |      | CHI SQ = 1.231 |       |
|   | DF = 0.925       |      | DF = 0.070     |      | DF = 0.353     |      | DF = 0.267     |       |
| MOTHER HAS LESS N<br>THAN 12 YEARS OF<br>EDUCATION        | 94               | 33   | 4              | 104  | 97             | 5    | 82             | 3     |
| N   | 46               | 16   | 3              | 39   | 51             | 4    | 44             | 1     |
| X   | 48.9             | 48.5 | 75.0           | 37.5 | 52.0           | 80.0 | 53.7           | 33.3  |
|   | CHI SQ = 0.002   |      | CHI SQ = 2.279 |      | CHI SQ = 1.439 |      | CHI SQ = 0.480 |       |
|   | DF = 0.964       |      | DF = 0.131     |      | DF = 0.230     |      | DF = 0.488     |       |
| MOTHER'S AGE AT N<br>BIRTH OF CHILD<br>LESS THAN 18 YEARS | 92               | 33   | 4              | 101  | 96             | 5    | 81             | 3     |
| N   | 14               | 7    | 1              | 22   | 16             | 0    | 13             | 0     |
| X   | 15.2             | 21.2 | 25.0           | 21.8 | 16.7           | 0.0  | 16.0           | 0.0   |
|   | CHI SQ = 0.624   |      | CHI SQ = 0.023 |      | CHI SQ = 0.990 |      | CHI SQ = 0.570 |       |
|   | DF = 0.429       |      | DF = 0.879     |      | DF = 0.320     |      | DF = 0.450     |       |

Table 3-28 (continued)

UNADJUSTED COMPARISONS, BETWEEN THOSE WHO DID AND THOSE WHO DID NOT RECEIVE PHYSICAL EXAM SCREENS FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| SCREENED                               |    | Greene/Humphreys                      |              | St. Clair                             |            | Paricopa                              |            | Hills                                 |            |
|--|----|---------------------------------------|--------------|---------------------------------------|------------|---------------------------------------|------------|---------------------------------------|------------|
|  |    | YES                                   | NO           | YES                                   | NO         | YES                                   | NO         | YES                                   | NO         |
| NO MEDICAL INSURANCE                   | N  | 82                                    | 31           | 4                                     | 102        | 95                                    | 5          | 78                                    | 3          |
|  | DX | 33<br>40.2                            | 25.8         | 1<br>25.0                             | 18<br>17.6 | 69<br>72.6                            | 3<br>60.0  | 30<br>38.5                            | 3<br>100.0 |
|  |    | CHI SQ = 2.028<br>DF = 1<br>P = 0.154 |              | CHI SQ = 0.141<br>DF = 1<br>P = 0.707 |            | CHI SQ = 0.376<br>DF = 1<br>P = 0.540 |            | CHI SQ = 4.531<br>DF = 1<br>P = 0.033 |            |
| NO MEDICAID INSURANCE                  | N  | 93                                    | 33           | 4                                     | 103        | 97                                    | 5          | 81                                    | 3          |
|  | DX | 60<br>64.5                            | 17<br>51.5   | 2<br>50.0                             | 32<br>31.1 | 97<br>100.0                           | 5<br>100.0 | 58<br>71.6                            | 3<br>100.0 |
|  |    | CHI SQ = 1.732<br>DF = 1<br>P = 0.188 |              | CHI SQ = 0.637<br>DF = 1<br>P = 0.425 |            |                                       |            | CHI SQ = 1.173<br>DF = 1<br>P = 0.279 |            |
| DIFFICULT ACCESS TO MEDICAL CARE       | N  | 94                                    | 33           | 4                                     | 104        | 96                                    | 5          | 79                                    | 3          |
|  | DX | 20<br>21.3                            | 18.6<br>18.2 | 0<br>0.0                              | 4<br>3.8   | 20<br>20.8                            | 1<br>20.0  | 19<br>24.1                            | 2<br>66.7  |
|  |    | CHI SQ = 0.144<br>DF = 1<br>P = 0.705 |              | CHI SQ = 0.160<br>DF = 1<br>P = 0.689 |            | CHI SQ = 0.002<br>DF = 1<br>P = 0.964 |            | CHI SQ = 2.755<br>DF = 1<br>P = 0.097 |            |
| NO PARTICIPATION IN GOVERNMENT PROGRAM | N  | 90                                    | 32           | 3                                     | 99         | 95                                    | 5          | 73                                    | 3          |
|  | DX | 8<br>8.9                              | 6.3          | 0<br>0.0                              | 1<br>1.0   | 13<br>13.7                            | 1<br>20.0  | 10<br>13.7                            | 2<br>66.7  |
|  |    | CHI SQ = 0.218<br>DF = 1<br>P = 0.640 |              | CHI SQ = 0.031<br>DF = 1<br>P = 0.861 |            | CHI SQ = 0.157<br>DF = 1<br>P = 0.692 |            | CHI SQ = 6.080<br>DF = 1<br>P = 0.014 |            |

Table 3-29

UNADJUSTED COMPARISONS BETWEEN THOSE WHO HAD AND THOSE WHO DID NOT HAVE PHYSICAL EXAM FINDINGS  
FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| FINDINGS  | Greene/Humphreys |      | St. Clair |      | Maricopa |      | Mingo |      |
|---|------------------|------|-----------|------|----------|------|-------|------|
|   | YES              | NO   | YES       | NO   | YES      | NO   | YES   | NO   |
| PER CAPITA INCOME N<br>LESS THAN \$1295                 | 43               | 46   | 0         | 4    | 31       | 62   | 13    | 65   |
| N   | 29               | 37   | 0         | 2    | 20       | 35   | 10    | 38   |
| %   | 67.4             | 80.4 | 0.0       | 50.0 | 64.3     | 56.5 | 76.9  | 58.5 |
| CHI SQ =  | 1.958            |      |           |      | 0.556    |      | 1.560 |      |
| DF =  | 1                |      |           |      | 1        |      | 1     |      |
| P =   | 0.162            |      |           |      | 0.454    |      | 0.212 |      |
| MOTHER HAS LESS<br>THAN 12 YEARS OF<br>EDUCATION        | 45               | 49   | 0         | 4    | 32       | 65   | 13    | 69   |
| N   | 16               | 30   | 0         | 3    | 18       | 33   | 7     | 37   |
| %   | 35.6             | 61.2 | 0.0       | 75.0 | 56.3     | 50.8 | 53.8  | 53.6 |
| CHI SQ =  | 6.185            |      |           |      | 0.258    |      | 0.000 |      |
| DF =  | 1                |      |           |      | 1        |      | 1     |      |
| P =   | 0.013            |      |           |      | 0.611    |      | 0.988 |      |
| MOTHER'S AGE AT<br>BIRTH OF CHILD<br>LESS THAN 18 YEARS | 44               | 48   | 0         | 4    | 31       | 65   | 13    | 68   |
| N   | 5                | 9    | 0         | 1    | 7        | 9    | 1     | 12   |
| %   | 11.4             | 18.8 | 0.0       | 25.0 | 22.6     | 13.8 | 7.7   | 17.6 |
| CHI SQ =  | 0.971            |      |           |      | 1.153    |      | 0.803 |      |
| DF =  | 1                |      |           |      | 1        |      | 1     |      |
| P =   | 0.324            |      |           |      | 0.283    |      | 0.370 |      |

Table 3-30,

UNADJUSTED COMPARISONS BETWEEN THOSE WHO WERE AND THOSE WHO WERE NOT REFERRED FOR TREATMENT FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| REFERRAL  | Greene/Humphreys |            | St. Clair |           | Maricopa       |            | Mingo          |            |
|---|------------------|------------|-----------|-----------|----------------|------------|----------------|------------|
|   | YES              | NO         | YES       | NO        | YES            | NO         | YES            | NO         |
| PER CAPITA INCOME LESS THAN \$1295                | 34               | 51         | 0         | 4         | 18             | 75         | 25             | 52         |
|   | 23<br>67.6       | 40<br>78.4 | 0<br>0.0  | 2<br>50.0 | 11<br>61.1     | 44<br>58.7 | 16<br>64.0     | 31<br>59.6 |
|   | CHI SQ = 1.237   |            |           |           | CHI SQ = 0.036 |            | CHI SQ = 0.136 |            |
|   | DF = 1           |            |           |           | DF = 1         |            | DF = 1         |            |
|   | P = 0.266        |            |           |           | P = 0.850      |            | P = 0.712      |            |
| MOTHER HAS LESS THAN 12 YEARS OF EDUCATION        | 36               | 54         | 0         | 4         | 18             | 79         | 25             | 56         |
|   | 17<br>47.2       | 27<br>50.0 | 0<br>0.0  | 3<br>75.0 | 12<br>66.7     | 39<br>49.4 | 10<br>40.0     | 34<br>60.7 |
|   | CHI SQ = 0.067   |            |           |           | CHI SQ = 1.760 |            | CHI SQ = 1.989 |            |
|   | DF = 1           |            |           |           | DF = 1         |            | DF = 1         |            |
|   | P = 0.796        |            |           |           | P = 0.185      |            | P = 0.084      |            |
| MOTHER'S AGE AT BIRTH OF CHILD LESS THAN 18 YEARS | 35               | 53         | 0         | 1         | 17             | 79         | 25             | 55         |
|   | 5<br>14.3        | 8<br>15.1  | 0<br>0.0  | 1<br>25.0 | 3<br>17.6      | 13<br>16.3 | 4<br>16.0      | 9<br>16.4  |
|   | CHI SQ = 0.011   |            |           |           | CHI SQ = 0.014 |            | CHI SQ = 0.002 |            |
|   | DF = 1           |            |           |           | DF = 1         |            | DF = 1         |            |
|   | P = 0.917        |            |           |           | P = 0.905      |            | P = 0.967      |            |



Table 3-30. (continued)

UNADJUSTED COMPARISONS BETWEEN THOSE WHO WERE AND THOSE WHO WERE NOT REFERRED FOR TREATMENT FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| REFERRAL                               |   | Greene/Humphreys                    |            | St. Clair |           | Maricopa                            |             | Mingo                               |            |
|--|---|-------------------------------------|------------|-----------|-----------|-------------------------------------|-------------|-------------------------------------|------------|
|  |   | YES                                 | NO         | YES       | NO        | YES                                 | NO          | YES                                 | NO         |
| NO MEDICAL INSURANCE                   | N | 34                                  | 44         | 0         | 4         | 17                                  | 78          | 23                                  | 54         |
|  | N | 12<br>35.3                          | 21<br>47.7 | 0<br>0.0  | 1<br>25.0 | 13<br>76.5                          | 56<br>71.8  | 7<br>30.4                           | 23<br>42.6 |
|  |   | CHI SQ = 1.215<br>DF =<br>P = 0.270 |            |           |           | CHI SQ = 0.154<br>DF =<br>P = 0.695 |             | CHI SQ = 1.003<br>DF =<br>P = 0.317 |            |
| NO MEDICAID INSURANCE                  | N | 36                                  | 53         | 0         | 4         | 18                                  | 79          | 25                                  | 55         |
|  | N | 24<br>66.7                          | 35<br>66.0 | 0<br>0.0  | 2<br>50.0 | 18<br>100.0                         | 79<br>100.0 | 18<br>72.0                          | 39<br>70.9 |
|  |   | CHI SQ = 0.004<br>DF =<br>P = 0.951 |            |           |           |                                     |             | CHI SQ = 0.010<br>DF =<br>P = 0.920 |            |
| DIFFICULT ACCESS TO MEDICAL CARE       | N | 36                                  | 54         | 0         | 4         | 18                                  | 78          | 25                                  | 54         |
|  | N | 13<br>33.3                          | 14<br>25.9 | 0<br>0.0  | 0<br>0.0  | 6<br>33.3                           | 14<br>17.9  | 6<br>24.0                           | 13<br>24.1 |
|  |   | CHI SQ = 1.879<br>DF =<br>P = 0.170 |            |           |           | CHI SQ = 2.099<br>DF =<br>P = 0.147 |             | CHI SQ = 0.000<br>DF =<br>P = 0.994 |            |
| NO PARTICIPATION IN GOVERNMENT PROGRAM | N | 36                                  | 50         | 0         | 3         | 17                                  | 78          | 2                                   | 50         |
|  | N | 6<br>11.1                           | 4<br>8.0   | 0<br>0.0  | 0<br>0.0  | 1<br>5.9                            | 12<br>15.4  | 2<br>18.2                           | 6<br>12.0  |
|  |   | CHI SQ = 0.240<br>DF =<br>P = 0.624 |            |           |           | CHI SQ = 1.067<br>DF =<br>P = 0.302 |             | CHI SQ = 0.488<br>DF =<br>P = 0.485 |            |

Table 3-30 (continued)

UNADJUSTED COMPARISONS BETWEEN THOSE WHO HAD AND THOSE WHO DID NOT HAVE PHYSICAL EXAM FINDINGS  
FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| FINDINGS                               |     | Greene/Humphreys                      |            | St. Clair |           | Maricopa                              |             | Mingo                                 |            |
|--|-----|---------------------------------------|------------|-----------|-----------|---------------------------------------|-------------|---------------------------------------|------------|
|  |     | YES                                   | NO         | YES       | NO        | YES                                   | NO          | YES                                   | NO         |
| NO MEDICAL INSURANCE                   | N   | 40                                    | 42         | 0         | 4         | 31                                    | 64          | 12                                    | 66         |
|  | n % | 17<br>42.5                            | 16<br>38.1 | 0.0       | 1<br>25.0 | 23<br>74.2                            | 46<br>71.9  | 4<br>33.3                             | 26<br>39.4 |
|  |     | CHI SQ = 0.165<br>DF = 1<br>P = 0.684 |            |           |           | CHI SQ = 0.056<br>DF = 1<br>P = 0.812 |             | CHI SQ = 0.158<br>DF = 1<br>P = 0.691 |            |
| NO MEDICAID INSURANCE                  | N   | 44                                    | 49         | 0         | 4         | 32                                    | 65          | 13                                    | 68         |
|  | n % | 35<br>79.5                            | 25<br>51.0 | 0.0       | 2<br>50.0 | 32<br>100.0                           | 65<br>100.0 | 11<br>84.6                            | 47<br>69.1 |
|  |     | CHI SQ = 8.240<br>DF = 1<br>P = 0.004 |            |           |           |                                       |             | CHI SQ = 1.289<br>DF = 1<br>P = 0.256 |            |
| DIFFICULT ACCESS TO MEDICAL CARE       | N   | 45                                    | 49         | 0         | 4         | 31                                    | 65          | 13                                    | 66         |
|  | n % | 8<br>17.8                             | 12<br>24.5 | 0.0       | 0<br>0.0  | 7<br>22.6                             | 13<br>20.0  | 3<br>23.1                             | 16<br>24.2 |
|  |     | CHI SQ = 0.631<br>DF = 1<br>P = 0.427 |            |           |           | CHI SQ = 0.085<br>DF = 1<br>P = 0.771 |             | CHI SQ = 0.008<br>DF = 1<br>P = 0.928 |            |
| NO PARTICIPATION IN GOVERNMENT PROGRAM | N   | 44                                    | 46         | 0         | 3         | 31                                    | 64          | 12                                    | 61         |
|  | n % | 4<br>9.1                              | 4<br>8.7   | 0.0       | 0<br>0.0  | 5<br>16.1                             | 8<br>12.5   | 2<br>16.7                             | 8<br>13.1  |
|  |     | CHI SQ = 0.004<br>DF = 1<br>P = 0.947 |            |           |           | CHI SQ = 0.233<br>DF = 1<br>P = 0.629 |             | CHI SQ = 0.107<br>DF = 1<br>P = 0.744 |            |

Table 9-31 \*

Percentage of Head Start and Non-Head Start Children By  
Prior Head Start Experience of Family According to Prenatal Health  
Characteristics in All Sites

| Prenatal Health Characteristics                           | No Prior Head Start Experience |                         | With Prior Head-Start Experience |                         |
|---|--------------------------------|-------------------------|----------------------------------|-------------------------|
|   | Head Start<br>n=244            | Non-Head Start<br>n=244 | Head Start<br>n=211              | Non-Head Start<br>n=102 |
| First prenatal visit more than three months               | 58/205<br>28.3                 | 57/222<br>25.7          | 42/175<br>24.0                   | 20/91<br>22.0           |
| Health problems during pregnancy (other than weight gain) | 49/209<br>23.4                 | 53/228<br>23.2          | 41/179<br>22.9                   | 24/95<br>25.3           |
| Pregnancy weight loss or gain of more than 30 lbs         | 73/171<br>42.7                 | 63/178<br>35.4          | 46/138<br>29.7                   | 31/77<br>40.3           |

Table 3-31 (continued)

Percentage of Head Start and Non-Head Start Children By  
Prior Head Start Experience of Family According to Prenatal Health  
Characteristics in Greene and Humphreys Counties

| Prenatal Health Characteristics                           | No Prior Head Start Experience |                        | With Prior Head-Start Experience |                        |
|---|--------------------------------|------------------------|----------------------------------|------------------------|
|   | Head Start<br>n=66             | Non-Head Start<br>n=59 | Head Start<br>n=61               | Non-Head Start<br>n=39 |
| First prenatal visit more than three months               | 15/57<br>26.3                  | 14/53<br>26.4          | 10/56<br>17.9                    | 7/37<br>18.9           |
| Health problems during pregnancy (other than weight gain) | 14/58<br>24.1                  | 13/54<br>24.1          | 8/57<br>14.0                     | 8/36<br>22.2           |
| Pregnancy weight loss or gain of more than 30 lbs         | 19/43<br>44.2                  | 8/43<br>18.6           | 6/40<br>15.0                     | 10/27<br>37.0          |

Table 3-31 (continued)

Percentage of Head Start and Non-Head Start Children By  
Prior Head Start Experience of Family According to Prenatal Health  
Characteristics in St. Clair County

| Prenatal Health Characteristics                           | No Prior Head Start Experience |                        | With Prior Head-Start Experience |                        |
|---|--------------------------------|------------------------|----------------------------------|------------------------|
|   | Head Start<br>n=60             | Non-Head Start<br>n=64 | Head Start<br>n=47               | Non-Head Start<br>n=18 |
| First prenatal visit more than three months               | n<br>8<br>9/42<br>21.4         | 11/56<br>19.6          | 7/35<br>20.0                     | 4/13<br>30.8           |
| Health problems during pregnancy (other than weight gain) | n<br>8<br>6/42<br>14.3         | 9/56<br>16.1           | 9/36<br>25.0                     | 3/15<br>20.0           |
| Pregnancy weight loss or gain of more than 30 lbs         | n<br>8<br>13/34<br>38.2        | 15/45<br>33.3          | 18/26<br>69.2                    | 3/11<br>27.3           |

Table 3-31 (continued)

Percentage of Head Start and Non-Head Start Children By  
Prior Head Start Experience of Family According to Prenatal Health  
Characteristics in Maricopa County

| Prenatal Health Characteristics                           | No Prior Head Start Experience |                        | With Prior Head-Start Experience |                        |
|---|--------------------------------|------------------------|----------------------------------|------------------------|
|   | Head Start<br>n=70             | Non-Head Start<br>n=49 | Head Start<br>n=35               | Non-Head Start<br>n=11 |
| First prenatal visit more than three months               | n<br>8<br>22/62<br>35.5        | 14/46<br>30.4          | 11/29<br>37.9                    | 2/10<br>20.0           |
| Health problems during pregnancy (other than weight gain) | n<br>8<br>21/63<br>33.3        | 11/48<br>22.9          | 6/30<br>20.0                     | 4/11<br>36.4           |
| Pregnancy weight loss or gain of more than 30 lbs         | n<br>8<br>23/54<br>42.6        | 15/35<br>42.9          | 8/25<br>32.0                     | 2/8<br>25.0            |

Table 3-31 (continued)

Percentage of Head Start and Non-Head Start Children By  
 Prior Head Start Experience of Family According to Prenatal Health  
 Characteristics in Lingo County

| Prenatal Health Characteristics                           | No Prior Head Start Experience |                         | With Prior Head-Start Experience |                         |
|---|--------------------------------|-------------------------|----------------------------------|-------------------------|
|   | Head Start<br>n=48             | Non-Head Start<br>n=72  | Head Start<br>n=68               | Non-Head Start<br>n=34  |
| First prenatal visit more than three months               | n<br>12/44<br>§<br>27.3        | n<br>18/67<br>§<br>26.9 | n<br>14/55<br>§<br>25.5          | n<br>7/31<br>§<br>22.6  |
| Health problems during pregnancy (other than weight gain) | n<br>8/46<br>§<br>17.4         | n<br>20/70<br>§<br>28.6 | n<br>18/56<br>§<br>32.1          | n<br>9/33<br>§<br>27.3  |
| Pregnancy weight loss or gain of more than 30 lbs         | n<br>18/40<br>§<br>45.0        | n<br>25/55<br>§<br>45.5 | n<br>14/47<br>§<br>29.8          | n<br>16/31<br>§<br>51.6 |

Table 3-32

Percentage of Head Start and Non-Head-Start Children By  
Prior Head Start Experience of Family According to Mother's Age  
at Birth of Child in All Sites

| Maternal Age<br>at Birth<br>of Child |        | No Prior Head<br>Start Experience |                             | With Prior Head<br>Start Experience |                             |
|--------------------------------------|--------|-----------------------------------|-----------------------------|-------------------------------------|-----------------------------|
|                                      |        | Head Start<br>n=244               | Non-<br>Head Start<br>n=244 | Head Start<br>n=211                 | Non-<br>Head Start<br>n=102 |
| Less than 15<br>years                | n<br>8 | 4/239<br>1.7                      | 2/237<br>0.8                | —                                   | —                           |
| 15 to 17 years                       | n<br>8 | 51/239<br>21.3                    | 44/237<br>18.6              | 17/207<br>8.2                       | 6/100<br>6.0                |
| 18 to 19 years                       | n<br>8 | 45/239<br>18.8                    | 56/237<br>23.6              | 29/207<br>14.0                      | 11/100<br>11.0              |
| Greater than<br>19 years             | n<br>8 | 139/239<br>58.2                   | 135/237<br>57.0             | 161/207<br>77.8                     | 83/100<br>83.0              |

Table 3-32 (continued)

Percentage of Head Start and Non-Head Start Children By  
Prior Head Start Experience of Family According to Mother's Age  
at Birth of Child in Greene and Humphreys Counties

| Maternal Age<br>at Birth<br>of Child |        | No Prior Head<br>Start Experience |                            | With Prior Head<br>Start Experience |                            |
|--------------------------------------|--------|-----------------------------------|----------------------------|-------------------------------------|----------------------------|
|                                      |        | Head Start<br>n=66                | Non-<br>Head Start<br>n=59 | Head Start<br>n=61                  | Non-<br>Head Start<br>n=39 |
| Less than 15<br>years                | n<br>8 | 3/64<br>4.7                       | —                          | —                                   | —                          |
| 15 to 17 years                       | n<br>8 | 14/64<br>21.9                     | 17/58<br>29.3              | 4/61<br>6.6                         | 3/38<br>7.9                |
| 18 to 19 years                       | n<br>8 | 9/64<br>14.1                      | 13/58<br>22.4              | 8/61<br>13.1                        | 4/38<br>10.5               |
| Greater than<br>19 years             | n<br>8 | 38/64<br>59.4                     | 28/58<br>48.3              | 49/61<br>80.3                       | 31/38<br>81.6              |

Table 3-32 (continued)

Percentage of Head Start and Non-Head Start Children By  
Prior Head Start Experience of Family According to Mother's Age  
at Birth of Child in St. Clair County

| Maternal Age<br>at Birth<br>of Child |        | No Prior Head<br>Start Experience |                            | With Prior Head<br>Start Experience |                            |
|--------------------------------------|--------|-----------------------------------|----------------------------|-------------------------------------|----------------------------|
|                                      |        | Head Start<br>n=60                | Non-<br>Head Start<br>n=64 | Head Start<br>n=47                  | Non-<br>Head Start<br>n=18 |
| Less than 15<br>years                | n<br>% | —                                 | 1/61<br>1.6                | —                                   | —                          |
| 15 to 17 years                       | n<br>% | 16/59<br>27.1                     | 12/61<br>19.7              | 7/46<br>15.2                        | —                          |
| 18 to 19 years                       | n<br>% | 14/59<br>23.7                     | 22/61<br>36.1              | 7/46<br>15.2                        | 3/17<br>17.6               |
| Greater than<br>19 years             | n<br>% | 29/59<br>49.2                     | 26/61<br>42.6              | 32/46<br>69.6                       | 14/17<br>82.4              |

Table 3-32 (continued)

Percentage of Head Start and Non-Head Start Children By  
Prior Head Start Experience of Family According to Mother's Age  
at Birth of Child in Maricopa County

| Maternal Age<br>at Birth<br>of Child |        | No Prior Head<br>Start Experience |                            | With Prior Head<br>Start Experience |                            |
|--------------------------------------|--------|-----------------------------------|----------------------------|-------------------------------------|----------------------------|
|                                      |        | Head Start<br>n=70                | Non-<br>Head Start<br>n=49 | Head Start<br>n=35                  | Non-<br>Head Start<br>n=11 |
| Less than 15<br>years                | n<br>% | —                                 | 1/49<br>2.0                | —                                   | —                          |
| 15 to 17 years                       | n<br>% | 12/69<br>17.4                     | 6/49<br>12.2               | 3/35<br>8.6                         | 1/11<br>9.1                |
| 18 to 19 years                       | n<br>% | 11/69<br>15.9                     | 10/49<br>20.4              | 5/35<br>14.3                        | —                          |
| Greater than<br>19 years             | n<br>% | 46/69<br>66.7                     | 32/49<br>65.3              | 27/35<br>77.1                       | 10/11<br>90.9              |

Table 3-32 (continued)

Percentage of Head Start and Non-Head Start Children By  
 Prior Head Start Experience of Family According to Mother's Age  
 at Birth of Child in Mingo County

| Maternal Age<br>at Birth<br>of Child |        | No Prior Head<br>Start Experience |                            | With Prior Head<br>Start Experience |                            |
|--------------------------------------|--------|-----------------------------------|----------------------------|-------------------------------------|----------------------------|
|                                      |        | Head Start<br>n=48                | Non-<br>Head Start<br>n=72 | Head Start<br>n=68                  | Non-<br>Head Start<br>n=34 |
| Less than 15<br>years                | n<br>% | 1/47<br>2.1                       | —                          | —                                   | —                          |
| 15 to 17 years                       | n<br>% | 9/47<br>19.1                      | 9/69<br>13.0               | 3/65<br>4.6                         | 2/34<br>5.9                |
| 18 to 19 years                       | n<br>% | 11/47<br>23.4                     | 11/69<br>15.9              | 9/65<br>13.8                        | 4/34<br>11.8               |
| Greater than<br>19 years             | n<br>% | 26/47<br>55.3                     | 49/69<br>71.0              | 53/65<br>81.5                       | 28/34<br>82.4              |

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Table 3-33

Percentage of Head Start and Non-Head Start Children  
By Prior Head Start Experience of Family  
According to Perinatal Health Characteristics  
in All Sites

| Perinatal Health Characteristics                           | No Prior Head Start Experience |                         | With Prior Head Start Experience |                         |
|--|--------------------------------|-------------------------|----------------------------------|-------------------------|
|  | Head Start<br>n=244            | Non-Head Start<br>n=244 | Head Start<br>n=211              | Non-Head Start<br>n=102 |
| Gestation less than 38 weeks or greater than 42 weeks      | 27/208<br>13.0                 | 33/229<br>14.4          | 24/176<br>13.6                   | 12/97<br>12.4           |
| Birthweight less than 5.5 pounds or greater than 10 pounds | 21/204<br>10.3                 | 27/221<br>12.2          | 34/176<br>19.3                   | 15/93<br>16.1           |
| Hospital stay at birth longer than mothers                 | 24/208<br>11.5                 | 20/229<br>8.7           | 29/177<br>16.4                   | 8/97<br>8.2             |
| Health problems at birth                                   | 49/209<br>23.4                 | 53/228<br>23.3          | 41/179<br>22.9                   | 24/95<br>25.3           |
| Congenital problems  | 33/208<br>15.9                 | 32/230<br>13.9          | 28/182<br>15.4                   | 12/98<br>12.2           |

Table 3-33 (continued)

Percentage of Head Start and Non-Head Start Children  
By Prior Head Start Experience of Family  
According to Perinatal Health Characteristics  
in Greene and Humphreys Counties

| Perinatal Health Characteristics                           | No Prior Head Start Experience |                        | With Prior Head Start Experience |                        |
|--|--------------------------------|------------------------|----------------------------------|------------------------|
|  | Head Start<br>n=66             | Non-Head Start<br>n=59 | Head Start<br>n=61               | Non-Head Start<br>n=39 |
| Gestation less than 38 weeks or greater than 42 weeks      | 4/58<br>6.9                    | 3/55<br>5.5            | 5/56<br>8.9                      | 3/38<br>7.9            |
| Birthweight less than 5.5 pounds or greater than 10 pounds | 7/58<br>12.1                   | 4/52<br>7.7            | 11/55<br>20.0                    | 5/36<br>13.9           |
| Hospital stay at birth longer than mothers                 | 2/58<br>3.4                    | 1/56<br>1.8            | 5/56<br>8.9                      | 2/38<br>5.3            |
| Health problems at birth                                   | 14/58<br>24.1                  | 13/54<br>24.1          | 8/57<br>14.0                     | 8/36<br>22.2           |
| Congenital problems  | 9/58<br>15.5                   | 4/57<br>7.0            | 9/57<br>15.8                     | 3/38<br>7.9            |

Table 3-33 (continued)

Percentage of Head Start and Non-Head Start Children  
By Prior Head Start Experience of Family  
According to Perinatal Health Characteristics  
in St. Clair County

| Perinatal Health Characteristics                           | No Prior Head Start Experience |                        | With Prior Head Start Experience |                        |
|--|--------------------------------|------------------------|----------------------------------|------------------------|
|  | Head Start<br>n=60             | Non-Head Start<br>n=64 | Head Start<br>n=47               | Non-Head Start<br>n=18 |
| Gestation less than 38 weeks or greater than 42 weeks      | 6/42<br>14.3                   | 10/56<br>17.9          | 6/36<br>16.7                     | —                      |
| Birthweight less than 5.5 pounds or greater than 10 pounds | 6/40<br>15.0                   | 7/54<br>13.0           | 9/35<br>25.7                     | 3/15<br>20.0           |
| Hospital stay at birth longer than mothers                 | 8/41<br>19.5                   | 6/55<br>10.9           | 8/35<br>22.9                     | —                      |
| Health problems at birth                                   | 6/42<br>14.3                   | 9/56<br>16.1           | 9/36<br>25.0                     | 3/15<br>20.0           |
| Congenital problems  | 7/41<br>17.1                   | 3/56<br>5.4            | 3/36<br>8.3                      | —                      |

Table 3-33 (continued)

Percentage of Head Start and Non-Head Start Children  
By Prior Head Start Experience of Family  
According to Perinatal Health Characteristics  
in Maricopa County

| Perinatal Health Characteristics                           | No Prior Head Start Experience |                        | With Prior Head Start Experience |                        |
|--|--------------------------------|------------------------|----------------------------------|------------------------|
|  | Head Start<br>n=70             | Non-Head Start<br>n=49 | Head Start<br>n=35               | Non-Head Start<br>n=11 |
| Gestation less than 38 weeks or greater than 42 weeks      | 14/62<br>22.6                  | 6/47<br>12.8           | 4/29<br>13.8                     | 3/11<br>27.3           |
| Birthweight less than 5.5 pounds or greater than 10 pounds | 7/63<br>11.1                   | 10/45<br>22.2          | 7/30<br>23.3                     | 2/9<br>22.2            |
| Hospital stay at birth longer than mothers                 | 11/63<br>17.5                  | 5/47<br>10.6           | 5/29<br>17.2                     | 2/11<br>18.2           |
| Health problems at birth                                   | 21/63<br>33.3                  | 11/48<br>22.9          | 6/30<br>20.0                     | 4/11<br>36.4           |
| Congenital problems  | 12/63<br>19.0                  | 10/47<br>21.3          | 4/30<br>13.3                     | 3/11<br>27.3           |

Table 3-33 (continued)

Percentage of Head Start and Non-Head Start Children  
By Prior Head Start Experience of Family  
According to Perinatal Health Characteristics  
in Mingo County

| Perinatal Health Characteristics                           | No Prior Head Start Experience |                        | With Prior Head Start Experience |                        |
|--|--------------------------------|------------------------|----------------------------------|------------------------|
|  | Head Start<br>n=48             | Non-Head Start<br>n=72 | Head Start<br>n=68               | Non-Head Start<br>n=34 |
| Gestation less than 38 weeks or greater than 42 weeks      | n<br>3/46<br>6.5               | n<br>14/71<br>19.7     | n<br>9/55<br>16.4                | n<br>6/33<br>18.2      |
| Birthweight less than 5.5 pounds or greater than 10 pounds | n<br>1/43<br>2.3               | n<br>6/70<br>8.6       | n<br>7/56<br>12.5                | n<br>5/33<br>15.2      |
| Hospital stay at birth longer than mothers                 | n<br>3/46<br>6.5               | n<br>8/71<br>11.3      | n<br>11/57<br>19.3               | n<br>4/32<br>12.5      |
| Health problems at birth                                   | n<br>8/46<br>17.4              | n<br>20/70<br>28.6     | n<br>18/56<br>32.1               | n<br>9/33<br>27.3      |
| Congenital problems  | n<br>5/46<br>10.9              | n<br>15/70<br>21.4     | n<br>12/59<br>20.3               | n<br>6/33<br>18.2      |

Table 3-34

Number of Problems Per Child Identified in the Pediatric Evaluation at Posttest by Gender<sup>a</sup>

| Number of Problems Per Child |   | Posttest Children (Samples A, B, C) in: |                |                  |               |                 |               |              |                |
|------------------------------|---|---|----------------|------------------|---------------|-----------------|---------------|--------------|----------------|
|                              |   | Greene & Humphreys Counties             |                | St. Clair County |               | Maricopa County |               | Mingo County |                |
|                              |   | Male (n=112)                            | Female (n=116) | Male (n=104)     | Female (n=90) | Male (n=81)     | Female (n=86) | Male (n=118) | Female (n=110) |
| 0                            | n | 56                                      | 51             | 54               | 63            | 43              | 46            | 83           | 66             |
|                              | % | 50.0                                    | 44.0           | 51.9             | 70.0          | 53.1            | 53.5          | 70.3         | 60.0           |
| 1                            | n | 41                                      | 45             | 32               | 16            | 14              | 28            | 28           | 36             |
|                              | % | 36.6                                    | 38.8           | 30.8             | 17.8          | 18.5            | 32.6          | 23.7         | 32.7           |
| 2                            | n | 11                                      | 12             | 13               | 9             | 14              | 8             | 6            | 5              |
|                              | % | 9.8                                     | 10.3           | 12.5             | 10.0          | 17.3            | 9.3           | 5.1          | 4.5            |
| > 3                          | n | 4                                       | 8              | 5                | 2             | 9               | 4             | 1            | 3              |
|                              | % | 3.6                                     | 6.9            | 4.8              | 2.2           | 11.1            | 4.7           | 0.8          | 2.7            |
| Mean                         |   | 0.67                                    | 0.80           | 0.70             | 0.44          | 0.86            | 0.65          | 0.36         | 0.50           |
| S.D.                         |   | 0.80                                    | 0.89           | 0.87             | 0.77          | 1.07            | 0.84          | 0.62         | 0.71           |
| Significance between genders |   | N.S. (0.6310)                           |                | N.S. (0.079)     |               | N.S. (0.059)    |               | N.S. (0.289) |                |

<sup>a</sup>All statistical tests are nonsignificant.

Table 3-35

Percentage of Head Start and Non-Head Start Children By  
 Prior Head Start Experience of Family According to Characteristics  
 of Medical Services for Checkups in Greene & Humphreys Counties

| Medical Services for Checkups | No Prior Head Start Experience |                        | With Prior Head-Start Experience |                        |
|-------------------------------|--------------------------------|------------------------|----------------------------------|------------------------|
|                               | Head Start<br>n=66             | Non-Head Start<br>n=59 | Head Start<br>n=61               | Non-Head Start<br>n=39 |
| <b>Providers Used:</b>        |                                |                        |                                  |                        |
| Pediatrician                  | n<br>6/65<br>9.2               | n<br>2/59<br>3.4       | n<br>3/60<br>5.0                 | n<br>2/38<br>5.3       |
| General Family                | n<br>49/65<br>75.4             | n<br>40/59<br>67.8     | n<br>40/60<br>66.7               | n<br>29/38<br>76.3     |
| Nurse                         | n<br>1/65<br>1.5               | n<br>5/59<br>8.5       | n<br>5/60<br>8.3                 | n<br>4/38<br>10.5      |
| Other                         | n<br>2/65<br>3.1               | n<br>0<br>0.0          | n<br>3/60<br>5.0                 | n<br>0<br>0            |
| No Provider                   | n<br>7/65<br>10.8              | n<br>12/59<br>20.3     | n<br>9/60<br>15.0                | n<br>3/38<br>7.9       |
| <b>Location of Services</b>   |                                |                        |                                  |                        |
| Community clinic              | n<br>7/63<br>11.1              | n<br>10/59<br>16.9     | n<br>6/60<br>10.0                | n<br>6/38<br>15.8      |
| Hospital clinic               | n<br>9/63<br>14.3              | n<br>5/59<br>8.55      | n<br>8/60<br>13.3                | n<br>4/38<br>10.5      |
| Private Physicians office     | n<br>29/63<br>46.0             | n<br>22/59<br>37.3     | n<br>15/60<br>25.0               | n<br>17/38<br>44.7     |
| Health Dept.                  | n<br>2/63<br>3.2               | n<br>4/59<br>6.8       | n<br>5/60<br>8.3                 | n<br>3/38<br>7.9       |
| Other                         | n<br>9/63<br>14.3              | n<br>6/59<br>10.2      | n<br>17/60<br>28.3               | n<br>5/38<br>13.2      |
| No Provider                   | n<br>7/63<br>11.1              | n<br>12/59<br>20.3     | n<br>9/60<br>15.0                | n<br>3/38<br>7.9       |

Table 3-35 (Continued)

Percentage of Head Start and Non-Head Start Children By  
 Prior Head Start Experience of Family According to Characteristics  
 of Medical Services for Checkups in St. Clair County

| Medical Services for Checkups | No Prior Head Start Experience |                        | With Prior Head-Start Experience |                        |
|-------------------------------|--------------------------------|------------------------|----------------------------------|------------------------|
|                               | Head Start<br>n=60             | Non-Head Start<br>n=64 | Head Start<br>n=47               | Non-Head Start<br>n=18 |
| <b>Providers Used:</b>        |                                |                        |                                  |                        |
| Pediatrician                  | n 55/60<br>% 91.7              | n 55/64<br>% 85.9      | n 37/42<br>% 88.1                | n 16/18<br>% 88.9      |
| General Family                | n 3/60<br>% 5.0                | n 4/64<br>% 6.33       | n 4/42<br>% 9.5                  | n 1/18<br>% 5.6        |
| Nurse                         | n 0<br>% 0                     | n 1/64<br>% 1.66       | n 1/42<br>% 2.4                  | n 0<br>% 0             |
| Other                         | n 1/60<br>% 1.7                | n 3/64<br>% 4.7        | n 0<br>% 0                       | n 1/18<br>% 5.6        |
| No Provider                   | n 1/60<br>% 1.7                | n 1/64<br>% 1.6        | n 0<br>% 0                       | n 0<br>% 0             |
| <b>Location of Services</b>   |                                |                        |                                  |                        |
| Community clinic              | n 13/60<br>% 21.7              | n 10/64<br>% 15.6      | n 5/42<br>% 11.9                 | n 6/18<br>% 33.3       |
| Hospital clinic               | n 0<br>% 0                     | n 4/64<br>% 6.3        | n 0<br>% 0                       | n 0<br>% 0             |
| Private Physicians office     | n 38/60<br>% 63.3              | n 47/64<br>% 73.4      | n 32/42<br>% 76.2                | n 11/18<br>% 61.1      |
| Health Dept.                  | n 2/60<br>% 3.3                | n 1/64<br>% 1.6        | n 0<br>% 0                       | n 0<br>% 0             |
| Other                         | n 6/60<br>% 10.0               | n 1/64<br>% 1.6        | n 5/42<br>% 11.9                 | n 1/18<br>% 5.6        |
| No Provider                   | n 1/60<br>% 1.7                | n 1/64<br>% 1.6        | n 0<br>% 0                       | n 0<br>% 0             |

Table 3-35 (Continued)

Percentage of Head Start and Non-Head Start Children By  
Prior Head Start Experience of Family According to Characteristics  
of Medical Services for Checkups in Maricopa County

| Medical Services for Checkups | No Prior Head Start Experience |                        | With Prior Head-Start Experience |                        |              |
|-------------------------------|--------------------------------|------------------------|----------------------------------|------------------------|--------------|
|                               | Head Start<br>n=70             | Non-Head Start<br>n=49 | Head Start<br>n=35               | Non-Head Start<br>n=11 |              |
| <u>Providers Used:</u>        |                                |                        |                                  |                        |              |
| Pediatrician                  | n<br>%                         | 16/61<br>26.2          | 15/46<br>32.6                    | 4/31<br>12.9           | 2/10<br>20.0 |
| General Family                | n<br>%                         | 37/61<br>60.7          | 23/46<br>50.0                    | 18/31<br>58.1          | 5/10<br>50.0 |
| Nurse                         | n<br>%                         | 0<br>0                 | 0<br>0                           | 2<br>6.5               | 0<br>0       |
| Other                         | n<br>%                         | 1/61<br>1.6            | 0<br>0                           | 2/31<br>6.5            | 0<br>0       |
| No Provider                   | n<br>%                         | 7/61<br>11.5           | 8/46<br>17.4                     | 5/31<br>16.1           | 3/10<br>30.0 |
| <u>Location of Services</u>   |                                |                        |                                  |                        |              |
| Community clinic              | n<br>%                         | 31/67<br>46.3          | 17/47<br>36.2                    | 17/35<br>48.6          | 4/10<br>40.0 |
| Hospital clinic               | n<br>%                         | 2/67<br>3.0            | 2/47<br>4.3                      | 3/35<br>8.6            | 0<br>0       |
| Private Physicians office     | n<br>%                         | 13/67<br>19.4          | 11/47<br>23.4                    | 5/35<br>14.3           | 2/10<br>20.0 |
| Health Dept.                  | n<br>%                         | 9/67<br>13.4           | 2/47<br>4.3                      | 4/35<br>11.4           | 0<br>0       |
| Other                         | n<br>%                         | 5/67<br>7.5            | 7/47<br>14.9                     | 1/35<br>2.9            | 1/10<br>10.0 |
| No Provider                   | n<br>%                         | 7/67<br>10.4           | 8/47<br>17.0                     | 5/35<br>14.3           | 3/10<br>30.0 |

Table 3-35 (Continued)

Percentage of Head Start and Non-Head Start Children By  
Prior Head Start Experience of Family According to Characteristics  
of Medical Services for Checkups in Mingo County

| Medical Services for Checkups | No Prior Head Start Experience |                        | With Prior Head-Start Experience |                        |
|-------------------------------|--------------------------------|------------------------|----------------------------------|------------------------|
|                               | Head Start<br>n=48             | Non-Head Start<br>n=72 | Head Start<br>n=68               | Non-Head Start<br>n=34 |
| <b>Providers Used:</b>        |                                |                        |                                  |                        |
| Pediatrician                  | n 23/43<br>% 53.5              | n 39/66<br>% 59.1      | n 35/62<br>% 56.5                | n 14/28<br>% 50.0      |
| General Family                | n 13/43<br>% 30.2              | n 25/66<br>% 37.9      | n 19/62<br>% 30.6                | n 11/28<br>% 39.3      |
| Nurse                         | n 0<br>% 0                     | n 0<br>% 0             | n 0<br>% 0                       | n 0<br>% 0             |
| Other                         | n 2/43<br>% 4.7                | n 0<br>% 0             | n 1/62<br>% 1.6                  | n 1/28<br>% 3.6        |
| No Provider                   | n 5/43<br>% 11.6               | n 2/66<br>% 3.0        | n 7/62<br>% 11.3                 | n 2/28<br>% 7.1        |
| <b>Location of Services</b>   |                                |                        |                                  |                        |
| Community clinic              | n 10/44<br>% 22.7              | n 9/71<br>% 12.7       | n 14/62<br>% 22.6                | n 6/32<br>% 18.8       |
| Hospital clinic               | n 9/44<br>% 20.5               | n 32/71<br>% 45.1      | n 24/62<br>% 38.7                | n 15/32<br>% 46.9      |
| Private Physicians office     | n 12/44<br>% 27.3              | n 15/71<br>% 21.1      | n 13/62<br>% 21.0                | n 8/32<br>% 25.0       |
| Health Dept.                  | n 2/44<br>% 4.5                | n 2/71<br>% 2.8        | n 3/62<br>% 4.8                  | n 0<br>% 0             |
| Other                         | n 6/44<br>% 13.6               | n 11/71<br>% 15.5      | n 1/62<br>% 1.6                  | n 1/32<br>% 3.1        |
| No Provider                   | n 5/44<br>% 11.4               | n 2/71<br>% 2.8        | n 7/62<br>% 11.3                 | n 2/32<br>% 6.3        |



Table 3-36

Percentage of Head Start and Non-Head Start Children  
By Prior Head Start Experience of Family According to  
Characteristics of Medical Services for Diagnosis and Treatment  
in Greene and Humphreys Counties

| Medical Services<br>for Diagnosis<br>and Treatment | No Prior Head<br>Start Experience |                            | With Prior Head-<br>Start Experience |                            |
|--|-----------------------------------|----------------------------|--------------------------------------|----------------------------|
|  | Head Start<br>n=66                | Non-<br>Head Start<br>n=59 | Head Start<br>n=61                   | Non-<br>Head Start<br>n=39 |
| <b>Providers Used:</b>                             |                                   |                            |                                      |                            |
| Pediatrician                                       | n 4/66<br>% 6.1                   | n 2/58<br>% 3.4            | n 4/61<br>% 6.6                      | n 2/39<br>% 5.1            |
| General Family                                     | n 55/66<br>% 83.3                 | n 41/58<br>% 70.7          | n 47/61<br>% 77.0                    | n 32/39<br>% 82.1          |
| Nurse  | n 1/66<br>% 1.5                   | n 3/58<br>% 5.2            | n 0<br>% 0                           | n 2/39<br>% 5.1            |
| Other  | n 0<br>% 0                        | n 0<br>% 0                 | n 0<br>% 0                           | n 1/39<br>% 2.6            |
| No Provider  | n 6/66<br>% 9.1                   | n 12/58<br>% 20.7          | n 10/61<br>% 16.4                    | n 2/39<br>% 5.1            |
| <b>Location of<br/>Services</b>                    |                                   |                            |                                      |                            |
| Community<br>clinic                                | n 8/66<br>% 12.1                  | n 10/58<br>% 17.2          | n 10/61<br>% 16.4                    | n 6/38<br>% 13.2           |
| Hospital clinic                                    | n 10/66<br>% 15.2                 | n 5/58<br>% 8.6            | n 7/61<br>% 11.5                     | n 5/38<br>% 13.2           |
| Private Physi-<br>cians office                     | n 33/66<br>% 50.0                 | n 22/58<br>% 37.9          | n 20/61<br>% 32.8                    | n 18/38<br>% 47.4          |
| Health Dept.                                       | n 1/66<br>% 1.5                   | n 2/58<br>% 3.44           | n 0<br>% 0                           | n 2/38<br>% 5.3            |
| Other  | n 8/66<br>% 12.1                  | n 7/58<br>% 12.1           | n 14/61<br>% 23.0                    | n 6/38<br>% 15.8           |
| No Provider  | n 6/66<br>% 9.1                   | n 12/58<br>% 20.7          | n 10/61<br>% 16.4                    | n 2/38<br>% 5.3            |

Table 3-36 (Continued)

Percentage of Head Start and Non-Head Start Children  
By Prior Head Start Experience of Family According to  
Characteristics of Medical Services for Diagnosis and Treatment  
in St. Clair County

| Medical Services<br>for Diagnosis<br>and Treatment | No Prior Head<br>Start Experience |                               | With Prior Head-<br>Start Experience |                            |
|--|-----------------------------------|-------------------------------|--------------------------------------|----------------------------|
|  | Head Start<br>n=60                | Non-<br>Head Start<br>n=64    | Head Start<br>n=47                   | Non-<br>Head Start<br>n=18 |
| <u>Providers Used:</u>                             |                                   |                               |                                      |                            |
| Pediatrician                                       | n<br>55/60<br>91.7                | n<br><del>54/64</del><br>84.4 | n<br>40/45<br>88.9                   | n<br>16/18<br>88.9         |
| General Family                                     | n<br>4/60<br>6.7                  | n<br>6/64<br>9.4              | n<br>5/45<br>11.1                    | n<br>1/18<br>5.6           |
| Nurse  | n<br>0<br>0                       | n<br>0<br>0                   | n<br>0<br>0                          | n<br>0<br>0                |
| Other  | n<br>0<br>0                       | n<br>3/64<br>4.7              | n<br>0<br>0                          | n<br>1/18<br>5.6           |
| No Provider  | n<br>1/60<br>1.7                  | n<br>1/64<br>1.6              | n<br>0<br>0                          | n<br>0<br>0                |
| <u>Location of<br/>Services</u>                    |                                   |                               |                                      |                            |
| Community<br>clinic                                | n<br>10/60<br>16.7                | n<br>10/64<br>15.6            | n<br>4/45<br>8.9                     | n<br>6/18<br>33.3          |
| Hospital clinic                                    | n<br>0<br>0                       | n<br>3/64<br>4.7              | n<br>0<br>0                          | n<br>0<br>0                |
| Private Physi-<br>cians office                     | n<br>40/60<br>66.7                | n<br>49/64<br>76.6            | n<br>35/45<br>77.8                   | n<br>11/18<br>61.1         |
| Health Dept.                                       | n<br>3/60<br>5.0                  | n<br>0<br>0                   | n<br>0<br>0                          | n<br>0<br>0                |
| Other  | n<br>6/60<br>10.0                 | n<br>1/64<br>1.6              | n<br>6/45<br>13.3                    | n<br>1/18<br>5.6           |
| No Provider  | n<br>1/60<br>1.7                  | n<br>1/64<br>1.6              | n<br>0<br>0                          | n<br>0<br>0                |

Table 3-36 (Continued)

Percentage of Head Start and Non-Head Start Children  
By Prior Head Start Experience of Family According to  
Characteristics of Medical Services for Diagnosis and Treatment  
in Maricopa County

| Medical Services<br>for Diagnosis<br>and Treatment | No Prior Head<br>Start Experience |                            | With Prior Head-<br>Start Experience |                            |              |
|--|-----------------------------------|----------------------------|--------------------------------------|----------------------------|--------------|
|  | Head Start<br>n=70                | Non-<br>Head Start<br>n=49 | Head Start<br>n=35                   | Non-<br>Head Start<br>n=11 |              |
| <b>Providers Used:</b>                             |                                   |                            |                                      |                            |              |
| Pediatrician                                       | n<br>z                            | 17/61<br>27.9              | 14/46<br>30.4                        | 5/31<br>16.1               | 3/11<br>27.3 |
| General Family                                     | n<br>z                            | 39/61<br>63.9              | 28/46<br>60.9                        | 20/31<br>64.5              | 7/11<br>63.6 |
| Nurse  | n<br>z                            | 0/61<br>0                  | 0<br>0                               | 2/31<br>6.5                | 0<br>0       |
| Other  | n<br>z                            | 1/61<br>1.6                | 0<br>0                               | 2/31<br>6.5                | 0<br>0       |
| No Provider  | n<br>z                            | 4/61<br>6.6                | 4/46<br>8.7                          | 2/31<br>6.5                | 1/11<br>9.1  |
| <b>Location of<br/>Services</b>                    |                                   |                            |                                      |                            |              |
| Community<br>clinic                                | n<br>z                            | 34/69<br>49.3              | 21/49<br>42.9                        | 16/35<br>45.7              | 4/11<br>36.4 |
| Hospital clinic                                    | n<br>z                            | 3/69<br>4.3                | 2/49<br>4.1                          | 3/35<br>8.6                | 1/11<br>9.1  |
| Private Physi-<br>cians office                     | n<br>z                            | 16/69<br>23.2              | 12/49<br>24.5                        | 11/35<br>31.4              | 4/11<br>36.4 |
| Health Dept.                                       | n<br>z                            | 7/69<br>10.1               | 3/49<br>6.1                          | 1/35<br>2.9                | 0<br>0       |
| Other  | n<br>z                            | 5/69<br>7.2                | 7/49<br>14.3                         | 2/35<br>5.7                | 1/11<br>9.1  |
| No Provider  | n<br>z                            | 4/69<br>5.8                | 4/49<br>8.2                          | 2/35<br>5.7                | 1/11<br>9.1  |

Table 3-36 (Continued)

Percentage of Head Start and Non-Head Start Children  
By Prior Head Start Experience of Family According to  
Characteristics of Medical Services for Diagnosis and Treatment  
in Mingo County

| Medical Services<br>for Diagnosis<br>and Treatment | No Prior Head<br>Start Experience |                            | With Prior Head-<br>Start Experience |                            |
|--|-----------------------------------|----------------------------|--------------------------------------|----------------------------|
|  | Head Start<br>n=48                | Non-<br>Head Start<br>n=72 | Head Start<br>n=68                   | Non-<br>Head Start<br>n=34 |
| <u>Providers Used:</u>                             |                                   |                            |                                      |                            |
| Pediatrician                                       | n<br>20/45<br>%                   | n<br>31/66<br>%            | n<br>33/63<br>%                      | n<br>13/29<br>%            |
| General Family                                     | n<br>17/45<br>%                   | n<br>31/66<br>%            | n<br>23/63<br>%                      | n<br>14/29<br>%            |
| Nurse  | n<br>0<br>%                       | n<br>0<br>%                | n<br>0<br>%                          | n<br>0<br>%                |
| Other  | n<br>3/45<br>%                    | n<br>2/66<br>%             | n<br>0<br>%                          | n<br>0<br>%                |
| No Provider  | n<br>5/45<br>%                    | n<br>2/66<br>%             | n<br>7/63<br>%                       | n<br>2/29<br>%             |
| <u>Location of<br/>Services</u>                    |                                   |                            |                                      |                            |
| Community<br>clinic                                | n<br>10/45<br>%                   | n<br>10/72<br>%            | n<br>16/63<br>%                      | n<br>8/33<br>%             |
| Hospital clinic                                    | n<br>10/45<br>%                   | n<br>32/72<br>%            | n<br>23/63<br>%                      | n<br>15/33<br>%            |
| Private Physi-<br>cians office                     | n<br>14/45<br>%                   | n<br>17/72<br>%            | n<br>14/63<br>%                      | n<br>8/33<br>%             |
| Health Dept.                                       | n<br>2/45<br>%                    | n<br>1/72<br>%             | n<br>3/63<br>%                       | n<br>0<br>%                |
| Other  | n<br>4/45<br>%                    | n<br>10/72<br>%            | n<br>0<br>%                          | n<br>0<br>%                |
| No Provider  | n<br>5/45<br>%                    | n<br>2/72<br>%             | n<br>7/63<br>%                       | n<br>2/33<br>%             |

Table 3-37

Percentage of Head Start and Non-Head Start Children By  
Prior Head Start Experience of Family According to Characteristics  
of Medical Services for Immunizations in Greene and Humphreys Counties

| Medical Services<br>for<br>Immunizations | No Prior Head<br>Start Experience |                            | With Prior Head-<br>Start Experience |                            |
|--|-----------------------------------|----------------------------|--------------------------------------|----------------------------|
|  | Head Start<br>n=66                | Non-<br>Head Start<br>n=59 | Head Start<br>n=61                   | Non-<br>Head Start<br>n=39 |
| <u>Providers Used:</u>                   |                                   |                            |                                      |                            |
| Pediatrician                             | n<br>0                            | 1/59                       | 1/61                                 | 0                          |
|  | Z<br>0                            | 1.7                        | 1.6                                  | 0                          |
| General Family                           | n<br>13/64                        | 6/59                       | 12/61                                | 5/38                       |
|  | Z<br>20.3                         | 10.2                       | 19.7                                 | 13.2                       |
| Nurse                                    | n<br>45/64                        | 40/59                      | 38/61                                | 29/38                      |
|  | Z<br>70.3                         | 67.8                       | 62.3                                 | 76.3                       |
| Other                                    | n<br>0                            | 0                          | 1/61                                 | 0                          |
|  | Z<br>0                            | 0                          | 1.6                                  | 0                          |
| No Provider                              | n<br>6/64                         | 12/59                      | 9/61                                 | 4/38                       |
|  | Z<br>9.4                          | 20.3                       | 14.8                                 | 10.5                       |
| <u>Location of<br/>Services</u>          |                                   |                            |                                      |                            |
| Community<br>clinic                      | n<br>4/64                         | 4/59                       | 8/60                                 | 4/39                       |
|  | Z<br>6.2                          | 6.8                        | 13.3                                 | 10.3                       |
| Hospital clinic                          | n<br>3/64                         | 2/59                       | 4/60                                 | 2/39                       |
|  | Z<br>4.7                          | 3.4                        | 6.7                                  | 5.1                        |
| Private Physi-<br>cians office           | n<br>3/64                         | 1/59                       | 2/60                                 | 0                          |
|  | Z<br>4.7                          | 1.7                        | 3.3                                  | 0                          |
| Health Dept.                             | n<br>48/64                        | 39/59                      | 33/60                                | 28/39                      |
|  | Z<br>75.0                         | 66.1                       | 58.3                                 | 71.8                       |
| Other                                    | n<br>0                            | 1/59                       | 2/60                                 | 1/39                       |
|  | Z<br>0                            | 1.7                        | 3.3                                  | 2.6                        |
| No Provider                              | n<br>6/64                         | 12/59                      | 9/60                                 | 4/39                       |
|  | Z<br>9.4                          | 20.3                       | 15.0                                 | 10.3                       |

Table 3-37 (continued)

Percentage of Head Start and Non-Head Start Children By  
Prior Head Start Experience of Family According to Characteristics  
of Medical Services for Immunizations in St. Clair County

| Medical Services<br>for<br>Immunizations | No Prior Head<br>Start Experience |                            | With Prior Head-<br>Start Experience |                            |
|--|-----------------------------------|----------------------------|--------------------------------------|----------------------------|
|  | Head Start<br>n=60                | Non-<br>Head Start<br>n=64 | Head Start<br>n=47                   | Non-<br>Head Start<br>n=18 |
| <b>Providers Used:</b>                   |                                   |                            |                                      |                            |
| Pediatrician                             | n<br>52/59                        | n<br>51/62                 | n<br>37/41                           | n<br>17/18                 |
|  | %<br>88.1                         | %<br>82.3                  | %<br>90.2                            | %<br>94.4                  |
| General Family                           | n<br>2/59                         | n<br>3/62                  | n<br>2/41                            | n<br>0                     |
|  | %<br>3.4                          | %<br>4.8                   | %<br>4.9                             | %<br>0                     |
| Nurse                                    | n<br>4/59                         | n<br>3/62                  | n<br>2/41                            | n<br>0                     |
|  | %<br>6.8                          | %<br>4.8                   | %<br>4.9                             | %<br>0                     |
| Other                                    | n<br>0                            | n<br>4/62                  | n<br>0                               | n<br>1/18                  |
|  | %<br>0                            | %<br>6.5                   | %<br>0                               | %<br>5.6                   |
| No Provider                              | n<br>1/59                         | n<br>1/62                  | n<br>0                               | n<br>0                     |
|  | %<br>1.7                          | %<br>1.6                   | %<br>0                               | %<br>0                     |
| <b>Location of<br/>Services</b>          |                                   |                            |                                      |                            |
| Community<br>clinic                      | n<br>15/60                        | n<br>11/63                 | n<br>5/41                            | n<br>6/18                  |
|  | %<br>25.0                         | %<br>17.5                  | %<br>12.2                            | %<br>33.3                  |
| Hospital clinic                          | n<br>0                            | n<br>2/63                  | n<br>0                               | n<br>0                     |
|  | %<br>0                            | %<br>3.2                   | %<br>0                               | %<br>0                     |
| Private Physi-<br>cians office           | n<br>36/60                        | n<br>45/63                 | n<br>28/41                           | n<br>10/18                 |
|  | %<br>60.0                         | %<br>71.4                  | %<br>68.3                            | %<br>55.6                  |
| Health Dept.                             | n<br>4/60                         | n<br>1/63                  | n<br>0                               | n<br>1/18                  |
|  | %<br>6.7                          | %<br>1.6                   | %<br>0                               | %<br>5.6                   |
| Other                                    | n<br>4/60                         | n<br>3/63                  | n<br>8/41                            | n<br>1/18                  |
|  | %<br>6.7                          | %<br>4.8                   | %<br>19.5                            | %<br>5.6                   |
| No Provider                              | n<br>1/60                         | n<br>1/63                  | n<br>0                               | n<br>0                     |
|  | %<br>1.7                          | %<br>1.6                   | %<br>0                               | %<br>0                     |

Table 3-37 (continued)

Percentage of Head Start and Non-Head Start Children By  
Prior Head Start Experience of Family According to Characteristics  
of Medical Services for Immunizations in Maricopa County

| Medical Services<br>for<br>Immunizations | No Prior Head<br>Start Experience |                            | With Prior Head-<br>Start Experience |                            |
|--|-----------------------------------|----------------------------|--------------------------------------|----------------------------|
|  | Head Start<br>n=70                | Non-<br>Head Start<br>n=49 | Head Start<br>n=35                   | Non-<br>Head Start<br>n=11 |
| <b>Providers Used:</b>                   |                                   |                            |                                      |                            |
| Pediatrician                             | n<br>16/59<br>27.1                | n<br>15/46<br>32.6         | n<br>4/30<br>13.3                    | n<br>1/11<br>9.1           |
| General Family                           | n<br>35/59<br>59.3                | n<br>24/46<br>52.2         | n<br>16/30<br>53.3                   | n<br>7/11<br>63.6          |
| Nurse                                    | n<br>4/59<br>6.8                  | n<br>3/46<br>6.4           | n<br>6/30<br>20.0                    | n<br>2/11<br>18.2          |
| Other                                    | n<br>0<br>0                       | n<br>0<br>0                | n<br>2/30<br>6.7                     | n<br>0<br>0                |
| No Provider                              | n<br>4/59<br>6.8                  | n<br>4/46<br>8.7           | n<br>2/30<br>6.7                     | n<br>1/11<br>9.1           |
| <b>Location of<br/>Services</b>          |                                   |                            |                                      |                            |
| Community<br>clinic                      | n<br>34/69<br>49.3                | n<br>22/49<br>44.9         | n<br>17/35<br>48.6                   | n<br>7/11<br>63.6          |
| Hospital clinic                          | n<br>2/69<br>2.9                  | n<br>2/49<br>4.1           | n<br>3/35<br>8.6                     | n<br>0<br>0                |
| Private Physi-<br>cians office           | n<br>9/69<br>13.0                 | n<br>9/49<br>18.4          | n<br>5/35<br>14.3                    | n<br>2/11<br>18.2          |
| Health Dept.                             | n<br>13/69<br>18.8                | n<br>3/49<br>6.1           | n<br>7/35<br>20.0                    | n<br>0<br>0                |
| Other                                    | n<br>7/69<br>10.1                 | n<br>9/49<br>18.4          | n<br>1/35<br>2.9                     | n<br>1/11<br>9.1           |
| No Provider                              | n<br>4/69<br>5.8                  | n<br>4/49<br>8.2           | n<br>2/35<br>5.7                     | n<br>1/11<br>9.1           |

Table 3-37 (continued)

Percentage of Head Start and Non-Head Start Children By  
Prior Head Start Experience of Family According to Characteristics  
of Medical Services for Immunizations in Mingo County

| Medical Services<br>for<br>Immunizations | No Prior Head<br>Start Experience |                            | With Prior Head-<br>Start Experience |                            |
|--|-----------------------------------|----------------------------|--------------------------------------|----------------------------|
|  | Head Start<br>n=65                | Non-<br>Head Start<br>n=59 | Head Start<br>n=60                   | Non-<br>Head Start<br>n=38 |
| <u>Providers Used:</u>                   |                                   |                            |                                      |                            |
| Pediatrician                             | n<br>12/36<br>33.3                | n<br>23/65<br>35.4         | n<br>6/54<br>11.1                    | n<br>8/29<br>27.6          |
| General Family                           | n<br>7/36<br>19.4                 | n<br>12/65<br>18.5         | n<br>12/54<br>22.2                   | n<br>6/29<br>20.7          |
| Nurse                                    | n<br>10/36<br>27.8                | n<br>26/65<br>40.0         | n<br>27/54<br>50.0                   | n<br>11/29<br>37.9         |
| Other                                    | n<br>1/36<br>2.8                  | n<br>2/65<br>3.1           | n<br>2/54<br>3.7                     | n<br>1/29<br>3.4           |
| No Provider                              | n<br>6/36<br>16.7                 | n<br>2/65<br>3.1           | n<br>7/54<br>13.0                    | n<br>3/29<br>10.3          |
| <u>Location of<br/>Services</u>          |                                   |                            |                                      |                            |
| Community<br>clinic                      | n<br>8/43<br>18.6                 | n<br>4/72<br>5.6           | n<br>9/65<br>13.8                    | n<br>2/33<br>6.1           |
| Hospital clinic                          | n<br>3/43<br>7.0                  | n<br>18/72<br>25.0         | n<br>4/65<br>6.2                     | n<br>8/33<br>24.2          |
| Private Physi-<br>cians' office          | n<br>4/43<br>9.3                  | n<br>12/72<br>16.7         | n<br>5/65<br>7.7                     | n<br>5/33<br>15.2          |
| Health Dept.                             | n<br>17/43<br>39.5                | n<br>28/72<br>38.9         | n<br>33/65<br>58.5                   | n<br>13/33<br>39.4         |
| Other                                    | n<br>5/43<br>11.6                 | n<br>8/72<br>11.1          | n<br>2/65<br>3.1                     | n<br>2/33<br>6.1           |
| No Provider                              | n<br>6/43<br>14.0                 | n<br>2/72<br>2.8           | n<br>7/65<br>10.8                    | n<br>3/33<br>9.1           |



**CHAPTER FOUR**

**APPENDIX TABLES**

Table 4-1

Children<sup>a</sup> Referred for Urgent Dental Condition Observed at Pretest and Posttest Dental Status

|                   | Pretest                    |                           |                            | Posttest                   |                           |                            | Conclude Treatment Received? |
|-------------------|----------------------------|---------------------------|----------------------------|----------------------------|---------------------------|----------------------------|------------------------------|
|                   | Number of Decayed Surfaces | Number of Filled Surfaces | Number of Missing Surfaces | Number of Decayed Surfaces | Number of Filled Surfaces | Number of Missing Surfaces |                              |
| <b>Head Start</b> |                            |                           |                            |                            |                           |                            |                              |
| <b>Sample A</b>   |                            |                           |                            |                            |                           |                            |                              |
| 421033            | 10                         | 0                         | 0                          | 24                         | 15                        | 0                          | x                            |
| 421034            | 25                         | 0                         | 0                          | 23                         | 14                        | 15                         | x                            |
| 421055            | 16                         | 0                         | 0                          | 16                         | 6                         | 0                          | x                            |
| 421064            | 14                         | 0                         | 0                          | 17                         | 7                         | 0                          | x                            |
| 421076            | 22                         | 1                         | 0                          | 28                         | 0                         | 0                          |                              |
| 421174            | 19                         | 0                         | 0                          | 19                         | 0                         | 10                         |                              |
| 721076            | 27                         | 0                         | 0                          | 31                         | 5                         | 5                          | x                            |
| 721094            | 41                         | 0                         | 0                          | 30                         | 6                         | 10                         | x                            |
| 721289            | 27                         | 2                         | 0                          | 73                         | 1                         | 0                          | x                            |
| <b>Head Start</b> |                            |                           |                            |                            |                           |                            |                              |
| <b>Sample D</b>   |                            |                           |                            |                            |                           |                            |                              |
| 421191            | 20                         | 0                         | 0                          |                            |                           |                            |                              |
| 621149            | 13                         | 0                         | 0                          |                            |                           |                            |                              |
| 621539            | 24                         | 0                         | 0                          |                            |                           |                            |                              |
| 721250            | 8                          | 0                         | 0                          |                            |                           |                            |                              |
| 721257            | 14                         | 0                         | 20                         |                            |                           |                            |                              |

<sup>a</sup>Syntax of Six Digit Identification Number

Site Code    Book Code    Pre/Post Code    Case Code

A

B

C

D

- A - 4 Greene and Humphreys Counties  
 - 5 St. Clair County  
 - 6 Maricopa County  
 - 7 Mingo County

B - 2 Child examination book (constant)

- C - 1 Pretest  
 - 3 Posttest

D - 001 Child Identification number  
 to 905

Table 4-1 (continued)

Children<sup>a</sup> Referred for Urgent Dental Condition Observed at Pretest and Posttest Dental Status

|                       | Pretest                    |                           |                            | Posttest                   |                           |                            | Conclude Treatment Received? |
|-----------------------|----------------------------|---------------------------|----------------------------|----------------------------|---------------------------|----------------------------|------------------------------|
|                       | Number of Decayed Surfaces | Number of Filled Surfaces | Number of Missing Surfaces | Number of Decayed Surfaces | Number of Filled Surfaces | Number of Missing Surfaces |                              |
| <b>Non-Head Start</b> |                            |                           |                            |                            |                           |                            |                              |
| <b>Sample A</b>       |                            |                           |                            |                            |                           |                            |                              |
| 421001                | 19                         | 0                         | 0                          | 14                         | 19                        | 20                         | x                            |
| 421019                | 31                         | 0                         | 0                          | 47                         | 0                         | 0                          |                              |
| 421075                | 16                         | 0                         | 20                         | 19                         | 0                         | 20                         |                              |
| 421098                | 10                         | 0                         | 0                          | 11                         | 1                         | 0                          | x                            |
| 421146                | a                          | 0                         | 0                          | 13                         | 0                         | 0                          |                              |
| 421175                | 10                         | 0                         | 0                          | 14                         | 0                         | 0                          |                              |
| 421192                | 8                          | 0                         | 0                          | 10                         | 16                        | 0                          | x                            |
| 721106                | 34                         | 0                         | 0                          | 33                         | 0                         | 10                         |                              |
| 721297                | 51                         | 0                         | 0                          | 5                          | 28                        | 30                         | x                            |
| <b>Non-Head Start</b> |                            |                           |                            |                            |                           |                            |                              |
| <b>Sample D</b>       |                            |                           |                            |                            |                           |                            |                              |
| 421081                | 18                         | 0                         | 0                          | not posttested             |                           |                            |                              |
| 421107                | 20                         | 0                         | 0                          |                            |                           |                            |                              |
| 721029                | 15                         | 0                         | 0                          |                            |                           |                            |                              |
| 721038                | 34                         | 0                         | 0                          |                            |                           |                            |                              |
| 721056                | 16                         | 1                         | 0                          |                            |                           |                            |                              |
| 721057                | 37                         | 0                         | 0                          |                            |                           |                            |                              |
| 721092                | 7                          | 0                         | 0                          |                            |                           |                            |                              |
| 721231                | 11                         | 1                         | 0                          |                            |                           |                            |                              |
| 721252                | b                          | b                         | b                          |                            |                           |                            |                              |

<sup>a</sup> Referred for possible pulp necrosis of L-central maxillary incisor.<sup>b</sup> Child would not cooperate with examiner because of discomfort from numerous caries and other severe dental problems. A precise count of the numbers of problems was not made.<sup>c</sup> See first page of Table 4-1 for syntax of ID number.

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Table 4-2

Prevalence of Affected Surfaces for Children at  
Pratest by Head Start/Non-Head Start

| Percent with Affected Surfaces |        | Pretested Children (Samples A and D) in: |             |                  |             |                 |             |              |             |
|--------------------------------|--------|--|-------------|------------------|-------------|-----------------|-------------|--------------|-------------|
|                                |        | Greene & Humphreys Counties              |             | St. Clair County |             | Maricopa County |             | Mingo County |             |
|                                |        | HS<br>n=50                               | NHS<br>n=41 | HS<br>n=58       | NHS<br>n=51 | HS<br>n=61      | NHS<br>n=33 | HS<br>n=40   | NHS<br>n=33 |
| Decayed Surfaces               | n<br>Z | 38<br>76                                 | 35<br>85    | 25<br>43         | 27<br>53    | 34<br>56        | 21<br>64    | 23<br>58     | 14<br>42    |
| Filled Surfaces                | n<br>Z | 3<br>6                                   | 3<br>7      | 0<br>0           | 1<br>2      | 8<br>13         | 6<br>18     | 2<br>5       | 5<br>15     |
| Missing Surfaces               | n<br>Z | 1<br>2                                   | 2<br>5      | 4<br>7           | 1<br>2      | 2<br>3          | 4<br>12     | 2<br>5       | 0<br>0      |

Table 4-3

Average Numbers of Affected Surfaces for Children at  
Pratest by Head Start/Non-Head Start

| Prevalence Variables |           | Pretested Children (Samples A & D) in: |             |                  |             |                 |             |              |             |
|----------------------|-----------|--|-------------|------------------|-------------|-----------------|-------------|--------------|-------------|
|                      |           | Greene & Humphreys Counties            |             | St. Clair County |             | Maricopa County |             | Mingo County |             |
|                      |           | HS<br>n=50                             | NHS<br>n=41 | HS<br>n=58       | NHS<br>n=51 | HS<br>n=61      | NHS<br>n=33 | HS<br>n=40   | NHS<br>n=33 |
| Decayed Surfaces     | $\bar{x}$ | 6.82                                   | 7.41        | 1.67             | 3.06        | 3.89            | 4.39        | 6.23         | 4.55        |
| Filled Surfaces      | $\bar{x}$ | .42                                    | .12         | .00              | .16         | 1.03            | 3.12        | .10          | .18         |
| Missing Surfaces     | $\bar{x}$ | .10                                    | .61         | .43              | .10         | .33             | 1.06        | .63          | .00         |
| <u>Dmf</u>           | $\bar{x}$ | 7.32                                   | 8.12        | 2.10             | 3.31        | 5.25            | 8.58        | 6.95         | 4.73        |

Table 4-4

Average Oral Hygiene Index for Head Start and Non-Head Start Children at Pretest

| Oral Hygiene Index <sup>a</sup> | Pretested Children (Samples A & D) in: |      |                  |      |                 |      |              |      |      |
|---------------------------------|--|------|------------------|------|-----------------|------|--------------|------|------|
|                                 | Greene & Humphreys Counties            |      | St. Clair County |      | Maricopa County |      | Mingo County |      |      |
|                                 | HS                                     | NHS  | HS               | NHS  | HS              | NHS  | HS           | NHS  |      |
| n                               | 50                                     | 41   | 58               | 51   | 61              | 33   | 40           | 33   |      |
| Mean                            | 1.91                                   | 1.97 | 1.28             | 1.13 | 1.19            | 1.23 | 1.57         | 1.64 |      |
| Standard Deviation              | .58                                    | .53  | .30              | .37  | .32             | .35  | .67          | .71  |      |
| Range                           | Min.                                   | .38  | .50              | .00  | .00             | .58  | .58          | .00  | .00  |
|                                 | Max.                                   | 3.00 | 2.75             | 1.83 | 1.67            | 1.83 | 1.92         | 3.00 | 2.67 |

<sup>a</sup>Range = 0 (no plaque) to 3 (extensive plaque).

Table 4-5

Classifications of the Profile and Primary Occlusion for Children at Pretest By Head Start/Non-Head Start

| Crossbite               | Pretested Children (Samples A & D) in: |     |                  |     |                 |     |              |     |    |
|-------------------------|--|-----|------------------|-----|-----------------|-----|--------------|-----|----|
|                         | Greene & Humphreys Counties            |     | St. Clair County |     | Maricopa County |     | Mingo County |     |    |
|                         | HS                                     | NHS | HS               | NHS | HS              | NHS | HS           | NHS |    |
| Profile                 | n                                      | 50  | 39               | 58  | 51              | 60  | 33           | 40  | 33 |
| Straight                | %                                      | 100 | 97               | 98  | 92              | 100 | 100          | 48  | 55 |
| Convex                  | %                                      | -   | -                | 2   | 4               | -   | -            | 48  | 39 |
| Concave                 | %                                      | -   | 3                | -   | 4               | -   | -            | 5   | 6  |
| Right Primary Occlusion | n                                      | 50  | 41               | 59  | 51              | 61  | 33           | 38  | 33 |
| Flat                    | %                                      | 4   | 2                | 41  | 55              | 48  | 33           | 42  | 42 |
| Distal Step             | %                                      | 4   | -                | 2   | 8               | 5   | 6            | 3   | 12 |
| Mesial Step             | %                                      | 92  | 98               | 58  | 37              | 48  | 61           | 55  | 46 |
| Left Primary Occlusion  | n                                      | 50  | 41               | 59  | 51              | 61  | 33           | 38  | 33 |
| Flat                    | %                                      | 4   | 2                | 42  | 45              | 49  | 36           | 40  | 36 |
| Distal Step             | %                                      | 4   | -                | -   | 4               | 3   | 6            | 3   | 3  |
| Mesial Step             | %                                      | 92  | 98               | 58  | 51              | 48  | 58           | 58  | 61 |

Table 4-6

## Occlusion Measures for Head Start and Non-Head Start Children at Pretest

|                             |   | Pretested Children (Samples A & D) in: |     |                  |     |                 |     |              |     |
|-----------------------------|---|--|-----|------------------|-----|-----------------|-----|--------------|-----|
|                             |   | Greene & Humphreys Counties            |     | St. Clair County |     | Maricopa County |     | Mingo County |     |
|                             |   | HS                                     | NHS | HS               | NHS | HS              | NHS | HS           | NHS |
| Degree of Overbite          | n | 49                                     | 40  | 58               | 50  | 57              | 29  | 38           | 32  |
| Openbite                    | % | 8                                      | 8   | 9                | 12  | 9               | 0   | 8            | 6   |
| 0-5%                        | % | 14                                     | 10  | 22               | 14  | 12              | 17  | 18           | 13  |
| 5-25%                       | % | 37                                     | 45  | 10               | 14  | 23              | 28  | 13           | 9   |
| 25-50%                      | % | 25                                     | 25  | 35               | 24  | 30              | 31  | 26           | 34  |
| 50-75%                      | % | 10                                     | 5   | 16               | 18  | 5               | 17  | 18           | 16  |
| 75-100%                     | % | 6                                      | 8   | 9                | 18  | 21              | 7   | 16           | 22  |
| Size of Overjet             | n | 48                                     | 39  | 57               | 49  | 59              | 31  | 33           | 32  |
| -2-0mm                      | % | 10                                     | 3   | 9                | 2   | 5               | 3   | 0            | 0   |
| 0-1mm                       | % | 21                                     | 13  | 18               | 10  | 22              | 26  | 9            | 9   |
| 1-2mm                       | % | 23                                     | 33  | 35               | 37  | 31              | 26  | 36           | 19  |
| 3mm                         | % | 25                                     | 31  | 23               | 29  | 17              | 26  | 24           | 41  |
| 4mm                         | % | 13                                     | 10  | 7                | 12  | 15              | 10  | 9            | 0   |
| 5mm or more                 | % | 8                                      | 10  | 9                | 10  | 10              | 10  | 21           | 31  |
| Crossbite                   | N | 48                                     | 39  | 57               | 52  | 61              | 33  | 38           | 33  |
|                             | % | 29                                     | 15  | 16               | 15  | 3               | 9   | 5            | 12  |
| Presence of Fractured Teeth | N | 45                                     | 38  | 57               | 51  | 61              | 33  | 39           | 32  |
|                             | % | 18                                     | 21  | 14               | 12  | 10              | 9   | 21           | 16  |

Table 4-7

Urgent Dental Treatment Needs of Children at Pretest  
by Head Start/Non-Head Start

| Urgent<br>Dental<br>Treatment<br>Needs | Pretested Children (Samples A & D) in: |     |                     |     |                    |     |                 |     |    |
|--|--|-----|---------------------|-----|--------------------|-----|-----------------|-----|----|
|  | Greene &<br>Humphreys<br>Counties      |     | St. Clair<br>County |     | Maricopa<br>County |     | Mingo<br>County |     |    |
|  | HS                                     | NHS | HS                  | NHS | HS                 | NHS | HS              | NHS |    |
| Oral Hygiene                           | n                                      | 50  | 41                  | 58  | 51                 | 61  | 33              | 40  | 33 |
|  | %                                      | 2   | 2                   | -   | 2                  | -   | -               | 25  | 15 |
| Decay                                  | n                                      | 50  | 41                  | 58  | 51                 | 61  | 33              | 40  | 33 |
|  | %                                      | 14  | 22                  | 9   | 18                 | 8   | 18              | 25  | 18 |
| Inflammation                           | n                                      | 49  | 41                  | 58  | 51                 | 61  | 33              | 39  | 33 |
|  | %                                      | 2   | 0                   | -   | 4                  | -   | -               | 18  | 12 |
| Unacceptable<br>Occlusion              | n                                      | 50  | 41                  | 54  | 48                 | 61  | 33              | 39  | 33 |
|  | %                                      | 22  | 15                  | 7   | 10                 | -   | 3               | 5   | 9  |
| Any                                    | n                                      | 50  | 41                  | 58  | 51                 | 61  | 33              | 40  | 33 |
|  | %                                      | 32  | 34                  | 17  | 29                 | 10  | 21              | 30  | 24 |

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Table 4-8

UNADJUSTED COMPARISONS BETWEEN THOSE WHO DID AND THOSE WHO DID NOT RECEIVE DENTAL SCREENS FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| SCREENED  | Greene/Humphreys |      | St. Clair      |      | Maricopa |     | Mingo          |      |
|---|------------------|------|----------------|------|----------|-----|----------------|------|
|   | YES              | NO   | YES            | NO   | YES      | NO  | YES            | NO   |
| PER CAPITA INCOME N<br>LESS THAN \$1295                   | 80               | 37   | 54             | 47   | 98       | 0   | 70             | 12   |
| n   | 57               | 29   | 41             | 43   | 59       | 0   | 40             | 10   |
| %   | 71.3             | 78.4 | 75.9           | 91.5 | 60.2     | 0.0 | 57.1           | 83.3 |
|   | CHI SQ = 0.660   |      | CHI SQ = 4.348 |      |          |     | CHI SQ = 2.953 |      |
|   | DF = 1           |      | DF = 1         |      |          |     | DF = 1         |      |
|   | P = 0.416        |      | P = 0.037      |      |          |     | P = 0.086      |      |
| MOTHER HAS LESS N<br>THAN 12 YEARS OF<br>EDUCATION        | 84               | 39   | 58             | 50   | 102      | 0   | 73             | 12   |
| n   | 38               | 21   | 22             | 20   | 55       | 0   | 42             | 5    |
| %   | 45.2             | 53.8 | 37.9           | 40.0 | 53.9     | 0.0 | 57.5           | 41.7 |
|   | CHI SQ = 0.791   |      | CHI SQ = 0.048 |      |          |     | CHI SQ = 1.050 |      |
|   | DF = 1           |      | DF = 1         |      |          |     | DF = 1         |      |
|   | P = 0.374        |      | P = 0.826      |      |          |     | P = 0.306      |      |
| MOTHER'S AGE AT N<br>BIRTH OF CHILD<br>LESS THAN 18 YEARS | 83               | 39   | 56             | 49   | 101      | 0   | 72             | 11   |
| n   | 12               | 9    | 14             | 9    | 16       | 0   | 11             | 2    |
| %   | 14.5             | 23.1 | 25.0           | 18.4 | 15.8     | 0.0 | 15.3           | 18.2 |
|   | CHI SQ = 1.383   |      | CHI SQ = 0.672 |      |          |     | CHI SQ = 0.061 |      |
|   | DF = 1           |      | DF = 1         |      |          |     | DF = 1         |      |
|   | P = 0.240        |      | P = 0.412      |      |          |     | P = 0.805      |      |



Table 4-8 (continued)

UNADJUSTED COMPARISONS BETWEEN THOSE WHO DID AND THOSE WHO DID NOT RECEIVE DENTAL SCREENS  
FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| SCREENED                                     |   | Greens/Humphreys |      | St. Clair      |      | Maricopa |     | Mingo          |      |
|--|---|------------------|------|----------------|------|----------|-----|----------------|------|
|  |   | YES              | NO   | YES            | NO   | YES      | NO  | YES            | NO   |
| NO MEDICAL<br>INSURANCE                      | N | 72               | 39   | 57             | 49   | 100      | 0   | 70             | 11   |
|  | n | 26               | 13   | 10             | 9    | 72       | 0   | 27             | 4    |
|  | % | 36.1             | 33.3 | 17.5           | 18.4 | 72.0     | 0.0 | 38.6           | 36.4 |
|  |   | CHI SQ = 0.086   |      | CHI SQ = 0.012 |      |          |     | CHI SQ = 0.020 |      |
|  |   | DF = 1           |      | DF = 1         |      |          |     | DF = 1         |      |
|  |   | P = 0.770        |      | P = 0.912      |      |          |     | P = 0.889      |      |
| NO MEDICAID<br>INSURANCE                     | N | 83               | 39   | 57             | 50   | 102      | 0   | 72             | 12   |
|  | n | 52               | 22   | 19             | 15   | 102      | 0   | 54             | 7    |
|  | % | 62.7             | 56.4 | 33.3           | 30.0 | 100.0    | 0.0 | 75.0           | 58.3 |
|  |   | CHI SQ = 0.433   |      | CHI SQ = 0.137 |      |          |     | CHI SQ = 1.437 |      |
|  |   | DF = 1           |      | DF = 1         |      |          |     | DF = 1         |      |
|  |   | P = 0.510        |      | P = 0.712      |      |          |     | P = 0.231      |      |
| DIFFICULT ACCESS<br>TO MEDICAL CARE          | N | 84               | 39   | 58             | 50   | 101      | 0   | 71             | 12   |
|  | n | 16               | 8    | 3              | 1    | 21       | 0   | 19             | 3    |
|  | % | 19.0             | 20.5 | 5.2            | 2.0  | 20.8     | 0.0 | 26.8           | 25.0 |
|  |   | CHI SQ = 0.036   |      | CHI SQ = 0.758 |      |          |     | CHI SQ = 0.016 |      |
|  |   | DF = 1           |      | DF = 1         |      |          |     | DF = 1         |      |
|  |   | P = 0.849        |      | P = 0.384      |      |          |     | P = 0.898      |      |
| NO PARTICIPATION<br>IN GOVERNMENT<br>PROGRAM | N | 81               | 37   | 53             | 49   | 100      | 0   | 65             | 11   |
|  | n | 8                | 1    | 0              | 1    | 14       | 0   | 11             | 2    |
|  | % | 9.9              | 2.7  | 0.0            | 2.0  | 14.0     | 0.0 | 16.9           | 18.2 |
|  |   | CHI SQ = 1.855   |      | CHI SQ = 1.092 |      |          |     | CHI SQ = 0.011 |      |
|  |   | DF = 1           |      | DF = 1         |      |          |     | DF = 1         |      |
|  |   | P = 0.173        |      | P = 0.296      |      |          |     | P = 0.918      |      |

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Table 4-9

UNADJUSTED COMPARISONS BETWEEN THOSE WHO HAD AND THOSE WHO DID NOT HAVE DENTAL FINDINGS  
FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| FINDINGS  | Greene/Humphreys |      | St. Clair      |      | Maricopa       |      | Mingo          |      |
|---|------------------|------|----------------|------|----------------|------|----------------|------|
|   | YES              | NO   | YES            | NO   | YES            | NO   | YES            | NO   |
| PER CAPITA INCOME N<br>LESS THAN \$1295                   | 20               | 60   | 36             | 18   | 90             | 8    | 19             | 51   |
| n   | 14               | 43   | 30             | 11   | 56             | 3    | 11             | 29   |
| %   | 70.0             | 71.7 | 83.3           | 61.1 | 62.2           | 37.5 | 57.9           | 56.9 |
|   | CHI SQ = 0.020   |      | CHI SQ = 3.242 |      | CHI SQ = 1.874 |      | CHI SQ = 0.006 |      |
|   | DF = 1           |      | DF = 1         |      | DF = 1         |      | DF = 1         |      |
|   | P = 0.887        |      | P = 0.072      |      | P = 0.171      |      | P = 0.938      |      |
| MOTHER HAS LESS N<br>THAN 12 YEARS OF<br>EDUCATION        | 22               | 62   | 37             | 21   | 93             | 9    | 19             | 54   |
| n   | 9                | 29   | 15             | 7    | 51             | 4    | 13             | 29   |
| %   | 40.9             | 46.8 | 40.5           | 33.3 | 54.8           | 44.4 | 68.4           | 53.7 |
|   | CHI SQ = 0.225   |      | CHI SQ = 0.296 |      | CHI SQ = 0.357 |      | CHI SQ = 1.246 |      |
|   | DF = 1           |      | DF = 1         |      | DF = 1         |      | DF = 1         |      |
|   | P = 0.635        |      | P = 0.587      |      | P = 0.550      |      | P = 0.264      |      |
| MOTHER'S AGE AT N<br>BIRTH OF CHILD<br>LESS THAN 18 YEARS | 22               | 61   | 36             | 20   | 92             | 9    | 19             | 53   |
| n   | 3                | 9    | 8              | 6    | 15             | 1    | 3              | 8    |
| %   | 13.6             | 14.8 | 22.2           | 30.0 | 16.3           | 11.1 | 15.8           | 15.1 |
|   | CHI SQ = 0.016   |      | CHI SQ = 0.415 |      | CHI SQ = 0.166 |      | CHI SQ = 0.005 |      |
|   | DF = 1           |      | DF = 1         |      | DF = 1         |      | DF = 1         |      |
|   | P = 0.898        |      | P = 0.519      |      | P = 0.684      |      | P = 0.942      |      |

Table 4-9 (continued).

UNADJUSTED COMPARISONS BETWEEN THOSE WHO HAD AND THOSE WHO DID NOT HAVE DENTAL FINDINGS FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| FINDINGS                               |   | Greene/Humphreys                      |                                       | St. Clair                             |                                       | Maricopa |       | Mingo |      |
|--|---|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|----------|-------|-------|------|
|  |   | YES                                   | NO                                    | YES                                   | NO                                    | YES      | NO    | YES   | NO   |
| NO MEDICAL INSURANCE                   | N | 19                                    | 53                                    | 37                                    | 20                                    | 91       | 9     | 18    | 52   |
|  | n | 6                                     | 20                                    | 6                                     | 4                                     | 66       | 6     | 8     | 19   |
|  | % | 31.6                                  | 37.7                                  | 16.2                                  | 20.0                                  | 72.5     | 66.7  | 44.4  | 36.5 |
|  |   | CHI SQ = 0.230<br>DF = 1<br>P = 0.622 | CHI SQ = 0.128<br>DF = 1<br>P = 0.720 | CHI SQ = 0.140<br>DF = 1<br>P = 0.709 | CHI SQ = 0.353<br>DF = 1<br>P = 0.553 |          |       |       |      |
| NO MEDICAID INSURANCE                  | N | 22                                    | 61                                    | 37                                    | 20                                    | 93       | 9     | 18    | 54   |
|  | n | 16                                    | 36                                    | 10                                    | 9                                     | 93       | 9     | 15    | 39   |
|  | % | 72.7                                  | 59.0                                  | 27.0                                  | 45.0                                  | 100.0    | 100.0 | 83.3  | 72.2 |
|  |   | CHI SQ = 4.299<br>DF = 1<br>P = 0.254 | CHI SQ = 1.887<br>DF = 1<br>P = 0.169 | CHI SQ = 0.889<br>DF = 1<br>P = 0.346 |                                       |          |       |       |      |
| DIFFICULT ACCESS TO MEDICAL CARE       | N | 22                                    | 62                                    | 37                                    | 21                                    | 92       | 9     | 18    | 53   |
|  | n | 2                                     | 14                                    | 2                                     | 1                                     | 19       | 2     | 4     | 15   |
|  | % | 9.1                                   | 22.6                                  | 5.4                                   | 4.8                                   | 20.7     | 22.2  | 22.2  | 28.3 |
|  |   | CHI SQ = 1.916<br>DF = 1<br>P = 0.166 | CHI SQ = 0.011<br>DF = 1<br>P = 0.915 | CHI SQ = 0.012<br>DF = 1<br>P = 0.912 | CHI SQ = 0.253<br>DF = 1<br>P = 0.615 |          |       |       |      |
| NO PARTICIPATION IN GOVERNMENT PROGRAM | N | 22                                    | 59                                    | 35                                    | 18                                    | 91       | 9     | 17    | 48   |
|  | n | 3                                     | 5                                     | 0                                     | 0                                     | 13       | 1     | 3     | 8    |
|  | % | 13.6                                  | 8.5                                   | 0.0                                   | 0.0                                   | 14.3     | 11.1  | 17.6  | 16.7 |
|  |   | CHI SQ = 0.480<br>DF = 1<br>P = 0.489 | CHI SQ = 0.069<br>DF = 1<br>P = 0.793 | CHI SQ = 0.009<br>DF = 1<br>P = 0.926 |                                       |          |       |       |      |

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Table 4-10

UNADJUSTED COMPARISONS BETWEEN THOSE WHO WERE AND THOSE WHO WERE NOT REFERRED FOR TREATMENT  
FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| REFERRAL  | Greene/Humphreys |      | St. Clair      |      | Maricopa       |      | Mingo          |      |
|---|------------------|------|----------------|------|----------------|------|----------------|------|
|   | YES              | NO   | YES            | NO   | YES            | NO   | YES            | NO   |
| PER CAPITA INCOME N<br>LESS THAN \$1295                   | 17               | 59   | 32             | 22   | 67             | 30   | 35             | 34   |
| n   | 13               | 41   | 27             | 14   | 43             | 15   | 21             | 18   |
| %   | 76.5             | 69.5 | 84.4           | 63.6 | 64.2           | 50.0 | 60.0           | 52.9 |
|   | CHI SQ = 0.313   |      | CHI SQ = 3.068 |      | CHI SQ = 1.733 |      | CHI SQ = 0.350 |      |
|   | DF = 1           |      | DF = 1         |      | DF = 1         |      | DF = 1         |      |
|   | P = 0.576        |      | P = 0.080      |      | P = 0.188      |      | P = 0.554      |      |
| MOTHER HAS LESS N<br>THAN 12 YEARS OF<br>EDUCATION        | 19               | 61   | 33             | 25   | 69             | 32   | 36             | 36   |
| n   | 10               | 27   | 13             | 9    | 40             | 14   | 25             | 16   |
| %   | 52.6             | 44.3 | 39.4           | 36.0 | 58.0           | 43.8 | 69.4           | 44.4 |
|   | CHI SQ = 0.408   |      | CHI SQ = 0.070 |      | CHI SQ = 1.777 |      | CHI SQ = 4.589 |      |
|   | DF = 1           |      | DF = 1         |      | DF = 1         |      | DF = 1         |      |
|   | P = 0.523        |      | P = 0.792      |      | P = 0.182      |      | P = 0.032      |      |
| MOTHER'S AGE AT N<br>BIRTH OF CHILD<br>LESS THAN 18 YEARS | 19               | 59   | 31             | 25   | 68             | 32   | 35             | 36   |
| n   | 0                | 12   | 7              | 7    | 12             | 4    | 6              | 5    |
| %   | 0.0              | 20.3 | 22.6           | 28.0 | 17.6           | 12.5 | 17.1           | 13.9 |
|   | CHI SQ = 4.567   |      | CHI SQ = 0.217 |      | CHI SQ = 0.429 |      | CHI SQ = 0.144 |      |
|   | DF = 1           |      | DF = 1         |      | DF = 1         |      | DF = 1         |      |
|   | P = 0.033        |      | P = 0.641      |      | P = 0.512      |      | P = 0.705      |      |

Table 4-10 (continued)

UNADJUSTED COMPARISONS BETWEEN THOSE WHO WERE AND THOSE WHO WERE NOT REFERRED FOR TREATMENT FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| REFERRAL                               |   | Greene/Humphreys |      | St. Clair      |      | Maricopa       |       | Mingo          |      |
|--|---|------------------|------|----------------|------|----------------|-------|----------------|------|
|  |   | YES              | NO   | YES            | NO   | YES            | NO    | YES            | NO   |
| NO MEDICAL INSURANCE                   | N | 17               | 50   | 33             | 24   | 67             | 32    | 34             | 35   |
|  | n | 4                | 19   | 3              | 7    | 50             | 21    | 14             | 13   |
|  | % | 23.5             | 38.0 | 9.1            | 29.2 | 74.6           | 65.6  | 41.2           | 37.1 |
|  |   | CHI SQ = 1.178   |      | CHI SQ = 3.874 |      | CHI SQ = 0.865 |       | CHI SQ = 0.118 |      |
|  |   | DF = 1           |      | DF = 1         |      | DF = 1         |       | DF = 1         |      |
|  |   | P = 0.278        |      | P = 0.049      |      | P = 0.352      |       | P = 0.731      |      |
| NO MEDICAID INSURANCE                  | N | 19               | 57   | 33             | 24   | 69             | 32    | 35             | 36   |
|  | n | 10               | 36   | 7              | 12   | 69             | 32    | 25             | 28   |
|  | % | 52.6             | 63.2 | 21.2           | 50.0 | 100.0          | 100.0 | 71.4           | 77.8 |
|  |   | CHI SQ = 0.661   |      | CHI SQ = 5.182 |      |                |       | CHI SQ = 0.378 |      |
|  |   | DF = 1           |      | DF = 1         |      |                |       | DF = 1         |      |
|  |   | P = 0.416        |      | P = 0.023      |      |                |       | P = 0.539      |      |
| DIFFICULT ACCESS TO MEDICAL CARE       | N | 19               | 61   | 33             | 25   | 68             | 32    | 34             | 36   |
|  | n | 1                | 17   | 3              | 0    | 14             | 7     | 7              | 12   |
|  | % | 5.3              | 27.9 | 9.1            | 0.0  | 20.6           | 21.9  | 20.6           | 33.3 |
|  |   | CHI SQ = 4.246   |      | CHI SQ = 2.397 |      | CHI SQ = 0.022 |       | CHI SQ = 1.436 |      |
|  |   | DF = 1           |      | DF = 1         |      | DF = 1         |       | DF = 1         |      |
|  |   | P = 0.039        |      | P = 0.122      |      | P = 0.883      |       | P = 0.231      |      |
| NO PARTICIPATION IN GOVERNMENT PROGRAM | N | 19               | 58   | 32             | 21   | 69             | 30    | 30             | 34   |
|  | n | 3                | 5    | 0              | 0    | 9              | 5     | 4              | 7    |
|  | % | 15.8             | 8.6  | 0.0            | 0.0  | 13.0           | 16.7  | 13.3           | 20.6 |
|  |   | CHI SQ = 0.790   |      |                |      | CHI SQ = 0.226 |       | CHI SQ = 0.589 |      |
|  |   | DF = 1           |      |                |      | DF = 1         |       | DF = 1         |      |
|  |   | P = 0.374        |      |                |      | P = 0.634      |       | P = 0.443      |      |

Table 4-11

Average Numbers of Decayed, Filled, and Missing Surfaces for Children at Pretest by Previous Head Start Experience of Family<sup>a</sup>

| Prevalence Variables    | Pretested Children (Samples A & D) in: |            |                             |            |                             |            |                             |            |
|-------------------------|--|------------|-----------------------------|------------|-----------------------------|------------|-----------------------------|------------|
|                         | Greene & Humphreys Counties            |            | St. Clair County            |            | Maricopa County             |            | Mingo County                |            |
|                         | Prior Head Start Experience            |            | Prior Head Start Experience |            | Prior Head Start Experience |            | Prior Head Start Experience |            |
|                         | Yes<br>n=56                            | No<br>n=21 | Yes<br>n=25                 | No<br>n=78 | Yes<br>n=28                 | No<br>n=59 | Yes<br>n=22                 | No<br>n=46 |
| <b>Decayed Surfaces</b> |  |            |                             |            |                             |            |                             |            |
| $\bar{x}$               | 7.57                                   | 6.76       | 1.72                        | 2.38       | 3.79                        | 4.12       | 6.41                        | 5.45       |
| $z^b$                   | 1.17                                   |            | -1.94*                      |            | -0.72                       |            | 1.53                        |            |
| <b>Filled Surfaces</b>  |  |            |                             |            |                             |            |                             |            |
| $\bar{x}$               | .32                                    | .38        | .00                         | .10        | 1.64                        | 1.69       | .27                         | .09        |
| $z^b$                   | -.40                                   |            | -1.60                       |            | -.17                        |            | 1.87*                       |            |
| <b>Missing Surfaces</b> |  |            |                             |            |                             |            |                             |            |
| $\bar{x}$               | .00                                    | 1.43       | .40                         | .25        | .18                         | .85        | .91                         | .11        |
| $z^b$                   | -4.00*                                 |            | .53                         |            | -1.64                       |            | 2.28                        |            |
| <b>Dmf</b>              |  |            |                             |            |                             |            |                             |            |
| $\bar{x}$               | 7.88                                   | 8.52       | 2.12                        | 2.74       | 5.61                        | 6.66       | 7.59                        | 5.65       |
| $z^b$                   | -.81                                   |            | -1.39                       |            | -1.54                       |            | 2.69                        |            |

<sup>a</sup> Children referred by pretest evaluation are included since their values are prior to subsequent intervention.

<sup>b</sup> Values of  $z$  beyond  $\pm 1.645$  are significant at  $p < .05$  and shown as (\*).

Table 4-12

Average Oral Hygiene Index for Children at Pretest From Families  
Previously Experienced and Not Experienced in Head Start

| Oral<br>Hygiene<br>Index <sup>a</sup> | Pretested Children (Samples A and D) |      |                                |      |                                |      |                                |      |
|---------------------------------------|--------------------------------------|------|--------------------------------|------|--------------------------------|------|--------------------------------|------|
|                                       | Greene &<br>Humphreys<br>Counties    |      | St. Clair<br>County            |      | Maricopa<br>County             |      | Mingo<br>County                |      |
|                                       | Prior Head Start<br>Experience       |      | Prior Head Start<br>Experience |      | Prior Head Start<br>Experience |      | Prior Head Start<br>Experience |      |
|                                       | Yes                                  | No   | Yes                            | No   | Yes                            | No   | Yes                            | No   |
| n                                     | 56                                   | 21   | 25                             | 78   | 28                             | 59   | 22                             | 46   |
| Mean                                  | 1.95                                 | 2.00 | 1.13                           | 1.24 | 1.13                           | 1.23 | 1.75                           | 1.57 |
| Standard Deviation                    | .56                                  | .62  | .47                            | .30  | .33                            | .33  | .81                            | .60  |
| Range                                 |                                      |      |                                |      |                                |      |                                |      |
| Min.                                  | .38                                  | .83  | .00                            | .00  | .58                            | .58  | .00                            | .00  |
| Max.                                  | 3.00                                 | 3.00 | 1.83                           | 1.75 | 1.75                           | 1.92 | 3.00                           | 2.58 |

<sup>a</sup>Range = 0 (no plaque) to 3 (extensive plaque).

Table 4-13

**Urgent Dental Treatment Needs of Children at Pretest from  
Families Previously Experienced with Head Start**

| Urgent<br>Dental<br>Treatment<br>Needs | Pretested Children (Samples A & D) |            |                                |            |                                |                |                                |            |    |  |
|--|------------------------------------|------------|--------------------------------|------------|--------------------------------|----------------|--------------------------------|------------|----|--|
|  | Greene &<br>Humphreys<br>Counties  |            | St. Clair<br>County            |            | Maricopa<br>County             |                | Mingo<br>County                |            |    |  |
|  | Prior Head Start<br>Experience     |            | Prior Head Start<br>Experience |            | Prior Head Start<br>Experience |                | Prior Head Start<br>Experience |            |    |  |
|  | Yes<br>n=56                        | No<br>n=21 | Yes<br>n=25                    | No<br>n=78 | Yes<br>n=28                    | No<br>n=59     | Yes<br>n=22                    | No<br>n=46 |    |  |
| Oral Hygiene                           | n                                  | 2          | 0 <sup>a</sup>                 | 1          | 0                              | 0              | 0                              | 6          | 8  |  |
|  | %                                  | 4          | 0 <sup>a</sup>                 | 4          | 0 <sup>a</sup>                 | 0              | 0                              | 27         | 17 |  |
| Decay                                  | n                                  | 11         | 5                              | 2          | 11                             | 3              | 7                              | 7          | 8  |  |
|  | %                                  | 20         | 24                             | 8          | 14                             | 11             | 12                             | 32         | 17 |  |
| Inflammation                           | n                                  | 1          | 0                              | 1          | 1                              | 0              | 0                              | 5          | 6  |  |
|  | %                                  | 2          | 0 <sup>a</sup>                 | 4          | 1 <sup>a</sup>                 | 0              | 0                              | 23         | 13 |  |
| Unacceptable occlusion                 | n                                  | 13         | 2                              | 2          | 8                              | 1              | 0                              | 1          | 3  |  |
|  | %                                  | 23         | 10                             | 9          | 10                             | 2 <sup>a</sup> | 0 <sup>a</sup>                 | 5          | 7  |  |
| Any                                    | n                                  | 20         | 7                              | 6          | 18                             | 3              | 9                              | 7          | 11 |  |
|  | %                                  | 36         | 33                             | 24         | 23                             | 11             | 15                             | 32         | 24 |  |

<sup>a</sup>Insufficient expected values for calculation of chi-squared test.



Table 4-14

Dental History and Care of Teeth According to Mother's Report for Children at Pretest From Families Previously Experienced and Not Previously Experienced with Head Start

| Dental History and Care of Teeth | Pretested Children (Samples A & D) |            |                             |            |                             |            |                             |            |                |  |
|----------------------------------|------------------------------------|------------|-----------------------------|------------|-----------------------------|------------|-----------------------------|------------|----------------|--|
|                                  | Greene & Humphreys Counties        |            | St. Clair County            |            | Maricopa County             |            | Mingo County                |            |                |  |
|                                  | Prior Head Start Experience        |            | Prior Head Start Experience |            | Prior Head Start Experience |            | Prior Head Start Experience |            |                |  |
|                                  | Yes<br>n=56                        | No<br>n=21 | Yes<br>n=26                 | No<br>n=78 | Yes<br>n=27                 | No<br>n=59 | Yes<br>n=22                 | No<br>n=46 |                |  |
| Brushes at Least Once a Day      | n                                  | 40         | 13                          | 19         | 62                          | 14         | 39                          | 8          | 28             |  |
|                                  | %                                  | 71         | 62                          | 73         | 80                          | 50         | 66                          | 36         | 61             |  |
| Ever Been to Dentist             | n                                  | 9          | 2                           | 7          | 23                          | 6          | 18                          | 1          | 1              |  |
|                                  | %                                  | 16         | 10                          | 27         | 30                          | 22         | 31                          | 5          | 2 <sup>a</sup> |  |
| Family Visits Dentist Regularly  | n                                  | 29         | 12                          | 15         | 31                          | 9          | 25                          | 6          | 9              |  |
|                                  | %                                  | 51         | 58                          | 56         | 40                          | 33         | 43                          | 25         | 19             |  |
| Has Dental Insurance             | n                                  | 28         | 7                           | 24         | 77                          | 4          | 6                           | 4          | 14             |  |
|                                  | %                                  | 50         | 33                          | 92         | 99 <sup>a</sup>             | 15         | 11                          | 18         | 30             |  |

<sup>a</sup> Insufficient expected values for calculation of chi-squared test.

Table 4-15

Average Number of Decayed, Filled, and Missing Surfaces for Children at Posttest  
Whose Families Have No Previous Head Start Experience and  
Were Not Referred for Treatment by Pretest Evaluation

| Prevalence Variables    | Posttested Children (Samples A & B) |             |                  |             |                 |             |              |             |
|-------------------------|-------------------------------------|-------------|------------------|-------------|-----------------|-------------|--------------|-------------|
|                         | Greene & Humphreys Counties         |             | St. Clair County |             | Maricopa County |             | Mingo County |             |
|                         | Head Start                          |             | Head Start       |             | Head Start      |             | Head Start   |             |
|                         | HS<br>n=31                          | NHS<br>n=21 | HS<br>n=23       | NHS<br>n=34 | HS<br>n=29      | NHS<br>n=13 | HS<br>n=14   | NHS<br>n=19 |
| <b>Decayed Surfaces</b> |                                     |             |                  |             |                 |             |              |             |
| $\bar{x}$               | 11.74                               | 12.29       | 3.96             | 3.50        | 2.59            | 4.69        | 4.07         | 4.63        |
| $z^a$                   |                                     | -0.56       |                  | 0.89        |                 | -3.50*      |              | -0.76       |
| <b>Filled Surfaces</b>  |                                     |             |                  |             |                 |             |              |             |
| $\bar{x}$               | 2.68                                | .19         | .00              | .18         | 7.59            | 5.00        | .71          | .21         |
| $z^a$                   |                                     | 6.82*       |                  | -1.97       |                 | 2.98*       |              | 2.19*       |
| <b>Missing Surfaces</b> |                                     |             |                  |             |                 |             |              |             |
| $\bar{x}$               | .48                                 | .71         | .65              | .74         | .34             | 2.31        | .00          | .26         |
| $z^a$                   |                                     | -0.48       |                  | -0.18       |                 | -2.71*      |              | -0.85       |
| <b>Dmf</b>              |                                     |             |                  |             |                 |             |              |             |
| $\bar{x}$               | 14.87                               | 13.14       | 4.61             | 4.41        | 10.41           | 12.00       | 4.79         | 5.11        |
| $z^a$                   |                                     | 1.51        |                  | 0.27        |                 | -1.24       |              | -0.38       |

<sup>a</sup>Values of z beyond  $\pm 1.645$  are significant at  $p < .05$  and shown as (\*).

Table 4-16

Oral Hygiene Index for Children at Posttest in Samples A and B  
Whose Families Have No Previous Head Start Experience

2

| Oral Hygiene Index <sup>a</sup> | Posttested Children (Samples A & B) |      |                  |                   |                 |                   |              |      |
|---------------------------------|-------------------------------------|------|------------------|-------------------|-----------------|-------------------|--------------|------|
|                                 | Greene & Humphreys Counties         |      | St. Clair County |                   | Maricopa County |                   | Mingo County |      |
|                                 | Head Start                          |      | Head Start       |                   | Head Start      |                   | Head Start   |      |
|                                 | HS                                  | NHS  | HS               | NHS               | HS              | NHS               | HS           | NHS  |
| n                               | 55                                  | 49   | 57               | 60 <sup>b</sup>   | 65              | 45                | 48           | 68   |
| Mean                            | 1.74                                | 1.92 | 1.43             | 1.54 <sup>b</sup> | 1.42            | 1.65 <sup>b</sup> | 1.72         | 1.73 |
| Standard Deviation              | .57                                 | .45  | .20              | .28               | .43             | .33               | .44          | .45  |
| Range                           |                                     |      |                  |                   |                 |                   |              |      |
| Min.                            | .17                                 | .92  | 1.00             | .90               | .33             | .88               | .75          | .83  |
| Max.                            | 3.00                                | 2.83 | 1.83             | 2.08              | 2.42            | 2.42              | 2.60         | 2.80 |

<sup>a</sup> Range = 0 (no plaque) to 3 (extensive plaque).

<sup>b</sup> Significant at  $p < .05$ .

730

Table 4-17

**Urgent Dental Needs of Children for Treatment at Posttest  
Whose Families Have No Previous Head Start Experience**

| Prevalence Variables   | Posttested Children (Samples A & B) |             |                          |             |                          |             |                          |             |                |
|------------------------|-------------------------------------|-------------|--------------------------|-------------|--------------------------|-------------|--------------------------|-------------|----------------|
|                        | Greene & Humphreys Counties         |             | St. Clair County         |             | Maricopa County          |             | Mingo County             |             |                |
|                        | Head Start<br>HS<br>n=55            | NHS<br>n=49 | Head Start<br>HS<br>n=58 | NHS<br>n=61 | Head Start<br>HS<br>n=67 | NHS<br>n=45 | Head Start<br>HS<br>n=48 | NHS<br>n=68 |                |
| Oral Hygiene           | n                                   | 1           | 0                        | 2           | 3                        | 0           | 0                        | 2           | 0              |
|                        | %                                   | 2           | 0 <sup>a</sup>           | 3           | 5                        | 0           | 0                        | 4           | 0 <sup>a</sup> |
| Decay                  | n                                   | 3           | 4                        | 3           | 5                        | 8           | 5                        | 12          | 19             |
|                        | %                                   | 6           | 8                        | 5           | 8                        | 12          | 11                       | 25          | 28             |
| Inflammation           | n                                   | 2           | 0                        | 2           | 4                        | 0           | 0                        | 6           | 7              |
|                        | %                                   | 4           | 0 <sup>a</sup>           | 3           | 7                        | 0           | 0                        | 13          | 10             |
| Unacceptable occlusion | n                                   | 10          | 7                        | 4           | 5                        | 0           | 0                        | 5           | 1              |
|                        | %                                   | 18          | 15                       | 7           | 9                        | 0           | 0                        | 11          | 2 <sup>a</sup> |
| Any                    | n                                   | 13          | 10                       | 7           | 11                       | 9           | 5                        | 15          | 20             |
|                        | %                                   | 24          | 20                       | 12          | 18                       | 13          | 11                       | 31          | 29             |

<sup>a</sup>Insufficient expected values for calculation of chi-squared test.

Table 4-18

Dental History and Care of Teeth According to Mother's Report for Children at Posttest  
in Samples A and B Whose Families Have No Previous Head Start Experience

| Prevalence<br>Variables            | Posttested Children (Samples A & B) |             |                     |             |                    |             |                 |             |                 |
|------------------------------------|-------------------------------------|-------------|---------------------|-------------|--------------------|-------------|-----------------|-------------|-----------------|
|                                    | Greene &<br>Humphreys<br>Counties   |             | St. Clair<br>County |             | Maricopa<br>County |             | Mingo<br>County |             |                 |
|                                    | Head Start                          |             | Head Start          |             | Head Start         |             | Head Start      |             |                 |
|                                    | HS<br>n=55                          | NHS<br>n=48 | HS<br>n=58          | NHS<br>n=59 | HS<br>n=67         | NHS<br>n=45 | HS<br>n=47      | NHS<br>n=70 |                 |
| Brushes at Least<br>Once a Day     | n                                   | 43          | 30                  | 47          | 47                 | 61          | 33              | 34          | 45              |
|                                    | %                                   | 78          | 63                  | 81          | 80                 | 91          | 73 <sup>a</sup> | 72          | 64              |
| Ever Been to<br>Dentist            | n                                   | 18          | 10                  | 47          | 24                 | 62          | 21              | 37          | 16              |
|                                    | %                                   | 33          | 21                  | 81          | 41 <sup>a</sup>    | 93          | 47 <sup>a</sup> | 78          | 23 <sup>a</sup> |
| Family Visits<br>Dentist Regularly | n                                   | n=41        | n=40                | n=52        | n=55               | n=60        | n=40            | n=40        | n=61            |
|                                    | %                                   | 22          | 20                  | 36          | 34                 | 23          | 13              | 17          | 20              |
|                                    | %                                   | 54          | 50                  | 69          | 62                 | 38          | 33              | 43          | 33              |
| Has Dental Insurance               | n                                   | 28          | 22                  | 42          | 39                 | 8           | 6               | 13          | 22              |
|                                    | %                                   | 51          | 45                  | 72          | 66                 | 12          | 13              | 27          | 31              |

<sup>a</sup> Chi-squared test is significant at  $p < .05$ .

Table 4-19

Average Number of Decayed, Filled and Missing Surfaces by Fluoridated or Non-Fluoridated Area and Overall at Posttest of Children Not Referred at Pretest<sup>a</sup>

| Prevalence Variables | Posttested Children (Samples A, B, C)         |  |                  |
|----------------------|---|--|------------------|
|                      | Non-Fluoridated <sup>b</sup><br>Area<br>n=214 | Fluoridated <sup>c</sup><br>Areas<br>n=357 | Overall<br>n=571 |
| Decayed Surfaces     | $\bar{x}$ 12.47                               | 3.45                                       | 6.54             |
| Filled Surfaces      | $\bar{x}$ 1.27                                | 2.41                                       | 1.62             |
| Missing Surfaces     | $\bar{x}$ 1.00                                | .59  | .84              |
| <u>Dmf</u>           | $\bar{x}$ 14.68                               | 6.41                                       | 8.96             |

<sup>a</sup> Mingo County was excluded from these analyses because the largest Head Start community, Williamson, has a fluoridated water supply, unlike other parts of this county.

<sup>b</sup> Non-Fluoridated - Greene and Humphreys Counties, including exception: Fluoridation of community water began in Leakesville, Mississippi at the start of the study year. Approximately 13% of the study children come from Leakesville.

<sup>c</sup> Fluoridated - St. Clair County and Maricopa County

CHAPTER FIVE

APPENDIX TABLES

Table 5-1

Regression Analysis of the Anthropometric Evaluation Measures  
Longitudinal Sample

| Dependent Variable      | Sample Size | Factors  | Effects <sup>a</sup> |             |
|-------------------------|-------------|--|----------------------|-------------|
|                         |             |  | b                    | se(b)       |
| HEIGHT                  | <u>171</u>  | Site <sup>b</sup>  |                      |             |
|                         |             | Greene & Humphreys   | <u>-.093</u>         | <u>.133</u> |
|                         |             | St. Clair  | <u>d</u>             |             |
|                         |             | Maricopa   | <u>-.022</u>         | <u>.115</u> |
|                         |             | Mingo  | <u>.114</u>          |             |
|                         |             | Head Start   | <u>-.014</u>         | <u>.114</u> |
|                         |             | Constant   | <u>-.643</u>         |             |
| Statistics <sup>c</sup> |             | F = <u>41.03**</u> R <sup>2</sup> = <u>.64</u> MS <sub>e</sub> = <u>.475</u> |                      |             |
| WEIGHT                  | <u>171</u>  | Site <sup>b</sup>  |                      |             |
|                         |             | Greene & Humphreys   | <u>-.507**</u>       | <u>.150</u> |
|                         |             | St. Clair  | <u>-.578**</u>       | <u>.166</u> |
|                         |             | Maricopa   | <u>-.427**</u>       | <u>.162</u> |
|                         |             | Mingo  | <u>.598</u>          |             |
|                         |             | Head Start   | <u>.163</u>          | <u>.091</u> |
|                         |             | Constant   | <u>-.904</u>         |             |
| Statistics <sup>c</sup> |             | F = <u>99.31**</u> R <sup>2</sup> = <u>.83</u> MS <sub>e</sub> = <u>.307</u> |                      |             |

<sup>a</sup> Adjusted for child's age, race, gender, and pretest z-score.

<sup>b</sup> Effects centered without weights; that is, effects sum to zero.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

<sup>d</sup> F is too small for this variable to enter the equation.



Table 5-1  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Longitudinal Sample

| Dependent Variable      | Sample Size | Factors  | Effects <sup>a</sup><br>b | se(b)       |
|-------------------------|-------------|--|---------------------------|-------------|
| TRICEPS<br>SKINFOLD     | <u>171</u>  | Site <sup>b</sup>  |                           |             |
|                         |             | Greene & Humphreys   | <u>.325</u>               | <u>.220</u> |
|                         |             | St. Clair  | <u>-.111</u>              | <u>.246</u> |
|                         |             | Maricopa   | <u>.213</u>               | <u>.239</u> |
|                         |             | Mingo  | <u>-.427</u>              |             |
|                         |             | Head Start   | <u>-.138</u>              | <u>.132</u> |
|                         |             | Constant   | <u>1.288</u>              |             |
| Statistics <sup>c</sup> |             | F = <u>21.24**</u> R <sup>2</sup> = <u>.51</u> MS <sub>e</sub> = <u>.656</u> |                           |             |
| ARM<br>CIRCUMFERENCE    | <u>171</u>  | Site <sup>b</sup>  |                           |             |
|                         |             | Greene & Humphreys   | <u>.003</u>               | <u>.168</u> |
|                         |             | St. Clair  | <u>.410*</u>              | <u>.190</u> |
|                         |             | Maricopa   | <u>-.225</u>              | <u>.181</u> |
|                         |             | Mingo  | <u>-.188</u>              |             |
|                         |             | Head Start   | <u>-.136</u>              | <u>.101</u> |
|                         |             | Constant   | <u>.086</u>               |             |
| Statistics <sup>c</sup> |             | F = <u>50.36**</u> R <sup>2</sup> = <u>.71</u> MS <sub>e</sub> = <u>.385</u> |                           |             |

<sup>a</sup> Adjusted for child's age, race, gender, and pretest z-score.

<sup>b</sup> Effects centered without weights; that is, effects sum to zero.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 5-1  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Longitudinal Sample

| Dependent Variable             | Sample Size | Factors            | Effects <sup>a</sup>        |                               |
|--------------------------------|-------------|--------------------|-----------------------------|-------------------------------|
|                                |             |                    | b                           | se(b)                         |
|                                |             | Site <sup>b</sup>  |                             |                               |
| ESTIMATED MUSCLE CIRCUMFERENCE | 171         | Greene & Humphreys | <u>-.239</u>                | <u>.217</u>                   |
|                                |             | St. Clair          | <u>.342</u>                 | <u>.225</u>                   |
|                                |             | Maricopa           | <u>-.406</u>                | <u>.235</u>                   |
|                                |             | Mingo              | <u>.302</u>                 |                               |
|                                |             | Head Start         | <u>-.019</u>                | <u>.132</u>                   |
|                                |             | Constant           | <u>-.635</u>                |                               |
| Statistics <sup>c</sup>        |             | F = <u>19.05**</u> | R <sup>2</sup> = <u>.48</u> | MS <sub>e</sub> = <u>.646</u> |

<sup>a</sup> Adjusted for child's age, race, gender, and pretest z-score.

<sup>b</sup> Effects centered without weights; that is, effects sum to zero.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 5-1  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Longitudinal Sample.

| Dependent Variable | Sample Size | Factors            | Effects <sup>a</sup> |             | Statistics <sup>b</sup>                                      |
|--------------------|-------------|--------------------|----------------------|-------------|--|
|                    |             |                    | b                    | se(b)       |  |
| HEIGHT             | <u>61</u>   | Greene & Humphreys |                      |             |  |
|                    |             | Head Start         | <u>-.173</u>         | <u>.159</u> | F = <u>39.62**</u>   |
|                    |             | Constant           | <u>-.673</u>         |             | R <sup>2</sup> = <u>.78</u><br>MS <sub>e</sub> = <u>.291</u> |
| HEIGHT             | <u>32</u>   | St. Clair          |                      |             |  |
|                    |             | Head Start         | <u>.249*</u>         | <u>.117</u> | F = <u>82.39**</u>   |
|                    |             | Constant           | <u>-.830</u>         |             | R <sup>2</sup> = <u>.92</u><br>MS <sub>e</sub> = <u>.077</u> |
| HEIGHT             | <u>50</u>   | Maricopa           |                      |             |  |
|                    |             | Head Start         | <u>-.193</u>         | <u>.343</u> | F = <u>6.48**</u>  |
|                    |             | Constant           | <u>-.368</u>         |             | R <sup>2</sup> = <u>.37</u><br>MS <sub>e</sub> = <u>.984</u> |
| HEIGHT             | <u>28</u>   | Mingo              |                      |             |  |
|                    |             | Head Start         | <u>.041</u>          | <u>.223</u> | F = <u>25.98**</u>   |
|                    |             | Constant           | <u>-.171</u>         |             | R <sup>2</sup> = <u>.76</u><br>MS <sub>e</sub> = <u>.321</u> |

<sup>a</sup> Adjusted for child's age, race, gender, and pretest z-score.

<sup>b</sup> MS<sub>e</sub> is residual mean square.

Table 5-1  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Longitudinal Sample.

| Dependent Variable            | Sample Size | Factors    | Effects <sup>a</sup><br>b | se(b)       | Statistics <sup>b</sup>       |
|-------------------------------|-------------|------------|---------------------------|-------------|-------------------------------|
| <b>Greene &amp; Humphreys</b> |             |            |                           |             |                               |
| WEIGHT                        | <u>61</u>   | Head Start | <u>.225</u>               | <u>.157</u> | F = <u>35.08**</u>            |
|                               |             | Constant   | <u>-1.479</u>             |             | R <sup>2</sup> = <u>.76</u>   |
|                               |             |            |                           |             | MS <sub>e</sub> = <u>.311</u> |
| <b>St. Clair</b>              |             |            |                           |             |                               |
| WEIGHT                        | <u>32</u>   | Head Start | <u>.121</u>               | <u>.153</u> | F = <u>45.39**</u>            |
|                               |             | Constant   | <u>-.782</u>              |             | R <sup>2</sup> = <u>.87</u>   |
|                               |             |            |                           |             | MS <sub>e</sub> = <u>.139</u> |
| <b>Maricopa</b>               |             |            |                           |             |                               |
| WEIGHT                        | <u>50</u>   | Head Start | <u>.123</u>               | <u>.183</u> | F = <u>70.37**</u>            |
|                               |             | Constant   | <u>.093</u>               |             | R <sup>2</sup> = <u>.86</u>   |
|                               |             |            |                           |             | MS <sub>e</sub> = <u>.275</u> |
| <b>Mingo</b>                  |             |            |                           |             |                               |
| WEIGHT                        | <u>28</u>   | Head Start | <u>.110</u>               | <u>.302</u> | F = <u>29.62**</u>            |
|                               |             | Constant   | <u>-.852</u>              |             | R <sup>2</sup> = <u>.84</u>   |
|                               |             |            |                           |             | MS <sub>e</sub> = <u>.577</u> |

<sup>a</sup> Adjusted for child's age, race, gender, and pretest z-score.

<sup>b</sup> MS<sub>e</sub> is residual mean square.

Table 5-1  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Longitudinal Sample

| Dependent Variable            | Sample Size | Factors    | Effects <sup>a</sup><br>b | se(b)       | Statistics <sup>b</sup>       |
|-------------------------------|-------------|------------|---------------------------|-------------|-------------------------------|
| <b>Greene &amp; Humphreys</b> |             |            |                           |             |                               |
| TRICEPS SKINFOLD              | <u>61</u>   | Head Start | <u>-.059</u>              | <u>.227</u> | F = <u>7.85**</u>             |
|                               |             | Constant   | <u>1.466</u>              |             | R <sup>2</sup> = <u>.42</u>   |
|                               |             |            |                           |             | MS <sub>e</sub> = <u>.720</u> |
| <b>St. Clair</b>              |             |            |                           |             |                               |
| TRICEPS SKINFOLD              | <u>32</u>   | Head Start | <u>-.488*</u>             | <u>.226</u> | F = <u>8.75**</u>             |
|                               |             | Constant   | <u>-.510</u>              |             | R <sup>2</sup> = <u>.56</u>   |
|                               |             |            |                           |             | MS <sub>e</sub> = <u>.322</u> |
| <b>Maricopa</b>               |             |            |                           |             |                               |
| TRICEPS SKINFOLD              | <u>50</u>   | Head Start | <u>-.140</u>              | <u>.313</u> | F = <u>14.22**</u>            |
|                               |             | Constant   | <u>-1.356</u>             |             | R <sup>2</sup> = <u>.62</u>   |
|                               |             |            |                           |             | MS <sub>e</sub> = <u>.790</u> |
| <b>Mingo</b>                  |             |            |                           |             |                               |
| TRICEPS SKINFOLD              | <u>28</u>   | Head Start | <u>-.179</u>              | <u>.230</u> | F = <u>10.21**</u>            |
|                               |             | Constant   | <u>2.635</u>              |             | R <sup>2</sup> = <u>.64</u>   |
|                               |             |            |                           |             | MS <sub>e</sub> = <u>.352</u> |

<sup>a</sup> Adjusted for child's age, race, gender, and pretest z-score.

<sup>b</sup> MS<sub>e</sub> is residual mean square.

Table 5-1  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Longitudinal Sample

| Dependent Variable | Sample Size | Factors            | Effects <sup>a</sup> |             | Statistics <sup>b</sup>                                      |
|--------------------|-------------|--------------------|----------------------|-------------|--|
|                    |             |                    | b                    | se(b)       |  |
| ARM CIRCUMFERENCE  | 61          | Greene & Humphreys |                      |             |  |
|                    |             | Head Start         | <u>-.049</u>         | <u>.164</u> | F = <u>27.10**</u>   |
|                    |             | Constant           | <u>.203</u>          |             | R <sup>2</sup> = <u>.71</u><br>MS <sub>e</sub> = <u>.369</u> |
| ARM CIRCUMFERENCE  | 32          | St. Clair          |                      |             |  |
|                    |             | Head Start         | <u>-.086*</u>        | <u>.220</u> | F = <u>10.68**</u>   |
|                    |             | Constant           | <u>-.572</u>         |             | R <sup>2</sup> = <u>.61</u><br>MS <sub>e</sub> = <u>.305</u> |
| ARM CIRCUMFERENCE  | 50          | Maricopa           |                      |             |  |
|                    |             | Head Start         | <u>.120</u>          | <u>.213</u> | F = <u>23.62**</u>   |
|                    |             | Constant           | <u>.484</u>          |             | R <sup>2</sup> = <u>.73</u><br>MS <sub>e</sub> = <u>.383</u> |
| ARM CIRCUMFERENCE  | 28          | Mingo              |                      |             |  |
|                    |             | Head Start         | <u>-.819**</u>       | <u>.202</u> | F = <u>33.07**</u>   |
|                    |             | Constant           | <u>-.163</u>         |             | R <sup>2</sup> = <u>.85</u><br>MS <sub>e</sub> = <u>.274</u> |

<sup>a</sup> Adjusted for child's age, race, gender, and pretest z-score.

<sup>b</sup> MS<sub>e</sub> is residual mean square.

Table 5-1  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Longitudinal Sample

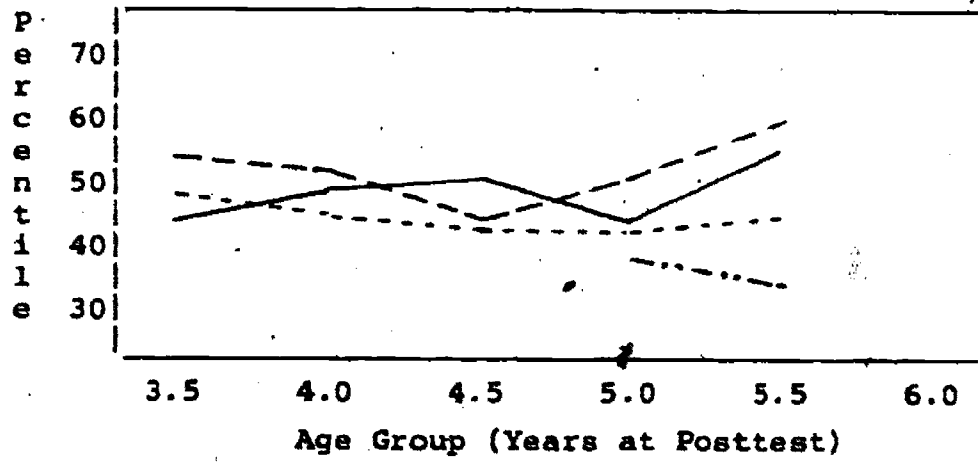
| Dependent Variable                   | Sample Size | Factors    | Effects <sup>a</sup><br>b | se(b)       | Statistics <sup>b</sup>       |
|--------------------------------------|-------------|------------|---------------------------|-------------|-------------------------------|
| Greene & Humphreys                   |             |            |                           |             |                               |
| ESTIMATED<br>MUSCLE<br>CIRCUMFERENCE | <u>61</u>   | Head Start | <u>.054</u>               | <u>.169</u> | F = <u>18.82**</u>            |
|                                      |             | Constant   | <u>-.460</u>              |             | R <sup>2</sup> = <u>.57</u>   |
|                                      |             |            |                           |             | MS <sub>e</sub> = <u>.402</u> |
| St. Clair                            |             |            |                           |             |                               |
| ESTIMATED<br>MUSCLE<br>CIRCUMFERENCE | <u>32</u>   | Head Start | <u>.244*</u>              | <u>.278</u> | F = <u>9.11**</u>             |
|                                      |             | Constant   | <u>.699</u>               |             | R <sup>2</sup> = <u>.57</u>   |
|                                      |             |            |                           |             | MS <sub>e</sub> = <u>.490</u> |
| Maricopa                             |             |            |                           |             |                               |
| ESTIMATED<br>MUSCLE<br>CIRCUMFERENCE | <u>50</u>   | Head Start | <u>.535</u>               | <u>.337</u> | F = <u>3.53**</u>             |
|                                      |             | Constant   | <u>2.023</u>              |             | R <sup>2</sup> = <u>.29</u>   |
|                                      |             |            |                           |             | MS <sub>e</sub> = <u>.910</u> |
| Mingo                                |             |            |                           |             |                               |
| ESTIMATED<br>MUSCLE<br>CIRCUMFERENCE | <u>28</u>   | Head Start | <u>-.823**</u>            | <u>.231</u> | F = <u>16.74**</u>            |
|                                      |             | Constant   | <u>2.068</u>              |             | R <sup>2</sup> = <u>.74</u>   |
|                                      |             |            |                           |             | MS <sub>e</sub> = <u>.354</u> |

<sup>a</sup> Adjusted for child's age, race, gender, and pretest z-score.

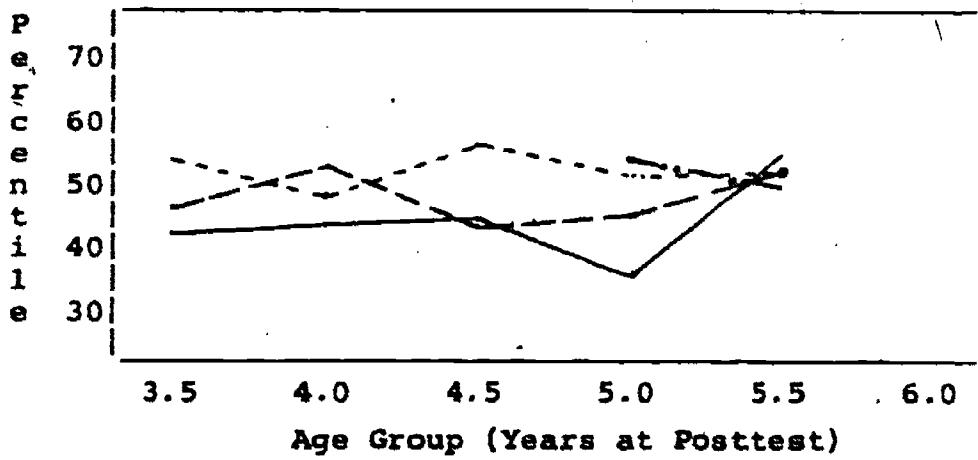
<sup>b</sup> MS<sub>e</sub> is residual mean square.

Table 5-2

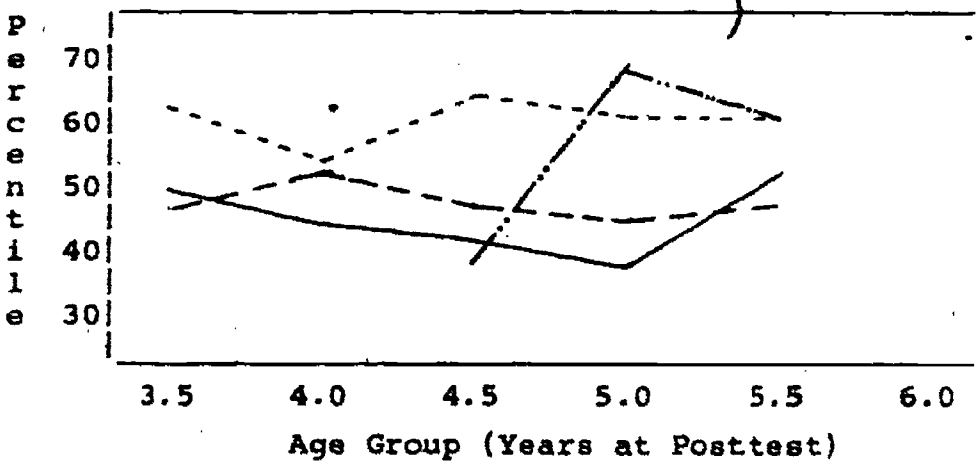
Growth Percentiles for Children  
by Age Group at Posttest



Height Percentiles



Weight Percentiles



Weight for Height Percentiles

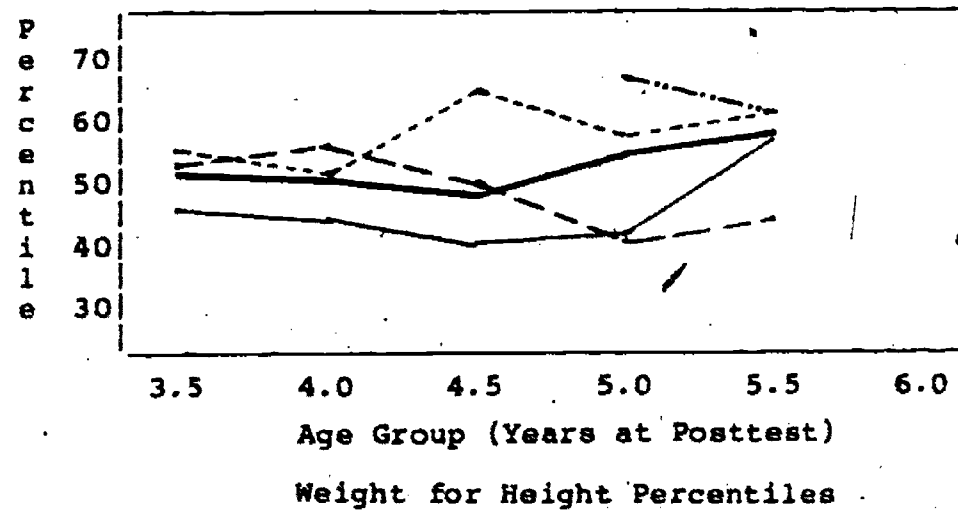
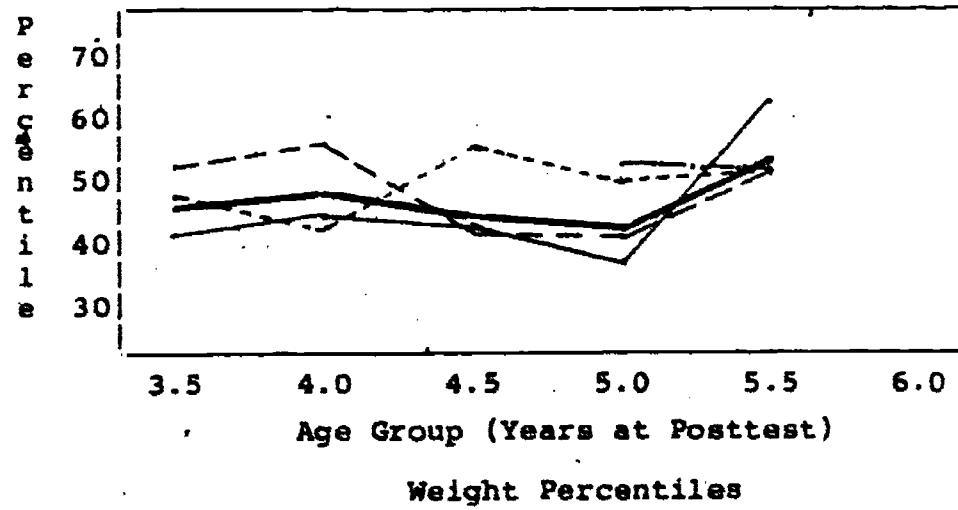
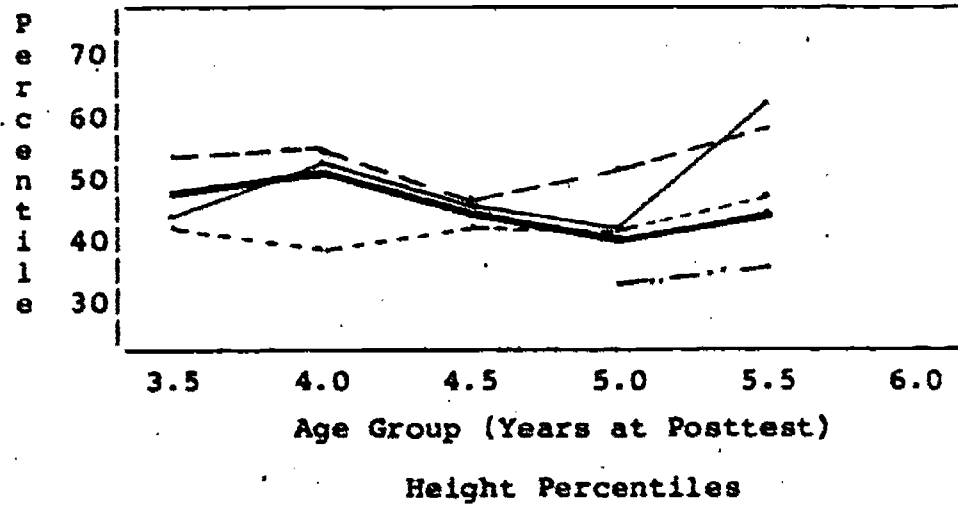
|                               |       |
|-------------------------------|-------|
| Greene and Humphreys Counties | _____ |
| St. Clair County              | _____ |
| Maricopa County               | _____ |
| Mingo County                  | _____ |

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Table 5-3

Growth Percentiles for Low Income Children  
by Age Group at Posttest



|                                  |       |
|----------------------------------|-------|
| Greene and<br>Humphreys Counties | _____ |
| St. Clair County                 | _____ |
| Maricopa County                  | _____ |
| Mingo County                     | _____ |
| All Sites                        | _____ |

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Table 5-4

DISTRIBUTION STATISTICS OF HEAD START AND NON-HEAD START CHILDREN ACCORDING TO AGE- AND SEX- SPECIFIC Z-SCORES FOR SELECTED ANTHROPOMETRY MEASURES RELATIVE TO NCHS REFERENCE DATA WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS ACROSS SITE

|                                  | HEAD START |        |        |        |        |      | NON-HEAD START |       |        |        |        |      | T     | P     |
|----------------------------------|------------|--------|--------|--------|--------|------|----------------|-------|--------|--------|--------|------|-------|-------|
|                                  | N          | Q1     | MED    | Q3     | MEAN   | SD   | N              | Q1    | MED    | Q3     | MEAN.  | SD   |       |       |
| HEIGHT Z                         | 447        | -0.88  | -0.09  | 0.65   | -0.20  | 1.24 | 350            | -0.79 | -0.20  | 0.54   | -0.15  | 1.05 | -0.62 | 0.532 |
| WEIGHT FOR HEIGHT Z              | 446        | -0.51  | 0.28   | 1.06   | 0.34   | 1.39 | 349            | -0.56 | 0.08   | 0.75   | 0.18   | 1.34 | 1.66  | 0.098 |
| WEIGHT Z                         | 453        | -0.75  | 0.04   | 0.79   | 0.07   | 1.25 | 350            | -0.79 | -0.08  | 0.72   | -0.00  | 1.37 | 0.81  | 0.420 |
| TRICEPS SKINFOLD Z               | 447        | -0.48  | 0.07   | 0.78   | 0.24   | 1.14 | 339            | -0.40 | 0.07   | 0.81   | 0.29   | 1.12 | -0.64 | 0.521 |
| ARM CIRCUMFERENCE Z              | 450        | -0.82  | -0.16  | 0.55   | -0.04  | 1.11 | 341            | -0.70 | -0.04  | 0.71   | 0.05   | 1.11 | -1.13 | 0.259 |
| ESTIMATED MUSCLE CIRCUMFERENCE Z | 447        | -0.90  | -0.23  | 0.46   | -0.21  | 1.00 | 335            | -0.78 | -0.22  | 0.46   | -0.12  | 0.99 | -1.32 | 0.188 |
| HEIGHT-CM                        | 447        | 100.55 | 105.10 | 109.50 | 105.23 | 6.51 | 350            | 98.20 | 102.70 | 108.00 | 103.23 | 6.64 | 4.26  | 0.000 |
| WEIGHT-KG                        | 483        | 15.69  | 17.33  | 19.60  | 17.87  | 3.24 | 350            | 14.97 | 16.37  | 18.64  | 17.03  | 3.43 | 3.54  | 0.000 |
| TRICEPS SKINFOLD-MM              | 447        | 8.75   | 10.25  | 12.25  | 10.79  | 3.33 | 339            | 9.00  | 10.25  | 12.50  | 10.97  | 3.25 | -0.78 | 0.437 |

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Table 5-4 (continued)

DISTRIBUTION STATISTICS OF HEAD START AND NON-HEAD START CHILDREN ACCORDING TO AGE- AND SEX- SPECIFIC Z-SCORES  
 FOR SELECTED ANTHROPOMETRY MEASURES RELATIVE TO NCHS REFERENCE DATA  
 WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                            | HEAD START |       |       |      |       |      | NON-HEAD START |       |       |      |       |      | T     | P     |
|----------------------------|------------|-------|-------|------|-------|------|----------------|-------|-------|------|-------|------|-------|-------|
|                            | N          | Q1    | MED   | Q3   | MEAN  | SD   | N              | Q1    | MED   | Q3   | MEAN  | SD   |       |       |
| <b>HEIGHT Z</b>            |            |       |       |      |       |      |                |       |       |      |       |      |       |       |
| Greene/Humphreys           | 123        | -0.48 | 0.14  | 0.77 | 0.15  | 1.10 | 101            | -0.95 | -0.21 | 0.69 | -0.15 | 1.11 | 1.99  | 0.048 |
| St. Clair                  | 105        | -0.49 | 0.10  | 0.93 | 0.12  | 0.96 | 82             | -0.71 | -0.10 | 0.73 | -0.09 | 1.17 | 1.31  | 0.194 |
| Maricopa                   | 101        | -2.25 | -0.62 | 0.31 | -0.89 | 1.49 | 61             | -0.95 | -0.27 | 0.26 | -0.29 | 0.92 | -3.18 | 0.002 |
| Mingo                      | 118        | -0.92 | -0.32 | 0.48 | -0.23 | 1.10 | 106            | -0.58 | -0.20 | 0.41 | -0.10 | 0.95 | -0.97 | 0.333 |
| <b>WEIGHT FOR HEIGHT Z</b> |            |       |       |      |       |      |                |       |       |      |       |      |       |       |
| Greene/Humphreys           | 123        | -0.99 | -0.09 | 0.65 | -0.13 | 1.34 | 101            | -0.89 | -0.26 | 0.27 | -0.34 | 1.12 | 1.29  | 0.198 |
| St. Clair                  | 104        | -0.69 | -0.11 | 0.58 | 0.06  | 1.10 | 82             | -0.75 | -0.15 | 0.52 | -0.07 | 0.88 | 0.93  | 0.351 |
| Maricopa                   | 101        | -0.10 | 1.00  | 1.96 | 1.08  | 1.70 | 61             | -0.39 | 0.03  | 0.66 | 0.34  | 1.40 | 3.01  | 0.003 |
| Mingo                      | 118        | -0.18 | 0.35  | 1.06 | 0.45  | 1.10 | 105            | -0.04 | 0.54  | 1.27 | 0.79  | 1.53 | -1.89 | 0.060 |
| <b>WEIGHT Z</b>            |            |       |       |      |       |      |                |       |       |      |       |      |       |       |
| Greene/Humphreys           | 123        | -1.07 | 0.06  | 0.77 | -0.07 | 1.28 | 101            | -1.19 | -0.56 | 0.44 | -0.41 | 1.28 | 1.94  | 0.054 |
| St. Clair                  | 105        | -0.59 | -0.14 | 0.56 | 0.05  | 1.17 | 82             | -0.89 | -0.18 | 0.45 | -0.18 | 1.10 | 1.38  | 0.168 |
| Maricopa                   | 106        | -0.59 | 0.78  | 0.95 | 0.21  | 1.36 | 61             | -0.83 | -0.20 | 0.79 | 0.07  | 1.43 | 0.62  | 0.534 |
| Mingo                      | 119        | -0.61 | 0.07  | 0.81 | 0.13  | 1.17 | 106            | -0.28 | 0.31  | 1.04 | 0.48  | 1.48 | -1.99 | 0.048 |

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Table 5-4 (continued)

DISTRIBUTION STATISTICS OF HEAD START AND NON-HEAD START CHILDREN ACCORDING TO AGE- AND SEX- SPECIFIC Z-SCORES  
FOR SELECTED ANTHROPOMETRY MEASURES RELATIVE TO NCHS REFERENCE DATA  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|   | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|---|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|   | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>TRICEPS SKINFOLD Z</b>               |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys                        | 118        | -0.36 | 0.31  | 0.98  | 0.50  | 1.23 | 91             | -0.25 | 0.21  | 0.98  | 0.46  | 1.09 | 0.23  | 0.817 |
| St. Clair                               | 106        | -0.54 | -0.05 | 0.64  | 0.09  | 1.12 | 82             | -0.54 | -0.10 | 0.47  | -0.02 | 0.86 | 0.76  | 0.448 |
| Maricopa                                | 106        | -0.48 | 0.17  | 1.04  | 0.41  | 1.22 | 61             | -0.25 | 0.23  | 1.21  | -0.67 | 1.40 | -1.20 | 0.233 |
| Mingo                                   | 117        | -0.67 | -0.13 | 0.78  | -0.04 | 0.90 | 105            | -0.57 | -0.02 | 0.81  | 0.17  | 1.08 | -1.57 | 0.118 |
| <b>ARM CIRCUMFERENCE Z</b>              |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys                        | 120        | -0.52 | 0.10  | 0.66  | 0.18  | 1.11 | 97             | -0.75 | 0.02  | 0.77  | 0.06  | 0.99 | 0.88  | 0.382 |
| St. Clair                               | 106        | -1.01 | -0.47 | 0.45  | -0.21 | 1.12 | 80             | -0.95 | -0.37 | 0.28  | -0.36 | 0.98 | 0.99  | 0.322 |
| Maricopa                                | 106        | -1.14 | -0.50 | 0.32  | -0.32 | 1.11 | 60             | -0.88 | -0.40 | 0.42  | -0.15 | 1.11 | -0.98 | 0.330 |
| Mingo                                   | 118        | -0.55 | 0.03  | 0.72  | 0.14  | 1.04 | 104            | -0.33 | 0.40  | 0.96  | 0.47  | 1.17 | -2.24 | 0.026 |
| <b>ESTIMATED MUSCLE CIRCUMFERENCE Z</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys                        | 118        | -0.80 | -0.13 | 0.45  | -0.13 | 1.01 | 91             | -0.79 | -0.31 | 0.34  | -0.20 | 0.87 | 0.52  | 0.604 |
| St. Clair                               | 106        | -0.97 | -0.41 | 0.23  | -0.30 | 0.90 | 80             | -1.04 | -0.36 | 0.23  | -0.38 | 0.96 | 0.59  | 0.557 |
| Maricopa                                | 106        | -1.45 | -0.68 | -0.13 | -0.68 | 1.05 | 60             | -1.14 | -0.51 | -0.04 | -0.64 | 0.86 | -0.25 | 0.802 |
| Mingo                                   | 117        | -0.35 | 0.13  | 0.78  | 0.21  | 0.81 | 104            | -0.25 | 0.38  | 0.95  | 0.46  | 0.93 | -2.13 | 0.035 |

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Table 5-4 (continued)

DISTRIBUTION STATISTICS OF HEADSTART AND NON-HEADSTART CHILDREN ACCORDING TO AGE- AND SEX- SPECIFIC Z-SCORES FOR SELECTED ANTHROPOMETRY MEASURES RELATIVE TO NCHS REFERENCE DATA

|                            | HEADSTART |        |        |        |        |      | NON-HEADSTART |        |        |        |        |      | T     | P     |
|----------------------------|-----------|--------|--------|--------|--------|------|---------------|--------|--------|--------|--------|------|-------|-------|
|                            | N         | Q1     | MED    | Q3     | MEAN   | SD   | N             | Q1     | MED    | Q3     | MEAN   | SD   |       |       |
| <b>HT-CM</b>               |           |        |        |        |        |      |               |        |        |        |        |      |       |       |
| Greene/Humphreys           | 123       | 101.40 | 105.80 | 109.55 | 105.94 | 6.60 | 101           | 97.20  | 101.70 | 106.80 | 102.31 | 6.84 | 4.01  | 0.000 |
| St. Clair                  | 105       | 101.20 | 104.80 | 109.30 | 105.19 | 6.01 | 82            | 98.00  | 101.95 | 106.90 | 102.66 | 6.18 | 2.81  | 0.005 |
| Maricopa                   | 101       | 99.50  | 106.50 | 110.10 | 105.40 | 6.88 | 61            | 104.30 | 108.50 | 111.50 | 108.13 | 4.36 | -3.09 | 0.002 |
| Mingo                      | 118       | 100.10 | 103.70 | 109.50 | 104.39 | 6.49 | 106           | 97.00  | 101.50 | 106.50 | 101.74 | 6.64 | 3.02  | 0.003 |
| <b>WEIGHT-KG</b>           |           |        |        |        |        |      |               |        |        |        |        |      |       |       |
| Greene/Humphreys           | 123       | 15.19  | 17.05  | 18.05  | 17.35  | 3.44 | 101           | 13.97  | 15.51  | 17.69  | 15.96  | 2.88 | 3.29  | 0.001 |
| St. Clair                  | 105       | 15.56  | 16.56  | 18.37  | 17.34  | 2.86 | 82            | 14.83  | 15.93  | 17.92  | 16.41  | 2.57 | 2.35  | 0.020 |
| Maricopa                   | 106       | 16.78  | 18.82  | 20.86  | 19.10  | 3.27 | 61            | 16.33  | 18.14  | 20.18  | 18.73  | 3.58 | 0.67  | 0.501 |
| Mingo                      | 119       | 15.90  | 17.93  | 19.57  | 17.77  | 3.04 | 106           | 14.97  | 16.78  | 19.05  | 17.54  | 3.92 | 0.48  | 0.628 |
| <b>TRICEPS SKINFOLD-MM</b> |           |        |        |        |        |      |               |        |        |        |        |      |       |       |
| Greene/Humphreys           | 118       | 9.25   | 11.00  | 13.25  | 11.63  | 3.60 | 91            | 9.50   | 10.75  | 13.13  | 11.44  | 3.14 | 0.41  | 0.681 |
| St. Clair                  | 106       | 8.50   | 10.00  | 11.75  | 10.33  | 3.14 | 82            | 8.50   | 9.88   | 11.75  | 10.06  | 2.42 | 0.67  | 0.503 |
| Maricopa                   | 106       | 8.50   | 10.63  | 13.00  | 11.23  | 3.63 | 61            | 9.50   | 10.50  | 13.25  | 12.07  | 4.11 | -1.32 | 0.188 |
| Mingo                      | 117       | 8.25   | 9.75   | 11.25  | 9.96   | 2.62 | 105           | 8.25   | 10.00  | 12.25  | 10.64  | 3.12 | -1.77 | 0.078 |

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Table 5-4 (continued)

DISTRIBUTION STATISTICS OF HEAD START AND NON-HEAD START CHILDREN ACCORDING TO AGE- AND SEX- SPECIFIC Z-SCORES FOR SELECTED ANTHROPOMETRY MEASURES RELATIVE TO NCHS REFERENCE DATA WITH UNADJUSTED COMPARISONS AMONG SAMPLES WITHIN SITE

|                     | Greenb/Humphreys |       |      | St. Clair |       |      | Maricopa |       |      | Mingo |       |      |
|---------------------|------------------|-------|------|-----------|-------|------|----------|-------|------|-------|-------|------|
|                     | N                | MEAN  | SD   | N         | MEAN  | SD   | N        | MEAN  | SD   | N     | MEAN  | SD   |
| HEIGHT Z            |                  |       |      |           |       |      |          |       |      |       |       |      |
| Sample A            | 73               | -0.16 | 1.12 | 42        | -0.19 | 1.12 | 56       | -0.69 | 1.17 | 35    | -0.29 | 1.00 |
| Sample B            | 54               | 0.08  | 1.15 | 39        | 0.09  | 1.08 | 11       | -0.64 | 1.67 | 31    | 0.02  | 1.05 |
| Sample C            | 97               | 0.10  | 1.08 | 106       | 0.09  | 1.02 | 95       | -0.66 | 1.40 | 158   | -0.18 | 1.03 |
|                     | F=               | P=    |      | F=        | P=    |      | F=       | P=    |      | F=    | P=    |      |
|                     | 1.30             | 0.276 |      | 1.20      | 0.304 |      | 0.01     | 0.991 |      | 0.77  | 0.466 |      |
| WEIGHT FOR HEIGHT Z |                  |       |      |           |       |      |          |       |      |       |       |      |
| Sample A            | 73               | -0.15 | 1.08 | 41        | -0.22 | 0.88 | 56       | 0.81  | 1.62 | 35    | 1.12  | 2.07 |
| Sample B            | 54               | -0.39 | 1.45 | 39        | 0.31  | 0.94 | 11       | 1.42  | 1.59 | 31    | 0.54  | 1.24 |
| Sample C            | 97               | -0.18 | 1.21 | 106       | -0.03 | 1.06 | 95       | 0.73  | 1.64 | 157   | 0.51  | 1.10 |
|                     | F=               | P=    |      | F=        | P=    |      | F=       | P=    |      | F=    | P=    |      |
|                     | 0.65             | 0.524 |      | 2.93      | 0.056 |      | 0.88     | 0.418 |      | 3.14  | 0.045 |      |
| WEIGHT Z            |                  |       |      |           |       |      |          |       |      |       |       |      |
| Sample A            | 73               | -0.28 | 1.14 | 41        | -0.36 | 1.05 | 56       | 0.16  | 1.31 | 35    | 0.63  | 1.97 |
| Sample B            | 54               | -0.30 | 1.59 | 39        | 0.23  | 1.15 | 11       | 0.63  | 1.57 | 31    | 0.37  | 1.32 |
| Sample C            | 97               | -0.14 | 1.22 | 107       | -0.03 | 1.15 | 100      | 0.11  | 1.40 | 159   | 0.21  | 1.04 |
|                     | F=               | P=    |      | F=        | P=    |      | F=       | P=    |      | F=    | P=    |      |
|                     | 0.37             | 0.692 |      | 2.76      | 0.066 |      | 0.71     | 0.494 |      | 1.53  | 0.218 |      |

Table 5-4 (continued)

DISTRIBUTION STATISTICS OF HEAD START AND NON-HEAD-START CHILDREN ACCORDING TO AGE- AND SEX- SPECIFIC Z-SCORES FOR SELECTED ANTHROPOMETRY MEASURES RELATIVE TO NCHS REFERENCE DATA WITH UNADJUSTED COMPARISONS AMONG SAMPLES WITHIN SITE

|   | Greene/Humphreys |       |      | St. Clair |       |      | Maricopa |       |      | Mingo |       |      |
|---|------------------|-------|------|-----------|-------|------|----------|-------|------|-------|-------|------|
|   | N                | MEAN  | SD   | N         | MEAN  | SD   | N        | MEAN  | SD   | N     | MEAN  | SD   |
| <b>TRICEPS SKINFOLD Z</b>               |                  |       |      |           |       |      |          |       |      |       |       |      |
| Sample A                                | 73               | 0.13  | 1.08 | 42        | -0.27 | 0.78 | 56       | 0.58  | 1.36 | 33    | 0.27  | 1.15 |
| Sample B                                | 48               | 0.48  | 0.95 | 39        | 0.23  | 1.17 | 11       | 0.72  | 0.71 | 31    | -0.05 | 0.99 |
| Sample C                                | 88               | 0.77  | 1.28 | 107       | 0.09  | 1.01 | 100      | 0.43  | 1.31 | 158   | 0.03  | 0.96 |
|   | F=               | P=    |      | F=        | P=    |      | F=       | P=    |      | F=    | P=    |      |
|   | 6.27             | 0.002 |      | 2.84      | 0.061 |      | 0.39     | 0.676 |      | 1.00  | 0.369 |      |
| <b>ARM CIRCUMFERENCE Z</b>              |                  |       |      |           |       |      |          |       |      |       |       |      |
| Sample A                                | 73               | -0.02 | 1.07 | 41        | -0.47 | 0.87 | 56       | -0.20 | 1.09 | 33    | 0.60  | 1.23 |
| Sample B                                | 51               | 0.04  | 1.15 | 39        | 0.01  | 1.08 | 11       | -0.42 | 0.96 | 31    | 0.19  | 1.10 |
| Sample C                                | 93               | 0.30  | 0.98 | 106       | -0.21 | 1.11 | 99       | -0.27 | 1.15 | 158   | 0.25  | 1.09 |
|   | F=               | P=    |      | F=        | P=    |      | F=       | P=    |      | F=    | P=    |      |
|   | 2.17             | 0.117 |      | 2.22      | 0.111 |      | 0.19     | 0.823 |      | 1.54  | 0.216 |      |
| <b>ESTIMATED MUSCLE CIRCUMFERENCE Z</b> |                  |       |      |           |       |      |          |       |      |       |       |      |
| Sample A                                | 73               | -0.12 | 0.91 | 41        | -0.35 | 1.02 | 56       | -0.68 | 1.08 | 32    | 0.62  | 1.05 |
| Sample B                                | 48               | -0.22 | 1.18 | 39        | -0.16 | 0.97 | 11       | -1.01 | 0.86 | 31    | 0.26  | 0.82 |
| Sample C                                | 88               | -0.17 | 0.86 | 106       | -0.39 | 0.87 | 99       | -0.62 | 0.94 | 158   | 0.28  | 0.84 |
|   | F=               | P=    |      | F=        | P=    |      | F=       | P=    |      | F=    | P=    |      |
|   | 0.15             | 0.857 |      | 0.86      | 0.424 |      | 0.79     | 0.453 |      | 2.09  | 0.126 |      |

Table 5-5

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample

| Dependent Variable      | Sample Size | Factors <sup>a</sup>   | Effects <sup>b</sup> |            |
|-------------------------|-------------|--|----------------------|------------|
|                         |             |  | b                    | se(b)      |
| HEIGHT                  | <u>770</u>  | Site <sup>b</sup>  |                      |            |
|                         |             | Greene & Humphreys   | <u>.20*</u>          | <u>.07</u> |
|                         |             | St. Clair  | <u>.19*</u>          | <u>.08</u> |
|                         |             | Maricopa   | <u>-.41</u>          | <u>.09</u> |
|                         |             | Mingo  | <u>.02</u>           |            |
|                         |             | Program  |                      |            |
|                         |             | Head Start   | <u>-.22</u>          | <u>.08</u> |
| Constant                | <u>-.23</u> |  |                      |            |
| Statistics <sup>c</sup> |             | F = <u>6.93**</u> R <sup>2</sup> = <u>.06</u> MS <sub>e</sub> = <u>1.28</u>  |                      |            |
| WEIGHT FOR HEIGHT       | <u>770</u>  | Site <sup>b</sup>  |                      |            |
|                         |             | Greene & Humphreys   | <u>-.48**</u>        | <u>.08</u> |
|                         |             | St. Clair  | <u>-.30**</u>        | <u>.09</u> |
|                         |             | Maricopa   | <u>.48**</u>         | <u>.10</u> |
|                         |             | Mingo  | <u>.30</u>           |            |
|                         |             | Head Start   | <u>.14</u>           | <u>.09</u> |
|                         |             | Constant   | <u>.21</u>           |            |
| Statistics <sup>c</sup> |             | F = <u>11.27**</u> R <sup>2</sup> = <u>.09</u> MS <sub>e</sub> = <u>1.60</u> |                      |            |

<sup>a</sup> Adjusted for child's age, race, and gender.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.



Table 5-5  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample

| Dependent Variable      | Sample Size | Factors <sup>a</sup>  | Effects <sup>b</sup> |            |
|-------------------------|-------------|---|----------------------|------------|
|                         |             |   | b                    | se(b)      |
| WEIGHT.                 | <u>770</u>  | Site <sup>b</sup>   |                      |            |
|                         |             | Greene & Humphreys  | <u>-.24**</u>        | <u>.08</u> |
|                         |             | St. Clair   | <u>-.10</u>          | <u>.09</u> |
|                         |             | Maricopa  | <u>.97</u>           | <u>.10</u> |
|                         |             | Mingo   | <u>-.63</u>          |            |
|                         |             | Program   |                      |            |
|                         |             | Head Start  | <u>.58</u>           | <u>.09</u> |
| Constant                | <u>-.23</u> |   |                      |            |
| Statistics <sup>c</sup> |             | F = <u>2.42**</u> R <sup>2</sup> = <u>.02</u> MS <sub>e</sub> = <u>1.61</u> |                      |            |
| TRICEPS SKINFOLD        | <u>770</u>  | Site <sup>b</sup>   |                      |            |
|                         |             | Greene & Humphreys  | <u>.29**</u>         | <u>.07</u> |
|                         |             | St. Clair   | <u>-.13</u>          | <u>.08</u> |
|                         |             | Maricopa  | <u>.10</u>           | <u>.08</u> |
|                         |             | Mingo   | <u>-.26</u>          |            |
|                         |             | Head Start  | <u>-.94</u>          | <u>.08</u> |
|                         |             | Constant  | <u>.18</u>           |            |
| Statistics <sup>c</sup> |             | F = <u>6.65**</u> R <sup>2</sup> = <u>.06</u> MS <sub>e</sub> = <u>1.22</u> |                      |            |

<sup>a</sup> Adjusted for child's age, race, and gender.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 5-5  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample

| Dependent Variable      | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup>        |                               |
|-------------------------|-------------|----------------------|-----------------------------|-------------------------------|
|                         |             |                      | b                           | se(b)                         |
| ARM CIRCUMFERENCE       | 770         | Site <sup>b</sup>    |                             |                               |
|                         |             | Greene & Humphreys   | <u>.19**</u>                | <u>.07</u>                    |
|                         |             | St. Clair            | <u>-.24</u>                 | <u>.08</u>                    |
|                         |             | Maricopa             | <u>-.24</u>                 | <u>.08</u>                    |
|                         |             | Mingo                | <u>.29</u>                  |                               |
|                         |             | Program              |                             |                               |
|                         |             | Head Start           | <u>-.71</u>                 | <u>.08</u>                    |
| Constant                |             | <u>.11</u>           |                             |                               |
| Statistics <sup>c</sup> |             | F = <u>6.04**</u>    | R <sup>2</sup> = <u>.05</u> | MS <sub>e</sub> = <u>1.20</u> |
| TRICEPS SKINFOLD        | 770         | Site <sup>b</sup>    |                             |                               |
|                         |             | Greene & Humphreys   | <u>.10</u>                  | <u>.06</u>                    |
|                         |             | St. Clair            | <u>-.18**</u>               | <u>.07</u>                    |
|                         |             | Maricopa             | <u>-.36**</u>               | <u>.07</u>                    |
|                         |             | Mingo                | <u>.44</u>                  |                               |
|                         |             | Head Start           | <u>-.71</u>                 | <u>.07</u>                    |
|                         |             | Constant             |                             | <u>.30</u>                    |
| Statistics <sup>c</sup> |             | F = <u>16.68**</u>   | R <sup>2</sup> = <u>.13</u> | MS <sub>e</sub> = <u>.87</u>  |

<sup>a</sup> Adjusted for child's age, race, and gender.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 5-5  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |            | Statistics <sup>c</sup>   |
|--------------------|-------------|----------------------|----------------------|------------|---|
|                    |             |                      | b                    | se(b)      |   |
| HEIGHT             | <u>209</u>  | Greene & Humphreys   |                      |            | F = <u>1.34</u><br>R <sup>2</sup> = <u>.03</u><br>MS <sub>e</sub> = <u>1.26</u>   |
|                    |             | Head Start           | <u>.24</u>           | <u>.16</u> |   |
|                    |             | Constant             | <u>-.26</u>          |            |   |
| HEIGHT             | <u>184</u>  | St. Clair            |                      |            | F = <u>1.90**</u><br>R <sup>2</sup> = <u>.04</u><br>MS <sub>e</sub> = <u>1.09</u> |
|                    |             | Head Start           | <u>.22</u>           | <u>.16</u> |   |
|                    |             | Constant             | <u>.58</u>           |            |   |
| HEIGHT             | <u>161</u>  | Maricopa             |                      |            | F = <u>2.72**</u><br>R <sup>2</sup> = <u>.07</u><br>MS <sub>e</sub> = <u>1.72</u> |
|                    |             | Head Start           | <u>-.60**</u>        | <u>.22</u> |   |
|                    |             | Constant             | <u>2.69</u>          |            |   |
| HEIGHT             | <u>216</u>  | Mingo                |                      |            | F = <u>.41</u><br>R <sup>2</sup> = <u>.01</u><br>MS <sub>e</sub> = <u>1.09</u>    |
|                    |             | Head Start           | <u>-.12</u>          | <u>.15</u> |   |
|                    |             | Constant             | <u>.42</u>           |            |   |

<sup>a</sup> Adjusted for child's age, race, and gender.

<sup>b</sup> Effects centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 5-5  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |       | Statistics <sup>c</sup> |
|--------------------|-------------|----------------------|----------------------|-------|-------------------------|
|                    |             |                      | b                    | se(b) |                         |
| Greene & Humphreys |             |                      |                      |       |                         |
| WEIGHT FOR HEIGHT  | 209         | Head Start           | .89                  | .18   | F = 1.52                |
|                    |             |                      |                      |       | R <sup>2</sup> = .03    |
|                    |             | Constant             | -.61                 |       | MS <sub>e</sub> = 1.46  |
| St. Clair          |             |                      |                      |       |                         |
| WEIGHT FOR HEIGHT  | 184         | Head Start           | .16                  | .15   | F = .44                 |
|                    |             |                      |                      |       | R <sup>2</sup> = .01    |
|                    |             | Constant             | -.56                 |       | MS <sub>e</sub> = 1.05  |
| Maricopa           |             |                      |                      |       |                         |
| WEIGHT FOR HEIGHT  | 161         | Head Start           | .79**                | .26   | F = 2.52*               |
|                    |             |                      |                      |       | R <sup>2</sup> = .06    |
|                    |             | Constant             | .70                  |       | MS <sub>e</sub> = 2.58  |
| Mingo              |             |                      |                      |       |                         |
| WEIGHT FOR HEIGHT  | 216         | Head Start           | -.36**               | .17   | F = 1.33                |
|                    |             |                      |                      |       | R <sup>2</sup> = .02    |
|                    |             | Constant             | .17                  |       | MS <sub>e</sub> = 1.40  |

<sup>a</sup> Adjusted for child's age, race, and gender.

<sup>b</sup> Effects centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 5-5  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup><br>b | se(b)      | Statistics <sup>c</sup>  |
|--------------------|-------------|----------------------|---------------------------|------------|--|
| Greene & Humphreys |             |                      |                           |            |  |
| WEIGHT             | <u>209</u>  | Head Start           | <u>.18</u>                | <u>.18</u> | F = <u>2.27*</u><br>R <sup>2</sup> = <u>.04</u><br>MS <sub>e</sub> = <u>1.60</u> |
|                    |             | Constant             | <u>-.93</u>               |            |  |
| St. Clair          |             |                      |                           |            |  |
| WEIGHT             | <u>184</u>  | Head Start           | <u>.25</u>                | <u>.17</u> | F = <u>.70</u><br>R <sup>2</sup> = <u>.02</u><br>MS <sub>e</sub> = <u>1.33</u>   |
|                    |             | Constant             | <u>-.14</u>               |            |  |
| Maricopa           |             |                      |                           |            |  |
| WEIGHT             | <u>161</u>  | Head Start           | <u>.19</u>                | <u>.23</u> | F = <u>.64</u><br>R <sup>2</sup> = <u>.02</u><br>MS <sub>e</sub> = <u>1.91</u>   |
|                    |             | Constant             | <u>2.12</u>               |            |  |
| Mingo              |             |                      |                           |            |  |
| WEIGHT             | <u>216</u>  | Head Start           | <u>-.38**</u>             | <u>.18</u> | F = <u>1.43</u><br>R <sup>2</sup> = <u>.03</u><br>MS <sub>e</sub> = <u>1.58</u>  |
|                    |             | Constant             | <u>-.26</u>               |            |  |

<sup>a</sup> Adjusted for child's age, race, and gender.

<sup>b</sup> Effects centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 5-5  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup><br>b | se(b)      | Statistics <sup>c</sup>                          |
|--------------------|-------------|----------------------|---------------------------|------------|--|
| TRICEPS SKINFOLD   | <u>209</u>  | Greene & Humphreys   |                           |            |  |
|                    |             | Head Start           | <u>.33</u>                | <u>.16</u> | F = <u>8.02**</u><br>R <sup>2</sup> = <u>.14</u> |
|                    |             | Constant             | <u>.86</u>                |            | MS <sub>e</sub> = <u>1.21</u>                    |
| TRICEPS SKINFOLD   | <u>184</u>  | St. Clair            |                           |            |  |
|                    |             | Head Start           | <u>.10</u>                | <u>.15</u> | F = <u>.60</u><br>R <sup>2</sup> = <u>.01</u>    |
|                    |             | Constant             | <u>.35</u>                |            | MS <sub>e</sub> = <u>1.04</u>                    |
| TRICEPS SKINFOLD   | <u>161</u>  | Maricopa             |                           |            |  |
|                    |             | Head Start           | <u>-.19</u>               | <u>.21</u> | F = <u>1.10</u><br>R <sup>2</sup> = <u>.03</u>   |
|                    |             | Constant             | <u>1.69</u>               |            | MS <sub>e</sub> = <u>1.70</u>                    |
| TRICEPS SKINFOLD   | <u>216</u>  | Mingo                |                           |            |  |
|                    |             | Head Start           | <u>-.22</u>               | <u>.14</u> | F = <u>1.00</u><br>R <sup>2</sup> = <u>.02</u>   |
|                    |             | Constant             | <u>-.27</u>               |            | MS <sub>e</sub> = <u>.93</u>                     |

<sup>a</sup> Adjusted for child's age, race, and gender.

<sup>b</sup> Effects centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 5-5  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |       | Statistics <sup>c</sup>                                    |
|--------------------|-------------|----------------------|----------------------|-------|--|
|                    |             |                      | b                    | se(b) |  |
| ARM CIRCUMFERENCE  | 209         | Greene & Humphreys   |                      |       | F = 1.90<br>R <sup>2</sup> = .04<br>MS <sub>e</sub> = 1.10 |
|                    |             | Head Start           | .87                  | .04   |  |
|                    |             | Constant             | .58                  |       |  |
| ARM CIRCUMFERENCE  | 184         | St. Clair            |                      |       | F = .92<br>R <sup>2</sup> = .02<br>MS <sub>e</sub> = 1.14  |
|                    |             | Head Start           | .19                  | .16   |  |
|                    |             | Constant             | .12                  |       |  |
| ARM CIRCUMFERENCE  | 161         | Maricopa             |                      |       | F = .62<br>R <sup>2</sup> = .02<br>MS <sub>e</sub> = 1.27  |
|                    |             | Head Start           | -.12                 | .19   |  |
|                    |             | Constant             | .67                  |       |  |
| ARM CIRCUMFERENCE  | 216         | Mingo                |                      |       | F = 1.61<br>R <sup>2</sup> = .03<br>MS <sub>e</sub> = 1.25 |
|                    |             | Head Start           | -.34*                | .16   |  |
|                    |             | Constant             | .36                  |       |  |

<sup>a</sup> Adjusted for child's age, race, and gender.

<sup>b</sup> Effects centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 5-5  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample

| Dependent Variable             | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |       | Statistics <sup>c</sup>            |  |
|--------------------------------|-------------|----------------------|----------------------|-------|------------------------------------|--|
|                                |             |                      | b                    | se(b) |                                    |  |
| ESTIMATED MUSCLE CIRCUMFERENCE | 209         | Greene & Humphreys   |                      |       |                                    |  |
|                                |             | Head Start           | .77                  | .14   | F = .69<br>R <sup>2</sup> = .01    |  |
|                                |             | Constant             | .26                  |       | MS <sub>e</sub> = .91              |  |
| ESTIMATED MUSCLE CIRCUMFERENCE | 184         | St. Clair            |                      |       |                                    |  |
|                                |             | Head Start           | .14                  | .14   | F = 2.72**<br>R <sup>2</sup> = .06 |  |
|                                |             | Constant             | -.18                 |       | MS <sub>e</sub> = .83              |  |
| ESTIMATED MUSCLE CIRCUMFERENCE | 161         | Maricopa             |                      |       |                                    |  |
|                                |             | Head Start           |                      |       | F = .29<br>R <sup>2</sup> = .01    |  |
|                                |             | Constant             | -.26                 |       | MS <sub>e</sub> = 1.00             |  |
| ESTIMATED MUSCLE CIRCUMFERENCE | 216         | Mingo                |                      |       |                                    |  |
|                                |             | Head Start           | -.22                 | .13   | F = 1.29<br>R <sup>2</sup> = .02*  |  |
|                                |             | Constant             | .60                  |       | MS <sub>e</sub> = .77              |  |

<sup>a</sup> Adjusted for child's age, race, and gender.

<sup>b</sup> Effects centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.



Table 5-6

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample, Controlling for Mother's Height

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                      |                        |
|--------------------|-------------|----------------------|----------------------|----------------------|------------------------|
|                    |             |                      | b                    | se <sub>b</sub>      |                        |
| HEIGHT             | 376         | Site                 |                      |                      |                        |
|                    |             | Greene & Humphreys   | .20                  | .15                  |                        |
|                    |             | St. Clair            | .13                  | .10                  |                        |
|                    |             | Maricopa             | -.36*                | .15                  |                        |
|                    |             | Mingo                | .03                  | .15                  |                        |
|                    |             | Program              |                      |                      |                        |
|                    |             | Head Start           |                      |                      |                        |
|                    |             | Constant             | -.77                 |                      |                        |
| Statistics         |             |                      | F = 9.13**           | R <sup>2</sup> = .15 | MS <sub>e</sub> = .93  |
| WEIGHT FOR HEIGHT  | 376         | Site                 |                      |                      |                        |
|                    |             | Greene & Humphreys   | -.15                 | .19                  |                        |
|                    |             | St. Clair            | -.29*                | .12                  |                        |
|                    |             | Maricopa             | .25                  | .18                  |                        |
|                    |             | Mingo                | .19                  |                      |                        |
|                    |             | Program              |                      |                      |                        |
|                    |             | Head Start           | .82                  | .13                  |                        |
|                    |             | Constant             | 2.93                 |                      |                        |
| Statistics         |             |                      | F = 3.32**           | R <sup>2</sup> = .07 | MS <sub>e</sub> = 1.40 |

<sup>a</sup> Adjusted for child's age, race and gender.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean squares.

Table 5-6  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample, Controlling for Mother's Height

| Dependent Variable  | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                      |                        |
|---------------------|-------------|----------------------|----------------------|----------------------|------------------------|
|                     |             |                      | b                    | se <sub>b</sub>      |                        |
| WEIGHT              | 376         | Site                 |                      |                      |                        |
|                     |             | Greene & Humphreys   | d                    |                      |                        |
|                     |             | St. Clair            | -.13                 | .12                  |                        |
|                     |             | Maricopa             | -.49                 | .15                  |                        |
|                     |             | Mingo                | e                    |                      |                        |
|                     |             | Program              |                      |                      |                        |
|                     |             | Head Start           | .42                  | .13                  |                        |
| Constant            |             | -2.87                |                      |                      |                        |
| Statistics          |             |                      | F = 1.57             | R <sup>2</sup> = .02 | MS <sub>e</sub> = 1.41 |
| TRICEPS<br>SKINFOLD | 376         | Site                 |                      |                      |                        |
|                     |             | Greene & Humphreys   | -.13                 | .16                  |                        |
|                     |             | St. Clair            | -.25                 | .11                  |                        |
|                     |             | Maricopa             | .36*                 | .16                  |                        |
|                     |             | Mingo                | .02                  |                      |                        |
|                     |             | Program              |                      |                      |                        |
|                     |             | Head Start           | -.81                 | .11                  |                        |
| Constant            |             | 2.95                 |                      |                      |                        |
| Statistics          |             |                      | F = 2.97**           | R <sup>2</sup> = .06 | MS <sub>e</sub> = 1.70 |

<sup>a</sup> Adjusted for child's age, race and gender.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 5-6  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample, Controlling for Mother's Height

| Dependent Variable                   | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                      |                        |
|--------------------------------------|-------------|----------------------|----------------------|----------------------|------------------------|
|                                      |             |                      | b                    | se <sub>b</sub>      |                        |
| ARM<br>CIRCUMFERENCE                 | 376         | Site                 |                      |                      |                        |
|                                      |             | Greene & Humphreys   | .17                  | .17                  |                        |
|                                      |             | St. Clair            | -.22                 | .11                  |                        |
|                                      |             | Maricopa             | -.20                 | .17                  |                        |
|                                      |             | Mingo                | .25                  |                      |                        |
|                                      |             | Program              |                      |                      |                        |
|                                      |             | Head Start           | -.74                 | .12                  |                        |
| Constant                             |             | .64                  |                      |                      |                        |
| Statistics                           |             |                      | F = 2.89**           | R <sup>2</sup> = .06 | MS <sub>e</sub> = 1.19 |
| ESTIMATED<br>MUSCLE<br>CIRCUMFERENCE | 376         | Site                 |                      |                      |                        |
|                                      |             | Greene & Humphreys   | .29*                 | .14                  |                        |
|                                      |             | St. Clair            | -.22*                | .09                  |                        |
|                                      |             | Maricopa             | -.52**               | .14                  |                        |
|                                      |             | Mingo                | .49                  |                      |                        |
|                                      |             | Program              |                      |                      |                        |
|                                      |             | Head Start           | -.17                 | .10                  |                        |
| Constant                             |             | -.46                 |                      |                      |                        |
| Statistics                           |             |                      | F = 9.17**           | R <sup>2</sup> = .17 | MS <sub>e</sub> = .83  |

<sup>a</sup> Adjusted for child's age, race and gender.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 5-6  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample, Controlling for Mother's Height

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> | SE <sub>b</sub> | Statistics <sup>c</sup> |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------|
| Greene & Humphreys |             |                      |                      |                 |                         |
| HEIGHT             | 28          | Head Start           | d                    |                 | F = .29                 |
|                    |             |                      |                      |                 | R <sup>2</sup> = .05    |
|                    |             | Constant             | 2.69                 |                 | MS <sub>e</sub> = .96   |
| St. Clair          |             |                      |                      |                 |                         |
| HEIGHT             | 147         | Head Start           | .65                  | .16             | F = 5.44**              |
|                    |             |                      |                      |                 | R <sup>2</sup> = .16    |
|                    |             | Constant             | -8.42                |                 | MS <sub>e</sub> = .93   |
| Maricopa           |             |                      |                      |                 |                         |
| HEIGHT             | 37          | Head Start           | d                    |                 | F = .13                 |
|                    |             |                      |                      |                 | R <sup>2</sup> = .01    |
|                    |             | Constant             | .80                  |                 | MS <sub>e</sub> = 1.50  |
| Mingo              |             |                      |                      |                 |                         |
| HEIGHT             | 164         | Head Start           | -.11                 | .15             | F = 5.98**              |
|                    |             |                      |                      |                 | R <sup>2</sup> = .16    |
|                    |             | Constant             | -9.24                |                 | MS <sub>e</sub> = .80   |

<sup>a</sup> Adjusted for child's age, race and gender.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

<sup>d</sup> F too small for this variable to enter the equation.

Table 5-6  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample, Controlling for Mother's Height

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |         |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------|---------|
|                    |             |                      | b                    | SE <sub>b</sub> |                         |         |
| Greene & Humphreys |             |                      |                      |                 |                         |         |
| WEIGHT FOR HEIGHT  | 28          | Head Start           | .884                 | .48             | F                       | = .88   |
|                    |             |                      |                      |                 | R <sup>2</sup>          | = .17   |
|                    |             | Constant             | 4.74                 |                 | MS <sub>e</sub>         | = .85   |
| St. Clair          |             |                      |                      |                 |                         |         |
| WEIGHT FOR HEIGHT  | 147         | Head Start           | .11                  | .18             | F                       | = .20   |
|                    |             |                      |                      |                 | R <sup>2</sup>          | = .01   |
|                    |             | Constant             | 1.66                 |                 | MS <sub>e</sub>         | = 1.06  |
| Maricopa           |             |                      |                      |                 |                         |         |
| WEIGHT FOR HEIGHT  | 37          | Head Start           | .36                  | .66             | F                       | = 2.41* |
|                    |             |                      |                      |                 | R <sup>2</sup>          | = .23   |
|                    |             | Constant             | 25.31                |                 | MS <sub>e</sub>         | = 2.78  |
| Mingo              |             |                      |                      |                 |                         |         |
| WEIGHT FOR HEIGHT  | 164         | Head Start           | -.30                 | .20             | F                       | = 1.05  |
|                    |             |                      |                      |                 | R <sup>2</sup>          | = .03   |
|                    |             | Constant             | 2.04                 |                 | MS <sub>e</sub>         | = 1.41  |

<sup>a</sup> Adjusted for child's age, race and gender.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

Table 5-6  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample, Controlling for Mother's Height

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup><br>b | SE <sub>b</sub> | Statistics <sup>c</sup> |
|--------------------|-------------|----------------------|---------------------------|-----------------|-------------------------|
| WEIGHT             | 28          | Greene & Humphreys   |                           |                 |                         |
|                    |             | Head Start           | .63                       | .49             | F = .53                 |
|                    |             | Constant             | 4.30                      |                 | MS <sub>e</sub> = .91   |
| WEIGHT             | 147         | St. Clair            |                           |                 |                         |
|                    |             | Head Start           | .12                       | .20             | F = 1.03                |
|                    |             | Constant             | -4.18                     |                 | MS <sub>e</sub> = 1.32  |
| WEIGHT             | 37          | Maricopa             |                           |                 |                         |
|                    |             | Head Start           | .30                       | .52             | F = 2.70*               |
|                    |             | Constant             | 18.02                     |                 | MS <sub>e</sub> = 1.74  |
| WEIGHT             | 164         | Mingo                |                           |                 |                         |
|                    |             | Head Start           | -.33                      | .20             | F = 1.88                |
|                    |             | Constant             | -4.24                     |                 | MS <sub>e</sub> = 1.43  |

<sup>a</sup> Adjusted for child's age, race and gender.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

Table 5-6  
(continued).

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample, Controlling for Mother's Height

| Dependent Variable                | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |               |
|-----------------------------------|-------------|----------------------|----------------------|-----------------|-------------------------|---------------|
|                                   |             |                      | b                    | SE <sub>b</sub> |                         |               |
| Greene & Humphreys                |             |                      |                      |                 |                         |               |
| <u>TRICEPS</u><br><u>SKINFOLD</u> | <u>28</u>   | Head Start           | <u>-.47</u>          | <u>.58</u>      | F                       | = <u>1.80</u> |
|                                   |             | Constant             | <u>1.09</u>          |                 | MS <sub>e</sub>         | = <u>1.24</u> |
| St. Clair                         |             |                      |                      |                 |                         |               |
| <u>TRICEPS</u><br><u>SKINFOLD</u> | <u>147</u>  | Head Start           | <u>.10</u>           | <u>.17</u>      | F                       | = <u>.80</u>  |
|                                   |             | Constant             | <u>3.49</u>          |                 | MS <sub>e</sub>         | = <u>1.00</u> |
| Maricopa                          |             |                      |                      |                 |                         |               |
| <u>TRICEPS</u><br><u>SKINFOLD</u> | <u>37</u>   | Head Start           | <u>-.65</u>          | <u>.51</u>      | F                       | = <u>1.95</u> |
|                                   |             | Constant             | <u>21.04</u>         |                 | MS <sub>e</sub>         | = <u>1.70</u> |
| Mingo                             |             |                      |                      |                 |                         |               |
| <u>TRICEPS</u><br><u>SKINFOLD</u> | <u>164</u>  | Head Start           | <u>-.14</u>          | <u>.16</u>      | F                       | = <u>.97</u>  |
|                                   |             | Constant             | <u>1.40</u>          |                 | MS <sub>e</sub>         | = <u>.91</u>  |

<sup>a</sup> Adjusted for child's age, race and gender.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

Table 5-6  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample, Controlling for Mother's Height

| Dependent Variable   | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup><br>b | SE <sub>b</sub> | Statistics <sup>c</sup> |
|----------------------|-------------|----------------------|---------------------------|-----------------|-------------------------|
| Greene & Humphreys   |             |                      |                           |                 |                         |
| ARM<br>CIRCUMFERENCE | 28          | Head Start           | .39                       | .51             | F = 1.84                |
|                      |             |                      |                           |                 | R <sup>2</sup> = .29    |
|                      |             | Constant             | 6.66                      |                 | MS <sub>e</sub> = .96   |
| St. Clair            |             |                      |                           |                 |                         |
| ARM<br>CIRCUMFERENCE | 147         | Head Start           | .46                       | .18             | F = .19                 |
|                      |             |                      |                           |                 | R <sup>2</sup> = .01    |
|                      |             | Constant             | .38                       |                 | MS <sub>e</sub> = 1.18  |
| Maricopa             |             |                      |                           |                 |                         |
| ARM<br>CIRCUMFERENCE | 37          | Head Start           | -.62                      | .45             | F = 2.32*               |
|                      |             |                      |                           |                 | R <sup>2</sup> = .22    |
|                      |             | Constant             | 16.56                     |                 | MS <sub>e</sub> = 1.37  |
| Mingo                |             |                      |                           |                 |                         |
| ARM<br>CIRCUMFERENCE | 164         | Head Start           | -.29                      | .18             | F = .87                 |
|                      |             |                      |                           |                 | R <sup>2</sup> = .03    |
|                      |             | Constant             | -.60                      |                 | MS <sub>e</sub> = 1.15  |

<sup>a</sup> Adjusted for child's age, race and gender.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square



Table 5-6  
(continued)

Regression Analysis of the Anthropometric Evaluation Measures  
Cross-Sectional Sample, Controlling for Mother's Height

| Dependent Variable                   | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup><br>b | SE <sub>b</sub> | Statistics <sup>c</sup> |
|--------------------------------------|-------------|----------------------|---------------------------|-----------------|-------------------------|
| Greene & Humphreys                   |             |                      |                           |                 |                         |
| ESTIMATED<br>MUSCLE<br>CIRCUMFERENCE | 28          | Head Start           | .81*                      | .35             | F = 2.52*               |
|                                      |             |                      |                           |                 | R <sup>2</sup> = .36    |
|                                      |             | Constant             | 7.41                      |                 | MS <sub>e</sub> = .45   |
| St. Clair                            |             |                      |                           |                 |                         |
| ESTIMATED<br>MUSCLE<br>CIRCUMFERENCE | 147         | Head Start           |                           |                 | F = 1.52                |
|                                      |             |                      |                           |                 | R <sup>2</sup> = .04    |
|                                      |             | Constant             | -2.31                     |                 | MS <sub>e</sub> = 1.88  |
| Maricopa                             |             |                      |                           |                 |                         |
| ESTIMATED<br>MUSCLE<br>CIRCUMFERENCE | 37          | Head Start           | .36                       | .46             | F = .98                 |
|                                      |             |                      |                           |                 | R <sup>2</sup> = .11    |
|                                      |             | Constant             | 5.07                      |                 | MS <sub>e</sub> = 1.35  |
| Mingo                                |             |                      |                           |                 |                         |
| ESTIMATED<br>MUSCLE<br>CIRCUMFERENCE | 164         | Head Start           | -.23                      | .14             | F = 1.42                |
|                                      |             |                      |                           |                 | R <sup>2</sup> = .03    |
|                                      |             | Constant             | -.96                      |                 | MS <sub>e</sub> = .70   |

<sup>a</sup> Adjusted for child's age, race and gender.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

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CHAPTER SIX

APPENDIX TABLES

Table 6 -1

Total 24-Hour Nutrient Intake and Percent of Recommended Daily Intake Received  
for Pretested Head Start-Eligible Children (Samples A and D) within Site

| Nutrients                       | Pretested Head Start-Eligible Children<br>(Samples A & D) in: |                     |
|---------------------------------|---|---------------------|
|                                 | Greene and Humphreys Counties                                 |                     |
|                                 | 2-3 Years<br>(n=67)   | 4-6 Years<br>(n=8)  |
| <b>Calories (Kcal/day)</b>      |   |                     |
| Mean                            | 1382  | 1436                |
| Median (min,max)                | 1289 (555, 3023)  | 1223 (856, 2223)    |
| Mean $\pm$ Standard (min,max)   | 114 (46, 286)   | 104 (57, 193)       |
| Mean Intake per kg Body Weight  | 94  | 85                  |
| <b>Protein (gms/day)</b>        |   |                     |
| Mean                            | 49  | 49                  |
| Median (min,max)                | 47 (8, 96)  | 46 (22, 74)         |
| Mean $\pm$ Standard (min,max)   | 223 (56, 537)   | 194 (82, 180)       |
| Mean Intake per kg Body Weight  | 3.3   | 2.9                 |
| <b>Calcium (mg/day)</b>         |   |                     |
| Mean                            | 516   | 634                 |
| Median (min,max)                | 449 (94, 1608)  | 615 (127, 1210)     |
| Mean $\pm$ Standard             | 64  | 79                  |
| Median $\pm$ Standard (min,max) | 56 (12, 201)  | 77 (16, 151)        |
| <b>Iron (mg/day)</b>            |   |                     |
| Mean                            | 11  | 8.4                 |
| Median (min,max)                | 10 (2.5, 49)  | 6.9 (3.7, 12.8)     |
| Mean $\pm$ Standard             | 76  | 84                  |
| Median $\pm$ Standard (min,max) | 67 (17, 326)  | 69 (37, 128)        |
| <b>Magnesium (mg/day)</b>       |   |                     |
| Mean                            | 172   | 165                 |
| Median (min,max)                | 169 (46, 405)   | 173 (70, 217)       |
| Mean $\pm$ Standard (min,max)   | 115 (31, 270)   | 82 (35, 108)        |
| <b>Phosphorus (mg/day)</b>      |   |                     |
| Mean                            | 743   | 819                 |
| Median (min,max)                | 688 (188, 1834)   | 793 (296, 1319)     |
| Mean $\pm$ Standard (min,max)   | 93 (23, 229)  | 102 (37, 163)       |
| <b>Vitamin A (IU/day)</b>       |   |                     |
| Mean                            | 4253  | 4121                |
| Median (min,max)                | 2508 (234, 16,304)  | 1748 (587, 12,835)  |
| Mean $\pm$ Standard             | 213   | 165                 |
| Median $\pm$ Standard (min,max) | 125 (12, 815)   | 70 (23, 513)        |
| <b>Thiamine (mg/day)</b>        |   |                     |
| Mean                            | 1.23  | 1.35                |
| Median (min,max)                | 1.15 (.29, 4.35)  | 1.21 (.32, 2.24)    |
| Mean $\pm$ Standard (min,max)   | 234 (90, 659)   | 230 (94, 290)       |
| <b>Riboflavin (mg/day)</b>      |   |                     |
| Mean                            | 1.43  | 1.42                |
| Median (min,max)                | 1.24 (.18, 6.1)   | 1.42 (.37, 2.08)    |
| Mean $\pm$ Standard             | 195   | 183                 |
| Median $\pm$ Standard (min,max) | 160 (59, 624)   | 161 (40, 332)       |
| <b>Niacin (mg/day)</b>          |   |                     |
| Mean                            | 14.88   | 11.87               |
| Median (min,max)                | 13.04 (3.19, 53.95)   | 11.74 (5.42, 18.16) |
| Mean $\pm$ Standard             | 168   | 124                 |
| Median $\pm$ Standard (min,max) | 142 (48, 508)   | 121 (96, 145)       |
| <b>Vitamin B6 (mg/day)</b>      |   |                     |
| Mean                            | 1.36  | 0.97                |
| Median (min,max)                | 1.11 (.17, 5.19)  | 0.94 (.39, 1.51)    |
| Mean $\pm$ Standard             | 851   | 75                  |
| Median $\pm$ Standard (min,max) | 123 (19, 577)   | 72 (30, 116)        |
| <b>Vitamin B12 (mg/day)</b>     |   |                     |
| Mean                            | 3.06  | 2.38                |
| Median (min,max)                | 2.21 (.15, 17.92)   | 2.24 (.78, 5.09)    |
| Mean $\pm$ Standard             | 153   | 95                  |
| Median $\pm$ Standard (min,max) | 111 (7, 896)  | 90 (31, 274)        |
| <b>Vitamin C (mg/day)</b>       |   |                     |
| Mean                            | 103   | 103                 |
| Median (min,max)                | 85 (1, 310)   | 68 (5, 300)         |
| Mean $\pm$ Standard             | 230   | 230                 |
| Median $\pm$ Standard (min,max) | 188 (2, 689)  | 150 (11, 667)       |

Table 6 -1 (continued)

Total 24-Hour Nutrient Intake and Percent of Recommended Daily Intake Received  
for Pretested Head Start-Eligible Children (Samples A and D) within Site

| Nutrient                        | Pretested Head Start-Eligible Children<br>(Samples A & D) in: |                     |
|---------------------------------|---|---------------------|
|                                 | St. Clair County  |                     |
|                                 | 2-3 Years<br>(n=67)   | 4-6 Years<br>(n=8)  |
| Calories (Kcal/day)             |   |                     |
| Mean                            | 1685  | 1782                |
| Median (min,max)                | 1580 (469, 3826)  | 1779 (558, 3922)    |
| Mean $\pm$ Standard (min,max)   | 142 (36, 343)   | 127 (35, 270)       |
| Mean Intake per kg Body Weight  | 117   | 104                 |
| Protein (gms/day)               |   |                     |
| Mean                            | 60  | 69                  |
| Median (min,max)                | 56 (15, 150)  | 71 (26, 144)        |
| Mean $\pm$ Standard (min,max)   | 277 (65, 709)   | 265 (101, 536)      |
| Mean Intake per kg Body Weight  | 4.2   | 4.0                 |
| Calcium (mg/day)                |   |                     |
| Mean                            | 668   | 733                 |
| Median (min,max)                | 564 (64, 2473)  | 580 (153, 2585)     |
| Mean $\pm$ Standard             | 84  | 92                  |
| Median $\pm$ Standard (min,max) | 71 (8, 309)   | 72 (19, 323)        |
| Iron (mg/day)                   |   |                     |
| Mean                            | 11.9  | 12.5                |
| Median (min,max)                | 10 (4, 74)  | 11.8 (3.6, 35.5)    |
| Mean $\pm$ Standard             | 79  | 125                 |
| Median $\pm$ Standard (min,max) | 68 (27, 494)  | 118 (36, 355)       |
| Magnesium (mg/day)              |   |                     |
| Mean                            | 196   | 212                 |
| Median (min,max)                | 179 (57, 503)   | 176 (84, 499)       |
| Mean $\pm$ Standard (min,max)   | 131 (38, 336)   | 106 (42, 450)       |
| Phosphorous (mg/day)            |   |                     |
| Mean                            | 937   | 1061                |
| Median (min,max)                | 816 (207, 2663)   | 1003 (374, 2636)    |
| Mean $\pm$ Standard             | 117   | 133                 |
| Median $\pm$ Standard (min,max) | 102 (26, 333)   | 125 (67, 329)       |
| Vitamin A (IU/day)              |   |                     |
| Mean                            | 4046  | 4620                |
| Median (min,max)                | 2385 (597, 22674)   | 3350 (420, 20298)   |
| Mean $\pm$ Standard             | 202   | 185                 |
| Median $\pm$ Standard (min,max) | 119 (30, 1134)  | 136 (17, 812)       |
| Thiamine (mg/day)               |   |                     |
| Mean                            | 1.29  | 1.31                |
| Median (min,max)                | 1.20 (0.38, 2.52)   | 1.17 (0.34, 4.43)   |
| Mean $\pm$ Standard (min,max)   | 197 (101, 347)  | 210 (94, 440)       |
| Riboflavin (mg/day)             |   |                     |
| Mean                            | 1.44  | 1.77                |
| Median (min,max)                | 1.44 (0.44, 4.56)   | 1.52 (0.50, 6.13)   |
| Mean $\pm$ Standard (min,max)   | 161 (68, 379)   | 182 (91, 417)       |
| Niacin (mg/day)                 |   |                     |
| Mean                            | 13.99   | 16.81               |
| Median (min,max)                | 12.17 (4.53, 42.86)   | 15.96 (4.69, 36.82) |
| Mean $\pm$ Standard             | 128   | 145                 |
| Median $\pm$ Standard (min,max) | 122 (62, 240)   | 136 (74, 280)       |
| Vitamin B6 (mg/day)             |   |                     |
| Mean                            | 1.16  | 1.28                |
| Median (min,max)                | 1.09 (0.18, 3.19)   | 1.19 (0.28, 3.88)   |
| Mean $\pm$ Standard (min,max)   | 129 (21, 315)   | 98 (21, 298)        |
| Vitamin B12 (mg/day)            |   |                     |
| Mean                            | 3.14  | 4.23                |
| Median (min,max)                | 2.65 (0.71, 13.40)  | 3.09 (0.84, 16.67)  |
| Mean $\pm$ Standard             | 157   | 169                 |
| Median $\pm$ Standard (min,max) | 132 (36, 670)   | 123 (33, 567)       |
| Vitamin C (mg/day)              |   |                     |
| Mean                            | 108   | 130                 |
| Median (min,max)                | 78 (5, 438)   | 97 (4, 483)         |
| Mean $\pm$ Standard             | 241   | 289                 |
| Median $\pm$ Standard (min,max) | 174 (12, 974)   | 215 (8, 1073)       |

Table 6 -1 (continued)

Total 24-Hour Nutrient Intake and Percent of Recommended Daily Intake Received  
for Pretested Head Start-Eligible Children (Samples A and D) within Site

| Nutrient                       | Pretested Head Start-Eligible Children<br>(Samples A & D) in: |                    |
|--------------------------------|---|--------------------|
|                                | Maricopa County   |                    |
|                                | 2-3 Years<br>(n=67)   | 4-6 Years<br>(n=8) |
| <b>Calories (Kcal/day)</b>     |   |                    |
| Mean                           | 1269  | 1398               |
| Median (min,max)               | 1198 (398, 2037)  | 1322 (563, 3278)   |
| Mean % Standard (min,max)      | 96 (27, 170)  | 102 (40, 209)      |
| Mean Intake per kg Body Weight | 79  | 83                 |
| <b>Protein (gms/day)</b>       |   |                    |
| Mean                           | 49  | 50                 |
| Median (min,max)               | 45 (13, 81)   | 46 (16, 129)       |
| Mean % Standard (min,max)      | 204 (53, 397)   | 201 (56, 416)      |
| Mean Intake per kg Body Weight | 3.05  | 3.0                |
| <b>Calcium (mg/day)</b>        |   |                    |
| Mean                           | 760   | 681                |
| Median (min,max)               | 790 (73, 1969)  | 600 (145, 2249)    |
| Mean % Standard (min,max)      | 95 (9, 246)   | 85 (18, 281)       |
| <b>Iron (mg/day)</b>           |   |                    |
| Mean                           | 8.1   | 9.0                |
| Median (min,max)               | 7.1 (3.2, 16.2)   | 7.6 (2.4, 2.8)     |
| Mean % Standard                | 54  | 90                 |
| Median % Standard (min,max)    | 47 (21, 108)  | 76 (24, 282)       |
| <b>Magnesium (mg/day)</b>      |   |                    |
| Mean                           | 162   | 161                |
| Median (min,max)               | 164 (46, 248)   | 143 (48, 523)      |
| Mean % Standard (min,max)      | 108 (31, 165)   | 80 (24, 261)       |
| <b>Phosphorous (mg/day)</b>    |   |                    |
| Mean                           | 916   | 885                |
| Median (min,max)               | 900 (203, 2009)   | 817 (250, 2506)    |
| Mean % Standard (min,max)      | 114 (25, 251)   | 111 (31, 313)      |
| <b>Vitamin A (IU/day)</b>      |   |                    |
| Mean                           | 3257  | 3489               |
| Median (min,max)               | 2450 (457, 10922)   | 2341 (355, 41299)  |
| Mean % Standard                | 163   | 140                |
| Median % Standard (min,max)    | 122 (23, 546)   | 94 (14, 1632)      |
| <b>Thiamine (mg/day)</b>       |   |                    |
| Mean                           | 0.88  | 0.94               |
| Median (min,max)               | 0.83 (0.13, 1.60)   | 0.77 (0.25, 2.58)  |
| Mean % Standard (min,max)      | 172 (78, 312)   | 169 (48, 316)      |
| <b>Riboflavin (mg/day)</b>     |   |                    |
| Mean                           | 1.45  | 1.40               |
| Median (min,max)               | 1.47 (.20, 2.86)  | 1.20 (0.50, 4.38)  |
| Mean % Standard (min,max)      | 205 (69, 308)   | 185 (85, 640)      |
| <b>Niacin (mg/day)</b>         |   |                    |
| Mean                           | 9.66  | 9.83               |
| Median (min,max)               | 8.65 (1.62, 26.15)  | 8.88 (1.78, 25.30) |
| Mean % Standard (min,max)      | 115 (34, 220)   | 109 (42, 242)      |
| <b>Vitamin B6 (mg/day)</b>     |   |                    |
| Mean                           | 0.97  | 0.92               |
| Median (min,max)               | 0.82 (0.16, 2.69)   | 0.80 (0.24, 2.96)  |
| Mean % Standard                | 108   | 71                 |
| Median % Standard (min,max)    | 91 (18, 299)  | 62 (19, 227)       |
| <b>Vitamin B12 (mg/day)</b>    |   |                    |
| Mean                           | 2.99  | 4.07               |
| Median (min,max)               | 3.03 (0.38, 7.48)   | 2.68 (0.43, 57.02) |
| Mean % Standard (min,max)      | 150 (19, 374)   | 163 (17, 2281)     |
| <b>Vitamin C (mg/day)</b>      |   |                    |
| Mean                           | 88  | 76                 |
| Median (min,max)               | 64 (6, 348)   | 61 (0, 124)        |
| Mean % Standard                | 196   | 168                |
| Median % Standard (min,max)    | 142 (13, 773)   | 137 (0, 719)       |

Table 6 -1 (continued)

Total 24-Hour Nutrient Intake and Percent of Recommended Daily Intake Received for Pretested Head Start-Eligible Children (Samples A and D) within Site

| Nutrient                        | Pretested Head Start-Eligible Children (Samples A & D) in: |                     |
|---------------------------------|--|---------------------|
|                                 | Greene and Humphreys Counties                              |                     |
|                                 | 2-3 Years (n=67)   | 4-6 Years (n=8)     |
| <b>Calories (Kcal/day)</b>      |  |                     |
| Mean                            | 1765   | 2028                |
| Median (min,max)                | 1618 (468, 3779)   | 1802 (877, 3655)    |
| Mean $\pm$ Standard (min,max)   | 144 (37, 290)  | 137 (86, 245)       |
| Mean Intake per kg Body Weight  | 118  | 113                 |
| <b>Protein (gms/day)</b>        |  |                     |
| Mean                            | 64   | 59                  |
| Median (min,max)                | 57 (19, 115)   | 54 (34, 100)        |
| Mean $\pm$ Standard (min,max)   | 284 (81, 549)  | 220 (127, 376)      |
| Mean Intake per kg Body Weight  | 4.3  | 3.3                 |
| <b>Calcium (mg/day)</b>         |  |                     |
| Mean                            | 907  | 974                 |
| Median (min,max)                | 805 (115, 2679)  | 907 (420, 1737)     |
| Mean $\pm$ Standard (min,max)   | 113 (14, 335)  | 122 (53, 217)       |
| <b>Iron (mg/day)</b>            |  |                     |
| Mean                            | 11.9   | 12.3                |
| Median (min,max)                | 10.4 (3.2, 32.5)   | 9.6 (6.2, 25.5)     |
| Mean $\pm$ Standard             | 80   | 123                 |
| Median $\pm$ Standard (min,max) | 69 (21, 217)   | 96 (62, 255)        |
| <b>Magnesium (mg/day)</b>       |  |                     |
| Mean                            | 216  | 232                 |
| Median (min,max)                | 190 (57, 498)  | 197 (91, 473)       |
| Mean $\pm$ Standard (min,max)   | 144 (38, 332)  | 116 (45, 239)       |
| <b>Phosphorous (mg/day)</b>     |  |                     |
| Mean                            | 1191   | 1208                |
| Median (min,max)                | 1078 (365, 2724)   | 1106 (486, 1910)    |
| Mean $\pm$ Standard (min,max)   | 150 (46, 341)  | 151 (61, 239)       |
| <b>Vitamin A (IU/day)</b>       |  |                     |
| Mean                            | 4359   | 3096                |
| Median (min,max)                | 3201 (208, 35316)  | 2204 (1317, 6234)   |
| Mean $\pm$ Standard             | 218  | 124                 |
| Median $\pm$ Standard (min,max) | 160 (10, 1766)   | 88 (53, 250)        |
| <b>Thiamine (mg/day)</b>        |  |                     |
| Mean                            | 1.40   | 1.36                |
| Median (min,max)                | 1.35 (0.31, 3.24)  | 1.09 (0.67, 2.55)   |
| Mean $\pm$ Standard             | 206  | 173                 |
| Median $\pm$ Standard (min,max) | 183 (118, 552)   | 156 (112, 319)      |
| <b>Riboflavin (mg/day)</b>      |  |                     |
| Mean                            | 1.94   | 1.90                |
| Median (min,max)                | 1.65 (0.58, 4.44)  | 1.79 (0.86, 2.70)   |
| Mean $\pm$ Standard (min,max)   | 210 (78, 573)  | 180 (120, 277)      |
| <b>Niacin (mg/day)</b>          |  |                     |
| Mean                            | 14.15  | 13.0                |
| Median (min,max)                | 11.76 (2.18, 33.69)  | 10.88 (6.39, 24.40) |
| Mean $\pm$ Standard             | 125  | 101                 |
| Median $\pm$ Standard (min,max) | 113 (32, 348)  | 76 (58, 209)        |
| <b>Vitamin B6 (mg/day)</b>      |  |                     |
| Mean                            | 1.39   | 1.22                |
| Median (min,max)                | 1.22 (0.31, 4.47)  | 0.91 (0.41, 2.83)   |
| Mean $\pm$ Standard             | 154  | 94                  |
| Median $\pm$ Standard (min,max) | 135 (34, 497)  | 70 (32, 217)        |
| <b>Vitamin B12 (ug/day)</b>     |  |                     |
| Mean                            | 4.61   | 4.04                |
| Median (min,max)                | 3.49 (0.96, 43.11)   | 3.53 (1.60, 7.36)   |
| Mean $\pm$ Standard             | 231  | 162                 |
| Median $\pm$ Standard (min,max) | 175 (48, 2155)   | 141 (64, 294)       |
| <b>Vitamin C (mg/day)</b>       |  |                     |
| Mean                            | 95   | 84                  |
| Median (min,max)                | 86 (0, 376)  | 33 (7, 281)         |
| Mean $\pm$ Standard             | 211  | 187                 |
| Median $\pm$ Standard (min,max) | 191 (0, 836)   | 74 (17, 625)        |

Table 6 -2

Mean 24-Hour Nutrient Intake Percent of Recommended Daily Intake Received:<sup>a</sup> USDA Household Food Consumption Survey (HFCS),<sup>b</sup> First National Health and Nutrition Examination Survey (NHANES-1),<sup>c</sup> and Ten-State Nutrition Survey (TSNS)<sup>d</sup>

|                                     | HFCS                | NHANES-1             | TSNS                 |
|-------------------------------------|---------------------|----------------------|----------------------|
|                                     | 3 to 5 years (n=51) | 2 to 6 years (n=627) | 2 to 3 years (n=278) |
| <b>KILOCALORIES</b>                 |                     |                      |                      |
| Intake                              | 1442                | 1586                 | 1244                 |
| Percent Standard <sup>e</sup>       | 92                  | 119                  | 112                  |
| <b>PROTEIN (g)</b>                  |                     |                      |                      |
| Intake                              | 58                  | 57                   | 57                   |
| Percent Standard <sup>e</sup>       | 207                 | 228                  | 231                  |
| <b>CALCIUM (mg)</b>                 |                     |                      |                      |
| Intake                              | 752                 | 838                  | 701                  |
| Percent Standard <sup>e</sup>       | 94                  | 104                  | 87                   |
| <b>IRON (mg)</b>                    |                     |                      |                      |
| Intake                              | 10.3                | 8.3                  | 6.6                  |
| Percent Standard <sup>e</sup>       | 86                  | 70                   | 43                   |
| <b>MAGNESIUM (mg)</b>               |                     |                      |                      |
| Intake                              | 170                 | not available        | not available        |
| Percent Standard <sup>e</sup>       | 93                  | available            | available            |
| <b>PHOSPHORUS (mg)</b>              |                     |                      |                      |
| Intake                              | 952                 | not available        | not available        |
| Percent Standard <sup>e</sup>       | 119                 | available            | available            |
| <b>VITAMIN A (IU)</b>               |                     |                      |                      |
| Intake                              | 3593                | 3718                 | 3309                 |
| Percent Standard <sup>e</sup>       | 154                 | 166                  | 147                  |
| <b>THIAMIN (mg)</b>                 |                     |                      |                      |
| Intake                              | 1.29                | 1.11                 | 0.74                 |
| Percent Standard <sup>e</sup>       | 161                 | 175                  | 169                  |
| <b>RIBOFLAVIN (mg)</b>              |                     |                      |                      |
| Intake                              | 1.76                | 1.72                 | 1.53                 |
| Percent Standard <sup>e</sup>       | 196                 | 198                  | 252                  |
| <b>NIACIN (mg)</b>                  |                     |                      |                      |
| Intake                              | 14.8                | 10.33                | 8.07                 |
| Percent Standard <sup>e</sup>       | 148                 | 100                  | 98                   |
| <b>VITAMIN B<sub>6</sub> (mg)</b>   |                     |                      |                      |
| Intake                              | 1.13                | not available        | not available        |
| Percent Standard <sup>e</sup>       | 96                  | available            | available            |
| <b>VITAMIN B<sub>12</sub> (mcg)</b> |                     |                      |                      |
| Intake                              | 3.42                | not available        | not available        |
| Percent Standard <sup>e</sup>       | 149                 | available            | available            |
| <b>VITAMIN C (mg)</b>               |                     |                      |                      |
| Intake                              | 71                  | 70                   | 43                   |
| Percent Standard <sup>e</sup>       | 157                 | 175                  | 95                   |

<sup>a</sup>Comparable data from the Head Start Health Evaluation is shown in Appendix Tables 6-12 through 6-23.

<sup>b</sup>Conducted 1977-1978. Figures presented here include only those children with family incomes below \$6000/year.

<sup>c</sup>Conducted 1971-1974. Figures presented here include only children of low-income families. Figures represent weighted averages of values for 2 to 3 year old children and 4 to 6 year old children.

<sup>d</sup>Conducted 1968-1970. Figures presented here include only children from low-income ratio.

<sup>e</sup>USDA-HFCS Standards based on average RDA values--not adjusted for body weight (calories and protein) or total caloric intake (thiamin, riboflavin, niacin). In general, use of these RDA values results in larger numbers of children not achieving the standard and/or a lower mean percent of standard.

<sup>f</sup>NHANES and TSNS standards were different (lower) than those used in this evaluation. Mean percent of standard figures presented here are based on the standard used in this evaluation, so do not match exactly the figures reported in the literature. (Mean intakes are the same.)

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Table 6 -3

Nutrient Density for Pretested Head Start-Eligible Children (Samples A & D)  
within Site

Pretested Head Start-Eligible Children (Samples A & D) in:

|                               | Greene and Humphreys Counties |                        | St. Clair County       |                        |
|-------------------------------|-------------------------------|------------------------|------------------------|------------------------|
|                               | 2-3 years<br>(n=67)           | 4-6 years<br>(n=8)     | 2-3 years<br>(n=59)    | 4-6 years<br>(n=35)    |
| Calories                      | 1382                          | 1436                   | 1685                   | 1782                   |
| Protein (gm) <sup>a</sup>     | 36 <sub>±</sub> 9             | 34 <sub>±</sub> 6      | 36 <sub>±</sub> 8      | 39 <sub>±</sub> 8      |
| Calcium (mg)                  | 377 <sub>±</sub> 148          | 461 <sub>±</sub> 307   | 397 <sub>±</sub> 192   | 413 <sub>±</sub> 182   |
| Iron (mg)                     | 8.6 <sub>±</sub> 5.2          | 5.7 <sub>±</sub> 1.1   | 6.9 <sub>±</sub> 2.7   | 6.9 <sub>±</sub> 2.2   |
| Magnesium (mg)                | 126 <sub>±</sub> 42           | 118 <sub>±</sub> 41    | 119 <sub>±</sub> 42    | 117 <sub>±</sub> 48    |
| Phosphorus (mg)               | 550 <sub>±</sub> 134          | 570 <sub>±</sub> 156   | 557 <sub>±</sub> 149   | 590 <sub>±</sub> 117   |
| Vitamin A (IU) <sup>b</sup>   | 3098 <sub>±</sub> 2865        | 2886 <sub>±</sub> 2827 | 2462 <sub>±</sub> 2703 | 2984 <sub>±</sub> 3375 |
| Thiamin (mg)                  | 0.93 <sub>±</sub> 0.47        | 0.92 <sub>±</sub> 0.25 | 0.79 <sub>±</sub> 0.25 | 0.84 <sub>±</sub> 0.31 |
| Riboflavin (mg)               | 1.07 <sub>±</sub> 0.58        | 1.01 <sub>±</sub> 0.43 | 0.88 <sub>±</sub> 0.31 | 1.0 <sub>±</sub> 0.4   |
| Niacin (mg) <sup>c</sup>      | 11.12 <sub>±</sub> 5.83       | 8.18 <sub>±</sub> 1.15 | 8.45 <sub>±</sub> 2.61 | 9.6 <sub>±</sub> 2.9   |
| Vitamin B <sub>6</sub> (mg)   | 1.04 <sub>±</sub> 0.66        | 0.68 <sub>±</sub> 0.25 | 0.72 <sub>±</sub> 0.33 | 0.74 <sub>±</sub> 0.32 |
| Vitamin B <sub>12</sub> (mcg) | 2.28 <sub>±</sub> 1.99        | 1.66 <sub>±</sub> 0.73 | 1.89 <sub>±</sub> 0.90 | 2.30 <sub>±</sub> 1.56 |
| Vitamin C (mg)                | 77 <sub>±</sub> 65            | 76 <sub>±</sub> 91     | 66 <sub>±</sub> 58     | 75 <sub>±</sub> 58     |

<sup>a</sup>All values expressed represent units of nutrient per 1000 calories.

<sup>b</sup>Total vitamin A value.

<sup>c</sup>Micrograms preformed niacin.



Table 6 -3 (continued)

Nutrient Density for Pretested Head Start-Eligible Children (Samples A & D)  
within Site

Pretested Head Start-Eligible Children (Samples A &amp; D) in:

|                               | Maricopa County        |                        | Mingo County           |                        |
|-------------------------------|------------------------|------------------------|------------------------|------------------------|
|                               | 2-3 years<br>(n=59)    | 4-6 years<br>(n=35)    | 2-3 years<br>(n=53)    | 4-6 years<br>(n=10)    |
| Calories                      | 1269                   | 1398                   | 1765                   | 2028                   |
| Protein (gm) <sup>a</sup>     | 36 <sub>±</sub> 8      | 39 <sub>±</sub> 8      | 37 <sub>±</sub> 8      | 30 <sub>±</sub> 6      |
| Calcium (mg)                  | 397 <sub>±</sub> 192   | 413 <sub>±</sub> 182   | 512 <sub>±</sub> 227   | 517 <sub>±</sub> 199   |
| Iron (mg)                     | 6.9 <sub>±</sub> 2.7   | 6.9 <sub>±</sub> 2.2   | 7.0 <sub>±</sub> 0.4   | 6.1 <sub>±</sub> 2.8   |
| Magnesium (mg)                | 119 <sub>±</sub> 42    | 117 <sub>±</sub> 48    | 125 <sub>±</sub> 29    | 113 <sub>±</sub> 16    |
| Phosphorus (mg)               | 557 <sub>±</sub> 149   | 590 <sub>±</sub> 117   | 686 <sub>±</sub> 170   | 619 <sub>±</sub> 149   |
| Vitamin A (IU) <sup>b</sup>   | 2462 <sub>±</sub> 2703 | 2984 <sub>±</sub> 3375 | 2823 <sub>±</sub> 5339 | 1610 <sub>±</sub> 860  |
| Thiamin (mg)                  | 0.79 <sub>±</sub> 0.25 | 0.84 <sub>±</sub> 0.31 | 0.82 <sub>±</sub> 0.34 | 0.69 <sub>±</sub> 0.23 |
| Riboflavin (mg)               | 0.88 <sub>±</sub> 0.31 | 1.0 <sub>±</sub> 0.4   | 1.15 <sub>±</sub> 0.52 | 0.99 <sub>±</sub> 0.27 |
| Niacin (mg) <sup>c</sup>      | 8.45 <sub>±</sub> 2.61 | 9.6 <sub>±</sub> 2.9   | 8.24 <sub>±</sub> 3.62 | 6.66 <sub>±</sub> 3.03 |
| Vitamin B <sub>6</sub> (mg)   | 0.72 <sub>±</sub> 0.33 | 0.74 <sub>±</sub> 0.32 | 0.79 <sub>±</sub> 0.44 | 0.59 <sub>±</sub> 0.30 |
| Vitamin B <sub>12</sub> (mcg) | 1.89 <sub>±</sub> 0.90 | 2.30 <sub>±</sub> 1.56 | 3.12 <sub>±</sub> 6.38 | 2.14 <sub>±</sub> 0.95 |
| Vitamin C (mg)                | 66 <sub>±</sub> 58     | 75 <sub>±</sub> 58     | 56 <sub>±</sub> 50     | 44 <sub>±</sub> 49     |

<sup>a</sup> All values expressed represent units of nutrient, per 1000 calories.<sup>b</sup> Total vitamin A value.<sup>c</sup> Milligrams preformed niacin

Table 6 -4

Nutrient Intake from Head Start Meals and Percent of Recommended Daily Intake Received for Posttested Head Start Children (Samples A, B, C) Present on Day of Recall within Site

|                         | N   | Q1     | MED    | Q3      | MEAN   | SD     |
|-------------------------|-----|--------|--------|---------|--------|--------|
| <b>KILOCALORIES</b>     |     |        |        |         |        |        |
| Greene/Humphreys        |     |        |        |         |        |        |
| Intake from H.S. Meals  | 109 | 613.18 | 721.00 | 821.87  | 729.36 | 172.00 |
| Pct of Dietary Standard | 110 | 44.35  | 54.90  | 61.64   | 54.29  | 14.30  |
| St. Clair               |     |        |        |         |        |        |
| Intake from H.S. Meals  | 71  | 607.14 | 767.49 | 894.73  | 777.30 | 231.00 |
| Pct of Dietary Standard | 72  | 41.67  | 54.69  | 67.05   | 56.42  | 17.50  |
| Maricopa                |     |        |        |         |        |        |
| Intake from H.S. Meals  | 58  | 437.29 | 518.94 | 741.02  | 600.44 | 258.00 |
| Pct of Dietary Standard | 58  | 29.60  | 37.07  | 51.44   | 41.02  | 15.40  |
| Mingo                   |     |        |        |         |        |        |
| Intake from H.S. Meals  | 67  | 658.41 | 847.50 | 1040.87 | 842.52 | 268.00 |
| Pct of Dietary Standard | 70  | 46.22  | 61.38  | 72.92   | 60.66  | 19.90  |
| <b>PROTEIN (GM)</b>     |     |        |        |         |        |        |
| Greene/Humphreys        |     |        |        |         |        |        |
| Intake from H.S. Meals  | 108 | 24.20  | 30.06  | 37.62   | 31.34  | 9.88   |
| Pct of Dietary Standard | 109 | 81.93  | 100.75 | 126.29  | 103.00 | 32.20  |
| St. Clair               |     |        |        |         |        |        |
| Intake from H.S. Meals  | 72  | 21.77  | 28.10  | 35.07   | 28.98  | 9.21   |
| Pct of Dietary Standard | 70  | 69.97  | 92.43  | 116.05  | 94.01  | 31.60  |
| Maricopa                |     |        |        |         |        |        |
| Intake from H.S. Meals  | 56  | 16.16  | 20.94  | 32.63   | 24.06  | 10.60  |
| Pct of Dietary Standard | 57  | 51.89  | 66.14  | 102.43  | 76.78  | 37.90  |
| Mingo                   |     |        |        |         |        |        |
| Intake from H.S. Meals  | 71  | 25.38  | 32.75  | 38.26   | 32.44  | 11.00  |
| Pct of Dietary Standard | 71  | 74.95  | 100.66 | 123.61  | 101.21 | 32.70  |

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Table 6, -4 (continued)

Nutrient Intake from Head Start Meals and Percent of Recommended Daily Intake Received for Posttested Head Start Children (Samples A, B, C) Present on Day of Recall within Site

|                         | N                | Q1     | MED    | Q3     | MEAN   | SD     |
|-------------------------|------------------|--------|--------|--------|--------|--------|
| <b>CALCIUM (MG)</b>     |                  |        |        |        |        |        |
| Greene/Humphreys        |                  |        |        |        |        |        |
| Intake from H.S. Meals  | 110              | 505.34 | 686.96 | 729.38 | 618.32 | 172.00 |
| Pct of Dietary Standard | 110              | 63.17  | 85.87  | 91.17  | 77.29  | 21.40  |
| St. Clair               |                  |        |        |        |        |        |
| Intake from H.S. Meals  | 71               | 346.61 | 504.03 | 652.20 | 493.27 | 205.00 |
| Pct of Dietary Standard | 69               | 42.84  | 62.86  | 78.43  | 60.95  | 25.70  |
| Maricopa                |                  |        |        |        |        |        |
| Intake from H.S. Meals  | 56               | 328.39 | 388.06 | 515.48 | 399.28 | 148.00 |
| Pct of Dietary Standard | 56               | 41.05  | 48.51  | 64.43  | 49.91  | 18.60  |
| Mingo                   |                  |        |        |        |        |        |
| Intake from H.S. Meals  | 70               | 514.04 | 667.05 | 779.31 | 643.07 | 237.00 |
| Pct of Dietary Standard | 71               | 64.28  | 83.79  | 97.41  | 80.48  | 29.40  |
| <b>IRON (MG)</b>        |                  |        |        |        |        |        |
| Greene/Humphreys        |                  |        |        |        |        |        |
| Intake from H.S. Meals  | 108 <sup>a</sup> | 3.31   | 4.25   | 5.97   | 4.94   | 2.34   |
| Pct of Dietary Standard | 109              | 28.21  | 37.99  | 54.12  | 43.20  | 22.80  |
| St. Clair               |                  |        |        |        |        |        |
| Intake from H.S. Meals  | 70               | 3.91   | 4.78   | 5.90   | 4.76   | 1.31   |
| Pct of Dietary Standard | 70               | 32.23  | 40.69  | 53.76  | 42.38  | 14.60  |
| Maricopa                |                  |        |        |        |        |        |
| Intake from H.S. Meals  | 55               | 2.41   | 2.88   | 4.19   | 3.44   | 1.76   |
| Pct of Dietary Standard | 55               | 24.07  | 28.81  | 41.86  | 34.37  | 17.60  |
| Mingo                   |                  |        |        |        |        |        |
| Intake from H.S. Meals  | 71               | 3.48   | 4.62   | 5.81   | 4.83   | 2.01   |
| Pct of Dietary Standard | 71               | 28.85  | 42.32  | 57.15  | 44.54  | 21.50  |

Table 6 -4 (continued)

Nutrient Intake from Head Start Meals and Percent of Recommended Daily Intake Received for Posttested Head Start Children (Samples A, B, C) Present on Day of Recall within Site

|                         | N   | Q1     | Q2     | Q3     | MEAN   | SD     |
|-------------------------|-----|--------|--------|--------|--------|--------|
| <b>MAGNESIUM (MG)</b>   |     |        |        |        |        |        |
| Greene/Humphreys        |     |        |        |        |        |        |
| Intake from H.S. Meals  | 110 | 95.58  | 115.27 | 137.95 | 119.07 | 32.90  |
| Pct of Dietary Standard | 110 | 51.14  | 65.38  | 79.91  | 66.33  | 19.80  |
| St. Clair               |     |        |        |        |        |        |
| Intake from H.S. Meals  | 71  | 91.02  | 125.20 | 153.64 | 127.00 | 47.20  |
| Pct of Dietary Standard | 72  | 53.95  | 68.27  | 83.58  | 70.39  | 26.00  |
| Maricopa                |     |        |        |        |        |        |
| Intake from H.S. Meals  | 58  | 57.18  | 73.63  | 98.94  | 77.56  | 31.00  |
| Pct of Dietary Standard | 58  | 28.59  | 36.81  | 49.47  | 38.78  | 15.50  |
| Mingo                   |     |        |        |        |        |        |
| Intake from H.S. Meals  | 68  | 104.33 | 121.38 | 145.89 | 123.26 | 45.90  |
| Pct of Dietary Standard | 70  | 53.27  | 65.92  | 78.47  | 66.83  | 24.90  |
| <b>PHOSPHORUS (MG)</b>  |     |        |        |        |        |        |
| Greene/Humphreys        |     |        |        |        |        |        |
| Intake from H.S. Meals  | 110 | 529.41 | 660.78 | 776.48 | 661.42 | 188.00 |
| Pct of Dietary Standard | 109 | 66.18  | 82.56  | 96.55  | 82.25  | 23.10  |
| St. Clair               |     |        |        |        |        |        |
| Intake from H.S. Meals  | 71  | 427.72 | 556.65 | 686.65 | 553.50 | 194.00 |
| Pct of Dietary Standard | 71  | 53.46  | 69.58  | 85.56  | 68.68  | 23.80  |
| Maricopa                |     |        |        |        |        |        |
| Intake from H.S. Meals  | 57  | 333.33 | 403.19 | 544.63 | 438.68 | 189.00 |
| Pct of Dietary Standard | 57  | 41.67  | 50.40  | 68.08  | 54.83  | 23.70  |
| Mingo                   |     |        |        |        |        |        |
| Intake from H.S. Meals  | 71  | 551.54 | 643.88 | 782.26 | 641.82 | 220.00 |
| Pct of Dietary Standard | 72  | 68.94  | 80.59  | 97.78  | 80.29  | 27.30  |

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Table 6 -4 (continued)

Nutrient Intake from Head Start Meals and Percent of Recommended Daily Intake Received for Posttested Head Start Children (Samples A, B, C) Present on Day of Recall within Site

|                         | N   | Q1    | MED   | Q3    | MEAN  | SD     |
|-------------------------|-----|-------|-------|-------|-------|--------|
| <b>VITAMIN A (IU)</b>   |     |       |       |       |       |        |
| Greene/Humphreys        |     |       |       |       |       |        |
| Intake from H.S. Meals  | 108 | 1561. | 2332. | 5448. | 6839. | 10243. |
| Pct of Dietary Standard | 107 | 67.   | 110.  | 259.  | 309.  | 488.   |
| St. Clair               |     |       |       |       |       |        |
| Intake from H.S. Meals  | 72  | 1342. | 2671. | 4179. | 4271. | 5807.  |
| Pct of Dietary Standard | 72  | 61.   | 114.  | 177.  | 187.  | 263.   |
| Maricopa                |     |       |       |       |       |        |
| Intake from H.S. Meals  | 57  | 787.  | 1059. | 1466. | 1349. | 1251.  |
| Pct of Dietary Standard | 58  | 31.   | 42.   | 61.   | 54.   | 50.    |
| Mingo                   |     |       |       |       |       |        |
| Intake from H.S. Meals  | 72  | 1282. | 1623. | 2337. | 2017. | 1141.  |
| Pct of Dietary Standard | 72  | 57.   | 70.   | 116.  | 85.   | 46.    |
| <b>THIAMIN (MG)</b>     |     |       |       |       |       |        |
| Greene/Humphreys        |     |       |       |       |       |        |
| Intake from H.S. Meals  | 109 | 0.43  | 0.51  | 0.62  | 0.54  | 0.16   |
| Pct of Dietary Standard | 110 | 50.71 | 63.17 | 87.56 | 68.46 | 22.00  |
| St. Clair               |     |       |       |       |       |        |
| Intake from H.S. Meals  | 71  | 0.42  | 0.54  | 0.62  | 0.52  | 0.15   |
| Pct of Dietary Standard | 70  | 42.43 | 50.42 | 64.03 | 51.58 | 16.40  |
| Maricopa                |     |       |       |       |       |        |
| Intake from H.S. Meals  | 57  | 0.91  | 0.39  | 0.46  | 0.40  | 0.14   |
| Pct of Dietary Standard | 54  | 40.93 | 52.68 | 64.32 | 54.85 | 20.20  |
| Mingo                   |     |       |       |       |       |        |
| Intake from H.S. Meals  | 69  | 0.53  | 0.61  | 0.81  | 0.65  | 0.25   |
| Pct of Dietary Standard | 72  | 51.30 | 62.34 | 79.89 | 65.82 | 23.30  |

Table 6 -4 (continued)

Nutrient Intake from Head Start Meals and Percent of Recommended  
Daily Intake Received for Posttested Head Start Children  
(Samples A, B, C) Present on Day of Recall within Site

|                         | N   | Q1    | MED    | Q3     | MEAN   | SD    |
|-------------------------|-----|-------|--------|--------|--------|-------|
| <b>RIBOFLAVIN (MG)</b>  |     |       |        |        |        |       |
| Greene/Humphreys        |     |       |        |        |        |       |
| Intake from H.S. Meals  | 103 | 0.98  | 1.11   | 1.31   | 1.22   | 0.55  |
| Pct of Dietary Standard | 101 | 99.01 | 126.36 | 163.31 | 136.20 | 57.00 |
| St. Clair               |     |       |        |        |        |       |
| Intake from H.S. Meals  | 72  | 0.76  | 0.97   | 1.19   | 1.01   | 0.49  |
| Pct of Dietary Standard | 71  | 61.08 | 87.05  | 110.51 | 89.92  | 45.50 |
| Maricopa                |     |       |        |        |        |       |
| Intake from H.S. Meals  | 55  | 0.55  | 0.67   | 0.80   | 0.69   | 0.29  |
| Pct of Dietary Standard | 57  | 60.26 | 81.69  | 105.42 | 84.35  | 31.10 |
| Mingo                   |     |       |        |        |        |       |
| Intake from H.S. Meals  | 71  | 0.90  | 1.12   | 1.30   | 1.06   | 0.35  |
| Pct of Dietary Standard | 72  | 75.67 | 98.54  | 120.97 | 98.28  | 32.60 |
| <b>NIACIN (MG)</b>      |     |       |        |        |        |       |
| Greene/Humphreys        |     |       |        |        |        |       |
| Intake from H.S. Meals  | 106 | 3.38  | 4.64   | 7.63   | 5.97   | 3.50  |
| Pct of Dietary Standard | 109 | 32.24 | 45.99  | 71.68  | 58.93  | 39.70 |
| St. Clair               |     |       |        |        |        |       |
| Intake from H.S. Meals  | 72  | 4.50  | 5.46   | 6.30   | 5.52   | 1.92  |
| Pct of Dietary Standard | 71  | 30.85 | 39.88  | 50.99  | 42.26  | 18.00 |
| Maricopa                |     |       |        |        |        |       |
| Intake from H.S. Meals  | 57  | 2.28  | 3.15   | 4.58   | 3.79   | 2.93  |
| Pct of Dietary Standard | 56  | 24.85 | 32.12  | 45.85  | 38.34  | 22.40 |
| Mingo                   |     |       |        |        |        |       |
| Intake from H.S. Meals  | 70  | 3.55  | 4.81   | 6.15   | 5.17   | 2.37  |
| Pct of Dietary Standard | 71  | 25.88 | 35.12  | 49.07  | 41.01  | 19.60 |

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Table 6 -4 (continued)

Nutrient Intake from Head Start Meals and Percent of Recommended Daily Intake Received for Posttested Head Start Children (Samples A, B, C) Present on Day of Recall within Site

|                          | N   | Q1    | MED   | Q3     | MEAN   | SD     |
|--------------------------|-----|-------|-------|--------|--------|--------|
| <b>VITAMIN B6 (MG)</b>   |     |       |       |        |        |        |
| Greene/Humphreys         |     |       |       |        |        |        |
| Intake from H.S. Meals   | 106 | 0.38  | 0.52  | 0.70   | 0.58   | 0.25   |
| Pct of Dietary Standard  | 108 | 31.23 | 46.22 | 73.23  | 52.10  | 25.60  |
| St. Clair                |     |       |       |        |        |        |
| Intake from H.S. Meals   | 69  | 0.42  | 0.50  | 0.68   | 0.55   | 0.21   |
| Pct of Dietary Standard  | 71  | 35.11 | 44.23 | 57.77  | 49.05  | 19.50  |
| Maricopa                 |     |       |       |        |        |        |
| Intake from H.S. Meals   | 57  | 0.29  | 0.37  | 0.45   | 0.38   | 0.20   |
| Pct of Dietary Standard  | 55  | 21.81 | 27.69 | 34.19  | 28.99  | 15.70  |
| Mingo                    |     |       |       |        |        |        |
| Intake from H.S. Meals   | 70  | 0.41  | 0.54  | 0.74   | 0.57   | 0.25   |
| Pct of Dietary Standard  | 71  | 34.81 | 46.44 | 58.15  | 49.16  | 22.90  |
| <b>VITAMIN B12 (MCG)</b> |     |       |       |        |        |        |
| Greene/Humphreys         |     |       |       |        |        |        |
| Intake from H.S. Meals   | 94  | 1.63  | 2.08  | 2.92   | 2.87   | 2.96   |
| Pct of Dietary Standard  | 102 | 73.60 | 98.13 | 142.75 | 275.46 | 670.00 |
| St. Clair                |     |       |       |        |        |        |
| Intake from H.S. Meals   | 67  | 1.31  | 1.89  | 2.23   | 1.82   | 0.79   |
| Pct of Dietary Standard  | 68  | 59.43 | 80.02 | 101.63 | 86.95  | 75.80  |
| Maricopa                 |     |       |       |        |        |        |
| Intake from H.S. Meals   | 56  | 1.04  | 1.51  | 1.96   | 1.65   | 1.07   |
| Pct of Dietary Standard  | 58  | 41.96 | 61.72 | 81.08  | 67.09  | 42.80  |
| Mingo                    |     |       |       |        |        |        |
| Intake from H.S. Meals   | 71  | 1.55  | 2.14  | 2.67   | 2.11   | 0.88   |
| Pct of Dietary Standard  | 72  | 62.98 | 90.52 | 109.42 | 89.70  | 37.00  |

Table 6 -4 (continued)

Nutrient Intake from Head Start Meals and Percent of Recommended  
Daily Intake Received for Posttested Head Start Children  
(Samples A, B, C) Present on Day of Recall within Site

|                         | N   | Q1     | MED    | Q3     | MEAN   | SD    |
|-------------------------|-----|--------|--------|--------|--------|-------|
| <b>VITAMIN C (MG)</b>   |     |        |        |        |        |       |
| Greene/Humphreys        |     |        |        |        |        |       |
| Intake from H.S. Meals  | 108 | 27.84  | 36.71  | 46.21  | 38.71  | 19.30 |
| Pct of Dietary Standard | 110 | 62.07  | 82.52  | 103.22 | 86.96  | 43.60 |
| St. Clair               |     |        |        |        |        |       |
| Intake from H.S. Meals  | 71  | 60.40  | 68.70  | 78.41  | 71.03  | 16.50 |
| Pct of Dietary Standard | 71  | 134.22 | 152.67 | 176.46 | 157.83 | 36.70 |
| Maricopa                |     |        |        |        |        |       |
| Intake from H.S. Meals  | 58  | 10.95  | 24.16  | 41.58  | 30.70  | 29.90 |
| Pct of Dietary Standard | 57  | 25.16  | 54.58  | 92.40  | 70.57  | 64.60 |
| Mingo                   |     |        |        |        |        |       |
| Intake from H.S. Meals  | 66  | 25.92  | 46.19  | 61.41  | 47.04  | 30.60 |
| Pct of Dietary Standard | 66  | 57.60  | 102.65 | 136.48 | 104.54 | 67.90 |



Table 6 -5

Nutrient Intake from Head Start Meals and Percent of Recommended Daily Intake Received for Posttested Head Start Children (Samples A, B, C) Present on Day of Recall across Sites

|                          | N   | Q1     | MED    | Q3     | MEAN   | SD     |
|--------------------------|-----|--------|--------|--------|--------|--------|
| <b>KILOCALORIES</b>      |     |        |        |        |        |        |
| Intake from H.S. Meals   | 305 | 572.71 | 734.52 | 869.43 | 740.86 | 239.00 |
| Pct of Dietary Standard  | 310 | 40.99  | 53.20  | 64.73  | 53.72  | 17.80  |
| <b>PROTEIN (GM)</b>      |     |        |        |        |        |        |
| Intake from H.S. Meals   | 307 | 21.96  | 29.63  | 35.92  | 29.71  | 10.50  |
| Pct of Dietary Standard  | 307 | 70.14  | 95.71  | 117.50 | 95.67  | 34.50  |
| <b>CALCIUM (MG)</b>      |     |        |        |        |        |        |
| Intake from H.S. Meals   | 307 | 393.54 | 580.40 | 710.32 | 555.09 | 213.00 |
| Pct of Dietary Standard  | 306 | 48.94  | 72.55  | 88.86  | 69.34  | 26.60  |
| <b>IRON (MG)</b>         |     |        |        |        |        |        |
| Intake from H.S. Meals   | 304 | 3.10   | 4.30   | 5.73   | 4.60   | 2.03   |
| Pct of Dietary Standard  | 305 | 27.17  | 38.50  | 52.90  | 41.73  | 20.20  |
| <b>MAGNESIUM (MG)</b>    |     |        |        |        |        |        |
| Intake from H.S. Meals   | 307 | 86.25  | 113.36 | 137.69 | 113.99 | 43.10  |
| Pct of Dietary Standard  | 310 | 43.95  | 61.19  | 76.74  | 62.23  | 24.60  |
| <b>PHOSPHORUS (MG)</b>   |     |        |        |        |        |        |
| Intake from H.S. Meals   | 309 | 429.00 | 616.79 | 721.62 | 591.03 | 213.00 |
| Pct of Dietary Standard  | 309 | 53.63  | 77.01  | 89.97  | 73.62  | 26.40  |
| <b>VITAMIN A (IU)</b>    |     |        |        |        |        |        |
| Intake from H.S. Meals   | 309 | 1187.  | 1869.  | 3641.  | 4104.  | 7061.  |
| Pct of Dietary Standard  | 309 | 51.    | 78.    | 150.   | 181.   | 331.   |
| <b>THIAMIN (MG)</b>      |     |        |        |        |        |        |
| Intake from H.S. Meals   | 306 | 0.39   | 0.52   | 0.62   | 0.53   | 0.19   |
| Pct of Dietary Standard  | 306 | 47.15  | 58.94  | 75.77  | 61.58  | 22.00  |
| <b>RIBOFLAVIN (MG)</b>   |     |        |        |        |        |        |
| Intake from H.S. Meals   | 301 | 0.70   | 1.04   | 1.21   | 1.04   | 0.48   |
| Pct of Dietary Standard  | 301 | 74.43  | 101.03 | 130.33 | 106.39 | 49.70  |
| <b>NIACIN (MG)</b>       |     |        |        |        |        |        |
| Intake from H.S. Meals   | 305 | 3.29   | 4.62   | 6.25   | 5.27   | 2.92   |
| Pct of Dietary Standard  | 307 | 28.47  | 39.14  | 56.24  | 47.18  | 29.80  |
| <b>VITAMIN B6 (MG)</b>   |     |        |        |        |        |        |
| Intake from H.S. Meals   | 302 | 0.37   | 0.47   | 0.68   | 0.53   | 0.24   |
| Pct of Dietary Standard  | 305 | 29.00  | 42.15  | 57.44  | 46.54  | 23.50  |
| <b>VITAMIN B12 (MCG)</b> |     |        |        |        |        |        |
| Intake from H.S. Meals   | 288 | 1.38   | 1.97   | 2.57   | 2.20   | 1.91   |
| Pct of Dietary Standard  | 300 | 59.48  | 83.52  | 110.98 | 147.87 | 202.00 |
| <b>VITAMIN C (MG)</b>    |     |        |        |        |        |        |
| Intake from H.S. Meals   | 302 | 26.06  | 41.82  | 64.22  | 46.82  | 27.60  |
| Pct of Dietary Standard  | 304 | 58.17  | 92.93  | 142.80 | 104.26 | 61.30  |

Table 6 -6

Nutrient Intake from Head Start Meals and Percent of Total  
Daily Intake for Posttested Head Start Children  
(Samples A, B, C) Present on Day of Recall within Site

|                           | N   | Q1     | MED    | Q3      | MEAN   | SD     |
|---------------------------|-----|--------|--------|---------|--------|--------|
| <b>KILOCALORIES</b>       |     |        |        |         |        |        |
| Greene/Humphreys          |     |        |        |         |        |        |
| Intake from H.S. Meals    | 108 | 613.18 | 721.00 | 821.87  | 729.36 | 172.00 |
| Pct of Total Daily Intake | 109 | 37.37  | 46.08  | 55.87   | 47.07  | 13.20  |
| St. Clair                 |     |        |        |         |        |        |
| Intake from H.S. Meals    | 71  | 607.14 | 767.49 | 894.73  | 777.30 | 231.00 |
| Pct of Total Daily Intake | 71  | 30.27  | 37.93  | 47.95   | 38.81  | 14.30  |
| Maricopa                  |     |        |        |         |        |        |
| Intake from H.S. Meals    | 58  | 437.29 | 518.94 | 741.02  | 600.44 | 258.00 |
| Pct of Total Daily Intake | 58  | 31.60  | 35.62  | 46.68   | 39.57  | 14.00  |
| Mingo                     |     |        |        |         |        |        |
| Intake from H.S. Meals    | 67  | 658.41 | 847.50 | 1040.87 | 842.52 | 268.00 |
| Pct of Total Daily Intake | 67  | 35.33  | 45.70  | 51.08   | 44.60  | 12.30  |
| <b>PROTEIN (GM)</b>       |     |        |        |         |        |        |
| Greene/Humphreys          |     |        |        |         |        |        |
| Intake from H.S. Meals    | 108 | 24.20  | 30.06  | 37.62   | 31.34  | 9.88   |
| Pct of Total Daily Intake | 108 | 39.68  | 49.25  | 62.77   | 51.80  | 17.30  |
| St. Clair                 |     |        |        |         |        |        |
| Intake from H.S. Meals    | 72  | 21.77  | 28.10  | 35.07   | 28.98  | 9.21   |
| Pct of Total Daily Intake | 72  | 30.70  | 40.40  | 48.19   | 40.16  | 13.20  |
| Maricopa                  |     |        |        |         |        |        |
| Intake from H.S. Meals    | 56  | 16.16  | 20.94  | 32.63   | 24.06  | 10.60  |
| Pct of Total Daily Intake | 56  | 30.64  | 38.55  | 53.38   | 42.65  | 15.80  |
| Mingo                     |     |        |        |         |        |        |
| Intake from H.S. Meals    | 71  | 25.38  | 32.75  | 38.26   | 32.44  | 11.00  |
| Pct of Total Daily Intake | 71  | 36.37  | 44.33  | 52.32   | 45.40  | 13.30  |

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Table 6 -6 (continued)

Nutrient Intake from Head Start Meals and Percent of Total  
Daily Intake for Posttested Head Start Children  
(Samples A, B, C) Present on Day of Recall within Site

|                           | N   | Q1    | MED    | Q3     | MEAN   | SD    |
|---------------------------|-----|-------|--------|--------|--------|-------|
| <b>FAT (GM)</b>           |     |       |        |        |        |       |
| Greene/Humphreys          |     |       |        |        |        |       |
| Intake from H.S. Meals    | 107 | 23.69 | 29.28  | 34.97  | 29.63  | 8.46  |
| Pct of Total Daily Intake | 107 | 36.63 | 49.04  | 60.19  | 50.09  | 16.50 |
| St. Clair                 |     |       |        |        |        |       |
| Intake from H.S. Meals    | 71  | 20.94 | 28.69  | 37.79  | 29.34  | 11.70 |
| Pct of Total Daily Intake | 71  | 27.25 | 39.23  | 45.70  | 37.35  | 13.50 |
| Maricopa                  |     |       |        |        |        |       |
| Intake from H.S. Meals    | 58  | 19.47 | 25.37  | 38.33  | 29.02  | 13.30 |
| Pct of Total Daily Intake | 58  | 35.84 | 43.73  | 57.47  | 45.60  | 17.00 |
| Mingo                     |     |       |        |        |        |       |
| Intake from H.S. Meals    | 66  | 24.38 | 33.46  | 37.54  | 31.58  | 9.85  |
| Pct of Total Daily Intake | 66  | 34.85 | 43.35  | 52.38  | 44.45  | 13.60 |
| <b>CARBOHYDRATE (GM)</b>  |     |       |        |        |        |       |
| Greene/Humphreys          |     |       |        |        |        |       |
| Intake from H.S. Meals    | 110 | 70.37 | 84.98  | 98.32  | 86.81  | 23.50 |
| Pct of Total Daily Intake | 110 | 35.16 | 43.48  | 52.18  | 44.56  | 12.80 |
| St. Clair                 |     |       |        |        |        |       |
| Intake from H.S. Meals    | 71  | 78.86 | 97.40  | 113.09 | 102.10 | 39.30 |
| Pct of Total Daily Intake | 71  | 30.90 | 35.71  | 46.76  | 39.60  | 12.70 |
| Maricopa                  |     |       |        |        |        |       |
| Intake from H.S. Meals    | 58  | 44.80 | 56.83  | 67.88  | 59.16  | 28.90 |
| Pct of Total Daily Intake | 58  | 25.76 | 29.62  | 40.14  | 34.15  | 14.50 |
| Mingo                     |     |       |        |        |        |       |
| Intake from H.S. Meals    | 70  | 85.94 | 105.67 | 137.72 | 110.27 | 43.10 |
| Pct of Total Daily Intake | 70  | 34.16 | 46.80  | 55.05  | 44.65  | 14.30 |

Table 6 -6 (continued)

Nutrient Intake from Head Start Meals and Percent of Total  
Daily Intake for Posttested Head Start Children  
(Samples A, B, C) Present on Day of Recall within Site

|                           | N   | Q1     | MED    | Q3     | MEAN   | SD     |
|---------------------------|-----|--------|--------|--------|--------|--------|
| <b>CALCIUM (MG)</b>       |     |        |        |        |        |        |
| Greene/Humphreys          |     |        |        |        |        |        |
| Intake from H.S. Meals    | 110 | 505.34 | 686.96 | 729.38 | 618.32 | 172.00 |
| Pct of Total Daily Intake | 110 | 83.43  | 67.96  | 81.84  | 66.73  | 18.10  |
| St. Clair                 |     |        |        |        |        |        |
| Intake from H.S. Meals    | 71  | 346.61 | 504.03 | 652.20 | 493.27 | 205.00 |
| Pct of Total Daily Intake | 71  | 33.22  | 48.19  | 57.82  | 46.67  | 17.30  |
| Maricopa                  |     |        |        |        |        |        |
| Intake from H.S. Meals    | 56  | 328.39 | 388.06 | 515.48 | 399.28 | 148.00 |
| Pct of Total Daily Intake | 56  | 36.58  | 46.67  | 57.53  | 49.23  | 18.80  |
| Mingo                     |     |        |        |        |        |        |
| Intake from H.S. Meals    | 70  | 514.04 | 667.05 | 779.31 | 643.07 | 237.00 |
| Pct of Total Daily Intake | 70  | 47.18  | 54.58  | 67.14  | 56.74  | 15.80  |
| <b>IRON (MG)</b>          |     |        |        |        |        |        |
| Greene/Humphreys          |     |        |        |        |        |        |
| Intake from H.S. Meals    | 108 | 3.31   | 4.25   | 5.97   | 4.94   | 2.34   |
| Pct of Total Daily Intake | 108 | 34.80  | 44.78  | 58.49  | 47.86  | 17.70  |
| St. Clair                 |     |        |        |        |        |        |
| Intake from H.S. Meals    | 70  | 3.91   | 4.78   | 5.90   | 4.76   | 1.31   |
| Pct of Total Daily Intake | 70  | 29.26  | 37.60  | 47.46  | 39.19  | 12.40  |
| Maricopa                  |     |        |        |        |        |        |
| Intake from H.S. Meals    | 55  | 2.41   | 2.88   | 4.19   | 3.44   | 1.76   |
| Pct of Total Daily Intake | 55  | 26.05  | 36.73  | 43.50  | 37.46  | 14.80  |
| Mingo                     |     |        |        |        |        |        |
| Intake from H.S. Meals    | 71  | 3.48   | 4.62   | 5.81   | 4.83   | 2.01   |
| Pct of Total Daily Intake | 71  | 30.67  | 40.01  | 49.53  | 41.93  | 15.00  |

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Table 6 -6 (continued)

Nutrient Intake from Head Start Meals and Percent of Total  
Daily Intake for Posttested Head Start Children  
(Samples A, B, C) Present on Day of Recall within Site

|                           | N   | Q1     | MED    | Q3     | MEAN   | SD     |
|---------------------------|-----|--------|--------|--------|--------|--------|
| <b>MAGNESIUM (MG)</b>     |     |        |        |        |        |        |
| Greene/Humphreys          |     |        |        |        |        |        |
| Intake from H.S. Meals    | 110 | 95.58  | 115.27 | 137.95 | 119.07 | 32.90  |
| Pct of Total Daily Intake | 110 | 42.29  | 50.84  | 65.89  | 54.35  | 15.60  |
| St. Clair                 |     |        |        |        |        |        |
| Intake from H.S. Meals    | 71  | 91.02  | 125.20 | 183.64 | 127.00 | 47.20  |
| Pct of Total Daily Intake | 71  | 33.16  | 43.16  | 57.64  | 45.38  | 15.50  |
| Maricopa                  |     |        |        |        |        |        |
| Intake from H.S. Meals    | 58  | 57.18  | 73.63  | 98.94  | 77.56  | 31.00  |
| Pct of Total Daily Intake | 58  | 30.76  | 38.67  | 54.71  | 42.31  | 16.40  |
| Mingo                     |     |        |        |        |        |        |
| Intake from H.S. Meals    | 68  | 104.33 | 121.38 | 145.89 | 123.26 | 45.90  |
| Pct of Total Daily Intake | 68  | 38.72  | 47.06  | 57.22  | 49.23  | 14.70  |
| <b>PHOSPHORUS (MG)</b>    |     |        |        |        |        |        |
| Greene/Humphreys          |     |        |        |        |        |        |
| Intake from H.S. Meals    | 110 | 528.41 | 660.78 | 776.48 | 661.42 | 188.00 |
| Pct of Total Daily Intake | 110 | 45.50  | 58.42  | 71.12  | 58.44  | 16.70  |
| St. Clair                 |     |        |        |        |        |        |
| Intake from H.S. Meals    | 71  | 427.72 | 556.65 | 686.65 | 553.50 | 194.00 |
| Pct of Total Daily Intake | 71  | 32.08  | 42.76  | 52.18  | 43.07  | 14.30  |
| Maricopa                  |     |        |        |        |        |        |
| Intake from H.S. Meals    | 57  | 333.33 | 403.19 | 544.63 | 438.68 | 189.00 |
| Pct of Total Daily Intake | 57  | 32.41  | 40.67  | 54.21  | 43.54  | 15.10  |
| Mingo                     |     |        |        |        |        |        |
| Intake from H.S. Meals    | 71  | 551.54 | 643.88 | 782.26 | 641.82 | 220.00 |
| Pct of Total Daily Intake | 71  | 40.58  | 46.94  | 59.11  | 48.85  | 13.70  |

Table 6 -6 (continued)

Nutrient Intake from Head Start Meals and Percent of Total  
Daily Intake for Posttested Head Start Children  
(Samples A, B, C) Present on Day of Recall within Site

|                           | N   | Q1    | MED   | Q3    | MEAN  | SD     |
|---------------------------|-----|-------|-------|-------|-------|--------|
| <b>VITAMIN A (IU)</b>     |     |       |       |       |       |        |
| Greene/Humphreys          |     |       |       |       |       |        |
| Intake from H.S. Meals    | 108 | 1561. | 2332. | 5448. | 6839. | 10243. |
| Pct of Total Daily Intake | 108 | 46.   | 69.   | 86.   | 64.   | 27.    |
| St. Clair                 |     |       |       |       |       |        |
| Intake from H.S. Meals    | 72  | 1342. | 2671. | 4179. | 4271. | 5807.  |
| Pct of Total Daily Intake | 72  | 31.   | 51.   | 66.   | 50.   | 23.    |
| Maricopa                  |     |       |       |       |       |        |
| Intake from H.S. Meals    | 57  | 787.  | 1059. | 1466. | 1349. | 1251.  |
| Pct of Total Daily Intake | 57  | 22.   | 37.   | 59.   | 42.   | 26.    |
| Mingo                     |     |       |       |       |       |        |
| Intake from H.S. Meals    | 72  | 1282. | 1623. | 2337. | 2017. | 1141.  |
| Pct of Total Daily Intake | 72  | 32.   | 51.   | 66.   | 48.   | 22.    |
| <b>THIAMIN (MG)</b>       |     |       |       |       |       |        |
| Greene/Humphreys          |     |       |       |       |       |        |
| Intake from H.S. Meals    | 109 | 0.43  | 0.51  | 0.62  | 0.54  | 0.16   |
| Pct of Total Daily Intake | 109 | 35.36 | 44.14 | 61.68 | 47.48 | 17.60  |
| St. Clair                 |     |       |       |       |       |        |
| Intake from H.S. Meals    | 71  | 0.42  | 0.54  | 0.62  | 0.52  | 0.15   |
| Pct of Total Daily Intake | 71  | 27.84 | 34.80 | 45.61 | 36.22 | 12.10  |
| Maricopa                  |     |       |       |       |       |        |
| Intake from H.S. Meals    | 57  | 0.31  | 0.39  | 0.46  | 0.40  | 0.14   |
| Pct of Total Daily Intake | 57  | 27.42 | 37.90 | 46.40 | 40.14 | 16.50  |
| Mingo                     |     |       |       |       |       |        |
| Intake from H.S. Meals    | 69  | 0.53  | 0.61  | 0.81  | 0.65  | 0.25   |
| Pct of Total Daily Intake | 69  | 38.27 | 45.51 | 56.49 | 47.59 | 14.70  |

Table 6 -6 (continued)

Nutrient Intake from Head Start Meals and Percent of Total  
Daily Intake for Posttested Head Start Children  
(Samples A, B, C) Present on Day of Recall within Site

|                           | N   | Q1    | MED   | Q3    | MEAN  | SD    |
|---------------------------|-----|-------|-------|-------|-------|-------|
| <b>RIBOFLAVIN (MG)</b>    |     |       |       |       |       |       |
| Greene/Humphreys          |     |       |       |       |       |       |
| Intake from H.S. Meals    | 103 | 0.98  | 1.11  | 1.31  | 1.22  | 0.55  |
| Pct of Total Daily Intake | 103 | 48.79 | 62.44 | 75.00 | 61.76 | 17.40 |
| St. Clair                 |     |       |       |       |       |       |
| Intake from H.S. Meals    | 72  | 0.76  | 0.97  | 1.19  | 1.01  | 0.49  |
| Pct of Total Daily Intake | 72  | 31.66 | 41.29 | 51.21 | 43.27 | 16.10 |
| Maricopa                  |     |       |       |       |       |       |
| Intake from H.S. Meals    | 55  | 0.55  | 0.67  | 0.80  | 0.69  | 0.29  |
| Pct of Total Daily Intake | 55  | 31.31 | 40.31 | 52.15 | 44.39 | 17.90 |
| Mingo                     |     |       |       |       |       |       |
| Intake from H.S. Meals    | 71  | 0.90  | 1.12  | 1.30  | 1.06  | 0.35  |
| Pct of Total Daily Intake | 71  | 42.49 | 51.46 | 60.76 | 51.14 | 14.60 |
| <b>NIACIN (MG)</b>        |     |       |       |       |       |       |
| Greene/Humphreys          |     |       |       |       |       |       |
| Intake from H.S. Meals    | 106 | 3.38  | 4.64  | 7.63  | 5.97  | 3.50  |
| Pct of Total Daily Intake | 106 | 26.96 | 39.85 | 56.93 | 48.42 | 20.30 |
| St. Clair                 |     |       |       |       |       |       |
| Intake from H.S. Meals    | 72  | 4.50  | 5.46  | 6.30  | 5.52  | 1.92  |
| Pct of Total Daily Intake | 72  | 23.23 | 33.07 | 45.58 | 34.79 | 14.00 |
| Maricopa                  |     |       |       |       |       |       |
| Intake from H.S. Meals    | 57  | 2.28  | 3.15  | 4.58  | 3.79  | 2.93  |
| Pct of Total Daily Intake | 57  | 18.19 | 29.53 | 41.91 | 34.50 | 19.80 |
| Mingo                     |     |       |       |       |       |       |
| Intake from H.S. Meals    | 70  | 3.55  | 4.81  | 6.15  | 5.17  | 2.37  |
| Pct of Total Daily Intake | 70  | 26.41 | 33.68 | 45.85 | 37.35 | 15.70 |

Table 6-6 (continued)

Nutrient Intake from Head Start Meals and Percent of Total  
Daily Intake for Posttested Head Start Children  
(Samples A, B, C) Present on Day of Recall within Site

|                           | N   | Q1    | MED   | Q3    | MEAN  | SD    |
|---------------------------|-----|-------|-------|-------|-------|-------|
| <b>VITAMIN B6 (MG)</b>    |     |       |       |       |       |       |
| Greene/Humphreys          |     |       |       |       |       |       |
| Intake from H.S. Meals    | 106 | 0.38  | 0.52  | 0.70  | 0.58  | 0.25  |
| Pct of Total Daily Intake | 106 | 32.86 | 47.31 | 59.91 | 47.78 | 18.50 |
| St. Clair                 |     |       |       |       |       |       |
| Intake from H.S. Meals    | 69  | 0.42  | 0.50  | 0.68  | 0.55  | 0.21  |
| Pct of Total Daily Intake | 69  | 27.32 | 35.38 | 47.89 | 37.85 | 14.10 |
| Maricopa                  |     |       |       |       |       |       |
| Intake from H.S. Meals    | 57  | 0.29  | 0.37  | 0.45  | 0.38  | 0.20  |
| Pct of Total Daily Intake | 57  | 21.79 | 30.53 | 49.90 | 36.14 | 19.20 |
| Mingo                     |     |       |       |       |       |       |
| Intake from H.S. Meals    | 70  | 0.41  | 0.54  | 0.74  | 0.57  | 0.25  |
| Pct of Total Daily Intake | 70  | 30.88 | 41.57 | 56.78 | 43.49 | 16.50 |
| <b>VITAMIN B12 (MCG)</b>  |     |       |       |       |       |       |
| Greene/Humphreys          |     |       |       |       |       |       |
| Intake from H.S. Meals    | 94  | 1.63  | 2.08  | 2.92  | 2.87  | 2.96  |
| Pct of Total Daily Intake | 94  | 46.89 | 62.74 | 83.35 | 63.99 | 22.20 |
| St. Clair                 |     |       |       |       |       |       |
| Intake from H.S. Meals    | 67  | 1.31  | 1.89  | 2.23  | 1.82  | 0.79  |
| Pct of Total Daily Intake | 67  | 28.75 | 44.87 | 56.59 | 43.32 | 20.10 |
| Maricopa                  |     |       |       |       |       |       |
| Intake from H.S. Meals    | 56  | 1.04  | 1.51  | 1.96  | 1.65  | 1.07  |
| Pct of Total Daily Intake | 56  | 30.84 | 41.41 | 64.37 | 45.33 | 23.30 |
| Mingo                     |     |       |       |       |       |       |
| Intake from H.S. Meals    | 71  | 1.55  | 2.14  | 2.67  | 2.11  | 0.88  |
| Pct of Total Daily Intake | 71  | 39.68 | 51.11 | 64.47 | 50.77 | 18.20 |

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Table 6 -6 (continued)

Nutrient Intake from Head Start Meals and Percent of Total  
Daily Intake for Posttested Head Start Children  
(Samples A, B, C) Present on Day of Recall within Site

|                           | N   | Q1    | MED    | Q3     | MEAN   | SD     |
|---------------------------|-----|-------|--------|--------|--------|--------|
| <b>VITAMIN C (NG)</b>     |     |       |        |        |        |        |
| Greene/Humphreys          |     |       |        |        |        |        |
| Intake from H.S. Meals    | 108 | 27.84 | 36.71  | 46.21  | 38.71  | 19.30  |
| Pct of Total Daily Intake | 108 | 20.58 | 39.80  | 66.25  | 45.25  | 27.90  |
| St. Clair                 |     |       |        |        |        |        |
| Intake from H.S. Meals    | 71  | 60.40 | 68.70  | 79.41  | 71.03  | 16.50  |
| Pct of Total Daily Intake | 71  | 27.06 | 39.69  | 60.22  | 44.89  | 20.70  |
| Maricopa                  |     |       |        |        |        |        |
| Intake from H.S. Meals    | 57  | 11.32 | 24.56  | 41.58  | 31.76  | 29.10  |
| Pct of Total Daily Intake | 57  | 21.04 | 34.74  | 59.82  | 39.18  | 26.40  |
| Mingo                     |     |       |        |        |        |        |
| Intake from H.S. Meals    | 66  | 25.92 | 46.19  | 61.41  | 47.04  | 30.60  |
| Pct of Total Daily Intake | 66  | 25.76 | 45.86  | 72.28  | 46.30  | 25.60  |
| <b>CHOLESTEROL (NG)</b>   |     |       |        |        |        |        |
| Greene/Humphreys          |     |       |        |        |        |        |
| Intake from H.S. Meals    | 105 | 94.22 | 143.35 | 277.17 | 189.27 | 121.00 |
| Pct of Total Daily Intake | 105 | 46.11 | 57.16  | 74.11  | 59.25  | 21.70  |
| St. Clair                 |     |       |        |        |        |        |
| Intake from H.S. Meals    | 71  | 90.18 | 152.67 | 272.22 | 188.38 | 127.00 |
| Pct of Total Daily Intake | 71  | 28.88 | 41.16  | 63.73  | 45.18  | 21.50  |
| Maricopa                  |     |       |        |        |        |        |
| Intake from H.S. Meals    | 58  | 55.97 | 87.60  | 129.56 | 150.78 | 176.00 |
| Pct of Total Daily Intake | 58  | 27.09 | 40.71  | 63.76  | 46.00  | 25.30  |
| Mingo                     |     |       |        |        |        |        |
| Intake from H.S. Meals    | 72  | 74.41 | 105.54 | 138.35 | 130.41 | 85.70  |
| Pct of Total Daily Intake | 72  | 34.25 | 41.84  | 50.00  | 42.95  | 17.50  |

Table 6 -7.

Nutrient Intake from Head Start Meals and Percent of Total  
Daily Intake for Posttested Head Start Children  
(Samples A, B, C) Present on Day of Recall across Sites

|                           | N   | Q1     | MED    | Q3     | MEAN   | SD     |
|---------------------------|-----|--------|--------|--------|--------|--------|
| <b>KILOCALORIES</b>       |     |        |        |        |        |        |
| Intake from H.S. Meals    | 305 | 572.41 | 734.52 | 869.43 | 740.86 | 239.00 |
| Pct of Total Daily Intake | 305 | 33.09  | 42.07  | 51.18  | 43.18  | 13.20  |
| <b>PROTEIN (GM)</b>       |     |        |        |        |        |        |
| Intake from H.S. Meals    | 307 | 21.96  | 29.63  | 35.92  | 29.71  | 10.50  |
| Pct of Total Daily Intake | 307 | 33.94  | 43.98  | 55.00  | 45.92  | 15.90  |
| <b>FAT (GM)</b>           |     |        |        |        |        |        |
| Intake from H.S. Meals    | 302 | 22.88  | 29.22  | 36.62  | 29.87  | 10.60  |
| Pct of Total Daily Intake | 302 | 34.15  | 44.18  | 54.39  | 45.00  | 16.00  |
| <b>CARBOHYDRATE (GM)</b>  |     |        |        |        |        |        |
| Intake from H.S. Meals    | 309 | 56.01  | 86.49  | 107.09 | 90.45  | 37.10  |
| Pct of Total Daily Intake | 309 | 31.15  | 39.22  | 51.63  | 41.49  | 14.00  |
| <b>CALCIUM (MG)</b>       |     |        |        |        |        |        |
| Intake from H.S. Meals    | 307 | 393.54 | 580.40 | 710.32 | 555.09 | 213.00 |
| Pct of Total Daily Intake | 307 | 43.65  | 54.80  | 70.28  | 56.62  | 19.40  |
| <b>IRON (MG)</b>          |     |        |        |        |        |        |
| Intake from H.S. Meals    | 304 | 3.10   | 4.30   | 5.73   | 4.60   | 2.03   |
| Pct of Total Daily Intake | 304 | 31.78  | 40.15  | 52.07  | 42.60  | 15.90  |
| <b>MAGNESIUM (MG)</b>     |     |        |        |        |        |        |
| Intake from H.S. Meals    | 307 | 86.25  | 113.36 | 137.69 | 113.99 | 43.10  |
| Pct of Total Daily Intake | 307 | 36.99  | 46.64  | 60.54  | 48.87  | 16.20  |
| <b>PHOSPHORUS (MG)</b>    |     |        |        |        |        |        |
| Intake from H.S. Meals    | 309 | 429.00 | 616.79 | 721.62 | 591.03 | 213.00 |
| Pct of Total Daily Intake | 309 | 38.04  | 48.19  | 61.32  | 49.96  | 16.60  |

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Table 6 -7 (continued)

Nutrient Intake from Head Start Meals and Percent of Total  
Daily Intake for Posttested Head Start Children  
(Samples A, B, C) Present on Day of Recall across Sites

|                           | N   | Q1    | MED    | Q3     | MEAN   | SD     |
|---------------------------|-----|-------|--------|--------|--------|--------|
| <b>VITAMIN A (IU)</b>     |     |       |        |        |        |        |
| Intake from H.S. Meals    | 309 | 1187. | 1869.  | 3641.  | 4104.  | 7061.  |
| Pct of Total Daily Intake | 309 | 31.   | 53.    | 75.    | 53.    | 26.    |
| <b>THIAMIN (MG)</b>       |     |       |        |        |        |        |
| Intake from H.S. Meals    | 306 | 0.39  | 0.52   | 0.62   | 0.53   | 0.19   |
| Pct of Total Daily Intake | 306 | 32.50 | 41.59  | 53.83  | 43.52  | 16.30  |
| <b>RIBOFLAVIN (MG)</b>    |     |       |        |        |        |        |
| Intake from H.S. Meals    | 301 | 0.70  | 1.04   | 1.21   | 1.04   | 0.48   |
| Pct of Total Daily Intake | 301 | 38.50 | 49.17  | 64.23  | 51.66  | 18.20  |
| <b>NIACIN (MG)</b>        |     |       |        |        |        |        |
| Intake from H.S. Meals    | 305 | 3.29  | 4.62   | 6.25   | 5.27   | 2.92   |
| Pct of Total Daily Intake | 305 | 24.31 | 35.38  | 49.45  | 38.32  | 18.20  |
| <b>VITAMIN B5 (MG)</b>    |     |       |        |        |        |        |
| Intake from H.S. Meals    | 302 | 0.37  | 0.47   | 0.68   | 0.53   | 0.24   |
| Pct of Total Daily Intake | 302 | 29.17 | 40.34  | 54.64  | 42.32  | 17.80  |
| <b>VITAMIN B12 (MCG)</b>  |     |       |        |        |        |        |
| Intake from H.S. Meals    | 288 | 1.38  | 1.97   | 2.57   | 2.20   | 1.91   |
| Pct of Total Daily Intake | 288 | 35.23 | 52.35  | 68.34  | 52.29  | 22.60  |
| <b>VITAMIN C (MG)</b>     |     |       |        |        |        |        |
| Intake from H.S. Meals    | 302 | 26.06 | 41.82  | 64.22  | 46.82  | 27.60  |
| Pct of Total Daily Intake | 302 | 24.03 | 39.77  | 62.15  | 44.25  | 25.60  |
| <b>CHOLESTEROL (MG)</b>   |     |       |        |        |        |        |
| Intake from H.S. Meals    | 306 | 81.56 | 120.13 | 232.11 | 167.92 | 130.00 |
| Pct of Total Daily Intake | 306 | 32.71 | 47.76  | 67.33  | 49.64  | 22.50  |

Table 6 -8

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal  
and non-Head Start Children (Sample A) across Sites

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>        |                       |
|--------------------|-------------|--|-----------------------------|-----------------------|
|                    |             |  | b                           | se <sub>b</sub>       |
|                    |             | Site                                     |                             |                       |
| Calories           | 183         | Greene & Humphreys                       | -117.75                     | 69.93                 |
|                    |             | St. Clair                                | 206.18                      | 81.80                 |
|                    |             | Maricopa                                 | -136.78                     | 88.70                 |
|                    |             | Mingo                                    | 48.35                       | 69.94                 |
|                    |             | Program                                  |                             |                       |
|                    |             | Head Start Present vs. Non-Head Start    | 78.16                       | 89.85                 |
|                    |             | Head Start Present vs. Head Start Absent | 161.26                      | 110.25                |
|                    |             | Head Start Absent vs. Non-Head Start     | -84.24                      | 117.02                |
|                    |             | Pretest Intake                           | 0.29***                     | 0.06                  |
|                    |             | Constant                                 | 1012.91                     |                       |
|                    |             | Statistics                               | F = 4.82                    | R <sup>2</sup> = 0.25 |
|                    |             |  | MS <sub>e</sub> = 280358.06 |                       |
|                    |             | Site                                     |                             |                       |
| Protein            | 183         | Greene & Humphreys                       | -0.91                       | 2.86                  |
|                    |             | St. Clair                                | 4.82                        | 3.36                  |
|                    |             | Maricopa                                 | -7.44*                      | 3.61                  |
|                    |             | Mingo                                    | 3.53                        | 2.79                  |
|                    |             | Program                                  |                             |                       |
|                    |             | Head Start Present vs. Non-Head Start    | 6.02                        | 3.68                  |
|                    |             | Head Start Present vs. Head Start Absent | 8.66                        | 4.70                  |
|                    |             | Head Start Absent vs. Non-Head Start     | -2.64*                      | 4.76                  |
|                    |             | Pretest Intake                           | 0.31***                     | 0.07                  |
|                    |             | Constant                                 | 34.06                       |                       |
|                    |             | Statistics                               | F = 4.16                    | R <sup>2</sup> = 0.23 |
|                    |             |  | MS <sub>e</sub> = 467.91    |                       |

<sup>a</sup> Significance shown as:

- \*p ≤ .05  
\*\*p ≤ .01  
\*\*\*p ≤ .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

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Table 6 -8 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal and non-Head Start Children (Sample A) across Sites

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>      |                       |
|--------------------|-------------|--|---------------------------|-----------------------|
|                    |             |  | b                         | se <sub>b</sub>       |
|                    |             | Site                                     |                           |                       |
| Fat                | 183         | Greene & Humphreys                       | -7.94*                    | 3.70                  |
|                    |             | St. Clair                                | 5.10                      | 4.36                  |
|                    |             | Maricopa                                 | -1.18                     | 4.73                  |
|                    |             | Mingo                                    | 3.13                      | 6.07                  |
|                    |             | Program                                  |                           |                       |
|                    |             | Head Start Present vs. Non-Head Start    | does not enter equation   |                       |
|                    |             | Head Start Present vs. Head Start Absent | 8.71                      | 6.13                  |
|                    |             | Head Start Absent vs. Non-Head Start     | -9.02                     | 6.22                  |
|                    |             | Pretest Intake                           | 0.26***                   | 0.07                  |
|                    |             | Constant                                 | 49.25                     |                       |
|                    |             | Statistics                               | F = 3.98                  | R <sup>2</sup> = 0.22 |
|                    |             |  | MS <sub>e</sub> = 794.93  |                       |
|                    |             | Site                                     |                           |                       |
| Carbohydrate       | 183         | Greene & Humphreys                       | -10.30                    | 9.29                  |
|                    |             | St. Clair                                | 31.79**                   | 10.84                 |
|                    |             | Maricopa                                 | -26.32*                   | 11.71                 |
|                    |             | Mingo                                    | 2.84                      | 3.09                  |
|                    |             | Program                                  |                           |                       |
|                    |             | Head Start Present vs. Non-Head Start    | 17.37                     | 11.96                 |
|                    |             | Head Start Present vs. Head Start Absent | 17.78                     | 15.31                 |
|                    |             | Head Start Absent vs. Non-Head Start     | does not enter equation   |                       |
|                    |             | Pretest Intake                           | 0.25***                   | 0.06                  |
|                    |             | Constant                                 | 115.29                    |                       |
|                    |             | Statistics                               | F = 3.74                  | R <sup>2</sup> = 0.21 |
|                    |             |  | MS <sub>e</sub> = 4962.44 |                       |

<sup>a</sup> Significance shown as:

\*p ≤ .05  
 \*\*p ≤ .01  
 \*\*\*p ≤ .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -8 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal and non-Head Start Children (Sample A) across Sites

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>        |                       |
|--------------------|-------------|--|-----------------------------|-----------------------|
|                    |             |  | b                           | se <sub>b</sub>       |
|                    |             | Site                                     |                             |                       |
| Calcium            | 183         | Greene & Humphreys                       | -70.30                      | 45.81                 |
|                    |             | St. Clair                                | -8.23                       | 52.14                 |
|                    |             | Maricopa                                 | -33.62                      | 56.14                 |
|                    |             | Mingo                                    | 112.14*                     | 29.09                 |
|                    |             | Program                                  |                             |                       |
|                    |             | Head Start Present vs. Non-Head Start    | 270.03***                   | 58.18                 |
|                    |             | Head Start Present vs. Head Start Absent | 420.94***                   | 73.88                 |
|                    |             | Head Start Absent vs. Non-Head Start     | 150.91*                     | 74.62                 |
|                    |             | Pretest Intake                           | 0.24***                     | 0.06                  |
|                    |             | Constant                                 | 339.04                      |                       |
|                    |             | Statistics                               | F = 6.51                    | R <sup>2</sup> = 0.32 |
|                    |             |  | MS <sub>e</sub> = 114765.03 |                       |
|                    |             | Site                                     |                             |                       |
| Iron               | 183         | Greene & Humphreys                       | 0.11                        | 0.62                  |
|                    |             | St. Clair                                | 1.30                        | 0.73                  |
|                    |             | Maricopa                                 | -1.69**                     | 0.79                  |
|                    |             | Mingo                                    | -0.27                       | 0.63                  |
|                    |             | Program                                  |                             |                       |
|                    |             | Head Start Present vs. Non-Head Start    | 0.62                        | 0.80                  |
|                    |             | Head Start Present vs. Head Start Absent | -0.54                       | 1.03                  |
|                    |             | Head Start Absent vs. Non-Head Start     | does not enter equation     |                       |
|                    |             | Pretest Intake                           | 0.29***                     | 0.06                  |
|                    |             | Constant                                 | 6.14                        |                       |
|                    |             | Statistics                               | F = 3.74                    | R <sup>2</sup> = 0.21 |
|                    |             |  | MS <sub>e</sub> = 83.88     |                       |

<sup>a</sup> Significance shown as:

- \*p ≤ .05
- \*\*p ≤ .01
- \*\*\*p ≤ .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -8 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal and non-Head Start Children (Sample A) across Sites

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup> |   |
|--------------------|-------------|--|----------------------|---|
|                    |             |  | b                    | se <sub>b</sub>   |
|                    |             | Site                                     |                      |   |
| <u>Magnesium</u>   | <u>183</u>  | Greene & Humphreys                       | <u>-12.32</u>        | <u>8.65</u>   |
|                    |             | St. Clair                                | <u>21.96*</u>        | <u>10.15</u>  |
|                    |             | Maricopa                                 | <u>-29.14**</u>      | <u>11.02</u>  |
|                    |             | Mingo                                    | <u>19.50</u>         | <u>5.56</u>   |
|                    |             | Program                                  |                      |   |
|                    |             | Head Start Present vs. Non-Head Start    | <u>40.27***</u>      | <u>11.13</u>  |
|                    |             | Head Start Present vs. Head Start Absent | <u>65.44***</u>      | <u>14.20</u>  |
|                    |             | Head Start Absent vs. Non-Head Start     | <u>-25.17</u>        | <u>14.45</u>  |
|                    |             | Pretest Intake                           | <u>0.28***</u>       | <u>0.05</u>   |
|                    |             | Constant                                 | <u>90.12</u>         |   |
|                    |             | Statistics                               | F = <u>8.00</u>      | R <sup>2</sup> = <u>0.36</u> MS <sub>e</sub> = <u>4296.96</u>   |
|                    |             | Site                                     |                      |   |
| <u>Phosphorus</u>  | <u>183</u>  | Greene & Humphreys                       | <u>5.79</u>          | <u>49.12</u>  |
|                    |             | St. Clair                                | <u>12.81</u>         | <u>56.26</u>  |
|                    |             | Maricopa                                 | <u>-116.83</u>       | <u>60.81</u>  |
|                    |             | Mingo                                    | <u>-98.23</u>        | <u>24.56</u>  |
|                    |             | Program                                  |                      |   |
|                    |             | Head Start Present vs. Non-Head Start    | <u>167.09**</u>      | <u>62.34</u>  |
|                    |             | Head Start Present vs. Head Start Absent | <u>311.54***</u>     | <u>79.52</u>  |
|                    |             | Head Start Absent vs. Non-Head Start     | <u>-144.4*</u>       | <u>80.46</u>  |
|                    |             | Pretest Intake                           | <u>0.36***</u>       | <u>0.06</u>   |
|                    |             | Constant                                 | <u>492.98</u>        |   |
|                    |             | Statistics                               | F = <u>6.50</u>      | R <sup>2</sup> = <u>0.31</u> MS <sub>e</sub> = <u>133443.31</u> |

<sup>a</sup> Significance shown as:

- \*p ≤ .05
- \*\*p ≤ .01
- \*\*\*p ≤ .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -8 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal and non-Head Start Children (Sample A) across Sites

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>    |                       |                        |
|--------------------|-------------|--|-------------------------|-----------------------|------------------------|
|                    |             |  | b                       | se <sub>b</sub>       |                        |
| Site               |             |  |                         |                       |                        |
| Vitamin A<br>(log) | 183         | Greene & Humphreys                       | 0.13**                  | 0.05                  |                        |
|                    |             | St. Clair                                | 0.86                    | 0.06                  |                        |
|                    |             | Maricopa                                 | -0.15*                  | 0.06                  |                        |
|                    |             | Mingo                                    | -0.83                   | 0.06                  |                        |
| Program            |             |  |                         |                       |                        |
|                    |             | Head Start Present vs. Non-Head Start    | 0.27***                 | 0.07                  |                        |
|                    |             | Head Start Present vs. Head Start Absent | 0.29***                 | 0.08                  |                        |
|                    |             | Head Start Absent vs. Non-Head Start     | -0.22                   | 0.08                  |                        |
|                    |             | Posttest Intake                          | 0.14*                   | 0.06                  |                        |
|                    |             | Constant                                 | 2.66                    |                       |                        |
| Statistics         |             |  | F = 3.82                | R <sup>2</sup> = 0.22 | MS <sub>e</sub> = 0.14 |
| Site               |             |  |                         |                       |                        |
| Thiamin            | 183         | Greene & Humphreys                       | -0.11                   | 0.07                  |                        |
|                    |             | St. Clair                                | 0.12                    | 0.09                  |                        |
|                    |             | Maricopa                                 | -0.17                   | 0.10                  |                        |
|                    |             | Mingo                                    | 0.06                    | 0.12                  |                        |
| Program            |             |  |                         |                       |                        |
|                    |             | Head Start Present vs. Non-Head Start    | does not enter equation |                       |                        |
|                    |             | Head Start Present vs. Head Start Absent | 1.20                    | 0.12                  |                        |
|                    |             | Head Start Absent vs. Non-Head Start     | -1.25                   | 0.13                  |                        |
|                    |             | Pretest Intake                           | 0.18**                  | 0.07                  |                        |
|                    |             | Constant                                 | 0.64                    |                       |                        |
| Statistics         |             |  | F = 2.11                | R <sup>2</sup> = 0.12 | MS <sub>e</sub> = 0.32 |

<sup>a</sup> Significance shown as:

- \*p ≤ .05
- \*\*p ≤ .01
- \*\*\*p ≤ .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.



Table 6 -8 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal and non-Head Start Children (Sample A) across Sites

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>    |                       |
|--------------------|-------------|--|-------------------------|-----------------------|
|                    |             |  | b                       | se <sub>b</sub>       |
|                    |             | Site                                     |                         |                       |
| Riboflavin         | 183         | Greene & Humphreys                       | 0.27*                   | 0.14                  |
|                    |             | St. Clair                                | 0.19                    | 0.15                  |
|                    |             | Maricopa                                 | -0.34*                  | 0.17                  |
|                    |             | Mingo                                    | -0.05                   | 0.13                  |
|                    |             | Program                                  |                         |                       |
|                    |             | Head Start Present vs. Non-Head Start    | 0.52**                  | 0.17                  |
|                    |             | Head Start Present vs. Head Start Absent | 0.68**                  | 0.22                  |
|                    |             | Head Start Absent vs. Non-Head Start     | 1.62                    | 0.23                  |
|                    |             | Pretest Intake                           | 0.35***                 | 0.09                  |
|                    |             | Constant                                 | 0.52                    |                       |
|                    |             | Statistics                               | F = 3.88                | R <sup>2</sup> = 0.21 |
|                    |             |  | MS <sub>e</sub> = 1.05  |                       |
|                    |             | Site                                     |                         |                       |
| Niacin             | 183         | Greene & Humphreys                       | 0.90                    | 0.96                  |
|                    |             | St. Clair                                | 1.69                    | 1.11                  |
|                    |             | Maricopa                                 | -3.49**                 | 1.22                  |
|                    |             | Mingo                                    | 0.90                    | 0.48                  |
|                    |             | Program                                  |                         |                       |
|                    |             | Head Start Present vs. Non-Head Start    | 0.73                    | 1.23                  |
|                    |             | Head Start Present vs. Head Start Absent | 1.24                    | 0.13                  |
|                    |             | Head Start Absent vs. Non-Head Start     | -0.55                   | 1.59                  |
|                    |             | Pretest Intake                           | 0.32***                 | 0.07                  |
|                    |             | Constant                                 | 4.94                    |                       |
|                    |             | Statistics                               | F = 3.50                | R <sup>2</sup> = 0.20 |
|                    |             |  | MS <sub>e</sub> = 52.11 |                       |

<sup>a</sup> Significance shown as:

\*p ≤ .05

\*\*p ≤ .01

\*\*\*p ≤ .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6-8 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal and non-Head Start Children (Sample A) across Sites

| Dependent Variable                       | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup> |                       |                        |
|--|-------------|--|----------------------|-----------------------|------------------------|
|  |             |  | b                    | se <sub>b</sub>       |                        |
| Vitamin B6                               | 183         | Site                                     |                      |                       |                        |
|  |             | Greene & Humphreys                       | 0.23                 | 0.08                  |                        |
|  |             | St. Clair                                | 0.50                 | 0.09                  |                        |
|  |             | Maricopa                                 | -0.16                | 0.10                  |                        |
|  |             | Mingo                                    | -0.57                | 0.11                  |                        |
|  |             | Program                                  |                      |                       |                        |
|  |             | Head Start Present vs. Non-Head Start    | 0.43                 | 0.10                  |                        |
|  |             | Head Start Present vs. Head Start Absent | 1.24                 | 0.13                  |                        |
|  |             | Head Start Absent vs. Non-Head Start     | -0.80                | 0.14                  |                        |
|  |             | Pretest Intake                           | 0.23***              | 0.06                  |                        |
|  |             | Constant                                 | 0.25                 |                       |                        |
|  |             | Statistics                               | F = 2.40             | R <sup>2</sup> = 0.14 | MS <sub>e</sub> = 0.39 |
|  |             | Vitamin B12<br>(log)                     | 183                  | Site                  |                        |
| Greene & Humphreys                       | 0.10*       |  |                      | 0.05                  |                        |
| St. Clair                                | -0.31       |  |                      | 0.06                  |                        |
| Maricopa                                 | -0.98       |  |                      | 0.06                  |                        |
| Mingo                                    | 1.19        |  |                      | 0.07                  |                        |
| Program                                  |             |  |                      |                       |                        |
| Head Start Present vs. Non-Head Start    | 0.22***     |  |                      | 0.06                  |                        |
| Head Start Present vs. Head Start Absent | 1.82*       |  |                      | 0.08                  |                        |
| Head Start Absent vs. Non-Head Start     | 0.34        |  |                      | 0.08                  |                        |
| Pretest Intake                           | 0.21**      |  |                      | 0.08                  |                        |
| Constant                                 | 0.37        |  |                      |                       |                        |
| Statistics                               | F = 2.90    |  |                      | R <sup>2</sup> = 0.18 | MS <sub>e</sub> = 0.12 |

<sup>a</sup> Significance shown as:

- \*p ≤ .05
- \*\*p ≤ .01
- \*\*\*p ≤ .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

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Table 6 -8 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal and non-Head Start Children (Sample A) across Sites

| Dependent Variable   | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>    |                 |
|--|-------------|--|-------------------------|-----------------|
|  |             |  | b                       | se <sub>b</sub> |
| Site   |             |  |                         |                 |
| Vitamin C  | 183         | Greene & Humphreys                       | 3.13                    | 11.74           |
|  |             | St. Clair                                | 59.96***                | 13.77           |
|  |             | Maricopa                                 | -32.42*                 | 14.77           |
|  |             | Mingo                                    | -30.67                  | 19.19           |
| Program  |             |  |                         |                 |
|  |             | Head Start Present vs. Non-Head Start    | 1.85                    | 15.12           |
|  |             | Head Start Present vs. Head Start Absent | 4.33                    | 18.55           |
|  |             | Head Start Absent vs. Non-Head Start     | does not enter equation |                 |
|  |             | Pretest Intake                           | 0.27***                 | 0.08            |
|  |             | Constant                                 | 54.75                   |                 |
| Statistics F = 3.48 R <sup>2</sup> = 0.20 MS <sub>e</sub> = 7942.59  |             |  |                         |                 |
| Site   |             |  |                         |                 |
| Cholesterol  | 183         | Greene & Humphreys                       | 33.89                   | 28.04           |
|  |             | St. Clair                                | -6.35                   | 32.19           |
|  |             | Maricopa                                 | 21.46                   | 34.70           |
|  |             | Mingo                                    | -48.99                  | 26.96           |
| Program  |             |  |                         |                 |
|  |             | Head Start Present vs. Non-Head Start    | -8.67                   | 35.47           |
|  |             | Head Start Present vs. Head Start Absent | -35.02                  | 45.29           |
|  |             | Head Start Absent vs. Non-Head Start     | -43.69                  | 46.04           |
|  |             | Pretest Intake                           | 0.39***                 | 0.07            |
|  |             | Constant                                 | 407.99                  |                 |
| Statistics F = 3.24 R <sup>2</sup> = 0.19 MS <sub>e</sub> = 43692.10 |             |  |                         |                 |

<sup>a</sup> Significance shown as:

- \*p ≤ .05
- \*\*p ≤ .01
- \*\*\*p ≤ .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -9

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal  
Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                         | Effects <sup>c</sup>               |                 |
|--------------------|-------------|--|------------------------------------|-----------------|
|                    |             |  | b                                  | SE <sub>b</sub> |
| Calories           | 65          | Greene & Humphreys                           |                                    |                 |
|                    |             | Head Start-Present vs. Non-Head Start        | does not enter equation            |                 |
|                    |             | Head Start-Present vs. Head Start-Absent     | <u>573.74</u>                      | <u>295.25</u>   |
|                    |             | Head Start-Absent vs. Non-Head Start         | <u>-579.55*</u>                    | <u>249.92</u>   |
|                    |             | Pretest Intake                               | <u>0.22*</u>                       | <u>0.10</u>     |
|                    |             | Constant                                     | <u>1166.40</u>                     |                 |
| Statistics         |             | F = <u>1.74</u> R <sup>2</sup> = <u>0.22</u> | MS <sub>e</sub> = <u>204565.64</u> |                 |
| Calories           | 35          | St. Clair                                    |                                    |                 |
|                    |             | Head Start-Present vs. Non-Head Start        | <u>190.89</u>                      | <u>264.23</u>   |
|                    |             | Head Start-Present vs. Head Start-Absent     | <u>123.06</u>                      | <u>262.54</u>   |
|                    |             | Head Start-Absent vs. Non-Head Start         | <u>313.95</u>                      | <u>228.48</u>   |
|                    |             | Pretest Intake                               | <u>0.21</u>                        | <u>0.15</u>     |
|                    |             | Constant                                     | <u>491.80</u>                      |                 |
| Statistics         |             | F = <u>1.82</u> R <sup>2</sup> = <u>0.39</u> | MS <sub>e</sub> = <u>258141.98</u> |                 |
| Calories           | 50          | Maricopa                                     |                                    |                 |
|                    |             | Head Start-Present vs. Non-Head Start        | <u>-193.89</u>                     | <u>225.32</u>   |
|                    |             | Head Start-Present vs. Head Start-Absent     | <u>121.87</u>                      | <u>204.65</u>   |
|                    |             | Head Start-Absent vs. Non-Head Start         | <u>-315.76</u>                     | <u>223.66</u>   |
|                    |             | Pretest Intake                               | <u>0.36*</u>                       | <u>0.18</u>     |
|                    |             | Constant                                     | <u>2991.40</u>                     |                 |
| Statistics         |             | F = <u>1.71</u> R <sup>2</sup> = <u>0.28</u> | MS <sub>e</sub> = <u>338971.62</u> |                 |
| Calories           | 33          | Mingo  |                                    |                 |
|                    |             | Head Start-Present vs. Non-Head Start        | <u>80.11</u>                       | <u>253.34</u>   |
|                    |             | Head Start-Present vs. Head Start-Absent     | <u>257.38</u>                      | <u>384.69</u>   |
|                    |             | Head Start-Absent vs. Non-Head Start         | <u>337.36</u>                      | <u>325.48</u>   |
|                    |             | Pretest Intake                               | <u>0.52***</u>                     | <u>0.16</u>     |
|                    |             | Constant                                     | <u>648.41</u>                      |                 |
| Statistics         |             | F = <u>2.82</u> R <sup>2</sup> = <u>0.49</u> | MS <sub>e</sub> = <u>884368.56</u> |                 |

<sup>a</sup> Significance shown as:

\*p<.05

\*\*p<.01

\*\*\*p<.001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -9 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                        | Effects <sup>c</sup>     |                 |
|--------------------|-------------|---|--------------------------|-----------------|
|                    |             |   | b                        | SE <sub>b</sub> |
| <u>Protein</u>     | <u>65</u>   | <u>Greene &amp; Humphreys</u>               |                          |                 |
|                    |             | Head Start-Present vs. Non-Head Start       | -3.15                    | 6.40            |
|                    |             | Head Start-Present vs. Head Start-Absent    | 26.14*                   | 12.11           |
|                    |             | Head Start-Absent vs. Non-Head Start        | -20.44                   | 12.10           |
|                    |             | Pretest Intake                              | 0.36***                  | 0.11            |
|                    |             | Constant                                    | 37.52                    |                 |
|                    |             | Statistics F = 2.65 R <sup>2</sup> = 0.4530 | MS <sub>e</sub> = 344.04 |                 |
| <u>Protein</u>     | <u>35</u>   | <u>St. Clair</u>                            |                          |                 |
|                    |             | Head Start-Present vs. Non-Head Start       | 5.70                     | 10.82           |
|                    |             | Head Start-Present vs. Head Start-Absent    | 1.45                     | 10.95           |
|                    |             | Head Start-Absent vs. Non-Head Start        | 4.24                     | 9.62            |
|                    |             | Pretest Intake                              | 0.30*                    | 0.12            |
|                    |             | Constant                                    | 16.63                    |                 |
|                    |             | Statistics F = 2.27 R <sup>2</sup> = 0.45   | MS <sub>e</sub> = 443.01 |                 |
| <u>Protein</u>     | <u>50</u>   | <u>Maricopa</u>                             |                          |                 |
|                    |             | Head Start-Present vs. Non-Head Start       | -1.56                    | 7.21            |
|                    |             | Head Start-Present vs. Head Start-Absent    | 10.98                    | 65.22           |
|                    |             | Head Start-Absent vs. Non-Head Start        | -12.54                   | 7.21            |
|                    |             | Pretest Intake                              | 0.23                     | 0.14            |
|                    |             | Constant                                    | 102.94                   |                 |
|                    |             | Statistics F = 2.13 R <sup>2</sup> = 0.32   | MS <sub>e</sub> = 343.17 |                 |
| <u>Protein</u>     | <u>33</u>   | <u>Mingo</u>                                |                          |                 |
|                    |             | Head Start-Present vs. Non-Head Start       | 7.47                     | 12.80           |
|                    |             | Head Start-Present vs. Head Start-Absent    | -19.59                   | 19.20           |
|                    |             | Head Start-Absent vs. Non-Head Start        | 27.06                    | 16.25           |
|                    |             | Pretest Intake                              | 0.53                     | 0.25            |
|                    |             | Constant                                    | 12.10                    |                 |
|                    |             | Statistics F = 1.62 R <sup>2</sup> = 0.35   | MS <sub>e</sub> = 791.41 |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -9 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>      |                 |
|--------------------|-------------|--|---------------------------|-----------------|
|                    |             |  | b                         | SE <sub>b</sub> |
| Fat                | 65          | Greene & Humphreys                       |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -3.15                     | 6.40            |
|                    |             | Head Start-Present vs. Head Start-Absent | 33.54*                    | 14.78           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -36.69*                   | 14.77           |
|                    |             | Pretest Intake                           | 0.15                      | 0.10            |
|                    |             | Constant                                 | 67.24                     |                 |
| Statistics         |             | F = 1.59 R <sup>2</sup> = 0.21           | MS <sub>e</sub> = 512.51  |                 |
| Fat                | 35          | St. Clair                                |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | does not enter equation   |                 |
|                    |             | Head Start-Present vs. Head Start-Absent | -16.88                    | 14.02           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 15.71                     | 12.23           |
|                    |             | Pretest Intake                           | 0.25                      | 0.15            |
|                    |             | Constant                                 | -13.75                    |                 |
| Statistics         |             | F = 1.78 R <sup>2</sup> = 0.21           | MS <sub>e</sub> = 741.58  |                 |
| Fat                | 50          | Maricopa                                 |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -4.89                     | 11.47           |
|                    |             | Head Start-Present vs. Head Start-Absent | 14.03                     | 10.18           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -18.91                    | 11.23           |
|                    |             | Pretest Intake                           | 0.43                      | 0.17            |
|                    |             | Constant                                 | 104.76                    |                 |
| Statistics         |             | F = 2.33 R <sup>2</sup> = 0.34           | MS <sub>e</sub> = 839.97  |                 |
| Fat                | 33          | Mingo                                    |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 2.08                      | 15.88           |
|                    |             | Head Start-Present vs. Head Start-Absent | -6.29                     | 23.76           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 8.38                      | 21.11           |
|                    |             | Pretest Intake                           | 0.46                      | 0.22            |
|                    |             | Constant                                 | 38.80                     |                 |
| Statistics         |             | F = 1.21 R <sup>2</sup> = 0.29           | MS <sub>e</sub> = 1360.30 |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001.

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

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Table 6 -9 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>      |                 |
|--------------------|-------------|--|---------------------------|-----------------|
|                    |             |  | b                         | SE <sub>b</sub> |
| Carbohydrate       | 65          | Greene & Humphreys                       |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 1.86                      | 18.59           |
|                    |             | Head Start-Present vs. Head Start-Absent | 46.13                     | 42.16           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -44.27                    | 42.12           |
|                    |             | Pretest Intake                           | 0.20*                     | 0.10            |
|                    |             | Constant                                 | 104.83                    |                 |
| Statistics         |             | F = 1.06 R <sup>2</sup> = 0.15           | MS <sub>e</sub> = 4167.53 |                 |
| Carbohydrate       | 35          | St. Clair                                |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 46.59                     | 39.92           |
|                    |             | Head Start-Present vs. Head Start-Absent | 13.14                     | 38.53           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 33.45                     | 33.86           |
|                    |             | Pretest Intake                           | 0.22                      | 0.21            |
|                    |             | Constant                                 | 126.64                    |                 |
| Statistics         |             | F = 1.65 R <sup>2</sup> = 0.37           | MS <sub>e</sub> = 5489.55 |                 |
| Carbohydrate       | 50          | Maricopa                                 |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -31.44                    | 30.07           |
|                    |             | Head Start-Present vs. Head Start-Absent | -8.86                     | 27.64           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -22.58                    | 29.80           |
|                    |             | Pretest Intake                           | 0.28                      | 0.17            |
|                    |             | Constant                                 | 437.83                    |                 |
| Statistics         |             | F = 1.28 R <sup>2</sup> = 0.22           | MS <sub>e</sub> = 6157.46 |                 |
| Carbohydrate       | 33          | Mingo                                    |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 32.63                     | 25.10           |
|                    |             | Head Start-Present vs. Head Start-Absent | 11.05                     | 38.47           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 21.58                     | 32.70           |
|                    |             | Pretest Intake                           | 0.33                      | 0.11            |
|                    |             | Constant                                 | 79.29                     |                 |
| Statistics         |             | F = 3.96 R <sup>2</sup> = 0.57           | MS <sub>e</sub> = 3147.04 |                 |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -9 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>        |                 |
|--------------------|-------------|--|-----------------------------|-----------------|
|                    |             |  | b                           | SE <sub>b</sub> |
| Calcium            | 65          | Greene & Humphreys                       |                             |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 345.52***                   | 78.30           |
|                    |             | Head Start-Present vs. Head Start-Absent | 666.82                      | 181.12          |
|                    |             | Head Start-Absent vs. Non-Head Start     | -321.29                     | 180.99          |
|                    |             | Pretest Intake                           | 0.28*                       | 0.12            |
|                    |             | Constant                                 | 530.61                      |                 |
| Statistics         |             | F = 3.85 R <sup>2</sup> = 0.39           | MS <sub>e</sub> = 76810.06  |                 |
| Calcium            | 65          | St. Clair                                |                             |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 50.64                       | 194.18          |
|                    |             | Head Start-Present vs. Head Start-Absent | 185.49                      | 195.25          |
|                    |             | Head Start-Absent vs. Non-Head Start     | -134.84                     | 171.67          |
|                    |             | Pretest Intake                           | 0.40*                       | 0.16            |
|                    |             | Constant                                 | -338.73                     |                 |
| Statistics         |             | F = 2.15 R <sup>2</sup> = 0.44           | MS <sub>e</sub> = 142333.07 |                 |
| Calcium            | 50          | Maricopa                                 |                             |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 98.93                       | 148.84          |
|                    |             | Head Start-Present vs. Head Start-Absent | 338.73**                    | 137.27          |
|                    |             | Head Start-Absent vs. Non-Head Start     | -239.80                     | 147.52          |
|                    |             | Pretest Intake                           | 0.13                        | 0.15            |
|                    |             | Constant                                 | 1814.06                     |                 |
| Statistics         |             | F = 1.35 R <sup>2</sup> = 0.23           | MS <sub>e</sub> = 151008.73 |                 |
| Calcium            | 33          | Mingo                                    |                             |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 451.73*                     | 212.71          |
|                    |             | Head Start-Present vs. Head Start-Absent | 695.33*                     | 328.43          |
|                    |             | Head Start-Absent vs. Non-Head Start     | 243.60                      | 226.58          |
|                    |             | Pretest Intake                           | 0.43                        | 0.24            |
|                    |             | Constant                                 | -129.64*                    |                 |
| Statistics         |             | F = 2.98 R <sup>2</sup> = 0.50           | MS <sub>e</sub> = 134322.86 |                 |

<sup>a</sup> Significance shown as:

- \*p<.05
- \*\*p<.01
- \*\*\*p<.001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.



Table 6 -9 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup><br>b | SE <sub>b</sub> |
|--------------------|-------------|--|---------------------------|-----------------|
| Iron               | 65          | Greene & Humphreys                       |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -2.34                     | 1.35            |
|                    |             | Head Start-Present vs. Head Start-Absent | 2.25                      | 3.12            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -4.64*                    | 2.22            |
|                    |             | Pretest Intake                           | 0.27***                   | 0.08            |
|                    |             | Constant                                 | 6.06                      |                 |
| Statistics         | F = 2.77    | R <sup>2</sup> = 0.31                    | MS <sub>e</sub> = 22.73   |                 |
| Iron               | 65          | St. Clair                                |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 1.58                      | 2.73            |
|                    |             | Head Start-Present vs. Head Start-Absent | -3.03                     | 2.91            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 4.61*                     | 2.32            |
|                    |             | Pretest Intake                           | 0.10                      | 0.24            |
|                    |             | Constant                                 | 9.49                      |                 |
| Statistics         | F = 1.01    | R <sup>2</sup> = 0.27                    | MS <sub>e</sub> = 26.60   |                 |
| Iron               | 50          | Maricopa                                 |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -.70                      | 1.55            |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.69                      | 1.42            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -1.39                     | 1.51            |
|                    |             | Pretest Intake                           | 0.22                      | 1.35            |
|                    |             | Constant                                 | 23.53                     |                 |
| Statistics         | F = 2.48    | R <sup>2</sup> = 0.36                    | MS <sub>e</sub> = 16.32   |                 |
| Iron               |             | Mingo                                    |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | .36                       | 1.66            |
|                    |             | Head Start-Present vs. Head Start-Absent | -3.84                     | 2.31            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 4.20                      | 2.30            |
|                    |             | Pretest Intake                           | 0.38**                    | 0.12            |
|                    |             | Constant                                 | -5.11                     |                 |
| Statistics         | F = 3.82    | R <sup>2</sup> = 0.56                    | MS <sub>e</sub> = 15.78   |                 |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -9 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>           |                           |
|--------------------|-------------|--|--------------------------------|---------------------------|
|                    |             |  | b                              | SE <sub>b</sub>           |
| Magnesium          | 65          | Greene & Humphreys                       |                                |                           |
|                    |             | Head Start-Present vs. Non-Head Start    | 38.03                          | 17.15                     |
|                    |             | Head Start-Present vs. Head Start-Absent | 107.58***                      | 39.31                     |
|                    |             | Head Start-Absent vs. Non-Head Start     | -69.56                         | 39.43                     |
|                    |             | Pretest Intake                           | 0.53***                        | 0.09                      |
|                    |             | Constant                                 | 115.67                         |                           |
|                    |             | Statistics                               | F = 2.97 R <sup>2</sup> = 0.33 | MS <sub>e</sub> = 3623.21 |
| Magnesium          | 65          | St. Clair                                |                                |                           |
|                    |             | Head Start-Present vs. Non-Head Start    | 14.10*                         | 30.52                     |
|                    |             | Head Start-Present vs. Head Start-Absent | 64.49*                         | 16.34                     |
|                    |             | Head Start-Absent vs. Non-Head Start     | -50.39                         | 28.96                     |
|                    |             | Pretest Intake                           | 0.37***                        | 0.09                      |
|                    |             | Constant                                 | -17.49                         |                           |
|                    |             | Statistics                               | F = 5.09 R <sup>2</sup> = 0.80 | MS <sub>e</sub> = 3531.75 |
| Magnesium          | 50          | Maricopa                                 |                                |                           |
|                    |             | Head Start-Present vs. Non-Head Start    | 20.70                          | 24.89                     |
|                    |             | Head Start-Present vs. Head Start-Absent | 50.44*                         | 22.59                     |
|                    |             | Head Start-Absent vs. Non-Head Start     | -29.68                         | 24.68                     |
|                    |             | Pretest Intake                           | 0.15*                          | 0.12                      |
|                    |             | Constant                                 | 151.69                         |                           |
|                    |             | Statistics                               | F = 1.76 R <sup>2</sup> = 0.26 | MS <sub>e</sub> = 4115.70 |
| Magnesium          |             | Mingo                                    |                                |                           |
|                    |             | Head Start-Present vs. Non-Head Start    | 53.33                          | 29.99                     |
|                    |             | Head Start-Present vs. Head Start-Absent | 21.28                          | 48.50                     |
|                    |             | Head Start-Absent vs. Non-Head Start     | 32.04                          | 41.47                     |
|                    |             | Pretest Intake                           | 0.44*                          | 0.18                      |
|                    |             | Constant                                 | -21.60                         |                           |
|                    |             | Statistics                               | F = 3.44 R <sup>2</sup> = 0.53 | MS <sub>e</sub> = 4746.35 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -9 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>           |                             |
|--------------------|-------------|--|--------------------------------|-----------------------------|
|                    |             |  | b                              | SE <sub>b</sub>             |
| Phosphorus         | 65          | Greene & Humphreys                       |                                |                             |
|                    |             | Head Start-Present vs. Non-Head Start    | 254.13*                        | 100.20                      |
|                    |             | Head Start-Present vs. Head Start-Absent | 658.08**                       | 231.29                      |
|                    |             | Head Start-Absent vs. Non-Head Start     | -403.96                        | 231.14                      |
|                    |             | Pretest Intake                           | 0.49                           | 0.13                        |
|                    |             | Constant                                 | 639.52                         |                             |
|                    |             | Statistics                               | F = 3.40 R <sup>2</sup> = 0.36 | MS <sub>e</sub> = 125645.91 |
| Phosphorus         | 35          | St. Clair                                |                                |                             |
|                    |             | Head Start-Present vs. Non-Head Start    | -134.30                        | 163.18                      |
|                    |             | Head Start-Present vs. Head Start-Absent | 104.42                         | 82.83                       |
|                    |             | Head Start-Absent vs. Non-Head Start     | -238.72                        | 147.40                      |
|                    |             | Pretest Intake                           | 0.48***                        | 0.13                        |
|                    |             | Constant                                 | 47.76                          |                             |
|                    |             | Statistics                               | F = 3.76 R <sup>2</sup> = 0.56 | MS <sub>e</sub> = 100351.99 |
| Phosphorus         | 49          | Maricopa                                 |                                |                             |
|                    |             | Head Start-Present vs. Non-Head Start    | 54.61                          | 130.59                      |
|                    |             | Head Start-Present vs. Head Start-Absent | 256.0 *                        | 119.84                      |
|                    |             | Head Start-Absent vs. Non-Head Start     | -201.47                        | 130.37                      |
|                    |             | Pretest Intake                           | 0.23                           | 0.13                        |
|                    |             | Constant                                 | 1484.99                        |                             |
|                    |             | Statistics                               | F = 2.00 R <sup>2</sup> = 0.31 | MS <sub>e</sub> = 115330.61 |
| Phosphorus         | 33          | Mingo                                    |                                |                             |
|                    |             | Head Start-Present vs. Non-Head Start    | 125.88                         | 226.08                      |
|                    |             | Head Start-Present vs. Head Start-Absent | does not enter eqn.            |                             |
|                    |             | Head Start-Absent vs. Non-Head Start     | 147.53                         | 280.67                      |
|                    |             | Pretest Intake                           | 0.44*                          | 0.18                        |
|                    |             | Constant                                 | 39.60                          |                             |
|                    |             | Statistics                               | F = 2.05 R <sup>2</sup> = 0.36 | MS <sub>e</sub> = 197222.27 |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -9 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                        | Effects <sup>c</sup>   |                 |
|--------------------|-------------|---|------------------------|-----------------|
|                    |             |   | b                      | SE <sub>b</sub> |
| Vitamin A<br>(Log) | 63          | Greene & Humphreys                          |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start       | 0.05***                | .132            |
|                    |             | Head Start-Present vs. Head Start-Absent    | 0.58*                  | 0.30            |
|                    |             | Head Start-Absent vs. Non-Head Start        | -1.25                  | 0.30            |
|                    |             | Pretest Intake                              | 0.35**                 | 0.13            |
|                    |             | Constant                                    | 2.27                   |                 |
| Statistics         |             | F = 2.56 R <sup>2</sup> = 0.31              | MS <sub>e</sub> = 0.21 |                 |
| Vitamin A<br>(Log) | 32          | St. Clair                                   |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start       | 0.03*                  | 0.14            |
|                    |             | Head Start-Present vs. Head Start-Absent    | 0.26*                  | 0.14            |
|                    |             | Head Start-Absent vs. Non-Head Start        | 1.62                   | 0.10            |
|                    |             | Pretest Intake                              | 0.31*                  | 0.13            |
|                    |             | Constant                                    | 1.37                   |                 |
| Statistics         |             | F <sub>1</sub> = 4.07 R <sup>2</sup> = 0.59 | MS <sub>e</sub> = 0.07 |                 |
| Vitamin A<br>(Log) | 49          | Maricopa                                    |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start       | -0.03                  | 0.10            |
|                    |             | Head Start-Present vs. Head Start-Absent    | 1.61                   | 0.10            |
|                    |             | Head Start-Absent vs. Non-Head Start        | 1.96                   | 0.11            |
|                    |             | Pretest Intake                              | -0.52                  | 0.12            |
|                    |             | Constant                                    | 5.30                   |                 |
| Statistics         |             | F = 0.99 R <sup>2</sup> = 0.19              | MS <sub>e</sub> = 0.07 |                 |
| Vitamin A<br>(Log) | 33          | Mingo                                       |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start       | 0.03*                  | 0.16            |
|                    |             | Head Start-Present vs. Head Start-Absent    | 0.33                   | 0.23            |
|                    |             | Head Start-Absent vs. Non-Head Start        | 0.23                   | 0.22            |
|                    |             | Pretest Intake                              | -0.11                  | 0.13            |
|                    |             | Constant                                    | 3.23                   |                 |
| Statistics         |             | F = 1.18 R <sup>2</sup> = 0.28              | MS <sub>e</sub> = 0.15 |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

815

6A-42

Table 6 -9 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>    |                 |
|--------------------|-------------|--|-------------------------|-----------------|
|                    |             |  | b                       | SE <sub>b</sub> |
| Thiamin            | 65          | Greene & Humphreys                       |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -0.22                   | 0.16            |
|                    |             | Head Start-Present vs. Head Start-Absent | 1.97                    | 0.36            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.42 ✓                 | 0.26            |
|                    |             | Pretest Intake                           | 0.14                    | 0.10            |
|                    |             | Constant                                 | 0.59                    |                 |
| Statistics         |             | F = 0.88 R <sup>2</sup> = 0.13           | MS <sub>e</sub> = 0.30  |                 |
| Thiamin            | 35          | St. Clair                                |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.25                    | 0.29            |
|                    |             | Head Start-Present vs. Head Start-Absent | 1.40                    | 0.31            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 0.11                    | 0.28            |
|                    |             | Pretest Intake                           | -0.95                   | 0.16            |
|                    |             | Constant                                 | 0.87                    |                 |
| Statistics         |             | F = 0.68 R <sup>2</sup> = 0.20           | MS <sub>e</sub> = 0.35  |                 |
| Thiamin            | 50          | Maricopa                                 |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -1.52                   | 0.21            |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.07                    | 0.19            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.22                   | 0.21            |
|                    |             | Pretest Intake                           | 0.22                    | 0.20            |
|                    |             | Constant                                 | 4.08                    |                 |
| Statistics         |             | F = 1.29 R <sup>2</sup> = 0.22           | MS <sub>e</sub> = 0.30  |                 |
| Thiamin            | 33          | Mingo                                    |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 1.07                    | 0.23            |
|                    |             | Head Start-Present vs. Head Start-Absent | does not enter equation |                 |
|                    |             | Head Start-Absent vs. Non-Head Start     | 1.26                    | 3.18            |
|                    |             | Pretest Intake                           | 0.53***                 | 0.16            |
|                    |             | Constant                                 | -0.93                   |                 |
| Statistics         |             | F = 3.21 R <sup>2</sup> = 0.47           | MS <sub>e</sub> = 0.29  |                 |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -9 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>  | Effects <sup>c</sup> |                 |
|--------------------|-------------|---|----------------------|-----------------|
|                    |             |   | b                    | SE <sub>b</sub> |
| <u>Riboflavin</u>  | <u>65</u>   | Greene & Humphreys  |                      |                 |
|                    |             | Head Start-Present vs. Non-Head Start   | <u>0.78*</u>         | <u>0.38</u>     |
|                    |             | Head Start-Present vs. Head Start-Absent  | <u>1.13</u>          | <u>0.88</u>     |
|                    |             | Head Start-Absent vs. Non-Head Start  | <u>-0.04</u>         | <u>0.88</u>     |
|                    |             | Pretest Intake  | <u>0.46*</u>         | <u>0.18</u>     |
|                    |             | Constant  | <u>0.88</u>          |                 |
|                    |             | Statistics F = <u>2.20</u> R <sup>2</sup> = <u>0.26</u> MS <sub>e</sub> = <u>1.82</u> |                      |                 |
| <u>Riboflavin</u>  | <u>35</u>   | St. Clair   |                      |                 |
|                    |             | Head Start-Present vs. Non-Head Start   | <u>0.31</u>          | <u>0.30</u>     |
|                    |             | Head Start-Present vs. Head Start-Absent  | <u>0.41</u>          | <u>0.30</u>     |
|                    |             | Head Start-Absent vs. Non-Head Start  | <u>-0.99</u>         | <u>0.27</u>     |
|                    |             | Pretest Intake  | <u>0.50**</u>        | <u>0.17</u>     |
|                    |             | Constant  | <u>0.14</u>          |                 |
|                    |             | Statistics F = <u>3.45</u> R <sup>2</sup> = <u>0.55</u> MS <sub>e</sub> = <u>0.34</u> |                      |                 |
| <u>Riboflavin</u>  | <u>50</u>   | Maricopa  |                      |                 |
|                    |             | Head Start-Present vs. Non-Head Start   | <u>1.47</u>          | <u>0.31</u>     |
|                    |             | Head Start-Present vs. Head Start-Absent  | <u>0.51</u>          | <u>0.29</u>     |
|                    |             | Head Start-Absent vs. Non-Head Start  | <u>-0.37</u>         | <u>0.32</u>     |
|                    |             | Pretest Intake  | <u>0.14</u>          | <u>0.17</u>     |
|                    |             | Constant  | <u>4.84</u>          |                 |
|                    |             | Statistics F = <u>1.12</u> R <sup>2</sup> = <u>0.20</u> MS <sub>e</sub> = <u>0.67</u> |                      |                 |
| <u>Riboflavin</u>  | <u>33</u>   | Mingo   |                      |                 |
|                    |             | Head Start-Present vs. Non-Head Start   | <u>0.27</u>          | <u>0.42</u>     |
|                    |             | Head Start-Present vs. Head Start-Absent  | <u>0.46</u>          | <u>0.53</u>     |
|                    |             | Head Start-Absent vs. Non-Head Start  | <u>-1.85</u>         | <u>0.53</u>     |
|                    |             | Pretest Intake  | <u>0.34</u>          | <u>0.21</u>     |
|                    |             | Constant  | <u>-1.00</u>         |                 |
|                    |             | Statistics F = <u>1.61</u> R <sup>2</sup> = <u>0.35</u> MS <sub>e</sub> = <u>0.81</u> |                      |                 |

<sup>a</sup> Significance shown as:

\*p<.05

\*\*p<.01

\*\*\*p<.001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -9 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>    |                 |
|--------------------|-------------|--|-------------------------|-----------------|
|                    |             |  | b                       | SE <sub>b</sub> |
| Niacin             | 65          | Greene & Humphreys                       |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -1.33                   | 2.07            |
|                    |             | Head Start-Present vs. Head Start-Absent | 2.24                    | 4.78            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -3.57                   | 4.77            |
|                    |             | Pretest Intake                           | 0.30**                  | 0.10            |
|                    |             | Constant                                 | 6.41                    |                 |
| Statistics         |             | F = 1.89 R <sup>2</sup> = 0.24           | MS <sub>e</sub> = 53.57 |                 |
| Niacin             | 35          | St. Clair                                |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 4.91                    | 3.76            |
|                    |             | Head Start-Present vs. Head Start-Absent | 2.00                    | 3.82            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 2.90                    | 3.31            |
|                    |             | Pretest Intake                           | 0.25                    | 0.17            |
|                    |             | Constant                                 | 7.55                    |                 |
| Statistics         |             | F = 0.98 R <sup>2</sup> = 0.26           | MS <sub>e</sub> = 53.40 |                 |
| Niacin             | 50          | Maricopa                                 |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -0.96                   | 2.37            |
|                    |             | Head Start-Present vs. Head Start-Absent | does not enter eqn.     |                 |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.94                   | 2.38            |
|                    |             | Pretest Intake                           | 0.20                    | 0.20            |
|                    |             | Constant                                 | 38.87                   |                 |
| Statistics         |             | F = 1.54 R <sup>2</sup> = 0.23           | MS <sub>e</sub> = 35.65 |                 |
| Niacin             | 33          | Mingo                                    |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 3.76                    | 3.38            |
|                    |             | Head Start-Present vs. Head Start-Absent | -2.48                   | 4.61            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 6.24                    | 4.71            |
|                    |             | Pretest Intake                           | 0.48                    | 0.21            |
|                    |             | Constant                                 | -10.83                  |                 |
| Statistics         |             | F = 2.37 R <sup>2</sup> = 0.44           | MS <sub>e</sub> = 62.93 |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6.-9 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable     | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>   |                 |
|------------------------|-------------|--|------------------------|-----------------|
|                        |             |  | b                      | SE <sub>b</sub> |
| Vitamin B <sub>6</sub> | 65          | Greene & Humphreys                       |                        |                 |
|                        |             | Head Start-Present vs. Non-Head Start    | -1.10                  | 0.18            |
|                        |             | Head Start-Present vs. Head Start-Absent | 0.24                   | 0.41            |
|                        |             | Head Start-Absent vs. Non-Head Start     | -0.44                  | 0.41            |
|                        |             | Pretest Intake                           | 0.10                   | 0.08            |
|                        |             | Constant                                 | 0.72                   |                 |
| Statistics             |             | F = 0.73 R <sup>2</sup> = 0.11           | MS <sub>e</sub> = 0.39 |                 |
| Vitamin B <sub>6</sub> | 35          | St. Clair                                |                        |                 |
|                        |             | Head Start-Present vs. Non-Head Start    | 0.26                   | 0.28            |
|                        |             | Head Start-Present vs. Head Start-Absent | 0.37                   | 0.29            |
|                        |             | Head Start-Absent vs. Non-Head Start     | -1.10                  | 0.26            |
|                        |             | Pretest Intake                           | 0.55***                | 0.13            |
|                        |             | Constant                                 | 0.42                   |                 |
| Statistics             |             | F = 4.17 R <sup>2</sup> = 0.60           | MS <sub>e</sub> = 0.29 |                 |
| Vitamin B <sub>6</sub> | 50          | Maricopa                                 |                        |                 |
|                        |             | Head Start-Present vs. Non-Head Start    | -0.40                  | 0.22            |
|                        |             | Head Start-Present vs. Head Start-Absent | 0.85                   | 0.21            |
|                        |             | Head Start-Absent vs. Non-Head Start     | -1.25                  | 0.22            |
|                        |             | Pretest Intake                           | 0.17                   | 0.17            |
|                        |             | Constant                                 | 4.17                   |                 |
| Statistics             |             | F = 1.66 R <sup>2</sup> = 0.27           | MS <sub>e</sub> = 0.33 |                 |
| Vitamin B <sub>6</sub> | 33          | Mingo                                    |                        |                 |
|                        |             | Head Start-Present vs. Non-Head Start    | 1.40                   | 0.24            |
|                        |             | Head Start-Present vs. Head Start-Absent | -1.46                  | 0.34            |
|                        |             | Head Start-Absent vs. Non-Head Start     | 0.28                   | 0.30            |
|                        |             | Pretest Intake                           | 0.29                   | 0.13            |
|                        |             | Constant                                 | -1.58                  |                 |
| Statistics             |             | F = 2.33 R <sup>2</sup> = 0.44           | MS <sub>e</sub> = 0.34 |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.



Table 6 -9 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable               | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>           |                        |
|----------------------------------|-------------|--|--------------------------------|------------------------|
|                                  |             |  | b                              | SE <sub>b</sub>        |
| Vitamin B <sub>12</sub><br>(Log) | 63          | Greene & Humphreys                       |                                |                        |
|                                  |             | Head Start-Present vs. Non-Head Start    | 0.42***                        | 0.17                   |
|                                  |             | Head Start-Present vs. Head Start-Absent | 0.80**                         | 0.30                   |
|                                  |             | Head Start-Absent vs. Non-Head Start     | -0.38                          | 0.30                   |
|                                  |             | Pretest Intake                           | 0.30                           | 0.16                   |
|                                  |             | Constant                                 | 0.63                           |                        |
|                                  |             | Statistics                               | F = 2.62 R <sup>2</sup> = 0.31 | MS <sub>e</sub> = 0.21 |
| Vitamin B <sub>12</sub><br>(Log) | 32          | St. Clair                                |                                |                        |
|                                  |             | Head Start-Present vs. Non-Head Start    | 0.68                           | 0.10                   |
|                                  |             | Head Start-Present vs. Head Start-Absent | -1.10                          | 0.09                   |
|                                  |             | Head Start-Absent vs. Non-Head Start     | 0.43                           | 0.08                   |
|                                  |             | Pretest Intake                           | 0.30                           | 0.16                   |
|                                  |             | Constant                                 | 0.24                           |                        |
|                                  |             | Statistics                               | F = 3.46 R <sup>2</sup> = 0.55 | MS <sub>e</sub> = 0.03 |
| Vitamin B <sub>12</sub><br>(Log) | 48          | Maricopa                                 |                                |                        |
|                                  |             | Head Start-Present vs. Non-Head Start    | 0.08                           | 0.08                   |
|                                  |             | Head Start-Present vs. Head Start-Absent | 0.88                           | 0.07                   |
|                                  |             | Head Start-Absent vs. Non-Head Start     | -1.25                          | 0.08                   |
|                                  |             | Pretest Intake                           | 0.14                           | 0.10                   |
|                                  |             | Constant                                 | 1.18                           |                        |
|                                  |             | Statistics                               | F = 0.95 R <sup>2</sup> = 0.18 | MS <sub>e</sub> = 0.04 |
| Vitamin B <sub>12</sub><br>(Log) | 33          | Mingo                                    |                                |                        |
|                                  |             | Head Start-Present vs. Non-Head Start    | 1.36                           | 0.13                   |
|                                  |             | Head Start-Present vs. Head Start-Absent | -0.31                          | 0.17                   |
|                                  |             | Head Start-Absent vs. Non-Head Start     | 1.71                           | 0.18                   |
|                                  |             | Pretest Intake                           | -0.54                          | 0.13                   |
|                                  |             | Constant                                 | -0.27                          |                        |
|                                  |             | Statistics                               | F = 1.20 R <sup>2</sup> = 0.25 | MS <sub>e</sub> = 0.10 |

<sup>a</sup> Significance shown as:

\*p<.05

\*\*p<.01

\*\*\*p<.001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -9 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>       |                 |
|--------------------|-------------|--|----------------------------|-----------------|
|                    |             |  | b                          | SE <sub>b</sub> |
| Vitamin C          | 65          | Greene & Humphreys                       |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -32.33                     | 3.82            |
|                    |             | Head Start-Present vs. Head Start-Absent | 25.74                      | 55.04           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -58.09                     | 55.27           |
|                    |             | Pretest Intake                           | 0.15                       | 0.14            |
|                    |             | Constant                                 | -23.25                     |                 |
| Statistics         |             | F = 0.89 R <sup>2</sup> = 0.13           | MS <sub>e</sub> = 7042.90  |                 |
| Vitamin C          | 35          | St. Clair                                |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 104.73                     | 62.17           |
|                    |             | Head Start-Present vs. Head Start-Absent | 46.70                      | 64.02           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 58.03                      | 54.82           |
|                    |             | Pretest Intake                           | 0.33                       | 0.26            |
|                    |             | Constant                                 | 273.96                     |                 |
| Statistics         |             | F = 1.37 R <sup>2</sup> = 0.33           | MS <sub>e</sub> = 14489.43 |                 |
| Vitamin C          | 50          | Maricopa                                 |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -40.68                     | 28.94           |
|                    |             | Head Start-Present vs. Head Start-Absent | -2.88                      | 12.47           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -37.79                     | 28.73           |
|                    |             | Pretest Intake                           | 0.18                       | 0.14            |
|                    |             | Constant                                 | 634.72                     |                 |
| Statistics         |             | F = 1.55 R <sup>2</sup> = 0.26           | MS <sub>e</sub> = 5661.60  |                 |
| Vitamin C          | 33          | Mingo                                    |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 6.21                       | 23.79           |
|                    |             | Head Start-Present vs. Head Start-Absent | -20.35                     | 35.37           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -26.56                     | 34.07           |
|                    |             | Pretest Intake                           | 0.55                       | 0.15            |
|                    |             | Constant                                 | -97.87                     |                 |
| Statistics         |             | F = 3.06 R <sup>2</sup> = 0.50           | MS <sub>e</sub> = 3612.90  |                 |

<sup>a</sup> Significance shown as:

- \*p<.05
- \*\*p<.01
- \*\*\*p<.001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -10

Regression Analyses<sup>a</sup> of Total Nutrient Density for Longitudinal and non-Head Start Children (Sample A) across Sites

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup> |  |
|--------------------|-------------|--|----------------------|--|
|                    |             |  | b                    | se <sub>b</sub>  |
|                    |             | Site                                     |                      |  |
| Protein            | 181         | Greene & Humphreys                       | <u>2.33</u>          | <u>1.24</u>  |
|                    |             | St. Clair                                | <u>-0.59</u>         | <u>1.45</u>  |
|                    |             | Maricopa                                 | <u>-1.90</u>         | <u>1.57</u>  |
|                    |             | Mingo                                    | <u>0.28</u>          | <u>0.54</u>  |
|                    |             | Program                                  |                      |  |
|                    |             | Head Start Present vs. Non-Head Start    | <u>3.28*</u>         | <u>1.60</u>  |
|                    |             | Head Start Present vs. Head Start Absent | <u>2.18</u>          | <u>2.06</u>  |
|                    |             | Head Start Absent vs. Non-Head Start     | <u>1.10</u>          | <u>2.11</u>  |
|                    |             | Pretest Intake                           | <u>0.61</u>          | <u>0.06</u>  |
|                    |             | Constant                                 | <u>31.95</u>         |  |
|                    |             | Statistics                               | F = <u>1.26</u>      | R <sup>2</sup> = <u>0.08</u> MS <sub>e</sub> = <u>87.503</u>   |
|                    |             | Site                                     |                      |  |
| Calcium            | 181         | Greene & Humphreys                       | <u>-10.44</u>        | <u>24.23</u>   |
|                    |             | St. Clair                                | <u>-58.36*</u>       | <u>27.56</u>   |
|                    |             | Maricopa                                 | <u>15.49</u>         | <u>30.36</u>   |
|                    |             | Mingo                                    | <u>53.31*</u>        | <u>21.97</u>   |
|                    |             | Program                                  |                      |  |
|                    |             | Head Start Present vs. Non-Head Start    | <u>166.17***</u>     | <u>30.80</u>   |
|                    |             | Head Start Present vs. Head Start Absent | <u>179.78***</u>     | <u>39.08</u>   |
|                    |             | Head Start Absent vs. Non-Head Start     | <u>-13.62</u>        | <u>39.48</u>   |
|                    |             | Pretest Intake                           | <u>0.12*</u>         | <u>0.06</u>  |
|                    |             | Constant                                 | <u>340.32</u>        |  |
|                    |             | Statistics                               | F = <u>5.21</u>      | R <sup>2</sup> = <u>0.27</u> MS <sub>e</sub> = <u>31613.45</u> |

Significance shown as:

- \*p < .05  
 \*\*p < .01  
 \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -10 (continued)

Regression Analyses<sup>a</sup> of Total Nutrient Density for Longitudinal and non-Head Start Children (Sample A) across Sites

| Dependent Variable                       | Sample Size | Factors <sup>b</sup> | Effects <sup>c</sup>   |                          |
|--|-------------|----------------------|------------------------|--------------------------|
|  |             |                      | b                      | se <sub>b</sub>          |
| Site                                     |             |                      |                        |                          |
| Iron                                     | 183         | Greene & Humphreys   | 0.62                   | 0.49                     |
|  |             | St. Clair            | 0.16                   | 0.57                     |
|  |             | Maricopa             | doesn't enter equation |                          |
|  |             | Mingo                | -0.78                  | 0.20                     |
| Program                                  |             |                      |                        |                          |
| Head Start Present vs. Non-Head Start    |             |                      | 1.69                   | 0.68                     |
| Head Start Present vs. Head Start Absent |             |                      | 0.42                   | 0.82                     |
| Head Start Absent vs. Non-Head Start     |             |                      | 0.27                   | 0.88                     |
| Pretest Intake                           |             |                      | -0.14                  | 0.09                     |
| Constant                                 |             |                      | 9.47                   |                          |
| Statistics                               |             | F = 1.15             | R <sup>2</sup> = 0.07  | MS <sub>e</sub> = 16.26  |
| Site                                     |             |                      |                        |                          |
| Magnesium                                | 181         | Greene & Humphreys   | 0.48                   | 3.57                     |
|  |             | St. Clair            | -1.49                  | 4.20                     |
|  |             | Maricopa             | -8.84*                 | 4.51                     |
|  |             | Mingo                | 9.85                   | 2.29                     |
| Program                                  |             |                      |                        |                          |
| Head Start Present vs. Non-Head Start    |             |                      | 22.09***               | 4.62                     |
| Head Start Present vs. Head Start Absent |             |                      | 25.26***               | 5.95                     |
| Head Start Absent vs. Non-Head Start     |             |                      | -3.16                  | 6.50                     |
| Pretest Intake                           |             |                      | 0.68                   | 0.05                     |
| Constant                                 |             |                      | 101.92                 |                          |
| Statistics                               |             | F = 5.30             | R <sup>2</sup> = 0.27  | MS <sub>e</sub> = 733.56 |

Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -10 (continued)

Regression Analyses<sup>a</sup> of Total Nutrient Density for Longitudinal and non-Head Start Children (Sample A) across Sites

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>          |                       |
|--------------------|-------------|--|-------------------------------|-----------------------|
|                    |             |  | b                             | se <sub>b</sub>       |
|                    |             | Site                                     |                               |                       |
| Phosphorus         | 181         | Greene & Humphreys                       | 19.92                         | 22.05                 |
|                    |             | St. Clair                                | -60.67*                       | 25.29                 |
|                    |             | Maricopa                                 | -17.85                        | 27.16                 |
|                    |             | Mingo                                    | 58.60*                        | 20.25                 |
|                    |             | Program                                  |                               |                       |
|                    |             | Head Start Present vs. Non-Head Start    | 106.62***                     | 28.03                 |
|                    |             | Head Start Present vs. Head Start Absent | 136.52***                     | 35.42                 |
|                    |             | Head Start Absent vs. Non-Head Start     | 29.92***                      | 18.03                 |
|                    |             | Pretest Intake                           | 0.82                          | 0.06                  |
|                    |             | Constant                                 | 494.58                        |                       |
|                    |             | Statistics                               | F = 3.61                      | R <sup>2</sup> = 0.20 |
|                    |             |  | MS <sub>e</sub> = 26486.89    |                       |
|                    |             | Site                                     |                               |                       |
| Vitamin A          | 192         | Greene & Humphreys                       | 1398.39**                     | 465.78                |
|                    |             | St. Clair                                | -671.49                       | 528.51                |
|                    |             | Maricopa                                 | -384.62                       | 573.26                |
|                    |             | Mingo                                    | 342.28                        | 247.78                |
|                    |             | Program                                  |                               |                       |
|                    |             | Head Start Present vs. Non-Head Start    | 2577.80***                    | 597.42                |
|                    |             | Head Start Present vs. Head Start Absent | 1919.36*                      | 787.62                |
|                    |             | Head Start Absent vs. Non-Head Start     | 658.46                        | 782.44                |
|                    |             | Pretest Intake                           | 0.55                          | 0.06                  |
|                    |             | Constant                                 | 3826.35                       |                       |
|                    |             | Statistics                               | F = 3.18                      | R <sup>2</sup> = 0.18 |
|                    |             |  | MS <sub>e</sub> = 13092533.57 |                       |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -10 (continued)

Regression Analyses<sup>a</sup> of Total Nutrient Density for Longitudinal and non-Head Start Children (Sample A) across Sites

| Dependent Variable                       | Sample Size | Factors <sup>b</sup> | Effects <sup>c</sup>    |  |
|--|-------------|----------------------|-------------------------|--|
|  |             |                      | b                       | se <sub>b</sub>                              |
| Site                                     |             |                      |                         |  |
| Thiamin                                  | 183         | Greene & Humphreys   | 0.19***                 | 0.06   |
|  |             | St. Clair            | 0.84                    | 0.07   |
|  |             | Maricopa             | -0.83                   | -0.07  |
|  |             | Mingo                | -0.20                   | 0.10   |
| Program                                  |             |                      |                         |  |
| Head Start Present vs. Non-Head Start    |             |                      | .030                    | 0.07   |
| Head Start Present vs. Head Start Absent |             |                      | does not enter equation |  |
| Head Start Absent vs. Non-Head Start     |             |                      | -0.36                   | 0.09   |
| Pretest Intake                           |             |                      | -0.17                   | 0.09   |
| Constant                                 |             |                      | 0.84                    |  |
| Statistics                               |             |                      | F = 1.71                | R <sup>2</sup> = 0.11 MS <sub>e</sub> = 0.18 |
| Site                                     |             |                      |                         |  |
| Riboflavin                               | 183         | Greene & Humphreys   | -0.25*                  | 0.12   |
|  |             | St. Clair            | -0.75                   | 0.14   |
|  |             | Maricopa             | 0.29*                   | 0.15   |
|  |             | Mingo                | 0.71                    | 0.14   |
| Program                                  |             |                      |                         |  |
| Head Start Present vs. Non-Head Start    |             |                      | 0.96                    | 0.15   |
| Head Start Present vs. Head Start Absent |             |                      | does not enter equation |  |
| Head Start Absent vs. Non-Head Start     |             |                      | 1.06                    | 0.20   |
| Pretest Intake                           |             |                      | -0.13                   | 0.13   |
| Constant                                 |             |                      | 2.35                    |  |
| Statistics                               |             |                      | F = 1.55                | R <sup>2</sup> = 0.10 MS <sub>e</sub> = 0.82 |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -10 (continued)

Regression Analyses<sup>a</sup> of Total Nutrient Density for Longitudinal and non-Head Start Children (Sample A) across Sites

| Dependent Variable                       | Sample Size             | Factors <sup>b</sup>                     | Effects <sup>c</sup>    |                       |                         |
|--|-------------------------|--|-------------------------|-----------------------|-------------------------|
|  |                         |  | b                       | se <sub>b</sub>       |                         |
| Niacin                                   | 183                     | Site                                     |                         |                       |                         |
|  |                         | Greene & Humphreys                       | 1.66*                   | 0.76                  |                         |
|  |                         | St. Clair                                | does not enter equation |                       |                         |
|  |                         | Maricopa                                 | -0.74                   | 0.88                  |                         |
|  |                         | Mingo                                    | -0.92                   | 0.54                  |                         |
|  |                         | Program                                  |                         |                       |                         |
|  |                         | Head Start Present vs. Non-Head Start    | 0.54                    | 0.96                  |                         |
|  |                         | Head Start Present vs. Head Start Absent | 1.51                    | 1.24                  |                         |
|  |                         | Head Start Absent vs. Non-Head Start     | -0.97                   | 1.26                  |                         |
|  |                         | Pretest Intake                           | 0.85                    | 0.10                  |                         |
|  |                         | Constant                                 | 7.41                    |                       |                         |
|  |                         | Statistics                               | F = 1.58                | R <sup>2</sup> = 0.09 | MS <sub>e</sub> = 32.26 |
|  |                         | Vitamin B6                               | 183                     | Site                  |                         |
| Greene & Humphreys                       | 0.15**                  |  |                         | 0.06                  |                         |
| St. Clair                                | does not enter equation |  |                         |                       |                         |
| Maricopa                                 | -0.21**                 |  |                         | 0.67                  |                         |
| Mingo                                    | 0.06                    |  |                         | 0.10                  |                         |
| Program                                  |                         |  |                         |                       |                         |
| Head Start Present vs. Non-Head Start    |                         |  |                         |                       |                         |
| Head Start Present vs. Head Start Absent | 1.83                    |  |                         | 0.09                  |                         |
| Head Start Absent vs. Non-Head Start     | 1.57                    |  |                         | 0.09                  |                         |
| Pretest Intake                           | -0.35                   |  |                         | 0.07                  |                         |
| Constant                                 | 0.30                    |  |                         |                       |                         |
| Statistics                               | F = 1.81                |  |                         | R <sup>2</sup> = 0.10 | MS <sub>e</sub> = 0.19  |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -10 (continued)

Regression Analyses<sup>a</sup> of Total Nutrient Density for Longitudinal and non-Head Start Children (Sample A) across Sites

| Dependent Variable                       | Sample Size | Factors <sup>b</sup> | Effects <sup>c</sup>      |                       |
|--|-------------|----------------------|---------------------------|-----------------------|
|  |             |                      | b                         | se <sub>b</sub>       |
| Site                                     |             |                      |                           |                       |
| Vitamin B <sub>12</sub>                  | 193         | Greene & Humphreys   | 2.62                      | 1.44                  |
|  |             | St. Clair            | 2.71                      | 1.65                  |
|  |             | Maricopa             | -3.27*                    | 1.77                  |
|  |             | Mingo                | -2.06                     | 1.70                  |
| Program                                  |             |                      |                           |                       |
| Head Start Present vs. Non-Head Start    |             |                      | 1.13*                     | 0.06                  |
| Head Start Present vs. Head Start Absent |             |                      | 2.62                      | 1.13                  |
| Head Start Absent vs. Non-Head Start     |             |                      | -3.82                     | 2.41                  |
| Pretest Intake                           |             |                      | 0.46                      | 0.17                  |
| Constant                                 |             |                      | -9.99                     |                       |
| Statistics                               |             |                      | F = 1.98                  | R <sup>2</sup> = 0.12 |
|  |             |                      | MS <sub>e</sub> = 125.65  |                       |
| Site                                     |             |                      |                           |                       |
| Vitamin C                                | 180         | Greene & Humphreys   | 11.27                     | 6.56                  |
|  |             | St. Clair            | 24.17**                   | 7.72                  |
|  |             | Maricopa             | -18.86*                   | 8.31                  |
|  |             | Mingo                | -16.58*                   | 3.56                  |
| Program                                  |             |                      |                           |                       |
| Head Start Present vs. Non-Head Start    |             |                      | -3.96*                    | 1.85                  |
| Head Start Present vs. Head Start Absent |             |                      | -4.36                     | 10.36                 |
| Head Start Absent vs. Non-Head Start     |             |                      | 3.12                      | 11.01                 |
| Pretest Intake                           |             |                      | 0.25***                   | 0.06                  |
| Constant                                 |             |                      | 37.47                     |                       |
| Statistics                               |             |                      | F = 3.47                  | R <sup>2</sup> = 0.20 |
|  |             |                      | MS <sub>e</sub> = 2441.62 |                       |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.



Table 6 -11

Regression Analyses<sup>a</sup> of Nutrient Density for Longitudinal  
Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>     |                 |
|--------------------|-------------|--|--------------------------|-----------------|
|                    |             |  | b                        | SE <sub>b</sub> |
| Protein            | 65          | Greene & Humphreys                       |                          |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 4.06                     | 2.09            |
|                    |             | Head Start-Present vs. Head Start-Absent | 6.70                     | 4.80            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -2.64                    | 4.60            |
|                    |             | Pretest Intake                           | 0.30                     | 0.06            |
|                    |             | Constant                                 | 36.93                    |                 |
| Statistics         |             | F = 1.17 R <sup>2</sup> = 0.19           | MS <sub>e</sub> = 54.18  |                 |
| Protein            | 35          | St. Clair                                |                          |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | does not enter equation  |                 |
|                    |             | Head Start-Present vs. Head Start-Absent | 4.30                     | 5.04            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -3.88                    | 4.35            |
|                    |             | Pretest Intake                           | 0.16                     | 4.35            |
|                    |             | Constant                                 | 28.84                    |                 |
| Statistics         |             | F = 0.56 R <sup>2</sup> = 0.17           | MS <sub>e</sub> = 82.54  |                 |
| Protein            | 49          | Maricopa                                 |                          |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 7.71                     | 4.90            |
|                    |             | Head Start-Present vs. Head Start-Absent | 1.82                     | 4.54            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 5.90                     | 5.08            |
|                    |             | Pretest Intake                           | 0.13                     | 0.19            |
|                    |             | Constant                                 | 7.46                     |                 |
| Statistics         |             | F = 0.47 R <sup>2</sup> = 0.09           | MS <sub>e</sub> = 156.92 |                 |
| Protein            | 32          | Mingo                                    |                          |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 2.63                     | 3.34            |
|                    |             | Head Start-Present vs. Head Start-Absent | does not enter equation  |                 |
|                    |             | Head Start-Absent vs. Non-Head Start     | 3.07                     | 5.46            |
|                    |             | Pretest Intake                           | 0.63                     | 0.20            |
|                    |             | Constant                                 | 32.34                    |                 |
| Statistics         |             | F = 1.63 R <sup>2</sup> = 0.32           | MS <sub>e</sub> = 67.73  |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -11 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>       |                 |
|--------------------|-------------|--|----------------------------|-----------------|
|                    |             |  | b                          | SE <sub>b</sub> |
| Calcium            | 65          | Greene & Humphreys                       |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 253.70***                  | 39.53           |
|                    |             | Head Start-Present vs. Head Start-Absent | 316.37***                  | 90.05           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 62.66                      | 91.19           |
|                    |             | Pretest Intake                           | 0.21                       | 0.10            |
|                    |             | Constant                                 | 346.50                     |                 |
|                    | Statistics  | F = 6.65 R <sup>2</sup> = 0.09           | MS <sub>e</sub> = 33093.43 |                 |
| Calcium            | 35          | St. Clair                                |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 57.73                      | 102.12          |
|                    |             | Head Start-Present vs. Head Start-Absent | 185.48                     | 104.92          |
|                    |             | Head Start-Absent vs. Non-Head Start     | -127.76                    | 91.89           |
|                    |             | Pretest Intake                           | 0.41**                     | 0.16            |
|                    |             | Constant                                 | 32.27                      |                 |
|                    | Statistics  | F = 1.37 R <sup>2</sup> = 0.33           | MS <sub>e</sub> = 39483.41 |                 |
| Calcium            | 48          | Maricopa                                 |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 119.62                     | 78.06           |
|                    |             | Head Start-Present vs. Head Start-Absent | 115.66                     | 73.32           |
|                    |             | Head Start-Absent vs. Non-Head Start     | does not enter equation    |                 |
|                    |             | Pretest Intake                           | 0.58                       | 0.14            |
|                    |             | Constant                                 | 88.62                      |                 |
|                    | Statistics  | F = 0.67 R <sup>2</sup> = 0.14           | MS <sub>e</sub> = 38437.71 |                 |
| Calcium            | 33          | Mingo                                    |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 186.15*                    | 91.98           |
|                    |             | Head Start-Present vs. Head Start-Absent | 326.08*                    | 140.02          |
|                    |             | Head Start-Absent vs. Non-Head Start     | -139.93                    | 122.64          |
|                    |             | Pretest Intake                           | -0.17                      |                 |
|                    |             | Constant                                 | 432.10                     |                 |
|                    | Statistics  | F = 1.24 R <sup>2</sup> = 0.29           | MS <sub>e</sub> = 44997.48 |                 |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -11 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>           |                              |
|--------------------|-------------|--|--------------------------------|------------------------------|
|                    |             |  | b                              | SE <sub>b</sub>              |
| <u>Iron</u>        | <u>65</u>   | <u>Greene &amp; Humphreys</u>            |                                |                              |
|                    |             | Head Start-Present vs. Non-Head Start    | <u>0.82</u>                    | <u>1.22</u>                  |
|                    |             | Head Start-Present vs. Head Start-Absent | <u>2.34</u>                    | <u>2.82</u>                  |
|                    |             | Head Start-Absent vs. Non-Head Start     | <u>4.24</u>                    | <u>2.82</u>                  |
|                    |             | Pretest Intake                           | <u>0.15</u>                    | <u>0.13</u>                  |
|                    |             | Constant                                 | <u>5.57</u>                    |                              |
|                    |             | Statistics                               | F = <u>1.18</u>                | R <sup>2</sup> = <u>0.16</u> |
|                    |             |  | MS <sub>e</sub> = <u>18.55</u> |                              |
| <u>Iron</u>        | <u>35</u>   | <u>St. Clair</u>                         |                                |                              |
|                    |             | Head Start-Present vs. Non-Head Start    | <u>-1.58</u>                   | <u>2.02</u>                  |
|                    |             | Head Start-Present vs. Head Start-Absent | <u>-2.14</u>                   | <u>2.32</u>                  |
|                    |             | Head Start-Absent vs. Non-Head Start     | <u>0.57</u>                    | <u>1.71</u>                  |
|                    |             | Pretest Intake                           | <u>-0.59</u>                   | <u>0.36</u>                  |
|                    |             | Constant                                 | <u>15.26</u>                   |                              |
|                    |             | Statistics                               | F = <u>0.85</u>                | R <sup>2</sup> = <u>0.23</u> |
|                    |             |  | MS <sub>e</sub> = <u>12.93</u> |                              |
| <u>Iron</u>        | <u>50</u>   | <u>Maricopa</u>                          |                                |                              |
|                    |             | Head Start-Present vs. Non-Head Start    | <u>-0.32</u>                   | <u>1.34</u>                  |
|                    |             | Head Start-Present vs. Head Start-Absent | <u>-1.09</u>                   | <u>1.22</u>                  |
|                    |             | Head Start-Absent vs. Non-Head Start     | <u>1.17</u>                    | <u>1.33</u>                  |
|                    |             | Pretest Intake                           | <u>-0.86</u>                   | <u>0.15</u>                  |
|                    |             | Constant                                 | <u>5.20</u>                    |                              |
|                    |             | Statistics                               | F = <u>0.80</u>                | R <sup>2</sup> = <u>0.13</u> |
|                    |             |  | MS <sub>e</sub> = <u>12.32</u> |                              |
| <u>Iron</u>        | <u>33</u>   | <u>Mingo</u>                             |                                |                              |
|                    |             | Head Start-Present vs. Non-Head Start    | <u>-0.99</u>                   | <u>1.60</u>                  |
|                    |             | Head Start-Present vs. Head Start-Absent | <u>7.94**</u>                  | <u>2.68</u>                  |
|                    |             | Head Start-Absent vs. Non-Head Start     | <u>-8.93***</u>                | <u>2.62</u>                  |
|                    |             | Pretest Intake                           | <u>-0.16</u>                   | <u>0.26</u>                  |
|                    |             | Constant                                 | <u>11.23</u>                   |                              |
|                    |             | Statistics                               | F = <u>2.56</u>                | R <sup>2</sup> = <u>0.46</u> |
|                    |             |  | MS <sub>e</sub> = <u>16.40</u> |                              |

<sup>a</sup> Significance shown as:

\*p<.05

\*\*p<.01

\*\*\*p<.001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -11 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>           |                          |
|--------------------|-------------|--|--------------------------------|--------------------------|
|                    |             |  | b                              | SE <sub>b</sub>          |
| Magnesium          | 65          | Greene & Humphreys                       |                                |                          |
|                    |             | Head Start-Present vs. Non-Head Start    | 26.38***                       | 7.26                     |
|                    |             | Head Start-Present vs. Head Start-Absent | 40.16*                         | 16.88                    |
|                    |             | Head Start-Absent vs. Non-Head Start     | -13.76                         | 16.90                    |
|                    |             | Pretest Intake                           | 0.47                           | 0.09                     |
|                    |             | Constant                                 | 128.82                         |                          |
|                    |             | Statistics                               | F = 3.34 R <sup>2</sup> = 0.35 | MS <sub>e</sub> = 662.67 |
| Magnesium          | 35          | St. Clair                                |                                |                          |
|                    |             | Head Start-Present vs. Non-Head Start    | 29.12***                       | 8.34                     |
|                    |             | Head Start-Present vs. Head Start-Absent | 46.83**                        | 14.94                    |
|                    |             | Head Start-Absent vs. Non-Head Start     | -40.56**                       | 12.98                    |
|                    |             | Pretest Intake                           | 0.30**                         | 0.09                     |
|                    |             | Constant                                 | 47.26                          |                          |
|                    |             | Statistics                               | F = 2.90 R <sup>2</sup> = 0.51 | MS <sub>e</sub> = 584.14 |
| Magnesium          | 49          | Maricopa                                 |                                |                          |
|                    |             | Head Start-Present vs. Non-Head Start    | -29.16**                       | 11.28                    |
|                    |             | Head Start-Present vs. Head Start-Absent | 22.56*                         | 10.54                    |
|                    |             | Head Start-Absent vs. Non-Head Start     | 6.60                           | 11.44                    |
|                    |             | Pretest Intake                           | -0.25                          | 0.13                     |
|                    |             | Constant                                 | 1.19                           |                          |
|                    |             | Statistics                               | F = 1.83 R <sup>2</sup> = 0.30 | MS <sub>e</sub> = 822.99 |
| Magnesium          | 32          | Mingo                                    |                                |                          |
|                    |             | Head Start-Present vs. Non-Head Start    | 17.82                          | 11.59                    |
|                    |             | Head Start-Present vs. Head Start-Absent | 15.81                          | 18.10                    |
|                    |             | Head Start-Absent vs. Non-Head Start     | 2.00                           | 17.33                    |
|                    |             | Pretest Intake                           | -0.15                          | 0.19                     |
|                    |             | Constant                                 | 120.46                         |                          |
|                    |             | Statistics                               | F = 1.03 R <sup>2</sup> = 0.26 | MS <sub>e</sub> = 856.26 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -11 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                      | Effects <sup>c</sup>       |                 |
|--------------------|-------------|---|----------------------------|-----------------|
|                    |             |   | b                          | SE <sub>b</sub> |
| <u>Phosphorus</u>  | <u>64</u>   | <u>Greene &amp; Humphreys</u>             |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start     | 190.00***                  | 42.98           |
|                    |             | Head Start-Present vs. Head Start-Absent  | 272.70**                   | 98.22           |
|                    |             | Head Start-Absent vs. Non-Head Start      | -82.66                     | 97.82           |
|                    |             | Pretest Intake                            | -0.18                      | 0.11            |
|                    |             | Constant                                  | 620.78                     |                 |
|                    |             | Statistics F = 3.69 R <sup>2</sup> = 0.38 | MS <sub>e</sub> = 22444.46 |                 |
| <u>Phosphorus</u>  | <u>35</u>   | <u>St. Clair</u>                          |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start     | 124.54*                    | 48.80           |
|                    |             | Head Start-Present vs. Head Start-Absent  | 156.67                     | 88.49           |
|                    |             | Head Start-Absent vs. Non-Head Start      | -217.01**                  | 78.93           |
|                    |             | Pretest Intake                            | 0.48                       | 0.16            |
|                    |             | Constant                                  | 256.08                     |                 |
|                    |             | Statistics F = 1.93 R <sup>2</sup> = 0.41 | MS <sub>e</sub> = 25288.55 |                 |
| <u>Phosphorus</u>  | <u>49</u>   | <u>Maricopa</u>                           |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start     | 127.92*                    | 57.18           |
|                    |             | Head Start-Present vs. Head Start-Absent  | 109.64*                    | 53.06           |
|                    |             | Head Start-Absent vs. Non-Head Start      | 18.30                      | 57.76           |
|                    |             | Pretest Intake                            | -0.47                      | 0.11            |
|                    |             | Constant                                  | 390.09                     |                 |
|                    |             | Statistics F = 0.90 R <sup>2</sup> = 0.17 | MS <sub>e</sub> = 21116.72 |                 |
| <u>Phosphorus</u>  | <u>33</u>   | <u>Mingo</u>                              |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start     | 47.66                      | 81.56           |
|                    |             | Head Start-Present vs. Head Start-Absent  | 90.58                      | 115.94          |
|                    |             | Head Start-Absent vs. Non-Head Start      | -40.96                     | 118.12          |
|                    |             | Pretest Intake                            | 0.68                       | 0.21            |
|                    |             | Constant                                  | 422.32                     |                 |
|                    |             | Statistics F = 0.72 R <sup>2</sup> = 0.17 | MS <sub>e</sub> = 39270.04 |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -11 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>          |                 |
|--------------------|-------------|--|-------------------------------|-----------------|
|                    |             |  | b                             | SE <sub>b</sub> |
| Vitamin A          | 68          | Greene & Humphreys                       |                               |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 5120.00***                    | 1521.02         |
|                    |             | Head Start-Present vs. Head Start-Absent | 6315.67                       | 3620.34         |
|                    |             | Head Start-Absent vs. Non-Head Start     | 1195.56                       | 3561.94         |
|                    |             | Pretest Intake                           | 0.54                          | 0.27            |
|                    |             | Constant                                 | 7113.04                       |                 |
| Statistics         |             | F = 1.84 R <sup>2</sup> = 0.22           | MS <sub>e</sub> = 31494759.62 |                 |
| Vitamin A          | 39          | St. Clair                                |                               |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 1970.86***                    | 621.72          |
|                    |             | Head Start-Present vs. Head Start-Absent | 1637.34*                      | 714.94          |
|                    |             | Head Start-Absent vs. Non-Head Start     | 333.51                        | 629.74          |
|                    |             | Pretest Intake                           | 0.14                          | 0.08            |
|                    |             | Constant                                 | 119.59                        |                 |
| Statistics         |             | F = 2.11 R <sup>2</sup> = 0.40           | MS <sub>e</sub> = 2115666.93  |                 |
| Vitamin A          | 53          | Maricopa                                 |                               |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 144.15                        | 576.81          |
|                    |             | Head Start-Present vs. Head Start-Absent | 129.60                        | 533.88          |
|                    |             | Head Start-Absent vs. Non-Head Start     | does not enter equation       |                 |
|                    |             | Pretest Intake                           | -0.30                         | 0.05            |
|                    |             | Constant                                 | 5798.62                       |                 |
| Statistics         |             | F = 0.32 R <sup>2</sup> = 0.06           | MS <sub>e</sub> = 2337364.14  |                 |
| Vitamin A          | 32          | Mingo                                    |                               |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 1392.82                       | 529.61          |
|                    |             | Head Start-Present vs. Head Start-Absent | 573.14                        | 828.54          |
|                    |             | Head Start-Absent vs. Non-Head Start     | 819.68                        | 818.77          |
|                    |             | Pretest Intake                           | 0.34                          | 0.04            |
|                    |             | Constant                                 | 2956.41                       |                 |
| Statistics         |             | F = 1.59 R <sup>2</sup> = 0.32           | MS <sub>e</sub> = 1773399.30  |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -11 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>           |                        |
|--------------------|-------------|--|--------------------------------|------------------------|
|                    |             |  | b                              | SE <sub>b</sub>        |
| Thiamin            | 65          | Greene & Humphreys                       |                                |                        |
|                    |             | Head Start-Present vs. Non-Head Start    | -0.86                          | 0.08                   |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.32                           | 0.18                   |
|                    |             | Head Start-Absent vs. Non-Head Start     | 0.23                           | 0.18                   |
|                    |             | Pretest Intake                           | -0.60                          | 0.18                   |
|                    |             | Constant                                 | 0.69                           |                        |
|                    |             | Statistics                               | F = 0.79 R <sup>2</sup> = 0.11 | MS <sub>e</sub> = 0.08 |
| Thiamin            | 35          | St. Clair                                |                                |                        |
|                    |             | Head Start-Present vs. Non-Head Start    | does not enter equation        |                        |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.55                           | 0.21                   |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.36                          | 0.18                   |
|                    |             | Pretest Intake                           | -0.14                          | 0.21                   |
|                    |             | Constant                                 | 1.20                           |                        |
|                    |             | Statistics                               | F = 1.94 R <sup>2</sup> = 0.37 | MS <sub>e</sub> = 0.14 |
| Thiamin            | 50          | Maricopa                                 |                                |                        |
|                    |             | Head Start-Present vs. Non-Head Start    | -1.46                          | 0.16                   |
|                    |             | Head Start-Present vs. Head Start-Absent | -0.54                          | 0.15                   |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.92                          | 0.16                   |
|                    |             | Pretest Intake                           | -0.34                          | 0.24                   |
|                    |             | Constant                                 | 0.33                           |                        |
|                    |             | Statistics                               | F = 1.79 R <sup>2</sup> = 0.29 | MS <sub>e</sub> = 0.18 |
| Thiamin            | 33          | Mingo                                    |                                |                        |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.23                           | 0.24                   |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.36                           | 0.39                   |
|                    |             | Head Start-Absent vs. Non-Head Start     | -1.31                          | 0.38                   |
|                    |             | Pretest Intake                           | 0.21                           | 0.34                   |
|                    |             | Constant                                 | 1.37                           |                        |
|                    |             | Statistics                               | F = 0.96 R <sup>2</sup> = 0.24 | MS <sub>e</sub> = 0.37 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -11 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>          |                              |
|--------------------|-------------|--|-------------------------------|------------------------------|
|                    |             |  | b                             | SE <sub>b</sub>              |
| <u>Riboflavin</u>  | <u>65</u>   | <u>Greene &amp; Humphreys</u>            |                               |                              |
|                    |             | Head Start-Present vs. Non-Head Start    | <u>-0.45</u>                  | <u>0.34</u>                  |
|                    |             | Head Start-Present vs. Head Start-Absent | <u>-0.51</u>                  | <u>0.81</u>                  |
|                    |             | Head Start-Absent vs. Non-Head Start     | does not enter equation       |                              |
|                    |             | Pretest Intake                           | <u>-0.20</u>                  | <u>0.31</u>                  |
|                    |             | Constant                                 | <u>3.21</u>                   |                              |
|                    |             | Statistics                               | F = <u>1.69</u>               | R <sup>2</sup> = <u>0.22</u> |
|                    |             |  | MS <sub>e</sub> = <u>1.52</u> |                              |
| <u>Riboflavin</u>  | <u>35</u>   | <u>St. Clair</u>                         |                               |                              |
|                    |             | Head Start-Present vs. Non-Head Start    | <u>1.70</u>                   | <u>0.15</u>                  |
|                    |             | Head Start-Present vs. Head Start-Absent | <u>0.34*</u>                  | <u>0.15</u>                  |
|                    |             | Head Start-Absent vs. Non-Head Start     | <u>-1.71</u>                  | <u>0.14</u>                  |
|                    |             | Pretest Intake                           | <u>0.27*</u>                  | <u>0.13</u>                  |
|                    |             | Constant                                 | <u>0.56</u>                   |                              |
|                    |             | Statistics                               | F = <u>1.62</u>               | R <sup>2</sup> = <u>0.33</u> |
|                    |             |  | MS <sub>e</sub> = <u>0.08</u> |                              |
| <u>Riboflavin</u>  | <u>50</u>   | <u>Maricopa</u>                          |                               |                              |
|                    |             | Head Start-Present vs. Non-Head Start    | <u>0.40*</u>                  | <u>0.19</u>                  |
|                    |             | Head Start-Present vs. Head Start-Absent | <u>0.24</u>                   | <u>0.18</u>                  |
|                    |             | Head Start-Absent vs. Non-Head Start     | <u>1.52</u>                   | <u>0.19</u>                  |
|                    |             | Pretest Intake                           | <u>-0.26</u>                  | <u>0.16</u>                  |
|                    |             | Constant                                 | <u>5.91</u>                   |                              |
|                    |             | Statistics                               | F = <u>2.64</u>               | R <sup>2</sup> = <u>0.37</u> |
|                    |             |  | MS <sub>e</sub> = <u>0.25</u> |                              |
| <u>Riboflavin</u>  | <u>33</u>   | <u>Mingo</u>                             |                               |                              |
|                    |             | Head Start-Present vs. Non-Head Start    | <u>0.50</u>                   | <u>0.38</u>                  |
|                    |             | Head Start-Present vs. Head Start-Absent | <u>1.24</u>                   | <u>0.58</u>                  |
|                    |             | Head Start-Absent vs. Non-Head Start     | <u>0.64</u>                   | <u>0.60</u>                  |
|                    |             | Pretest Intake                           | <u>-0.31</u>                  | <u>0.33</u>                  |
|                    |             | Constant                                 | <u>1.66</u>                   |                              |
|                    |             | Statistics                               | F = <u>0.73</u>               | R <sup>2</sup> = <u>0.17</u> |
|                    |             |  | MS <sub>e</sub> = <u>0.89</u> |                              |

<sup>a</sup> Significance shown as:  
 \*p < .05  
 \*\*p < .01  
 \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.





Table 6 -11 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>           |                         |
|--------------------|-------------|--|--------------------------------|-------------------------|
|                    |             |  | b                              | SE <sub>b</sub>         |
| Niacin             | 65          | Greene & Humphreys                       |                                |                         |
|                    |             | Head Start-Present vs. Non-Head Start    | 1.66                           | 1.44                    |
|                    |             | Head Start-Present vs. Head Start-Absent | 2.71                           | 3.32                    |
|                    |             | Head Start-Absent vs. Non-Head Start     | 1.05                           | 3.32                    |
|                    |             | Pretest Intake                           | 0.83                           | 0.13                    |
|                    |             | Constant                                 | 6.59                           |                         |
|                    |             | Statistics                               | F = 0.91 R <sup>2</sup> = 0.13 | MS <sub>e</sub> = 25.91 |
| Niacin             | 35          | St. Clair                                |                                |                         |
|                    |             | Head Start-Present vs. Non-Head Start    | 2.42                           | 2.16                    |
|                    |             | Head Start-Present vs. Head Start-Absent | 5.28*                          | 2.28                    |
|                    |             | Head Start-Absent vs. Non-Head Start     | -2.84                          | 1.92                    |
|                    |             | Pretest Intake                           | 0.34                           | 0.21                    |
|                    |             | Constant                                 | 10.04                          |                         |
|                    |             | Statistics                               | F = 1.18 R <sup>2</sup> = 0.30 | MS <sub>e</sub> = 17.34 |
| Niacin             | 50          | Maricopa                                 |                                |                         |
|                    |             | Head Start-Present vs. Non-Head Start    | 2.27                           | 2.41                    |
|                    |             | Head Start-Present vs. Head Start-Absent | does not enter equation        |                         |
|                    |             | Head Start-Absent vs. Non-Head Start     | 2.07                           | 2.41                    |
|                    |             | Pretest Intake                           | 0.94                           | 0.30                    |
|                    |             | Constant                                 | -3.84                          |                         |
|                    |             | Statistics                               | F = 0.41 R <sup>2</sup> = 0.07 | MS <sub>e</sub> = 37.90 |
| Niacin             | 33          | Mingo                                    |                                |                         |
|                    |             | Head Start-Present vs. Non-Head Start    | 2.24                           | 2.74                    |
|                    |             | Head Start-Present vs. Head Start-Absent | 13.84**                        | 5.00                    |
|                    |             | Head Start-Absent vs. Non-Head Start     | -11.59*                        | 5.13                    |
|                    |             | Pretest Intake                           | 0.85*                          | 0.40                    |
|                    |             | Constant                                 | 13.59                          |                         |
|                    |             | Statistics                               | F = 1.67 R <sup>2</sup> = 0.36 | MS <sub>e</sub> = 47.31 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -11 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable      | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>    |                 |
|-------------------------|-------------|--|-------------------------|-----------------|
|                         |             |  | b                       | SE <sub>b</sub> |
| Vitamin B <sub>6</sub>  | 65          | Greene & Humphreys                       |                         |                 |
|                         |             | Head Start-Present vs. Non-Head Start    | does not enter equation |                 |
|                         |             | Head Start-Present vs. Head Start-Absent | -0.59                   | 0.26            |
|                         |             | Head Start-Absent vs. Non-Head Start     | 0.67                    | 0.26            |
|                         |             | Pretest Intake                           | -0.30                   | 0.09            |
|                         |             | Constant                                 | 0.68                    |                 |
| Statistics              | F = 0.69    | R <sup>2</sup> = 0.10                    | MS <sub>e</sub> = 0.16  |                 |
| Vitamin B <sub>6</sub>  | 35          | St. Clair                                |                         |                 |
|                         |             | Head Start-Present vs. Non-Head Start    | 1.03                    | 0.12            |
|                         |             | Head Start-Present vs. Head Start-Absent | 0.23                    | 0.13            |
|                         |             | Head Start-Absent vs. Non-Head Start     | -1.28                   | 0.11            |
|                         |             | Pretest Intake                           | 0.27*                   | 0.11            |
|                         |             | Constant                                 | 0.42                    |                 |
| Statistics              | F = 1.71    | R <sup>2</sup> = 0.38                    | MS <sub>e</sub> = 0.05  |                 |
| Vitamin B <sub>6</sub>  | 50          | Maricopa                                 |                         |                 |
|                         |             | Head Start-Present vs. Non-Head Start    | -0.27                   | 0.24            |
|                         |             | Head Start-Present vs. Head Start-Absent | 0.38                    | 0.22            |
|                         |             | Head Start-Absent vs. Non-Head Start     | 1.06                    | 0.23            |
|                         |             | Pretest Intake                           | 0.41                    | 0.33            |
|                         |             | Constant                                 | 1.00                    |                 |
| Statistics <sup>d</sup> | F = 1.13    | R <sup>2</sup> = 0.20                    | MS <sub>e</sub> = 0.38  |                 |
| Vitamin B <sub>6</sub>  | 33          | Mingo                                    |                         |                 |
|                         |             | Head Start-Present vs. Non-Head Start    | -1.73                   | 0.12            |
|                         |             | Head Start-Present vs. Head Start-Absent | -0.39*                  | 0.09            |
|                         |             | Head Start-Absent vs. Non-Head Start     | 0.36                    | 0.18            |
|                         |             | Pretest Intake                           | -0.13                   | 0.13            |
|                         |             | Constant                                 | -0.23                   |                 |
| Statistics              | F = 1.89    | R <sup>2</sup> = 0.39                    | MS <sub>e</sub> = 0.09  |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -11 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable      | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>     |                 |
|-------------------------|-------------|--|--------------------------|-----------------|
|                         |             |  | b                        | SE <sub>b</sub> |
| Vitamin B <sub>12</sub> | 68          | Greene & Humphreys                       |                          |                 |
|                         |             | Head Start-Present vs. Non-Head Start    | -4.18                    | 3.68            |
|                         |             | Head Start-Present vs. Head Start-Absent | -2.92                    | 8.62            |
|                         |             | Head Start-Absent vs. Non-Head Start     | -1.27                    | 8.59            |
|                         |             | Pretest Intake                           | 0.16                     | 0.78            |
|                         |             | Constant                                 | 3.18                     |                 |
| Statistics              |             | F = 1.38 R <sup>2</sup> = 0.18           | MS <sub>e</sub> = 187.06 |                 |
| Vitamin B <sub>12</sub> | 35          | St. Clair                                |                          |                 |
|                         |             | Head Start-Present vs. Non-Head Start    | 11.18**                  | 4.04            |
|                         |             | Head Start-Present vs. Head Start-Absent | 3.80                     | 4.40            |
|                         |             | Head Start-Absent vs. Non-Head Start     | -4.62                    | 4.29            |
|                         |             | Pretest Intake                           | -1.90                    | 2.21            |
|                         |             | Constant                                 | -24.56                   |                 |
| Statistics              |             | F = 3.78 R <sup>2</sup> = 0.54           | MS <sub>e</sub> = 83.01  |                 |
| Vitamin B <sub>12</sub> | 53          | Maricopa                                 |                          |                 |
|                         |             | Head Start-Present vs. Non-Head Start    | -3.28                    | 3.43            |
|                         |             | Head Start-Present vs. Head Start-Absent | 1.86                     | 3.16            |
|                         |             | Head Start-Absent vs. Non-Head Start     | -5.16                    | 3.37            |
|                         |             | Pretest Intake                           | -0.17                    | 0.23            |
|                         |             | Constant                                 | 30.35                    |                 |
| Statistics              |             | F = 0.75 R <sup>2</sup> = 0.14           | MS <sub>e</sub> = 81.86  |                 |
| Vitamin B <sub>12</sub> | 32          | Mingo                                    |                          |                 |
|                         |             | Head Start-Present vs. Non-Head Start    | 1.55                     | 3.97            |
|                         |             | Head Start-Present vs. Head Start-Absent | does not enter equation  |                 |
|                         |             | Head Start-Absent vs. Non-Head Start     | -1.55                    | 6.01            |
|                         |             | Pretest Intake                           | 0.12                     | 0.24            |
|                         |             | Constant                                 | -7.30                    |                 |
| Statistics              |             | F = 0.52 R <sup>2</sup> = 0.13           | MS <sub>e</sub> = 96.93  |                 |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -11 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Longitudinal Head Start and non-Head Start Children (Sample A) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>      |                 |
|--------------------|-------------|--|---------------------------|-----------------|
|                    |             |  | b                         | SE <sub>b</sub> |
| Vitamin C          | 65          | Greene & Humphreys                       |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -28.24*                   | 13.92           |
|                    |             | Head Start-Present vs. Head Start-Absent | -17.72                    | 33.26           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -10.32                    | 32.50           |
|                    |             | Pretest Intake                           | 0.23*                     | 0.11            |
|                    |             | Constant                                 | -18.20                    |                 |
| Statistics         |             | F = 1.62 R <sup>2</sup> = 0.21           | MS <sub>e</sub> = 2014.16 |                 |
| Vitamin C          | 34          | St. Clair                                |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -14.73                    | 18.88           |
|                    |             | Head Start-Present vs. Head Start-Absent | 43.08                     | 29.78           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 7.30                      | 18.95           |
|                    |             | Pretest Intake                           | 0.39*                     | 0.16            |
|                    |             | Constant                                 | 188.89                    |                 |
| Statistics         |             | F = 1.10 R <sup>2</sup> = 0.43           | MS <sub>e</sub> = 3006.39 |                 |
| Vitamin C          | 48          | Maricopa                                 |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 65.02*                    | 28.34           |
|                    |             | Head Start-Present vs. Head Start-Absent | -7.42                     | 17.23           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 21.93                     | 25.46           |
|                    |             | Pretest Intake                           | 0.11                      | 0.13            |
|                    |             | Constant                                 | 362.28                    |                 |
| Statistics         |             | F = 0.88 R <sup>2</sup> = 0.17           | MS <sub>e</sub> = 2377.95 |                 |
| Vitamin C          | 33          | Mingo                                    |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | does not enter equation   |                 |
|                    |             | Head Start-Present vs. Head Start-Absent | 20.52                     | 24.70           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 21.89                     | 23.10           |
|                    |             | Pretest Intake                           | 0.36*                     | 0.17            |
|                    |             | Constant                                 | -18.05                    |                 |
| Statistics         |             | F = 1.63 R <sup>2</sup> = 0.35           | MS <sub>e</sub> = 1570.02 |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -12

Total 24-Hour Nutrient Intake for Posttested Head Start and  
Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons  
Between those present on Day of Recall and Non-Head Start Children across Sites

|                    | PRESENT IN HEAD START |        |        |        |        |        | NON-HEAD START |        |        |        |        |        | T     | P     |
|--------------------|-----------------------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|-------|-------|
|                    | N                     | Q1     | MED    | Q3     | MEAN   | SD     | N              | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| KILOCALORIES       | 305                   | 1423.  | 1691.  | 2104.  | 1776.  | 502.   | 309            | 1235.  | 1536.  | 1899.  | 1584.  | 501.   | 4.75  | 0.000 |
| PROTEIN (GM)       | 307                   | 51.53  | 64.88  | 80.82  | 67.53  | 21.40  | 313            | 38.17  | 52.84  | 69.34  | 55.63  | 21.90  | 6.85  | 0.000 |
| FAT (GM)           | 302                   | 53.74  | 66.14  | 85.55  | 70.25  | 23.20  | 310            | 48.64  | 66.58  | 82.08  | 66.96  | 25.90  | 1.65  | 0.099 |
| CARBOHYDRATE (GM)  | 309                   | 175.71 | 211.66 | 260.86 | 223.38 | 67.70  | 306            | 145.89 | 187.36 | 231.07 | 191.91 | 66.60  | 5.81  | 0.000 |
| CALCIUM (MG)       | 307                   | 764.   | 966.   | 1217.  | 1015.  | 364.   | 310            | 425.   | 637.   | 864.   | 680.   | 346.   | 11.73 | 0.000 |
| IRON (MG)          | 304                   | 8.32   | 10.74  | 13.57  | 11.27  | 3.92   | 302            | 7.24   | 9.74   | 12.33  | 10.18  | 4.06   | 3.37  | 0.001 |
| MAGNESIUM (MG)     | 307                   | 181.82 | 229.69 | 286.58 | 242.02 | 81.60  | 311            | 129.57 | 172.44 | 230.90 | 185.00 | 78.60  | 8.85  | 0.000 |
| PHOSPHORUS (MG)    | 309                   | 938.   | 1176.  | 1462.  | 1225.  | 397.   | 310            | 665.   | 899.   | 1162.  | 947.   | 387.   | 8.80  | 0.000 |
| LOG VITAMIN A (IU) | 309                   | 3.45   | 3.66   | 3.93   | 3.70   | 0.36   | 300            | 3.24   | 3.42   | 3.61   | 3.44   | 0.32   | 9.54  | 0.000 |
| VITAMIN A (IU)     | 309                   | 2789.  | 4567.  | 8528.  | 7350.  | 8195.  | 300            | 1722.  | 2641.  | 4050.  | 3724.  | 4127.  | 6.93  | 0.000 |
| THIAMIN (MG)       | 306                   | 0.95   | 1.21   | 1.65   | 1.32   | 0.51   | 302            | 0.78   | 1.10   | 1.48   | 1.18   | 0.53   | 3.34  | 0.001 |
| RIBOFLAVIN (MG)    | 301                   | 1.51   | 1.96   | 2.50   | 2.07   | 0.75   | 305            | 1.04   | 1.45   | 1.95   | 1.55   | 0.68   | 9.00  | 0.000 |
| NIACIN (MG)        | 305                   | 10.18  | 13.74  | 18.07  | 14.72  | 5.99   | 308            | 8.62   | 12.52  | 17.39  | 13.67  | 6.55   | 2.07  | 0.039 |
| VITAMIN B6 (MG)    | 302                   | 0.99   | 1.23   | 1.64   | 1.35   | 0.53   | 306            | 0.70   | 1.13   | 1.55   | 1.17   | 0.56   | 4.06  | 0.000 |
| LOG VIT. B12 (MCG) | 288                   | 0.46   | 0.60   | 0.71   | 0.58   | 0.23   | 305            | 0.28   | 0.43   | 0.58   | 0.41   | 0.28   | 8.50  | 0.000 |
| VITAMIN B12 (MCG)  | 288                   | 2.90   | 3.98   | 5.10   | 4.40   | 2.58   | 305            | 1.85   | 2.69   | 3.83   | 3.05   | 1.78   | 7.35  | 0.000 |
| VITAMIN C (MG)     | 302                   | 63.08  | 113.29 | 179.73 | 129.06 | 81.50  | 308            | 35.67  | 86.09  | 151.26 | 108.91 | 91.50  | 2.87  | 0.004 |
| CHOLESTERDL (MG)   | 306                   | 193.08 | 280.59 | 456.54 | 342.95 | 194.00 | 308            | 144.46 | 267.35 | 475.14 | 328.30 | 217.00 | 0.88  | 0.377 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6 -13

Total 24-Hour Nutrient Intake for Posttested Head Start Children  
(Samples A, B, C) with Unadjusted Comparisons Between Groups Present  
and Absent on Day of Recall across Sites

|                    | PRESENT IN HEAD START |        |        |        |        |        | ABSENT FROM HEAD START |        |        |        |        |        | T     | P     |
|--------------------|-----------------------|--------|--------|--------|--------|--------|------------------------|--------|--------|--------|--------|--------|-------|-------|
|                    | N                     | Q1     | MED    | Q3     | MEAN   | SD     | N                      | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| KILOCALORIES       | 305                   | 1423.  | 1691.  | 2104.  | 1776.  | 502.   | 121                    | 1164.  | 1498.  | 1873.  | 1561.  | 530.   | 3.84  | 0.000 |
| PROTEIN (GM)       | 307                   | 51.53  | 64.88  | 80.82  | 67.53  | 21.40  | 120                    | 40.08  | 51.42  | 65.46  | 54.57  | 21.00  | 5.70  | 0.000 |
| FAT (GM)           | 302                   | 53.74  | 66.14  | 85.55  | 70.25  | 23.20  | 120                    | 44.89  | 58.29  | 84.87  | 65.76  | 27.60  | 1.57  | 0.117 |
| CARBOHYDRATE (GM)  | 309                   | 175.71 | 211.66 | 260.86 | 223.38 | 67.70  | 121                    | 145.51 | 174.98 | 229.85 | 186.70 | 68.40  | 5.01  | 0.000 |
| CALCIUM (MG)       | 307                   | 764.   | 966.   | 1217.  | 1015.  | 364.   | 122                    | 445.   | 618.   | 862.   | 667.   | 313.   | 9.89  | 0.000 |
| IRON (MG)          | 304                   | 8.32   | 10.74  | 13.57  | 11.27  | 3.92   | 113                    | 7.24   | 9.19   | 11.72  | 9.97   | 3.92   | 3.01  | 0.003 |
| MAGNESIUM (MG)     | 307                   | 181.82 | 229.69 | 286.58 | 242.02 | 81.60  | 121                    | 118.20 | 164.53 | 221.07 | 175.69 | 73.70  | 8.13  | 0.000 |
| PHOSPHORUS (MG)    | 309                   | 938.   | 1176.  | 1462.  | 1225.  | 397.   | 122                    | 656.   | 857.   | 1128.  | 915.   | 359.   | 7.82  | 0.000 |
| LOG VITAMIN A (IU) | 309                   | 3.45   | 3.66   | 3.93   | 3.70   | 0.36   | 120                    | 3.24   | 3.42   | 3.72   | 3.45   | 0.33   | 6.89  | 0.000 |
| VITAMIN A (IU)     | 309                   | 2789.  | 4567.  | 8528.  | 7350.  | 8195.  | 120                    | 1746.  | 2642.  | 5319.  | 3711.  | 3009.  | 6.73  | 0.000 |
| THIAMIN (MG)       | 306                   | 0.95   | 1.21   | 1.65   | 1.32   | 0.51   | 117                    | 0.79   | 1.11   | 1.49   | 1.20   | 0.55   | 2.11  | 0.036 |
| RIBOFLAVIN (MG)    | 301                   | 1.51   | 1.96   | 2.50   | 2.07   | 0.75   | 118                    | 1.13   | 1.43   | 1.90   | 1.55   | 0.65   | 7.07  | 0.000 |
| NIACIN (MG)        | 305                   | 10.18  | 13.74  | 18.07  | 14.72  | 5.99   | 113                    | 8.38   | 11.54  | 16.67  | 13.17  | 6.77   | 2.13  | 0.035 |
| VITAMIN B6 (MG)    | 302                   | 0.99   | 1.23   | 1.64   | 1.35   | 0.53   | 116                    | 0.67   | 1.06   | 1.57   | 1.18   | 0.62   | 2.53  | 0.010 |
| LOG VIT. B12 (MCG) | 288                   | 0.46   | 0.60   | 0.71   | 0.58   | 0.23   | 120                    | 0.34   | 0.48   | 0.61   | 0.47   | 0.28   | 3.90  | 0.000 |
| VITAMIN B12 (MCG)  | 288                   | 2.90   | 3.98   | 5.10   | 4.40   | 2.58   | 120                    | 2.20   | 3.03   | 4.10   | 3.56   | 2.23   | 3.31  | 0.001 |
| VITAMIN C (MG)     | 302                   | 63.08  | 113.29 | 179.73 | 129.06 | 81.50  | 120                    | 41.49  | 94.21  | 172.43 | 114.57 | 92.30  | 1.50  | 0.135 |
| CHOLESTERDL (MG)   | 306                   | 193.08 | 290.59 | 456.54 | 342.96 | 194.00 | 121                    | 161.78 | 352.88 | 484.35 | 346.28 | 211.00 | -0.15 | 0.881 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6 -14

Total 24-Hour Nutrient Intake for Posttested Head Start  
Children (Samples A, B, C) with Unadjusted Comparisons  
Between those Absent on Day of Recall and Non-Head Start Children across Sites

|                    | ABSENT FROM HEAD START |        |        |        |        |        | NON-HEAD START |        |        |        |        |        | T     | P     |
|--------------------|------------------------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|-------|-------|
|                    | N                      | Q1     | MED    | Q3     | MEAN   | SD     | N              | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| KILOCALORIES       | 121                    | 1164.  | 1498.  | 1873.  | 1561.  | 530.   | 309            | 1235.  | 1536.  | 1899.  | 1584.  | 501.   | -0.41 | 0.679 |
| PROTEIN (GM)       | 120                    | 40.08  | 51.42  | 65.46  | 54.57  | 21.00  | 313            | 38.17  | 52.84  | 69.34  | 55.63  | 21.90  | -0.47 | 0.642 |
| FAT (GM)           | 120                    | 44.89  | 58.29  | 84.87  | 65.76  | 27.60  | 310            | 48.64  | 66.58  | 82.08  | 66.96  | 25.90  | -0.41 | 0.679 |
| CARBOHYDRATE (GM)  | 121                    | 145.51 | 174.98 | 229.85 | 186.70 | 68.40  | 306            | 145.89 | 187.36 | 231.07 | 191.91 | 66.60  | -0.71 | 0.476 |
| CALCIUM (MG)       | 122                    | 445.   | 618.   | 862.   | 667.   | 313.   | 310            | 425.   | 637.   | 864.   | 680.   | 346.   | -0.36 | 0.719 |
| IRON (MG)          | 113                    | 7.24   | 9.19   | 11.72  | 9.87   | 3.92   | 302            | 7.24   | 9.74   | 12.33  | 10.18  | 4.06   | -0.47 | 0.639 |
| MAGNESIUM (MG)     | 121                    | 118.20 | 164.53 | 221.07 | 175.69 | 73.70  | 311            | 129.57 | 172.44 | 230.90 | 185.00 | 78.60  | -1.16 | 0.249 |
| PHOSPHORUS (MG)    | 122                    | 656.   | 857.   | 1128.  | 915.   | 359.   | 310            | 665.   | 899.   | 1162.  | 947.   | 387.   | -0.82 | 0.411 |
| LOG VITAMIN A (IU) | 120                    | 3.24   | 3.42   | 3.72   | 3.45   | 0.33   | 300            | 3.24   | 3.42   | 3.61   | 3.44   | 0.32   | 0.34  | 0.735 |
| VITAMIN A (IU)     | 120                    | 1746.  | 2642.  | 5319.  | 3711.  | 3009.  | 300            | 1722.  | 2641.  | 4050.  | 3724.  | 4127.  | -0.03 | 0.972 |
| THIAMIN (MG)       | 147                    | 0.79   | 1.11   | 1.49   | 1.20   | 0.55   | 302            | 0.78   | 1.10   | 1.48   | 1.18   | 0.53   | 0.29  | 0.774 |
| RIBOFLAVIN (MG)    | 118                    | 1.13   | 1.43   | 1.90   | 1.55   | 0.65   | 305            | 1.04   | 1.45   | 1.95   | 1.55   | 0.68   | 0.03  | 0.975 |
| NIACIN (MG)        | 113                    | 8.38   | 11.54  | 16.67  | 13.17  | 6.77   | 308            | 8.62   | 12.52  | 17.39  | 13.67  | 6.55   | -0.67 | 0.504 |
| VITAMIN B6 (MG)    | 116                    | 0.67   | 1.06   | 1.57   | 1.18   | 0.62   | 306            | 0.70   | 1.13   | 1.55   | 1.17   | 0.56   | 0.16  | 0.874 |
| LOG VIT. B12 (MCG) | 120                    | 0.34   | 0.48   | 0.61   | 0.47   | 0.28   | 305            | 0.28   | 0.43   | 0.58   | 0.41   | 0.28   | 2.19  | 0.029 |
| VITAMIN B12 (MCG)  | 120                    | 2.20   | 3.03   | 4.10   | 3.56   | 2.23   | 305            | 1.89   | 2.69   | 3.83   | 3.05   | 1.78   | 2.22  | 0.027 |
| VITAMIN C (MG)     | 120                    | 41.49  | 94.21  | 172.43 | 114.57 | 92.30  | 308            | 35.67  | 86.09  | 151.26 | 108.91 | 91.50  | 0.57  | 0.569 |
| CHOLESTEROL (MG)   | 121                    | 161.78 | 352.88 | 484.35 | 346.28 | 211.00 | 308            | 144.46 | 267.35 | 475.14 | 328.30 | 217.00 | 0.79  | 0.432 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

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Table 6 -15

Total 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Present on Day of Recall and Non-Head Start Children within Site

|                          | PRESENT IN HEAD START |        |        |        |        |       | NON-HEAD START |        |        |        |        |       | T     | P     |
|--------------------------|-----------------------|--------|--------|--------|--------|-------|----------------|--------|--------|--------|--------|-------|-------|-------|
|                          | N                     | Q1     | MED    | Q3     | MEAN   | SD    | N              | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>KILOCALORIES</b>      |                       |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys         | 109                   | 1341   | 1532   | 1856   | 1618   | 412   | 88             | 1274   | 1507   | 1895   | 1549   | 498   | 1.04  | 0.301 |
| St. Clair                | 71                    | 1659   | 2030   | 2520   | 2064   | 519   | 67             | 1475   | 1709   | 2040   | 1762   | 454   | 3.65  | 0.000 |
| Maricopa                 | 58                    | 1274   | 1490   | 1844   | 1555   | 429   | 51             | 1897   | 1389   | 1917   | 1475   | 568   | 0.82  | 0.414 |
| Mingo                    | 67                    | 1511   | 1914   | 2301   | 1920   | 485   | 103            | 1220   | 1510   | 1790   | 1552   | 476   | 4.82  | 0.000 |
| <b>PROTEIN (GM)</b>      |                       |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys         | 108                   | 50.36  | 61.44  | 73.33  | 63.41  | 17.10 | 80             | 41.14  | 55.49  | 71.45  | 57.49  | 21.90 | 2.09  | 0.038 |
| St. Clair                | 72                    | 58.92  | 73.04  | 93.20  | 75.72  | 22.40 | 68             | 46.72  | 60.53  | 71.45  | 60.95  | 20.70 | 4.06  | 0.000 |
| Maricopa                 | 56                    | 45.34  | 56.31  | 67.92  | 57.52  | 19.00 | 51             | 35.18  | 45.34  | 66.29  | 51.46  | 23.10 | 1.48  | 0.143 |
| Mingo                    | 71                    | 59.78  | 71.70  | 85.80  | 73.38  | 23.60 | 104            | 36.73  | 50.62  | 67.29  | 52.60  | 21.40 | 5.95  | 0.000 |
| <b>FAT (GM)</b>          |                       |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys         | 107                   | 49.20  | 59.82  | 75.82  | 63.27  | 19.90 | 88             | 48.33  | 63.48  | 78.65  | 63.65  | 24.50 | -0.12 | 0.908 |
| St. Clair                | 71                    | 60.76  | 76.65  | 100.48 | 81.65  | 27.00 | 68             | 59.45  | 74.28  | 92.74  | 76.25  | 24.10 | 1.24  | 0.216 |
| Maricopa                 | 58                    | 51.44  | 63.28  | 80.59  | 66.10  | 23.00 | 51             | 40.70  | 61.11  | 83.58  | 64.62  | 30.40 | 0.28  | 0.777 |
| Mingo                    | 66                    | 59.60  | 74.68  | 88.92  | 72.93  | 18.90 | 103            | 48.80  | 65.36  | 77.49  | 64.83  | 24.60 | 2.41  | 0.017 |
| <b>CARBOHYDRATE (GM)</b> |                       |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys         | 110                   | 166.90 | 196.30 | 232.29 | 201.34 | 47.90 | 87             | 139.31 | 178.51 | 226.34 | 187.41 | 66.90 | 1.64  | 0.103 |
| St. Clair                | 71                    | 204.73 | 256.60 | 323.24 | 263.85 | 70.20 | 67             | 172.49 | 203.00 | 243.22 | 213.66 | 68.30 | 4.26  | 0.000 |
| Maricopa                 | 58                    | 160.92 | 182.08 | 213.99 | 182.49 | 49.70 | 50             | 129.04 | 165.99 | 221.95 | 171.58 | 64.40 | 0.97  | 0.338 |
| Mingo                    | 70                    | 185.96 | 244.91 | 304.11 | 250.84 | 71.90 | 102            | 146.96 | 186.45 | 229.34 | 191.43 | 63.00 | 5.60  | 0.000 |

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Table 6 -15 (continued)

Total 24-Hour Nutrient Intake for Posttested Head Start and  
Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons  
Between those Present on Day of Recall and Non-Head Start Children within Site

|                        | PRESENT IN HEAD START |        |        |        |        |       | NON-HEAD START |        |        |        |        |       | T    | P     |
|------------------------|-----------------------|--------|--------|--------|--------|-------|----------------|--------|--------|--------|--------|-------|------|-------|
|                        | N                     | Q1     | MED    | Q3     | MEAN   | SD    | N              | Q1     | MED    | Q3     | MEAN   | SD    |      |       |
| <b>CALCIUM (MG)</b>    |                       |        |        |        |        |       |                |        |        |        |        |       |      |       |
| Greene/Humphreys       | 110                   | 788.   | 932.   | 1143.  | 952.   | 271.  | 89             | 405.   | 565.   | 827.   | 617.   | 297.  | 8.21 | 0.000 |
| St. Clair              | 71                    | 798.   | 1022.  | 1350.  | 1101.  | 417.  | 67             | 451.   | 637.   | 852.   | 657.   | 332.  | 6.93 | 0.000 |
| Maricopa               | 56                    | 623.   | 860.   | 1105.  | 863.   | 332.  | 50             | 397.   | 710.   | 931.   | 706.   | 367.  | 2.30 | 0.024 |
| Mingo                  | 70                    | 891.   | 1144.  | 1420.  | 1151.  | 393.  | 104            | 438.   | 673.   | 944.   | 736.   | 377.  | 6.95 | 0.000 |
| <b>IRON (MG)</b>       |                       |        |        |        |        |       |                |        |        |        |        |       |      |       |
| Greene/Humphreys       | 108                   | 8.25   | 9.93   | 12.69  | 10.76  | 3.82  | 82             | 6.95   | 9.77   | 13.17  | 10.18  | 3.97  | 1.02 | 0.310 |
| St. Clair              | 70                    | 10.08  | 12.69  | 15.45  | 12.88  | 4.03  | 68             | 9.18   | 10.31  | 14.24  | 11.59  | 4.28  | 1.81 | 0.072 |
| Maricopa               | 55                    | 7.11   | 9.63   | 11.07  | 9.43   | 3.07  | 49             | 7.19   | 9.65   | 11.34  | 9.51   | 3.60  | 0.13 | 0.900 |
| Mingo                  | 71                    | 9.11   | 11.42  | 14.43  | 11.90  | 3.87  | 103            | 6.72   | 8.88   | 11.69  | 9.56   | 4.01  | 3.86 | 0.000 |
| <b>MAGNESIUM (MG)</b>  |                       |        |        |        |        |       |                |        |        |        |        |       |      |       |
| Greene/Humphreys       | 110                   | 187.10 | 218.14 | 265.04 | 228.58 | 67.00 | 89             | 136.24 | 174.92 | 236.34 | 190.78 | 81.50 | 3.52 | 0.001 |
| St. Clair              | 71                    | 214.90 | 283.62 | 358.82 | 289.89 | 87.60 | 68             | 131.05 | 178.36 | 232.05 | 191.71 | 79.60 | 6.92 | 0.000 |
| Maricopa               | 58                    | 144.98 | 177.99 | 239.41 | 194.98 | 69.50 | 51             | 105.77 | 154.36 | 218.33 | 167.27 | 79.90 | 1.92 | 0.058 |
| Mingo                  | 68                    | 200.24 | 240.11 | 325.29 | 253.89 | 78.80 | 103            | 133.17 | 172.38 | 224.06 | 184.33 | 74.40 | 5.77 | 0.000 |
| <b>PHOSPHORUS (MG)</b> |                       |        |        |        |        |       |                |        |        |        |        |       |      |       |
| Greene/Humphreys       | 110                   | 998.   | 1125.  | 1341.  | 1181.  | 350.  | 89             | 669.   | 888.   | 1124.  | 931.   | 387.  | 4.73 | 0.000 |
| St. Clair              | 71                    | 1006.  | 1320.  | 1579.  | 1332.  | 404.  | 67             | 640.   | 899.   | 1225.  | 936.   | 377.  | 5.95 | 0.000 |
| Maricopa               | 57                    | 786.   | 997.   | 1273.  | 1034.  | 345.  | 51             | 629.   | 848.   | 1169.  | 906.   | 393.  | 1.80 | 0.076 |
| Mingo                  | 71                    | 1048.  | 1319.  | 1659.  | 1340.  | 434.  | 103            | 687.   | 942.   | 1205.  | 989.   | 393.  | 5.44 | 0.000 |

Table 6 -15 (continued)

Total 24-Hour Nutrient Intake for Posttested Head Start and  
Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons  
Between those Present on Day of Recall and Non-Head Start Children within Site

| A                         | PRESENT IN HEAD START |      |      |       |       |       | NON-HEAD START |      |      |      |      |      | T     | P     |
|---------------------------|-----------------------|------|------|-------|-------|-------|----------------|------|------|------|------|------|-------|-------|
|                           | N                     | Q1   | MED  | Q3    | MEAN  | SD    | N              | Q1   | MED  | Q3   | MEAN | SD   |       |       |
| <b>LOG VITAMIN A (IU)</b> |                       |      |      |       |       |       |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 108                   | 3.46 | 3.77 | 4.13  | 3.81  | 0.41  | 89             | 3.32 | 3.50 | 3.68 | 3.54 | 0.36 | 4.99  | 0.000 |
| St. Clair                 | 72                    | 3.53 | 3.78 | 3.96  | 3.77  | 0.34  | 65             | 3.19 | 3.38 | 3.54 | 3.39 | 0.31 | 6.76  | 0.000 |
| Maricopa                  | 57                    | 3.32 | 3.52 | 3.64  | 3.51  | 0.29  | 49             | 3.20 | 3.41 | 3.59 | 3.42 | 0.29 | 1.60  | 0.112 |
| Mingo                     | 72                    | 3.45 | 3.59 | 3.81  | 3.62  | 0.27  | 97             | 3.20 | 3.40 | 3.61 | 3.38 | 0.29 | 5.48  | 0.000 |
| <b>VITAMIN A (IU)</b>     |                       |      |      |       |       |       |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 108                   | 2906 | 5887 | 13433 | 10279 | 11398 | 89             | 2104 | 3130 | 4810 | 5150 | 6386 | 3.98  | 0.000 |
| St. Clair                 | 72                    | 3404 | 6052 | 9097  | 8042  | 7173  | 65             | 1547 | 2405 | 3461 | 3271 | 3080 | 5.14  | 0.000 |
| Maricopa                  | 57                    | 2100 | 3312 | 4376  | 3994  | 2858  | 49             | 1572 | 2601 | 3859 | 3299 | 2511 | 1.33  | 0.186 |
| Mingo                     | 72                    | 2796 | 3873 | 6401  | 4922  | 3016  | 97             | 1584 | 2535 | 4079 | 2933 | 1852 | 4.95  | 0.000 |
| <b>THIAMIN (MG)</b>       |                       |      |      |       |       |       |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 109                   | 0.91 | 1.17 | 1.45  | 1.23  | 0.45  | 85             | 0.80 | 1.24 | 1.63 | 1.27 | 0.60 | -0.45 | 0.651 |
| St. Clair                 | 71                    | 1.09 | 1.46 | 1.98  | 1.55  | 0.60  | 68             | 1.01 | 1.30 | 1.73 | 1.38 | 0.57 | 1.79  | 0.075 |
| Maricopa                  | 57                    | 0.81 | 1.02 | 1.27  | 1.11  | 0.44  | 48             | 0.63 | 0.92 | 1.32 | 0.97 | 0.42 | 1.72  | 0.089 |
| Mingo                     | 69                    | 1.08 | 1.36 | 1.68  | 1.40  | 0.44  | 101            | 0.74 | 0.99 | 1.37 | 1.08 | 0.44 | 4.67  | 0.000 |
| <b>RIBOFLAVIN* (MG)</b>   |                       |      |      |       |       |       |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 103                   | 1.50 | 1.91 | 2.38  | 2.02  | 0.69  | 87             | 1.13 | 1.44 | 1.96 | 1.58 | 0.72 | 4.29  | 0.000 |
| St. Clair                 | 72                    | 1.73 | 2.37 | 3.03  | 2.40  | 0.88  | 65             | 1.04 | 1.49 | 1.93 | 1.53 | 0.60 | 6.86  | 0.000 |
| Maricopa                  | 55                    | 1.17 | 1.69 | 2.11  | 1.67  | 0.63  | 51             | 0.96 | 1.31 | 1.95 | 1.51 | 0.70 | 1.26  | 0.209 |
| Mingo                     | 71                    | 1.70 | 2.04 | 2.48  | 2.12  | 0.65  | 102            | 1.04 | 1.45 | 1.96 | 1.55 | 0.70 | 5.55  | 0.000 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6 -15 (continued)

Total 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Present on Day of Recall and Non-Head Start Children within Site

|                           | PRESENT IN HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|---------------------------|-----------------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                           | N                     | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>NIACIN (MG)</b>        |                       |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys          | 106                   | 10.38 | 14.00 | 17.26 | 14.39 | 5.48 | 87             | 10.28 | 14.10 | 19.80 | 15.13 | 6.80 | -0.81 | 0.419 |
| St. Clair                 | 72                    | 12.78 | 16.18 | 21.26 | 17.30 | 6.43 | 68             | 11.13 | 13.99 | 18.73 | 15.58 | 6.59 | 1.56  | 0.121 |
| Maricopa                  | 57                    | 8.73  | 11.12 | 13.67 | 11.87 | 5.04 | 49             | 7.69  | 10.27 | 13.53 | 11.16 | 5.00 | 0.83  | 0.409 |
| Mingo                     | 70                    | 9.78  | 13.54 | 18.50 | 14.78 | 5.98 | 104            | 7.42  | 10.77 | 16.07 | 12.38 | 6.35 | 2.53  | 0.012 |
| <b>VITAMIN B6 (MG)</b>    |                       |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys          | 106                   | 1.00  | 1.20  | 1.47  | 1.27  | 0.43 | 84             | 0.84  | 1.25  | 1.76  | 1.29  | 0.57 | -0.23 | 0.818 |
| St. Clair                 | 69                    | 1.03  | 1.48  | 1.93  | 1.57  | 0.60 | 68             | 0.71  | 1.09  | 1.51  | 1.16  | 0.54 | 4.21  | 0.000 |
| Maricopa                  | 57                    | 0.81  | 1.15  | 1.43  | 1.19  | 0.55 | 51             | 0.74  | 1.13  | 1.46  | 1.14  | 0.53 | 0.47  | 0.640 |
| Mingo                     | 70                    | 1.03  | 1.26  | 1.71  | 1.38  | 0.49 | 103            | 0.64  | 0.96  | 1.47  | 1.09  | 0.58 | 3.46  | 0.001 |
| <b>LOG VIT. B12 (MCG)</b> |                       |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys          | 94                    | 0.44  | 0.55  | 0.67  | 0.58  | 0.24 | 87             | 0.23  | 0.41  | 0.56  | 0.39  | 0.28 | 5.04  | 0.000 |
| St. Clair                 | 67                    | 0.50  | 0.64  | 0.78  | 0.62  | 0.24 | 66             | 0.32  | 0.46  | 0.58  | 0.44  | 0.21 | 4.59  | 0.000 |
| Maricopa                  | 56                    | 0.39  | 0.54  | 0.68  | 0.52  | 0.24 | 52             | 0.29  | 0.48  | 0.65  | 0.43  | 0.31 | 1.59  | 0.114 |
| Mingo                     | 71                    | 0.51  | 0.62  | 0.71  | 0.60  | 0.19 | 100            | 0.25  | 0.42  | 0.58  | 0.39  | 0.29 | 5.80  | 0.000 |
| <b>VITAMIN B12 (MCG)</b>  |                       |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys          | 94                    | 2.78  | 3.59  | 4.73  | 4.59  | 3.54 | 87             | 1.70  | 2.55  | 3.62  | 2.99  | 1.97 | 3.79  | 0.000 |
| St. Clair                 | 67                    | 3.19  | 4.33  | 6.05  | 4.73  | 2.27 | 66             | 2.11  | 2.91  | 3.82  | 3.07  | 1.38 | 5.08  | 0.000 |
| Maricopa                  | 56                    | 2.48  | 3.46  | 4.85  | 3.80  | 1.94 | 52             | 1.95  | 3.01  | 4.51  | 3.33  | 1.97 | 1.23  | 0.222 |
| Mingo                     | 71                    | 3.24  | 4.20  | 5.10  | 4.30  | 1.54 | 100            | 1.79  | 2.65  | 3.78  | 2.94  | 1.73 | 5.38  | 0.000 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6 -15 (continued)

Total 24-Hour Nutrient Intake for Posttested Head Start and  
 Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons  
 Between those Present on Day of Recall and Non-Head Start Children within Site

|                         | PRESENT IN HEAD START |        |        |        |        |        | NON-HEAD START |        |        |        |        |        | T     | p\    |
|-------------------------|-----------------------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|-------|-------|
|                         | N                     | Q1     | MED    | Q3     | MEAN   | SD     | N              | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>VITAMIN C (MG)</b>   |                       |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys        | 108                   | 56.44  | 98.65  | 168.20 | 118.11 | 77.00  | 90             | 50.36  | 121.94 | 185.23 | 130.45 | 90.90  | -1.02 | 0.309 |
| St. Clair               | 71                    | 125.12 | 186.31 | 252.79 | 190.62 | 84.50  | 68             | 27.81  | 123.04 | 208.85 | 144.77 | 121.00 | 2.59  | 0.011 |
| Maricopa                | 57                    | 42.88  | 69.09  | 116.71 | 89.58  | 60.40  | 50             | 36.08  | 67.89  | 118.25 | 78.89  | 52.20  | 0.98  | 0.328 |
| Mingo                   | 66                    | 64.41  | 98.46  | 155.33 | 114.87 | 65.10  | 100            | 28.11  | 63.98  | 104.95 | 80.15  | 68.90  | 3.29  | 0.001 |
| <b>CHOLESTEROL (MG)</b> |                       |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys        | 105                   | 189.94 | 289.32 | 427.12 | 324.85 | 160.00 | 88             | 145.04 | 230.58 | 417.11 | 295.16 | 190.00 | 1.16  | 0.247 |
| St. Clair               | 71                    | 261.16 | 412.47 | 544.90 | 428.91 | 212.00 | 66             | 167.88 | 264.89 | 522.24 | 356.50 | 226.00 | 1.93  | 0.056 |
| Maricopa                | 58                    | 146.53 | 220.08 | 423.64 | 311.33 | 227.00 | 52             | 119.05 | 310.34 | 507.96 | 332.56 | 223.00 | -0.49 | 0.622 |
| Mingo                   | 72                    | 197.72 | 273.13 | 373.10 | 310.12 | 168.00 | 102            | 144.64 | 277.69 | 468.30 | 336.46 | 229.00 | -0.87 | 0.383 |

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Table 6 -16

**Total 24-Hour Nutrient Intake for Posttested Head Start Children  
(Samples A, B, C) with Unadjusted Comparisons Between Groups  
Present and Absent on Day of Recall within Site**

|                          | PRESENT IN HEAD START |        |        |        |        |       | ABSENT FROM HEAD START |        |        |        |        |       | T    | P     |
|--------------------------|-----------------------|--------|--------|--------|--------|-------|------------------------|--------|--------|--------|--------|-------|------|-------|
|                          | N                     | Q1     | MED    | Q3     | MEAN   | SD    | N.                     | Q1     | MED    | Q3     | MEAN   | SD    |      |       |
| <b>KILOCALORIES</b>      |                       |        |        |        |        |       |                        |        |        |        |        |       |      |       |
| Greene/Humphreys         | 109                   | 1341.  | 1532.  | 1856.  | 1618.  | 412.  | 10                     | 1096.  | 1248.  | 1946.  | 1459.  | 520.  | 0.94 | 0.370 |
| St. Clair                | 71                    | 1659.  | 2030.  | 2520.  | 2064.  | 519.  | 32                     | 1542.  | 1940.  | 2383.  | 1946.  | 499.  | 1.10 | 0.276 |
| Maricopa                 | 58                    | 1274.  | 1490.  | 1844.  | 1555.  | 429.  | 40                     | 1010.  | 1301.  | 1526.  | 1304.  | 412.  | 2.91 | 0.005 |
| Mingo                    | 67                    | 1511.  | 1914.  | 2301.  | 1920.  | 495.  | 39                     | 1141.  | 1514.  | 1824.  | 1534.  | 498.  | 3.86 | 0.000 |
| <b>PROTEIN (GM)</b>      |                       |        |        |        |        |       |                        |        |        |        |        |       |      |       |
| Greene/Humphreys         | 108                   | 50.36  | 61.44  | 73.33  | 63.41  | 17.10 | 9                      | 32.72  | 47.93  | 50.12  | 46.98  | 20.20 | 2.37 | 0.042 |
| St. Clair                | 72                    | 58.92  | 73.04  | 93.20  | 75.72  | 22.40 | 32                     | 54.94  | 65.30  | 83.70  | 69.70  | 21.60 | 1.30 | 0.199 |
| Maricopa                 | 56                    | 45.34  | 56.31  | 67.92  | 57.52  | 19.00 | 41                     | 39.82  | 44.93  | 54.38  | 46.26  | 16.80 | 3.09 | 0.003 |
| Mingo                    | 71                    | 59.78  | 71.70  | 85.80  | 73.39  | 23.60 | 38                     | 38.53  | 53.16  | 63.07  | 52.60  | 18.70 | 5.04 | 0.000 |
| <b>FAT (GM)</b>          |                       |        |        |        |        |       |                        |        |        |        |        |       |      |       |
| Greene/Humphreys         | 107                   | 49.20  | 59.82  | 75.82  | 63.27  | 19.90 | 10                     | 36.78  | 48.74  | 93.27  | 60.99  | 35.10 | 0.20 | 0.844 |
| St. Clair                | 71                    | 60.76  | 76.65  | 100.48 | 81.65  | 27.00 | 31                     | 65.25  | 77.27  | 109.23 | 84.51  | 26.50 | 0.50 | 0.621 |
| Maricopa                 | 58                    | 51.44  | 63.28  | 80.51  | 66.10  | 23.00 | 41                     | 37.06  | 50.67  | 74.27  | 55.51  | 24.00 | 2.20 | 0.031 |
| Mingo                    | 66                    | 59.60  | 74.68  | 88.92  | 72.93  | 18.90 | 38                     | 45.04  | 58.39  | 77.50  | 62.77  | 23.00 | 2.31 | 0.024 |
| <b>CARBOHYDRATE (GM)</b> |                       |        |        |        |        |       |                        |        |        |        |        |       |      |       |
| Greene/Humphreys         | 110                   | 166.90 | 196.30 | 232.29 | 201.34 | 47.90 | 10                     | 144.00 | 158.92 | 212.69 | 175.41 | 45.30 | 1.73 | 0.112 |
| St. Clair                | 71                    | 204.73 | 256.60 | 323.24 | 263.85 | 70.20 | 32                     | 163.59 | 212.36 | 276.57 | 223.67 | 72.30 | 2.64 | 0.011 |
| Maricopa                 | 58                    | 160.92 | 182.08 | 213.99 | 182.49 | 49.70 | 40                     | 109.03 | 161.92 | 200.35 | 161.35 | 60.10 | 1.83 | 0.071 |
| Mingo                    | 70                    | 185.96 | 244.91 | 304.11 | 250.84 | 71.90 | 39                     | 143.16 | 178.13 | 228.18 | 185.27 | 66.90 | 4.77 | 0.000 |

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Table 6 -16 (continued)

Total 24-Hour Nutrient Intake For Posttested Head Start Children  
(Samples A, B, C) with Unadjusted Comparisons Between Groups  
Present and Absent on Day of Recall within Site

|                        | PRESENT IN HEAD START |        |        |        |        |       | ABSENT FROM HEAD START |        |        |        |        |       | F    | P     |
|------------------------|-----------------------|--------|--------|--------|--------|-------|------------------------|--------|--------|--------|--------|-------|------|-------|
|                        | N                     | Q1     | MED    | Q3     | MEAN   | SD    | N                      | Q1     | MED    | Q3     | MEAN   | SD    |      |       |
| <b>CALCIUM (MG)</b>    |                       |        |        |        |        |       |                        |        |        |        |        |       |      |       |
| Greene/Humphreys       | 110                   | 788    | 932    | 1143   | 952    | 271   | 10                     | 332    | 418    | 583    | 461    | 170   | 8.33 | 0.000 |
| St. Clair              | 71                    | 798    | 1022   | 1350   | 1101   | 417   | 32                     | 505    | 665    | 824    | 722    | 320   | 5.04 | 0.000 |
| Maricopa               | 56                    | 623    | 860    | 1105   | 863    | 332   | 41                     | 445    | 599    | 777    | 626    | 309   | 3.61 | 0.001 |
| Mingo                  | 70                    | 891    | 1144   | 1420   | 1151   | 393   | 39                     | 463    | 651    | 912    | 720    | 321   | 6.19 | 0.000 |
| <b>IRON (MG)</b>       |                       |        |        |        |        |       |                        |        |        |        |        |       |      |       |
| Greene/Humphreys       | 108                   | 8.25   | 9.93   | 12.69  | 10.76  | 3.82  | 9                      | 7.84   | 8.91   | 9.15   | 9.17   | 3.19  | 1.41 | 0.189 |
| St. Clair              | 70                    | 10.08  | 12.69  | 15.45  | 12.88  | 4.03  | 29                     | 9.14   | 12.08  | 15.64  | 12.71  | 4.55  | 0.17 | 0.865 |
| Maricopa               | 55                    | 7.11   | 9.63   | 11.07  | 9.43   | 3.07  | 40                     | 6.43   | 8.51   | 11.10  | 8.81   | 3.47  | 0.90 | 0.371 |
| Mingo                  | 71                    | 9.11   | 11.42  | 14.43  | 11.90  | 3.87  | 35                     | 7.76   | 9.16   | 9.94   | 9.24   | 2.96  | 3.92 | 0.000 |
| <b>MAGNESIUM (MG)</b>  |                       |        |        |        |        |       |                        |        |        |        |        |       |      |       |
| Greene/Humphreys       | 110                   | 187.10 | 218.14 | 265.04 | 228.58 | 67.00 | 10                     | 99.03  | 180.90 | 227.58 | 170.97 | 72.20 | 2.43 | 0.035 |
| St. Clair              | 71                    | 214.90 | 283.62 | 358.82 | 289.89 | 87.60 | 32                     | 162.68 | 202.98 | 270.20 | 217.98 | 77.70 | 4.17 | 0.000 |
| Maricopa               | 58                    | 144.98 | 177.99 | 239.41 | 194.98 | 69.50 | 40                     | 105.15 | 135.21 | 176.94 | 145.14 | 64.40 | 3.64 | 0.000 |
| Mingo                  | 68                    | 200.24 | 240.11 | 325.29 | 253.89 | 78.80 | 39                     | 123.38 | 163.80 | 209.42 | 173.54 | 65.10 | 5.68 | 0.000 |
| <b>PHOSPHORUS (MG)</b> |                       |        |        |        |        |       |                        |        |        |        |        |       |      |       |
| Greene/Humphreys       | 110                   | 998    | 1125   | 1341   | 1181   | 350   | 10                     | 519    | 703    | 941    | 790    | 391   | 3.06 | 0.012 |
| St. Clair              | 71                    | 1006   | 1320   | 1579   | 1332   | 404   | 32                     | 759    | 1096   | 1204   | 1044   | 343   | 3.73 | 0.000 |
| Maricopa               | 57                    | 786    | 997    | 1273   | 1034   | 345   | 41                     | 612    | 756    | 912    | 803    | 317   | 3.43 | 0.001 |
| Mingo                  | 71                    | 1048   | 1319   | 1659   | 1340   | 434   | 39                     | 733    | 911    | 1148   | 959    | 373   | 4.82 | 0.000 |

Table 6-16 (continued)

Total 24-Hour Nutrient Intake for Posttested Head Start Children  
(Samples A, B, C) with Unadjusted Comparisons Between Groups  
Present and Absent on Day of Recall within Site

|                           | PRESENT IN HEAD START |      |      |       |       |       | ABSENT FROM HEAD START |      |      |      |      |      | T    | P     |
|---------------------------|-----------------------|------|------|-------|-------|-------|------------------------|------|------|------|------|------|------|-------|
|                           | N                     | Q1   | MED  | Q3    | MEAN  | SD    | N                      | Q1   | MED  | Q3   | MEAN | SD   |      |       |
| <b>LOG VITAMIN A (IU)</b> |                       |      |      |       |       |       |                        |      |      |      |      |      |      |       |
| Greene/Humphreys          | 108                   | 3.46 | 3.77 | 4.13  | 3.81  | 0.41  | 10                     | 3.29 | 3.33 | 3.73 | 3.45 | 0.40 | 2.69 | 0.021 |
| St. Clair                 | 72                    | 3.53 | 3.78 | 3.96  | 3.77  | 0.34  | 32                     | 3.31 | 3.60 | 3.78 | 3.53 | 0.31 | 3.59 | 0.001 |
| Maricopa                  | 57                    | 3.32 | 3.52 | 3.64  | 3.51  | 0.29  | 39                     | 3.11 | 3.27 | 3.44 | 3.32 | 0.33 | 2.85 | 0.006 |
| Mingo                     | 72                    | 3.45 | 3.59 | 3.81  | 3.62  | 0.27  | 39                     | 3.29 | 3.49 | 3.75 | 3.51 | 0.30 | 1.87 | 0.066 |
| <b>VITAMIN A (IU)</b>     |                       |      |      |       |       |       |                        |      |      |      |      |      |      |       |
| Greene/Humphreys          | 108                   | 2906 | 5887 | 13433 | 10279 | 11398 | 10                     | 1942 | 2160 | 5432 | 4395 | 5403 | 2.90 | 0.010 |
| St. Clair                 | 72                    | 3404 | 6052 | 9097  | 8042  | 7173  | 32                     | 2046 | 4008 | 6034 | 4128 | 2386 | 4.14 | 0.000 |
| Maricopa                  | 57                    | 2100 | 3342 | 4376  | 3994  | 2858  | 39                     | 1301 | 1869 | 2757 | 2908 | 3013 | 1.77 | 0.080 |
| Mingo                     | 72                    | 2796 | 3873 | 9401  | 4922  | 3016  | 39                     | 1965 | 3073 | 5578 | 3996 | 2588 | 1.70 | 0.093 |
| <b>THIAMIN (MG)</b>       |                       |      |      |       |       |       |                        |      |      |      |      |      |      |       |
| Greene/Humphreys          | 109                   | 0.91 | 1.17 | 1.45  | 1.23  | 0.45  | 10                     | 1.00 | 1.26 | 1.49 | 1.28 | 0.28 | 0.46 | 0.650 |
| St. Clair                 | 71                    | 1.09 | 1.46 | 1.98  | 1.55  | 0.60  | 31                     | 1.13 | 1.41 | 1.82 | 1.52 | 0.63 | 0.26 | 0.797 |
| Maricopa                  | 57                    | 0.81 | 1.02 | 1.27  | 1.11  | 0.44  | 39                     | 0.61 | 0.85 | 1.16 | 0.93 | 0.40 | 2.04 | 0.045 |
| Mingo                     | 69                    | 1.08 | 1.36 | 1.68  | 1.40  | 0.44  | 37                     | 0.86 | 1.00 | 1.38 | 1.19 | 0.54 | 2.05 | 0.045 |
| <b>RIBOFLAVIN (MG)</b>    |                       |      |      |       |       |       |                        |      |      |      |      |      |      |       |
| Greene/Humphreys          | 103                   | 1.50 | 1.91 | 2.38  | 2.02  | 0.69  | 9                      | 0.97 | 1.22 | 1.38 | 1.22 | 0.37 | 5.72 | 0.000 |
| St. Clair                 | 72                    | 1.73 | 2.37 | 3.03  | 2.40  | 0.88  | 32                     | 1.30 | 1.83 | 2.20 | 1.85 | 0.74 | 3.32 | 0.001 |
| Maricopa                  | 55                    | 1.17 | 1.69 | 2.11  | 1.67  | 0.63  | 40                     | 0.92 | 1.27 | 1.58 | 1.35 | 0.55 | 2.59 | 0.011 |
| Mingo                     | 71                    | 1.70 | 2.04 | 2.48  | 2.12  | 0.65  | 37                     | 1.19 | 1.55 | 1.88 | 1.58 | 0.63 | 4.21 | 0.000 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6 -16. (continued)

Total 24-Hour Nutrient Intake for Posttested Head Start Children  
(Samples A, B, C) with Unadjusted Comparisons Between Groups  
Present and Absent on Day of Recall within Site

|                           | PRESENT IN HEAD START |       |       |       |       |      | ABSENT FROM HEAD START |       |       |       |       |      | T     | P     |
|---------------------------|-----------------------|-------|-------|-------|-------|------|------------------------|-------|-------|-------|-------|------|-------|-------|
|                           | N                     | Q1    | MED   | Q3    | MEAN  | SD   | N                      | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>NIACIN (MG)</b>        |                       |       |       |       |       |      |                        |       |       |       |       |      |       |       |
| Greene/Humphreys          | 106                   | 10.38 | 14.00 | 17.26 | 14.39 | 5.48 | 9                      | 10.28 | 10.45 | 15.79 | 12.45 | 3.41 | 1.55  | 0.148 |
| St. Clair                 | 72                    | 12.76 | 16.18 | 21.26 | 17.30 | 6.43 | 30                     | 10.65 | 15.99 | 22.55 | 17.93 | 8.37 | -0.37 | 0.713 |
| Maricopa                  | 57                    | 8.73  | 11.12 | 13.67 | 11.97 | 5.04 | 39                     | 5.97  | 9.64  | 13.45 | 10.28 | 4.90 | 1.64  | 0.105 |
| Mingo                     | 70                    | 9.78  | 13.54 | 18.50 | 14.78 | 5.98 | 35                     | 8.26  | 11.80 | 15.60 | 12.51 | 5.63 | 1.91  | 0.060 |
| <b>VITAMIN B6 (MG)</b>    |                       |       |       |       |       |      |                        |       |       |       |       |      |       |       |
| Greene/Humphreys          | 106                   | 1.00  | 1.20  | 1.47  | 1.27  | 0.43 | 10                     | 0.73  | 1.27  | 1.58  | 1.29  | 0.57 | -0.09 | 0.931 |
| St. Clair                 | 69                    | 1.03  | 1.48  | 1.93  | 1.57  | 0.60 | 29                     | 0.75  | 1.16  | 1.87  | 1.34  | 0.72 | 1.54  | 0.131 |
| Maricopa                  | 57                    | 0.81  | 1.15  | 1.43  | 1.19  | 0.55 | 41                     | 0.60  | 0.89  | 1.34  | 1.06  | 0.55 | 1.18  | 0.242 |
| Mingo                     | 70                    | 1.03  | 1.26  | 1.71  | 1.38  | 0.49 | 36                     | 0.74  | 1.06  | 1.41  | 1.16  | 0.63 | 1.79  | 0.078 |
| <b>LOG VIT. B12 (MCG)</b> |                       |       |       |       |       |      |                        |       |       |       |       |      |       |       |
| Greene/Humphreys          | 94                    | 0.44  | 0.55  | 0.67  | 0.58  | 0.24 | 9                      | -0.10 | 0.20  | 0.38  | 0.20  | 0.30 | 3.76  | 0.004 |
| St. Clair                 | 67                    | 0.50  | 0.64  | 0.78  | 0.62  | 0.24 | 32                     | 0.45  | 0.54  | 0.72  | 0.57  | 0.22 | 0.94  | 0.352 |
| Maricopa                  | 56                    | 0.39  | 0.54  | 0.68  | 0.52  | 0.24 | 40                     | 0.30  | 0.46  | 0.56  | 0.44  | 0.24 | 1.70  | 0.093 |
| Mingo                     | 71                    | 0.51  | 0.62  | 0.71  | 0.60  | 0.19 | 39                     | 0.41  | 0.48  | 0.60  | 0.49  | 0.30 | 2.03  | 0.047 |
| <b>VITAMIN B12 (MCG)</b>  |                       |       |       |       |       |      |                        |       |       |       |       |      |       |       |
| Greene/Humphreys          | 94                    | 2.79  | 3.59  | 4.73  | 4.59  | 3.54 | 9                      | 0.80  | 1.58  | 2.38  | 1.95  | 1.38 | 4.48  | 0.000 |
| St. Clair                 | 67                    | 3.19  | 4.33  | 6.05  | 4.73  | 2.27 | 32                     | 2.84  | 3.51  | 5.32  | 4.28  | 2.35 | 0.90  | 0.373 |
| Maricopa                  | 56                    | 2.48  | 3.46  | 4.85  | 3.80  | 1.94 | 40                     | 1.98  | 2.87  | 3.62  | 3.13  | 1.72 | 1.77  | 0.080 |
| Mingo                     | 71                    | 3.24  | 4.20  | 5.10  | 4.30  | 1.54 | 39                     | 2.57  | 3.01  | 3.99  | 3.77  | 2.51 | 1.21  | 0.233 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.



Table 6-16 (continued)

Total 24-Hour Nutrient Intake for Posttested Head Start Children  
(Samples A, B, C) with Unadjusted Comparisons Between Groups  
Present and Absent on Day of Recall within Site

|                         | PRESENT IN HEAD START. |        |        |        |        |        | ABSENT FROM HEAD START |        |        |        |        |        | T     | P     |
|-------------------------|------------------------|--------|--------|--------|--------|--------|------------------------|--------|--------|--------|--------|--------|-------|-------|
|                         | N                      | Q1     | MED    | Q3     | MEAN   | SD     | N                      | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>VITAMIN C (MG)</b>   |                        |        |        |        |        |        |                        |        |        |        |        |        |       |       |
| Greene/Humphreys        | 108                    | 56.44  | 98.65  | 168.20 | 118.11 | 77.00  | 10                     | 28.36  | 118.94 | 166.10 | 117.48 | 81.20  | 0.02  | 0.982 |
| St. Clair               | 71                     | 125.12 | 186.31 | 252.79 | 190.62 | 84.50  | 32                     | 106.66 | 156.80 | 246.60 | 178.97 | 109.00 | 0.54  | 0.594 |
| Maricopa                | 57                     | 42.88  | 69.09  | 116.71 | 89.58  | 60.40  | 39                     | 25.09  | 45.72  | 137.35 | 81.81  | 73.10  | 0.55  | 0.585 |
| Mingo                   | 66                     | 64.41  | 98.46  | 155.33 | 114.87 | 65.10  | 39                     | 41.77  | 86.64  | 114.95 | 93.73  | 71.30  | 1.52  | 0.134 |
| <b>CHOLESTEROL (MG)</b> |                        |        |        |        |        |        |                        |        |        |        |        |        |       |       |
| Greene/Humphreys        | 105                    | 189.94 | 289.32 | 427.12 | 324.85 | 160.00 | 9                      | 102.88 | 160.20 | 390.38 | 266.55 | 230.00 | 0.74  | 0.476 |
| St. Clair               | 71                     | 261.16 | 412.47 | 544.90 | 428.91 | 212.00 | 32                     | 201.03 | 398.90 | 526.68 | 401.99 | 228.00 | 0.57  | 0.574 |
| Maricopa                | 58                     | 146.53 | 220.08 | 423.64 | 311.33 | 227.00 | 41                     | 147.58 | 327.68 | 408.98 | 315.83 | 193.00 | 0.11  | 0.916 |
| Mingo                   | 72                     | 197.72 | 273.13 | 373.10 | 310.12 | 168.00 | 39                     | 162.94 | 352.88 | 495.02 | 350.97 | 208.00 | -1.06 | 0.295 |

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Table 6-17

Total 24-Hour Nutrient Intake for Posttested Head Start and non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between Those Absent on Day of Recall and Non-Head Start Children within Site

|                          | ABSENT FROM HEAD START |        |        |        |        |       | NON-HEAD START |        |        |        |        |       | T     | P     |
|--------------------------|------------------------|--------|--------|--------|--------|-------|----------------|--------|--------|--------|--------|-------|-------|-------|
|                          | N                      | Q1     | MED    | Q3     | MEAN   | SD    | N              | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>KILOCALORIES</b>      |                        |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys         | 10                     | 1096   | 1248   | 1946   | 1459   | 520   | 88             | 1274   | 1507   | 1895   | 1549   | 498   | -0.52 | 0.613 |
| St. Clair                | 32                     | 1542   | 1940   | 2383   | 1946   | 499   | 67             | 1475   | 1709   | 2040   | 1762   | 454   | 1.77  | 0.083 |
| Maricopa                 | 40                     | 1010   | 1301   | 1526   | 1304   | 412   | 51             | 1097   | 1389   | 1917   | 1475   | 568   | -1.66 | 0.100 |
| Mingo                    | 39                     | 1141   | 1514   | 1824   | 1534   | 498   | 103            | 1220   | 1510   | 1790   | 1552   | 476   | -0.19 | 0.849 |
| <b>PROTEIN (GM)</b>      |                        |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys         | 9                      | 32.72  | 47.93  | 50.12  | 46.98  | 20.20 | 90             | 41.14  | 55.49  | 71.45  | 57.49  | 21.90 | -1.48 | 0.170 |
| St. Clair                | 32                     | 54.94  | 65.30  | 83.70  | 69.70  | 21.60 | 68             | 46.72  | 60.53  | 71.45  | 60.95  | 20.70 | 1.92  | 0.060 |
| Maricopa                 | 41                     | 39.82  | 44.93  | 54.38  | 46.26  | 16.80 | 51             | 35.18  | 46.34  | 66.29  | 51.46  | 23.10 | -1.25 | 0.215 |
| Mingo                    | 38                     | 38.53  | 53.16  | 63.07  | 52.60  | 18.70 | 104            | 36.73  | 50.62  | 67.29  | 52.60  | 21.40 | 0.00  | 0.998 |
| <b>FAT (GM)</b>          |                        |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys         | 10                     | 36.78  | 48.74  | 93.27  | 60.99  | 35.10 | 88             | 48.33  | 63.49  | 78.65  | 63.65  | 24.50 | -0.23 | 0.821 |
| St. Clair                | 31                     | 65.25  | 77.27  | 109.23 | 84.51  | 26.50 | 68             | 59.45  | 74.28  | 92.74  | 76.25  | 24.10 | 1.48  | 0.146 |
| Maricopa                 | 41                     | 37.06  | 50.67  | 74.27  | 55.51  | 24.00 | 51             | 40.70  | 61.11  | 83.58  | 64.62  | 30.40 | -1.60 | 0.112 |
| Mingo                    | 38                     | 45.04  | 58.39  | 77.50  | 62.77  | 23.00 | 102            | 48.80  | 65.36  | 77.49  | 64.83  | 24.60 | -0.46 | 0.645 |
| <b>CARBOHYDRATE (GM)</b> |                        |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys         | 10                     | 144.00 | 158.92 | 212.69 | 175.41 | 45.30 | 87             | 139.31 | 178.51 | 226.34 | 187.41 | 66.90 | -0.75 | 0.466 |
| St. Clair                | 32                     | 163.59 | 212.36 | 276.57 | 223.67 | 72.30 | 67             | 172.49 | 203.00 | 243.22 | 213.66 | 68.30 | 0.66  | 0.514 |
| Maricopa                 | 40                     | 109.03 | 161.92 | 200.35 | 161.35 | 60.10 | 50             | 129.04 | 165.99 | 221.95 | 171.58 | 64.40 | -0.78 | 0.439 |
| Mingo                    | 39                     | 143.16 | 178.13 | 228.18 | 185.27 | 66.90 | 102            | 146.96 | 186.45 | 229.34 | 191.43 | 63.00 | -0.50 | 0.621 |

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Table 6 -17 (continued)

Total 24-Hour Nutrient Intake for Posttested Head Start and non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between Those Absent on Day of Recall and Non-Head Start Children within Site

|                        | ABSENT FROM HEAD START |        |        |        |        |       | NON-HEAD START |        |        |        |        |       | T     | P     |
|------------------------|------------------------|--------|--------|--------|--------|-------|----------------|--------|--------|--------|--------|-------|-------|-------|
|                        | N                      | Q1     | MED    | Q3     | MEAN   | SD    | N              | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>CALCIUM (MG)</b>    |                        |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys       | 10                     | 332.   | 418.   | 583.   | 461.   | 170.  | 89             | 405.   | 565.   | 827.   | 617.   | 297.  | -2.51 | 0.023 |
| St. Clair              | 32                     | 505.   | 665.   | 824.   | 722.   | 320.  | 67             | 451.   | 637.   | 852.   | 657.   | 332.  | 0.93  | 0.357 |
| Maricopa               | 41                     | 445.   | 599.   | 777.   | 626.   | 309.  | 50             | 397.   | 710.   | 931.   | 706.   | 367.  | -1.12 | 0.264 |
| Mingo                  | 39                     | 463.   | 651.   | 912.   | 720.   | 321.  | 104            | 438.   | 673.   | 944.   | 736.   | 377.  | -0.26 | 0.798 |
| <b>IRON (MG)</b>       |                        |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys       | 9                      | 7.84   | 8.91   | 9.15   | 9.17   | 3.19  | 82             | 6.9    | 9.77   | 13.17  | 10.18  | 3.97  | -0.87 | 0.401 |
| St. Clair              | 29                     | 9.14   | 12.08  | 15.64  | 12.71  | 4.55  | 68             | 9.18   | 10.31  | 14.24  | 11.59  | 4.28  | 1.13  | 0.265 |
| Maricopa               | 40                     | 6.43   | 8.51   | 11.10  | 8.81   | 3.47  | 49             | 7.19   | 9.65   | 11.34  | 9.51   | 3.60  | -0.93 | 0.353 |
| Mingo                  | 35                     | 7.76   | 9.16   | 9.94   | 9.24   | 2.96  | 103            | 6.72   | 8.88   | 11.69  | 9.56   | 4.01  | -0.51 | 0.613 |
| <b>MAGNESIUM (MG)</b>  |                        |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys       | 10                     | 99.03  | 180.90 | 227.58 | 170.97 | 72.20 | 89             | 136.24 | 174.92 | 236.34 | 190.78 | 81.50 | -0.81 | 0.433 |
| St. Clair              | 32                     | 162.68 | 202.98 | 270.20 | 217.98 | 77.70 | 68             | 131.05 | 178.36 | 232.05 | 191.71 | 79.60 | 1.56  | 0.123 |
| Maricopa               | 40                     | 105.15 | 135.21 | 176.94 | 145.14 | 64.40 | 51             | 105.77 | 154.36 | 218.33 | 167.27 | 79.90 | -1.46 | 0.147 |
| Mingo                  | 39                     | 123.38 | 163.80 | 209.42 | 173.54 | 65.10 | 103            | 133.17 | 172.38 | 224.06 | 184.33 | 74.40 | -0.85 | 0.399 |
| <b>PHOSPHORUS (MG)</b> |                        |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys       | 10                     | 519.   | 703.   | 941.   | 790.   | 391.  | 89             | 669.   | 888.   | 1124.  | 931.   | 387.  | -1.09 | 0.300 |
| St. Clair              | 32                     | 759.   | 1096.  | 1204.  | 1044.  | 343.  | 67             | 640.   | 899.   | 1225.  | 936.   | 377.  | 1.41  | 0.163 |
| Maricopa               | 41                     | 612.   | 756.   | 912.   | 803.   | 317.  | 51             | 629.   | 848.   | 1169.  | 906.   | 393.  | -1.39 | 0.169 |
| Mingo                  | 39                     | 733.   | 911.   | 1148.  | 959.   | 373.  | 103            | 687.   | 942.   | 1205.  | 989.   | 393.  | -0.42 | 0.674 |

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Table 6 -17 (continued).

Total 24-Hour Nutrient Intake for Posttested Head Start and non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between Those Absent on Day of Recall and Non-Head Start Children within Site

|                           | ABSENT FROM HEAD START |      |      |      |      |      | NON-HEAD START |      |      |      |      |      | T     | P     |
|---------------------------|------------------------|------|------|------|------|------|----------------|------|------|------|------|------|-------|-------|
|                           | N                      | Q1   | MED  | Q3   | MEAN | SD   | N              | Q1   | MED  | Q3   | MEAN | SD   |       |       |
| <b>LOG VITAMIN A (IU)</b> |                        |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 10                     | 3.29 | 3.33 | 3.73 | 3.45 | 0.40 | 89             | 3.32 | 3.50 | 3.68 | 3.54 | 0.36 | -0.65 | 0.529 |
| St. Clair                 | 32                     | 3.31 | 3.50 | 3.78 | 3.53 | 0.31 | 65             | 3.19 | 3.38 | 3.54 | 3.39 | 0.31 | 1.95  | 0.056 |
| Maricopa                  | 39                     | 3.11 | 3.27 | 3.44 | 3.32 | 0.33 | 49             | 3.20 | 3.41 | 3.59 | 3.42 | 0.29 | -1.41 | 0.161 |
| Mingo                     | 39                     | 3.29 | 3.49 | 3.75 | 3.51 | 0.30 | 97             | 3.20 | 3.40 | 3.61 | 3.38 | 0.29 | 2.27  | 0.026 |
| <b>VITAMIN A (IU)</b>     |                        |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 10                     | 1942 | 2160 | 5432 | 4395 | 5403 | 89             | 2104 | 3130 | 4810 | 5150 | 6386 | -0.41 | 0.688 |
| St. Clair                 | 32                     | 2046 | 4008 | 6034 | 4128 | 2386 | 65             | 1547 | 2405 | 3461 | 3271 | 3080 | 1.51  | 0.136 |
| Maricopa                  | 39                     | 1301 | 1869 | 2757 | 2908 | 3013 | 49             | 1572 | 2601 | 3859 | 3299 | 2511 | -0.65 | 0.518 |
| Mingo                     | 39                     | 1965 | 3073 | 5578 | 3996 | 2588 | 97             | 1584 | 2535 | 4079 | 2933 | 1852 | 2.34  | 0.023 |
| <b>THIAMIN (MG)</b>       |                        |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 10                     | 1.00 | 1.26 | 1.49 | 1.28 | 0.28 | 85             | 0.80 | 1.24 | 1.63 | 1.27 | 0.60 | 0.10  | 0.925 |
| St. Clair                 | 31                     | 1.13 | 1.41 | 1.82 | 1.52 | 0.63 | 68             | 1.01 | 1.30 | 1.73 | 1.38 | 0.57 | 1.07  | 0.288 |
| Maricopa                  | 39                     | 0.61 | 0.85 | 1.16 | 0.93 | 0.40 | 48             | 0.63 | 0.92 | 1.32 | 0.97 | 0.42 | -0.38 | 0.705 |
| Mingo                     | 37                     | 0.86 | 1.00 | 1.38 | 1.19 | 0.54 | 101            | 0.74 | 0.99 | 1.37 | 1.08 | 0.44 | 1.10  | 0.277 |
| <b>RIBOFLAVIN (MG)</b>    |                        |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 9                      | 0.97 | 1.22 | 1.38 | 1.22 | 0.37 | 87             | 1.13 | 1.44 | 1.96 | 1.58 | 0.72 | -2.51 | 0.024 |
| St. Clair                 | 32                     | 1.30 | 1.83 | 2.20 | 1.85 | 0.74 | 65             | 1.04 | 1.49 | 1.93 | 1.53 | 0.60 | 2.13  | 0.038 |
| Maricopa                  | 40                     | 0.92 | 1.27 | 1.58 | 1.35 | 0.55 | 51             | 0.96 | 1.31 | 1.95 | 1.51 | 0.70 | -1.16 | 0.248 |
| Mingo                     | 37                     | 1.19 | 1.55 | 1.88 | 1.58 | 0.63 | 102            | 1.04 | 1.45 | 1.96 | 1.55 | 0.70 | 0.25  | 0.800 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6-17 (continued)

Total 24-Hour Nutrient Intake for Posttested Head Start and non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between Those Absent on Day of Recall and Non-Head Start Children within Site

|                           | ABSENT FROM HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|---------------------------|------------------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                           | N                      | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>NIACIN (MG)</b>        |                        |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys          | 9                      | 10.28 | 10.45 | 15.79 | 12.45 | 3.41 | 87             | 10.28 | 14.10 | 19.80 | 15.13 | 6.80 | -1.98 | 0.065 |
| St. Clair                 | 30                     | 10.65 | 15.99 | 22.55 | 17.93 | 8.37 | 68             | 11.13 | 13.99 | 18.73 | 15.58 | 6.59 | 1.36  | 0.180 |
| Maricopa                  | 39                     | 6.97  | 9.64  | 13.45 | 10.28 | 4.90 | 49             | 7.69  | 10.27 | 13.53 | 11.16 | 5.00 | -0.83 | 0.410 |
| Mingo                     | 35                     | 8.26  | 11.80 | 15.60 | 12.51 | 5.63 | 104            | 7.42  | 10.77 | 16.07 | 12.38 | 6.35 | 0.11  | 0.912 |
| <b>VITAMIN B6</b>         |                        |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys          | 10                     | 0.73  | 1.37  | 1.58  | 1.29  | 0.57 | 84             | 0.84  | 1.25  | 1.76  | 1.29  | 0.57 | 0.00  | 0.997 |
| St. Clair                 | 29                     | 0.75  | 1.16  | 1.87  | 1.34  | 0.72 | 68             | 0.71  | 1.09  | 1.51  | 1.16  | 0.54 | 1.19  | 0.239 |
| Maricopa                  | 41                     | 0.60  | 0.89  | 1.34  | 1.06  | 0.55 | 51             | 0.74  | 1.13  | 1.46  | 1.14  | 0.53 | -0.73 | 0.466 |
| Mingo                     | 36                     | 0.74  | 1.06  | 1.41  | 1.16  | 0.63 | 103            | 0.64  | 0.96  | 1.47  | 1.09  | 0.58 | 0.58  | 0.566 |
| <b>LOG VIT. B12 (MCG)</b> |                        |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys          | 9                      | -0.10 | 0.20  | 0.38  | 0.20  | 0.30 | 87             | 0.23  | 0.41  | 0.56  | 0.39  | 0.28 | -1.82 | 0.098 |
| St. Clair                 | 32                     | 0.45  | 0.54  | 0.72  | 0.57  | 0.22 | 66             | 0.32  | 0.46  | 0.58  | 0.44  | 0.21 | 2.80  | 0.007 |
| Maricopa                  | 40                     | 0.30  | 0.46  | 0.56  | 0.44  | 0.24 | 52             | 0.29  | 0.48  | 0.65  | 0.43  | 0.31 | 0.04  | 0.971 |
| Mingo                     | 39                     | 0.41  | 0.48  | 0.60  | 0.49  | 0.30 | 100            | 0.25  | 0.42  | 0.58  | 0.39  | 0.29 | 1.81  | 0.074 |
| <b>VITAMIN B12 (MCG)</b>  |                        |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys          | 9                      | 0.80  | 1.58  | 2.38  | 1.95  | 1.38 | 87             | 1.70  | 2.55  | 3.62  | 2.99  | 1.97 | -2.04 | 0.064 |
| St. Clair                 | 32                     | 2.84  | 3.51  | 5.32  | 4.28  | 2.35 | 66             | 2.11  | 2.91  | 3.82  | 3.07  | 1.38 | 2.68  | 0.011 |
| Maricopa                  | 40                     | 1.98  | 2.67  | 3.62  | 3.13  | 1.72 | 52             | 1.95  | 3.01  | 4.51  | 3.33  | 1.97 | -0.52 | 0.603 |
| Mingo                     | 39                     | 2.57  | 3.01  | 3.99  | 3.77  | 2.51 | 100            | 1.79  | 2.65  | 3.78  | 2.94  | 1.73 | 1.89  | 0.064 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6 -17 (continued)

Total 24-Hour Nutrient Intake for Posttested Head Start Children  
(Samples A, B, C) with Unadjusted Comparisons Between those  
Absent on Day of Recall and Non-Head Start Children within Site

|                         | ABSENT FROM HEAD START |        |        |        |        |        | NON-HEAD START |        |        |        |        |        | T     | P     |
|-------------------------|------------------------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|-------|-------|
|                         | N                      | Q1     | MED    | Q3     | MEAN   | SD     | N              | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>VITAMIN C (MG)</b>   |                        |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys        | 10                     | 28.36  | 118.94 | 166.10 | 117.48 | 81.20  | 90             | 50.36  | 121.94 | 185.23 | 130.45 | 90.90  | -0.47 | 0.644 |
| St. Clair               | 32                     | 106.66 | 156.80 | 246.60 | 178.97 | 109.00 | 68             | 27.81  | 123.04 | 208.85 | 144.77 | 121.00 | 1.41  | 0.162 |
| Maricopa                | 39                     | 25.09  | 45.72  | 137.35 | 81.84  | 73.10  | 50             | 36.08  | 67.89  | 118.25 | 78.89  | 52.20  | 0.21  | 0.833 |
| Mingo                   | 39                     | 41.77  | 86.64  | 114.95 | 93.73  | 71.30  | 100            | 28.11  | 63.98  | 104.95 | 80.15  | 68.90  | 1.02  | 0.312 |
| <b>CHOLESTEROL (MG)</b> |                        |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys        | 9                      | 102.88 | 160.20 | 390.38 | 266.55 | 230.00 | 88             | 145.04 | 230.58 | 417.11 | 295.16 | 190.00 | -0.36 | 0.727 |
| St. Clair               | 32                     | 201.03 | 398.90 | 526.68 | 401.99 | 228.00 | 66             | 167.88 | 264.89 | 522.24 | 356.50 | 226.00 | 0.93  | 0.357 |
| Maricopa                | 41                     | 147.58 | 327.68 | 408.98 | 315.83 | 193.00 | 52             | 119.05 | 310.34 | 507.96 | 332.56 | 223.00 | -0.39 | 0.700 |
| Mingo                   | 39                     | 162.94 | 352.88 | 495.02 | 350.97 | 208.00 | 102            | 144.64 | 277.69 | 468.30 | 336.46 | 229.00 | 0.36  | 0.720 |

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Table 6 -18

Percent of Recommended Daily Intake Received for Posttested Head Start  
and Non-Head Start Children with Unadjusted Comparisons  
Between those Present on Day of Recall and Non-Head Start Children across Site

|               | PRESENT IN HEAD START |        |        |        |        |        | NON-HEAD START |        |        |        |        |        | t     | p     |
|---------------|-----------------------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|-------|-------|
|               | N                     | Q1     | MED    | Q3     | MEAN   | SD     | N              | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| KILOCALORIES  | 310                   | 98.34  | 125.12 | 155.81 | 130.47 | 42.00  | 311            | 89.74  | 117.36 | 144.80 | 120.66 | 42.80  | 2.88  | 0.004 |
| PROTEIN       | 307                   | 163.16 | 213.89 | 262.98 | 217.81 | 72.20  | 308            | 125.48 | 179.03 | 231.94 | 184.75 | 77.20  | 5.48  | 0.000 |
| CALCIUM       | 306                   | 94.84  | 120.60 | 151.88 | 126.75 | 45.70  | 310            | 83.11  | 79.60  | 107.99 | 84.89  | 42.90  | 11.72 | 0.000 |
| IRON          | 305                   | 71.69  | 97.74  | 130.16 | 103.74 | 41.90  | 306            | 56.82  | 83.99  | 113.43 | 89.67  | 42.20  | 4.14  | 0.000 |
| MAGNESIUM     | 310                   | 100.00 | 125.44 | 161.55 | 132.08 | 46.10  | 311            | 71.25  | 101.97 | 125.44 | 104.21 | 45.40  | 7.59  | 0.000 |
| PHOSPHORUS    | 309                   | 117.30 | 146.96 | 182.79 | 153.18 | 49.80  | 308            | 81.77  | 111.70 | 143.75 | 116.96 | 47.50  | 9.25  | 0.000 |
| LOG VITAMIN A | 309                   | 2.07   | 2.27   | 2.55   | 2.33   | 0.36   | 305            | 1.88   | 2.06   | 2.26   | 2.09   | 0.34   | 8.20  | 0.000 |
| VITAMIN A     | 309                   | 117.14 | 184.60 | 357.96 | 313.39 | 360.00 | 305            | 76.24  | 115.98 | 181.19 | 178.45 | 223.00 | 5.60  | 0.000 |
| THIAMIN       | 306                   | 121.93 | 141.95 | 165.94 | 148.01 | 38.00  | 306            | 114.50 | 142.13 | 176.40 | 155.31 | 77.80  | 1.47  | 0.143 |
| RIBOFLAVIN    | 301                   | 187.73 | 205.19 | 239.31 | 210.76 | 59.60  | 303            | 133.10 | 167.45 | 214.63 | 176.66 | 59.80  | 7.02  | 0.000 |
| NIACIN        | 307                   | 97.74  | 118.64 | 146.57 | 126.21 | 43.40  | 303            | 95.36  | 120.45 | 153.67 | 128.02 | 46.40  | -0.50 | 0.618 |
| VITAMIN B6    | 305                   | 79.92  | 108.85 | 143.85 | 116.89 | 49.30  | 305            | 63.33  | 98.56  | 140.00 | 105.35 | 51.40  | 2.88  | 0.005 |
| LOG VIT. B12  | 300                   | 2.10   | 2.23   | 2.34   | 2.25   | 0.30   | 301            | 1.94   | 2.10   | 2.24   | 2.09   | 0.28   | 6.60  | 0.000 |
| VITAMIN B12   | 300                   | 127.12 | 170.46 | 221.07 | 247.48 | 408.00 | 301            | 87.20  | 124.96 | 174.92 | 164.38 | 249.00 | 3.01  | 0.003 |
| VITAMIN C     | 304                   | 140.47 | 254.55 | 401.59 | 291.37 | 189.00 | 308            | 79.27  | 191.31 | 336.13 | 242.03 | 203.00 | 3.11  | 0.002 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6 -19

Percent of Recommended Daily Intake Received, for Posttested Head Start  
Children (Samples A, B, C) with Unadjusted Comparisons  
Between Groups Present and Absent on Day of Recall across Site

|               | PRESENT IN HEAD START |        |        |        |        |        | ABSENT FROM HEAD START |        |        |        |        |        | T     | P     |
|---------------|-----------------------|--------|--------|--------|--------|--------|------------------------|--------|--------|--------|--------|--------|-------|-------|
|               | N                     | Q1     | MED    | Q3     | MEAN   | SD     | N                      | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| KILOCALORIES  | 310                   | 98.34  | 125.12 | 155.81 | 130.47 | 42.00  | 122                    | 76.51  | 107.59 | 134.19 | 109.91 | 41.70  | 4.60  | 0.000 |
| PROTEIN       | 307                   | 163.16 | 213.89 | 262.98 | 217.81 | 72.20  | 121                    | 118.56 | 160.47 | 209.12 | 171.10 | 73.50  | 5.95  | 0.000 |
| CALCIUM       | 306                   | 94.84  | 120.60 | 151.88 | 126.75 | 45.70  | 122                    | 55.60  | 77.28  | 107.77 | 83.43  | 39.20  | 9.83  | 0.000 |
| IRON          | 305                   | 71.69  | 97.74  | 130.16 | 103.74 | 41.90  | 115                    | 65.28  | 90.11  | 115.65 | 96.80  | 42.30  | 1.50  | 0.134 |
| MAGNESIUM     | 310                   | 100.00 | 125.44 | 161.55 | 132.08 | 46.10  | 120                    | 59.86  | 88.17  | 113.71 | 93.08  | 40.60  | 8.60  | 0.000 |
| PHOSPHORUS    | 309                   | 117.30 | 146.96 | 182.79 | 153.18 | 49.80  | 121                    | 82.02  | 106.17 | 140.63 | 113.11 | 42.90  | 8.32  | 0.000 |
| LOG VITAMIN A | 309                   | 2.07   | 2.27   | 2.55   | 2.33   | 0.36   | 122                    | 1.85   | 2.03   | 2.34   | 2.06   | 0.35   | 6.93  | 0.000 |
| VITAMIN A     | 309                   | 117.14 | 184.60 | 357.96 | 313.39 | 360.00 | 122                    | 70.29  | 107.99 | 218.28 | 158.26 | 138.00 | 6.47  | 0.000 |
| THIAMIN       | 306                   | 121.93 | 141.95 | 165.94 | 148.01 | 39.00  | 115                    | 116.87 | 143.52 | 184.65 | 151.04 | 46.10  | -0.63 | 0.531 |
| RIBOFLAVIN    | 301                   | 167.73 | 205.19 | 239.31 | 210.76 | 59.60  | 116                    | 135.00 | 180.86 | 218.74 | 181.08 | 57.80  | 4.66  | 0.000 |
| NIACIN        | 307                   | 97.74  | 118.64 | 146.57 | 126.21 | 43.40  | 113                    | 96.15  | 125.94 | 163.90 | 128.95 | 45.90  | -0.55 | 0.582 |
| VITAMIN B6    | 305                   | 79.92  | 108.85 | 143.85 | 116.89 | 49.30  | 119                    | 56.11  | 87.77  | 132.88 | 100.11 | 56.70  | 2.84  | 0.000 |
| LOG VIT. B12  | 300                   | 2.10   | 2.23   | 2.34   | 2.25   | 0.30   | 118                    | 1.98   | 2.12   | 2.24   | 2.11   | 0.27   | 4.36  | 0.000 |
| VITAMIN B12   | 300                   | 127.12 | 170.46 | 221.07 | 247.48 | 408.00 | 118                    | 96.44  | 130.56 | 172.92 | 158.24 | 123.00 | 3.41  | 0.001 |
| VITAMIN C     | 304                   | 140.47 | 254.55 | 401.59 | 281.37 | 189.00 | 118                    | 91.55  | 203.89 | 372.94 | 246.21 | 194.00 | 2.16  | 0.032 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.



Table 6 -20

Percent of Recommended Daily Intake Received for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Absent on Day of Recall and Non-Head Start Children across Site

|               | ABSENT FROM HEAD START |        |        |        |        |        | NON-HEAD START |        |        |        |        |        | T     | P.    |
|---------------|------------------------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|-------|-------|
|               | N                      | Q1     | MED    | Q3     | MEAN   | SD     | N              | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| KILOCALORIES  | 122                    | 76.51  | 107.59 | 134.19 | 100.91 | 41.70  | 311            | 89.74  | 117.36 | 144.80 | 120.66 | 42.80  | -2.40 | 0.017 |
| PROTEIN       | 121                    | 118.56 | 160.47 | 209.12 | 171.10 | 73.50  | 308            | 125.48 | 179.03 | 231.94 | 184.75 | 77.20  | -1.71 | 0.089 |
| CALCIUM       | 122                    | 55.60  | 77.28  | 107.77 | 83.43  | 39.20  | 310            | 53.11  | 79.60  | 107.99 | 84.89  | 42.90  | -0.34 | 0.735 |
| IRON          | 115                    | 65.28  | 90.11  | 115.65 | 96.80  | 42.30  | 306            | 56.82  | 83.99  | 113.43 | 89.67  | 42.20  | 41.54 | 0.124 |
| MAGNESIUM     | 120                    | 59.86  | 88.17  | 113.71 | 93.08  | 40.60  | 111            | 71.25  | 101.97 | 125.44 | 104.21 | 45.40  | -2.47 | 0.014 |
| PHOSPHORUS    | 121                    | 82.02  | 106.17 | 140.63 | 113.11 | 42.90  | 308            | 81.77  | 111.70 | 143.75 | 116.96 | 47.50  | -0.81 | 0.418 |
| LOG VITAMIN A | 122                    | 1.85   | 2.03   | 2.34   | 2.06   | 0.35   | 305            | 1.88   | 2.06   | 2.26   | 2.09   | 0.34   | -0.70 | 0.486 |
| VITAMIN A     | 122                    | 70.29  | 107.99 | 218.28 | 158.26 | 138.00 | 305            | 76.24  | 115.98 | 181.19 | 178.45 | 223.00 | -1.13 | 0.258 |
| THIAMIN       | 115                    | 116.87 | 143.52 | 184.65 | 151.04 | 46.10  | 306            | 114.50 | 142.13 | 176.40 | 155.31 | 77.80  | -0.69 | 0.491 |
| RIBOFLAVIN    | 116                    | 135.00 | 180.86 | 218.74 | 181.08 | 57.80  | 303            | 133.10 | 167.45 | 214.63 | 176.66 | 59.80  | -0.69 | 0.489 |
| NIACIN        | 113                    | 96.15  | 125.94 | 163.90 | 128.95 | 45.90  | 303            | 95.36  | 120.45 | 153.67 | 128.02 | 46.40  | 0.18  | 0.855 |
| VITAMIN B6    | 119                    | 56.11  | 87.77  | 132.88 | 100.11 | 56.70  | 305            | 63.33  | 98.56  | 140.00 | 105.35 | 51.40  | -0.88 | 0.381 |
| LOG VIT. B12  | 118                    | 1.98   | 2.12   | 2.24   | 2.11   | 0.27   | 301            | 1.94   | 2.10   | 2.24   | 2.09   | 0.28   | 0.80  | 0.427 |
| VITAMIN B12   | 118                    | 96.44  | 130.56 | 172.92 | 158.24 | 123.00 | 301            | 87.20  | 124.96 | 174.92 | 164.38 | 249.00 | -0.34 | 0.737 |
| VITAMIN C     | 118                    | 91.55  | 203.89 | 372.94 | 246.21 | 194.00 | 308            | 79.27  | 191.31 | 336.13 | 242.03 | 203.00 | 0.20  | 0.844 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6 -21

Percent of Recommended Daily Intake Received for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Present on Day of Recall and Non-Head Start Children within Site.

|                     | PRESENT IN HEAD START |        |        |        |        |       | NON-HEAD START |        |        |        |        |       | T     | P     |
|---------------------|-----------------------|--------|--------|--------|--------|-------|----------------|--------|--------|--------|--------|-------|-------|-------|
|                     | N                     | Q1     | MED    | Q3     | MEAN   | SD    | N              | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>KILOCALORIES</b> |                       |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys    | 110                   | 89.95  | 117.23 | 148.97 | 121.12 | 36.10 | 90             | 98.83  | 122.97 | 150.33 | 127.42 | 43.60 | -1.10 | 0.274 |
| St. Clair           | 72                    | 114.55 | 148.03 | 189.51 | 153.63 | 45.80 | 68             | 108.56 | 128.25 | 160.67 | 139.45 | 43.40 | 1.88  | 0.062 |
| Maricopa            | 58                    | 85.67  | 99.12  | 134.59 | 108.24 | 35.30 | 51             | 71.04  | 89.72  | 130.91 | 99.76  | 42.10 | 1.13  | 0.261 |
| Mingo               | 70                    | 108.94 | 132.94 | 168.91 | 139.77 | 38.30 | 102            | 87.53  | 112.60 | 137.12 | 112.63 | 35.30 | 4.74  | 0.000 |
| <b>PROTEIN</b>      |                       |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys    | 109                   | 168.21 | 199.00 | 258.76 | 211.28 | 64.00 | 90             | 144.32 | 197.48 | 258.95 | 204.96 | 77.10 | 0.62  | 0.536 |
| St. Clair           | 70                    | 177.64 | 237.14 | 300.28 | 244.06 | 76.30 | 65             | 145.65 | 199.70 | 235.01 | 205.18 | 77.40 | 2.94  | 0.004 |
| Maricopa            | 57                    | 132.51 | 170.88 | 222.21 | 181.79 | 67.50 | 49             | 98.05  | 126.14 | 188.73 | 147.67 | 67.20 | 2.60  | 0.011 |
| Mingo               | 71                    | 190.58 | 223.47 | 269.71 | 230.86 | 71.40 | 104            | 117.31 | 155.49 | 216.68 | 171.97 | 73.30 | 5.30  | 0.000 |
| <b>CALCIUM</b>      |                       |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys    | 110                   | 88.54  | 116.53 | 142.85 | 118.97 | 33.90 | 89             | 50.63  | 70.66  | 103.33 | 77.13  | 37.20 | 8.21  | 0.000 |
| St. Clair           | 69                    | 99.31  | 127.12 | 164.07 | 134.33 | 49.20 | 67             | 56.33  | 79.60  | 106.47 | 82.13  | 41.50 | 6.70  | 0.000 |
| Maricopa            | 56                    | 77.84  | 107.47 | 138.12 | 107.83 | 41.50 | 51             | 51.78  | 90.46  | 118.35 | 90.90  | 49.30 | 1.91  | 0.059 |
| Mingo               | 71                    | 111.51 | 143.60 | 179.93 | 146.34 | 52.50 | 103            | 54.73  | 84.09  | 115.60 | 90.43  | 44.50 | 7.34  | 0.000 |
| <b>IRON</b>         |                       |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys    | 109                   | 66.85  | 86.96  | 115.57 | 96.88  | 42.30 | 85             | 54.67  | 76.87  | 116.19 | 90.60  | 48.50 | 0.94  | 0.347 |
| St. Clair           | 70                    | 83.32  | 118.01 | 142.25 | 115.67 | 43.50 | 68             | 65.90  | 96.09  | 119.04 | 97.87  | 39.30 | 2.52  | 0.013 |
| Maricopa            | 55                    | 71.09  | 96.25  | 110.74 | 94.27  | 30.70 | 51             | 72.15  | 98.67  | 118.23 | 98.99  | 40.30 | -0.67 | 0.502 |
| Mingo               | 71                    | 72.56  | 108.86 | 143.04 | 109.86 | 44.30 | 102            | 51.32  | 72.93  | 97.95  | 78.76  | 37.00 | 4.85  | 0.000 |

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Table 6 -21 (continued)

Percent of Recommended Daily Intake Received for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Present on Day of Recall and Non-Head Start Children within Site

|                      | PRESENT IN HEAD START |        |        |        |        |        | NON-HEAD START |       |        |        |        |        | T    | P     |
|----------------------|-----------------------|--------|--------|--------|--------|--------|----------------|-------|--------|--------|--------|--------|------|-------|
|                      | N                     | Q1     | MED    | Q3     | MEAN   | SD     | N              | Q1    | MED    | Q3     | MEAN   | SD     |      |       |
| <b>MAGNESIUM</b>     |                       |        |        |        |        |        |                |       |        |        |        |        |      |       |
| Greene/Humphreys     | 110                   | 99.96  | 124.59 | 144.46 | 126.63 | 37.00  | 90             | 76.16 | 109.20 | 131.06 | 108.17 | 46.80  | 3.04 | 0.003 |
| St. Clair            | 72                    | 119.88 | 159.87 | 192.62 | 160.67 | 48.50  | 68             | 77.48 | 103.22 | 128.51 | 109.67 | 45.00  | 6.46 | 0.000 |
| Maricopa             | 58                    | 72.49  | 89.00  | 119.70 | 97.49  | 34.70  | 50             | 52.34 | 73.85  | 106.03 | 81.63  | 37.70  | 2.26 | 0.026 |
| Mingo                | 70                    | 107.38 | 137.46 | 177.12 | 139.81 | 44.30  | 103            | 75.36 | 105.09 | 131.12 | 108.12 | 45.10  | 4.60 | 0.000 |
| <b>PHOSPHORUS</b>    |                       |        |        |        |        |        |                |       |        |        |        |        |      |       |
| Greene/Humphreys     | 109                   | 124.78 | 140.09 | 166.42 | 145.82 | 39.70  | 88             | 80.20 | 109.76 | 138.40 | 112.44 | 45.90  | 5.39 | 0.000 |
| St. Clair            | 71                    | 125.71 | 165.01 | 197.41 | 166.93 | 51.50  | 67             | 79.98 | 112.35 | 153.18 | 117.02 | 47.10  | 5.94 | 0.000 |
| Maricopa             | 57                    | 98.24  | 124.66 | 159.18 | 129.30 | 43.20  | 50             | 78.55 | 103.78 | 142.32 | 111.04 | 47.00  | 2.08 | 0.040 |
| Mingo                | 72                    | 130.94 | 166.09 | 208.35 | 169.66 | 57.00  | 103            | 85.91 | 117.77 | 150.68 | 123.67 | 49.10  | 5.58 | 0.000 |
| <b>LOG VITAMIN A</b> |                       |        |        |        |        |        |                |       |        |        |        |        |      |       |
| Greene/Humphreys     | 107                   | 2.11   | 2.38   | 2.73   | 2.44   | 0.41   | 90             | 1.98  | 2.13   | 2.33   | 2.17   | 0.37   | 4.77 | 0.000 |
| St. Clair            | 72                    | 2.16   | 2.42   | 2.57   | 2.41   | 0.34   | 65             | 1.88  | 2.04   | 2.17   | 2.04   | 0.31   | 6.56 | 0.000 |
| Maricopa             | 58                    | 1.92   | 2.12   | 2.31   | 2.12   | 0.30   | 51             | 1.80  | 2.02   | 2.21   | 2.05   | 0.33   | 1.16 | 0.250 |
| Mingo                | 72                    | 2.07   | 2.19   | 2.45   | 2.24   | 0.26   | 99             | 1.87  | 2.08   | 2.26   | 2.07   | 0.35   | 3.74 | 0.000 |
| <b>VITAMIN A</b>     |                       |        |        |        |        |        |                |       |        |        |        |        |      |       |
| Greene/Humphreys     | 107                   | 128.16 | 241.36 | 542.42 | 437.83 | 498.00 | 90             | 95.07 | 134.91 | 214.37 | 227.40 | 295.00 | 3.67 | 0.000 |
| St. Clair            | 72                    | 144.29 | 262.33 | 372.94 | 350.00 | 327.00 | 65             | 76.19 | 109.54 | 149.18 | 143.33 | 128.00 | 4.95 | 0.000 |
| Maricopa             | 58                    | 84.02  | 132.50 | 204.23 | 169.31 | 135.00 | 51             | 63.01 | 104.97 | 160.71 | 155.43 | 153.00 | 0.50 | 0.619 |
| Mingo                | 72                    | 118.35 | 156.94 | 279.08 | 207.91 | 124.00 | 99             | 73.54 | 115.98 | 182.35 | 168.88 | 220.00 | 1.47 | 0.143 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6 -21 (continued)

Percent of Recommended Daily Intake Received for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Present on Day of Recall and Non-Head Start Children within Site

|                   | PRESENT IN HEAD START |        |        |        |        |       | NON-HEAD START |        |        |        |        |        | T     | P     |
|-------------------|-----------------------|--------|--------|--------|--------|-------|----------------|--------|--------|--------|--------|--------|-------|-------|
|                   | N                     | Q1     | MED    | Q3     | MEAN   | SD    | N              | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>THIAMIN</b>    |                       |        |        |        |        |       |                |        |        |        |        |        |       |       |
| Greene/Humphreys  | 110                   | 128.46 | 145.11 | 166.15 | 153.61 | 41.10 | 89             | 122.49 | 160.50 | 210.39 | 186.10 | 125.00 | -2.35 | 0.021 |
| St. Clair         | 70                    | 117.65 | 143.05 | 170.48 | 147.18 | 40.30 | 66             | 117.51 | 142.67 | 179.26 | 148.70 | 42.80  | -0.21 | 0.832 |
| Maricopa          | 54                    | 113.52 | 136.71 | 156.81 | 138.60 | 34.90 | 52             | 114.40 | 140.69 | 169.98 | 141.26 | 38.10  | -0.37 | 0.709 |
| Mingo             | 72                    | 123.78 | 142.01 | 165.04 | 147.30 | 36.30 | 99             | 111.92 | 133.04 | 160.94 | 139.42 | 40.10  | 1.34  | 0.182 |
| <b>RIBOFLAVIN</b> |                       |        |        |        |        |       |                |        |        |        |        |        |       |       |
| Greene/Humphreys  | 101                   | 184.99 | 214.43 | 256.50 | 225.31 | 61.60 | 85             | 132.37 | 169.36 | 225.07 | 181.61 | 63.80  | 4.72  | 0.000 |
| St. Clair         | 71                    | 166.46 | 211.11 | 238.05 | 208.75 | 62.40 | 67             | 125.53 | 154.61 | 198.67 | 164.18 | 58.10  | 4.36  | 0.000 |
| Maricopa          | 57                    | 150.07 | 199.87 | 239.80 | 204.50 | 62.90 | 51             | 148.91 | 191.76 | 220.07 | 184.60 | 50.20  | 1.83  | 0.071 |
| Mingo             | 72                    | 164.73 | 190.73 | 228.73 | 197.30 | 47.20 | 100            | 138.19 | 169.58 | 211.41 | 176.78 | 61.30  | 2.48  | 0.014 |
| <b>NIACIN</b>     |                       |        |        |        |        |       |                |        |        |        |        |        |       |       |
| Greene/Humphreys  | 109                   | 106.17 | 128.92 | 162.80 | 141.12 | 53.20 | 87             | 113.32 | 130.91 | 166.17 | 147.15 | 51.80  | -0.80 | 0.425 |
| St. Clair         | 71                    | 100.77 | 118.64 | 141.73 | 124.35 | 32.80 | 67             | 108.01 | 122.62 | 151.86 | 130.62 | 39.20  | -1.01 | 0.312 |
| Maricopa          | 56                    | 89.72  | 112.38 | 139.08 | 115.44 | 34.00 | 51             | 90.99  | 123.41 | 146.62 | 121.49 | 36.30  | -0.89 | 0.377 |
| Mingo             | 71                    | 91.30  | 105.55 | 131.22 | 113.66 | 35.80 | 98             | 80.42  | 107.12 | 135.02 | 112.67 | 44.90  | 0.16  | 0.873 |
| <b>VITAMIN B6</b> |                       |        |        |        |        |       |                |        |        |        |        |        |       |       |
| Greene/Humphreys  | 108                   | 80.46  | 108.54 | 136.99 | 114.30 | 43.70 | 83             | 81.29  | 115.22 | 147.13 | 118.39 | 50.20  | -0.59 | 0.556 |
| St. Clair         | 71                    | 102.80 | 129.33 | 178.50 | 141.00 | 57.50 | 68             | 67.81  | 96.70  | 143.59 | 106.53 | 50.00  | 3.78  | 0.000 |
| Maricopa          | 55                    | 62.19  | 87.85  | 102.58 | 87.55  | 36.90 | 51             | 57.23  | 86.54  | 112.38 | 87.81  | 41.10  | -0.03 | 0.973 |
| Mingo             | 71                    | 91.96  | 112.85 | 148.82 | 119.43 | 44.60 | 103            | 54.92  | 89.54  | 143.69 | 102.76 | 55.60  | 2.19  | 0.030 |

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Table 6 -21 (continued)

Percent of Recommended Daily Intake Received for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Present on Day of Recall and Non-Head Start Children within Site

|                     | PRESENT IN HEAD START |        |        |        |        |        | NON-HEAD START |        |        |        |        |        | T     | P     |
|---------------------|-----------------------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|-------|-------|
|                     | N                     | Q1     | MED    | Q3     | MEAN   | SD     | N              | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>LOG VIT. B12</b> |                       |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys    | 102                   | 2.11   | 2.21   | 2.34   | 2.30   | 0.38   | 88             | 1.89   | 2.10   | 2.23   | 2.09   | 0.32   | 4.20  | 0.000 |
| St. Clair           | 68                    | 2.13   | 2.27   | 2.41   | 2.26   | 0.25   | 66             | 2.00   | 2.11   | 2.24   | 2.09   | 0.21   | 4.42  | 0.000 |
| Maricopa            | 58                    | 2.00   | 2.15   | 2.30   | 2.14   | 0.27   | 51             | 1.91   | 2.09   | 2.26   | 2.06   | 0.27   | 1.68  | 0.096 |
| Mingo               | 72                    | 2.17   | 2.26   | 2.34   | 2.24   | 0.20   | 96             | 1.97   | 2.10   | 2.24   | 2.11   | 0.30   | 3.24  | 0.001 |
| <b>VITAMIN B12</b>  |                       |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys    | 102                   | 130.15 | 160.78 | 220.84 | 358.72 | 673.00 | 88             | 76.98* | 124.66 | 169.38 | 178.53 | 276.00 | 2.47  | 0.015 |
| St. Clair           | 68                    | 133.66 | 187.18 | 254.86 | 211.06 | 116.00 | 66             | 99.05  | 127.88 | 172.15 | 135.73 | 57.90  | 4.77  | 0.000 |
| Maricopa            | 58                    | 100.60 | 140.94 | 198.52 | 168.06 | 115.00 | 51             | 80.84  | 122.84 | 180.54 | 135.80 | 77.70  | 1.73  | 0.087 |
| Mingo               | 72                    | 148.14 | 180.52 | 221.47 | 188.28 | 80.40  | 96             | 92.84  | 127.17 | 176.01 | 186.28 | 343.00 | 0.06  | 0.956 |
| <b>VITAMIN C</b>    |                       |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys    | 110                   | 126.02 | 230.01 | 382.53 | 275.52 | 195.00 | 90             | 111.90 | 270.98 | 411.62 | 289.90 | 202.00 | -0.51 | 0.612 |
| St. Clair           | 71                    | 278.04 | 414.02 | 561.75 | 423.60 | 188.00 | 68             | 61.81  | 273.43 | 464.10 | 321.71 | 268.00 | 2.59  | 0.011 |
| Maricopa            | 57                    | 95.30  | 153.54 | 259.36 | 199.08 | 134.00 | 50             | 80.18  | 150.86 | 262.78 | 175.31 | 116.00 | 0.98  | 0.328 |
| Mingo               | 66                    | 143.14 | 218.79 | 345.18 | 255.26 | 145.00 | 100            | 62.47  | 142.17 | 233.21 | 178.12 | 153.00 | 3.28  | 0.001 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

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Table 6 -22 .

Percent of Recommended Daily Intake Received for Posttested Head Start Children (Samples A, B, -C) with Unadjusted Comparisons Between Groups Present and Absent on Day of Recall within Site

|                     | PRESENT IN HEAD START |        |        |        |        |       | ABSENT FROM HEAD START |        |        |        |        |       | T     | P     |
|---------------------|-----------------------|--------|--------|--------|--------|-------|------------------------|--------|--------|--------|--------|-------|-------|-------|
|                     | N                     | Q1     | MED    | Q3     | MEAN   | SD    | N                      | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>KILOCALORIES</b> |                       |        |        |        |        |       |                        |        |        |        |        |       |       |       |
| Greene/Humphreys    | 110                   | 89.95  | 117.23 | 148.97 | 121.12 | 36.10 | 10                     | 73.28  | 97.13  | 134.07 | 104.63 | 35.30 | 1.41  | 0.186 |
| St. Clair           | 72                    | 114.55 | 148.03 | 189.51 | 153.63 | 45.80 | 32                     | 109.61 | 133.81 | 156.18 | 141.06 | 39.50 | 1.42  | 0.159 |
| Maricopa            | 58                    | 85.67  | 99.12  | 134.59 | 108.24 | 35.30 | 41                     | 61.75  | 80.21  | 97.63  | 84.13  | 28.80 | 3.74  | 0.000 |
| Mingo               | 70                    | 108.94 | 132.34 | 168.91 | 139.77 | 38.30 | 39                     | 76.64  | 111.53 | 144.71 | 112.81 | 39.40 | 3.46  | 0.001 |
| <b>PROTEIN</b>      |                       |        |        |        |        |       |                        |        |        |        |        |       |       |       |
| Greene/Humphreys    | 109                   | 168.21 | 199.00 | 258.76 | 211.28 | 64.00 | 10                     | 116.52 | 154.76 | 207.79 | 173.41 | 91.70 | 1.28  | 0.230 |
| St. Clair           | 70                    | 177.64 | 237.14 | 300.28 | 244.06 | 76.30 | 32                     | 170.00 | 219.40 | 278.90 | 224.72 | 74.20 | 1.21  | 0.231 |
| Maricopa            | 57                    | 132.51 | 170.88 | 222.21 | 181.79 | 67.50 | 41                     | 100.07 | 124.31 | 161.68 | 128.50 | 44.80 | 4.69  | 0.000 |
| Mingo               | 71                    | 190.58 | 223.47 | 269.71 | 230.86 | 71.40 | 38                     | 122.77 | 166.91 | 209.12 | 171.30 | 64.60 | 4.42  | 0.000 |
| <b>CALCIUM</b>      |                       |        |        |        |        |       |                        |        |        |        |        |       |       |       |
| Greene/Humphreys    | 110                   | 98.54  | 116.53 | 142.85 | 118.97 | 33.90 | 10                     | 41.45  | 52.21  | 72.92  | 57.59  | 21.30 | 8.23  | 0.000 |
| St. Clair           | 69                    | 99.31  | 127.12 | 164.07 | 134.33 | 49.20 | 32                     | 63.17  | 83.10  | 102.94 | 90.20  | 40.00 | 4.78  | 0.000 |
| Maricopa            | 56                    | 77.84  | 107.47 | 138.12 | 107.83 | 41.50 | 41                     | 55.60  | 74.89  | 97.09  | 78.24  | 38.70 | 3.61  | 0.001 |
| Mingo               | 71                    | 111.51 | 143.60 | 179.93 | 146.34 | 52.50 | 39                     | 57.82  | 81.35  | 113.95 | 89.96  | 40.20 | 6.30  | 0.000 |
| <b>IRON</b>         |                       |        |        |        |        |       |                        |        |        |        |        |       |       |       |
| Greene/Humphreys    | 109                   | 66.85  | 86.96  | 115.57 | 96.88  | 42.30 | 10                     | 65.03  | 85.77  | 92.62  | 103.74 | 58.00 | -0.37 | 0.723 |
| St. Clair           | 70                    | 83.32  | 108.01 | 142.25 | 115.67 | 43.50 | 29                     | 89.74  | 104.31 | 155.62 | 116.55 | 45.80 | -0.09 | 0.930 |
| Maricopa            | 56                    | 71.09  | 96.25  | 110.74 | 94.27  | 30.70 | 41                     | 64.74  | 86.02  | 112.19 | 90.59  | 37.80 | 0.51  | 0.611 |
| Mingo               | 71                    | 72.56  | 108.86 | 143.04 | 109.86 | 44.30 | 35                     | 61.85  | 86.42  | 99.36  | 85.73  | 34.20 | 3.09  | 0.003 |

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Table 3 -22 (continued)

Percent of Recommended Daily Intake Received for Posttested Head Start  
Children (Samples A, B, C) with Unadjusted Comparisons  
Between Groups Present and Absent on Day of Recall within Site

|                      | PRESENT IN HEAD START |        |        |        |        |        | ABSENT FROM HEAD START |       |        |        |        |        | T    | P     |
|----------------------|-----------------------|--------|--------|--------|--------|--------|------------------------|-------|--------|--------|--------|--------|------|-------|
|                      | N                     | Q1     | MED    | Q3     | MEAN   | SD     | N                      | Q1    | MED    | Q3     | MEAN   | SD     |      |       |
| <b>MAGNESIUM</b>     |                       |        |        |        |        |        |                        |       |        |        |        |        |      |       |
| Greene/Humphreys     | 110                   | 99.96  | 124.59 | 144.46 | 126.63 | 37.00  | 10                     | 49.52 | 90.45  | 113.79 | 87.48  | 35.00  | 3.37 | 0.006 |
| St. Clair            | 72                    | 119.88 | 159.87 | 192.62 | 160.67 | 48.50  | 32                     | 88.92 | 112.76 | 143.80 | 117.70 | 43.40  | 4.49 | 0.000 |
| Maricopa             | 58                    | 72.49  | 89.00  | 119.70 | 97.49  | 34.70  | 40                     | 52.58 | 67.61  | 88.47  | 72.57  | 32.20  | 3.64 | 0.000 |
| Mingo                | 70                    | 107.38 | 137.46 | 177.12 | 139.91 | 44.30  | 38                     | 66.94 | 92.92  | 110.53 | 95.42  | 36.40  | 5.61 | 0.000 |
| <b>PHOSPHORUS</b>    |                       |        |        |        |        |        |                        |       |        |        |        |        |      |       |
| Greene/Humphreys     | 109                   | 124.78 | 140.09 | 166.42 | 145.82 | 39.70  | 10                     | 64.90 | 87.93  | 117.66 | 98.70  | 48.90  | 2.96 | 0.014 |
| St. Clair            | 71                    | 125.71 | 165.01 | 197.41 | 166.93 | 51.50  | 31                     | 94.83 | 135.82 | 147.43 | 126.01 | 35.40  | 4.64 | 0.000 |
| Maricopa             | 57                    | 98.24  | 124.66 | 159.18 | 129.30 | 43.20  | 41                     | 76.50 | 94.54  | 113.95 | 100.41 | 39.70  | 3.43 | 0.001 |
| Mingo                | 72                    | 130.94 | 166.09 | 208.35 | 169.66 | 57.00  | 39                     | 91.59 | 113.85 | 143.45 | 119.91 | 46.70  | 4.95 | 0.000 |
| <b>LOG VITAMIN A</b> |                       |        |        |        |        |        |                        |       |        |        |        |        |      |       |
| Greene/Humphreys     | 107                   | 2.11   | 2.38   | 2.73   | 2.44   | 0.41   | 10                     | 1.89  | 1.98   | 2.34   | 2.06   | 0.40   | 2.81 | 0.017 |
| St. Clair            | 72                    | 2.16   | 2.42   | 2.57   | 2.41   | 0.34   | 32                     | 1.92  | 2.20   | 2.39   | 2.15   | 0.30   | 3.76 | 0.000 |
| Maricopa             | 58                    | 1.92   | 2.12   | 2.31   | 2.12   | 0.30   | 41                     | 1.70  | 1.87   | 2.05   | 1.93   | 0.38   | 2.72 | 0.008 |
| Mingo                | 72                    | 2.07   | 2.19   | 2.45   | 2.24   | 0.26   | 39                     | 1.90  | 2.09   | 2.36   | 2.13   | 0.30   | 1.90 | 0.062 |
| <b>VITAMIN A</b>     |                       |        |        |        |        |        |                        |       |        |        |        |        |      |       |
| Greene/Humphreys     | 107                   | 128.16 | 241.36 | 542.42 | 437.83 | 498.00 | 10                     | 77.68 | 98.22  | 217.27 | 178.14 | 215.00 | 3.11 | 0.005 |
| St. Clair            | 72                    | 144.29 | 262.33 | 372.94 | 350.00 | 327.00 | 32                     | 83.68 | 160.33 | 247.89 | 173.69 | 101.00 | 4.15 | 0.000 |
| Maricopa             | 58                    | 84.02  | 132.50 | 204.23 | 169.31 | 135.00 | 41                     | 50.24 | 74.77  | 111.41 | 130.74 | 161.00 | 1.26 | 0.213 |
| Mingo                | 72                    | 118.35 | 156.94 | 279.08 | 207.91 | 124.00 | 39                     | 80.26 | 122.92 | 232.12 | 169.44 | 113.00 | 1.65 | 0.102 |

\* Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6 -22 (continued)

Percent of Recommended Daily Intake Received for Posttested Head Start  
Children (Samples A, B, C) with Unadjusted Comparisons  
Between Groups Present and Absent on Day of Recall within Site

|                   | PRESENT IN HEAD START |        |        |        |        |       | ABSENT FROM HEAD START |        |        |        |        |       | T     | P     |
|-------------------|-----------------------|--------|--------|--------|--------|-------|------------------------|--------|--------|--------|--------|-------|-------|-------|
|                   | N                     | Q1     | MED    | Q3     | MEAN   | SD    | N                      | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>THIAMIN</b>    |                       |        |        |        |        |       |                        |        |        |        |        |       |       |       |
| Greene/Humphreys  | 110                   | 128.46 | 145.11 | 166.15 | 153.61 | 41.10 | 10                     | 146.54 | 195.54 | 208.05 | 184.75 | 37.80 | -2.48 | 0.031 |
| St. Clair         | 70                    | 117.65 | 143.05 | 170.48 | 147.18 | 40.30 | 31                     | 115.73 | 143.05 | 184.65 | 153.62 | 51.50 | -0.62 | 0.540 |
| Maricopa          | 54                    | 113.52 | 136.71 | 156.81 | 138.60 | 34.90 | 39                     | 114.84 | 133.68 | 165.09 | 140.36 | 41.80 | -0.21 | 0.831 |
| Mingo             | 72                    | 123.78 | 142.01 | 165.04 | 147.30 | 36.30 | 35                     | 114.52 | 145.81 | 181.25 | 151.04 | 44.30 | -0.43 | 0.667 |
| <b>RIBOFLAVIN</b> |                       |        |        |        |        |       |                        |        |        |        |        |       |       |       |
| Greene/Humphreys  | 101                   | 184.99 | 214.43 | 256.50 | 225.31 | 61.60 | 9                      | 114.47 | 184.74 | 228.83 | 172.72 | 57.90 | 2.60  | 0.027 |
| St. Clair         | 71                    | 166.46 | 211.11 | 238.05 | 208.75 | 62.10 | 31                     | 132.02 | 163.81 | 188.60 | 165.11 | 46.60 | 3.90  | 0.000 |
| Maricopa          | 57                    | 150.07 | 199.87 | 239.80 | 204.50 | 62.90 | 39                     | 139.11 | 179.05 | 218.74 | 184.11 | 60.10 | 1.60  | 0.113 |
| Mingo             | 72                    | 164.73 | 190.73 | 228.73 | 197.30 | 47.20 | 37                     | 135.13 | 193.13 | 240.19 | 193.13 | 62.40 | 0.36  | 0.723 |
| <b>NIACIN</b>     |                       |        |        |        |        |       |                        |        |        |        |        |       |       |       |
| Greene/Humphreys  | 109                   | 106.17 | 128.92 | 162.80 | 141.12 | 53.20 | 10                     | 125.94 | 140.38 | 176.31 | 151.98 | 41.40 | -0.77 | 0.455 |
| St. Clair         | 71                    | 100.77 | 118.64 | 141.73 | 124.35 | 32.80 | 28                     | 98.96  | 127.22 | 167.43 | 133.68 | 48.00 | -0.94 | 0.351 |
| Maricopa          | 56                    | 89.72  | 112.38 | 139.08 | 115.44 | 34.00 | 39                     | 88.25  | 111.02 | 142.73 | 116.86 | 41.40 | -0.19 | 0.860 |
| Mingo             | 71                    | 91.30  | 105.55 | 131.22 | 113.66 | 35.80 | 36                     | 89.53  | 129.71 | 170.19 | 131.89 | 48.10 | -2.02 | 0.048 |
| <b>VITAMIN B6</b> |                       |        |        |        |        |       |                        |        |        |        |        |       |       |       |
| Greene/Humphreys  | 108                   | 80.46  | 108.54 | 136.99 | 114.30 | 43.70 | 10                     | 56.23  | 107.96 | 138.23 | 104.12 | 48.40 | 0.64  | 0.536 |
| St. Clair         | 71                    | 102.80 | 129.33 | 178.50 | 141.00 | 67.50 | 32                     | 72.19  | 105.85 | 176.47 | 127.70 | 73.00 | 0.91  | 0.367 |
| Maricopa          | 55                    | 62.19  | 87.85  | 102.58 | 87.55  | 36.90 | 41                     | 46.38  | 68.23  | 103.31 | 81.40  | 42.20 | 0.74  | 0.459 |
| Mingo             | 71                    | 91.96  | 112.85 | 148.82 | 119.43 | 44.60 | 36                     | 65.74  | 84.88  | 119.04 | 95.79  | 48.40 | 2.45  | 0.017 |



Table 6-22 (continued)

Percent of Recommended Daily Intake Received for Posttested Head Start  
Children (Samples A, B, C) with Unadjusted Comparisons  
Between Groups Present and Absent on Day of Recall within Site

|                     | PRESENT IN HEAD START |        |        |        |        |        | ABSENT FROM HEAD START |        |        |        |        |        | T     | P     |
|---------------------|-----------------------|--------|--------|--------|--------|--------|------------------------|--------|--------|--------|--------|--------|-------|-------|
|                     | N                     | Q1     | MED    | Q3     | MEAN   | SD     | N                      | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>LOG VIT. B12</b> |                       |        |        |        |        |        |                        |        |        |        |        |        |       |       |
| Greene/Humphreys    | 102                   | 2.11   | 2.21   | 2.34   | 2.30   | 0.38   | 7                      | 1.76   | 1.92   | 2.10   | 1.91   | 0.26   | 3.68  | 0.006 |
| St. Clair           | 68                    | 2.13   | 2.27   | 2.41   | 2.26   | 0.25   | 32                     | 2.09   | 2.16   | 2.38   | 2.20   | 0.22   | 1.26  | 0.213 |
| Maricopa            | 58                    | 2.00   | 2.15   | 2.30   | 2.14   | 0.27   | 41                     | 1.91   | 2.07   | 2.18   | 2.06   | 0.28   | 1.50  | 0.138 |
| Mingo               | 72                    | 2.17   | 2.26   | 2.34   | 2.24   | 0.20   | 38                     | 2.04   | 2.13   | 2.24   | 2.14   | 0.28   | 1.92  | 0.060 |
| <b>VITAMIN B12</b>  |                       |        |        |        |        |        |                        |        |        |        |        |        |       |       |
| Greene/Humphreys    | 102                   | 130.15 | 160.78 | 220.84 | 358.72 | 673.00 | 57.90                  | 83.90  | 129.52 | 94.65  | 54.10  | 3.79   | 0.000 |       |
| St. Clair           | 68                    | 133.66 | 187.18 | 254.86 | 211.06 | 116.00 | 32                     | 123.86 | 145.34 | 242.33 | 180.30 | 95.20  | 1.40  | 0.165 |
| Maricopa            | 58                    | 100.60 | 140.94 | 198.52 | 168.06 | 115.00 | 41                     | 80.68  | 116.56 | 151.56 | 146.86 | 154.00 | 0.75  | 0.458 |
| Mingo               | 72                    | 148.14 | 180.52 | 221.47 | 188.28 | 80.40  | 38                     | 109.44 | 135.85 | 175.12 | 163.66 | 111.00 | 1.21  | 0.233 |
| <b>VITAMIN C</b>    |                       |        |        |        |        |        |                        |        |        |        |        |        |       |       |
| Greene/Humphreys    | 110                   | 126.02 | 230.01 | 382.53 | 275.52 | 195.00 | 10                     | 63.03  | 264.30 | 369.11 | 261.06 | 180.00 | 0.24  | 0.814 |
| St. Clair           | 71                    | 278.04 | 414.02 | 561.75 | 423.60 | 188.00 | 31                     | 237.03 | 323.93 | 545.25 | 378.90 | 221.00 | 0.98  | 0.331 |
| Maricopa            | 57                    | 95.30  | 153.54 | 259.36 | 199.08 | 134.00 | 39                     | 55.76  | 101.60 | 305.23 | 181.81 | 162.00 | 0.55  | 0.585 |
| Mingo               | 66                    | 143.14 | 218.79 | 345.18 | 255.26 | 145.00 | 38                     | 88.32  | 182.13 | 255.13 | 200.16 | 152.00 | 1.81  | 0.074 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

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Table 6 -23

Percent of Recommended Daily Intake Received for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Absent on Day of Recall and Non-Head Start Children within Site

|                     | ABSENT FROM HEAD START |        |        |        |        |       | NON-HEAD START |        |        |        |        |       | T     | P     |
|---------------------|------------------------|--------|--------|--------|--------|-------|----------------|--------|--------|--------|--------|-------|-------|-------|
|                     | N                      | Q1     | MED    | Q3     | MEAN   | SD    | N              | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>KILOCALORIES</b> |                        |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys    | 10                     | 73.28  | 97.13  | 134.07 | 104.63 | 35.30 | 90             | 98.83  | 122.97 | 150.33 | 127.42 | 43.60 | -1.89 | 0.084 |
| St. Clair           | 32                     | 109.61 | 133.81 | 156.18 | 141.06 | 39.50 | 68             | 108.56 | 128.25 | 160.67 | 139.45 | 43.40 | 0.18  | 0.855 |
| Maricopa            | 41                     | 61.75  | 80.21  | 97.63  | 84.13  | 28.80 | 51             | 71.04  | 89.72  | 130.91 | 99.76  | 42.10 | -2.11 | 0.038 |
| Mingo               | 39                     | 76.64  | 111.53 | 144.71 | 112.81 | 39.40 | 102            | 87.53  | 112.60 | 137.12 | 112.63 | 35.30 | 0.02  | 0.981 |
| <b>PROTEIN</b>      |                        |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys    | 10                     | 116.52 | 154.76 | 207.79 | 173.41 | 91.70 | 90             | 144.32 | 197.48 | 258.95 | 204.96 | 77.10 | -1.05 | 0.319 |
| St. Clair           | 32                     | 170.00 | 219.40 | 278.90 | 224.72 | 74.20 | 65             | 145.65 | 199.70 | 235.01 | 205.18 | 77.40 | 1.20  | 0.234 |
| Maricopa            | 41                     | 100.07 | 124.31 | 161.68 | 128.50 | 44.80 | 49             | 98.05  | 126.14 | 188.73 | 147.67 | 67.20 | -1.61 | 0.110 |
| Mingo               | 38                     | 122.77 | 166.91 | 209.12 | 171.30 | 64.60 | 104            | 117.31 | 155.49 | 216.68 | 171.97 | 73.30 | -0.05 | 0.959 |
| <b>CALCIUM</b>      |                        |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys    | 10                     | 41.45  | 52.21  | 72.92  | 57.59  | 21.30 | 89             | 50.63  | 70.66  | 103.33 | 77.13  | 37.20 | -2.51 | 0.023 |
| St. Clair           | 32                     | 63.17  | 83.10  | 102.94 | 90.20  | 40.00 | 67             | 56.33  | 79.60  | 106.47 | 82.13  | 41.50 | 0.93  | 0.357 |
| Maricopa            | 41                     | 55.60  | 74.89  | 97.09  | 78.24  | 38.70 | 51             | 51.78  | 90.46  | 118.35 | 90.90  | 49.30 | -1.38 | 0.171 |
| Mingo               | 39                     | 57.82  | 81.35  | 113.95 | 89.96  | 40.20 | 103            | 54.73  | 84.09  | 115.60 | 90.43  | 44.50 | -0.06 | 0.953 |
| <b>IRON</b>         |                        |        |        |        |        |       |                |        |        |        |        |       |       |       |
| Greene/Humphreys    | 10                     | 65.03  | 85.77  | 92.62  | 103.74 | 58.00 | 85             | 54.67  | 76.87  | 116.19 | 90.60  | 48.50 | 0.69  | 0.506 |
| St. Clair           | 29                     | 89.74  | 104.31 | 155.62 | 116.55 | 45.80 | 68             | 65.90  | 96.09  | 119.04 | 97.87  | 39.30 | 1.92  | 0.062 |
| Maricopa            | 41                     | 64.74  | 86.02  | 112.19 | 90.59  | 37.80 | 51             | 72.15  | 98.67  | 118.23 | 98.99  | 40.30 | -1.03 | 0.307 |
| Mingo               | 35                     | 61.85  | 86.42  | 99.36  | 85.73  | 34.20 | 102            | 51.32  | 72.93  | 97.95  | 78.76  | 37.00 | 1.02  | 0.312 |

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Table 6 -23 (continued)

Percent of Recommended Daily Intake Received for Posttested Head Start  
and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons  
Between those Absent on Day of Recall and Non-Head Start Children within Site

|                      | ABSENT FROM HEAD START |       |        |        |        |        | NON-HEAD START |       |        |        |        |        | T     | P     |
|----------------------|------------------------|-------|--------|--------|--------|--------|----------------|-------|--------|--------|--------|--------|-------|-------|
|                      | N                      | Q1    | MED    | Q3     | MEAN   | SD     | N              | Q1    | MED    | Q3     | MEAN   | SD     |       |       |
| <b>MAGNESIUM</b>     |                        |       |        |        |        |        |                |       |        |        |        |        |       |       |
| Greene/Humphreys     | 10                     | 49.52 | 90.45  | 113.79 | 87.48  | 35.00  | 90             | 76.16 | 109.20 | 131.06 | 108.17 | 46.80  | -1.71 | 0.112 |
| St. Clair            | 32                     | 88.92 | 112.76 | 143.80 | 117.70 | 43.40  | 68             | 77.48 | 103.22 | 128.51 | 109.67 | 45.00  | 0.85  | 0.397 |
| Maricopa             | 40                     | 52.58 | 67.61  | 88.47  | 72.57  | 32.20  | 50             | 52.34 | 73.85  | 106.03 | 81.63  | 37.70  | -1.23 | 0.222 |
| Mingo                | 38                     | 66.94 | 92.92  | 110.53 | 95.42  | 36.40  | 103            | 75.36 | 105.09 | 131.12 | 108.12 | 45.10  | -1.72 | 0.090 |
| <b>PHOSPHORUS</b>    |                        |       |        |        |        |        |                |       |        |        |        |        |       |       |
| Greene/Humphreys     | 10                     | 64.90 | 87.93  | 117.66 | 98.70  | 48.20  | 88             | 80.20 | 109.76 | 138.40 | 112.44 | 45.90  | -0.85 | 0.415 |
| St. Clair            | 31                     | 94.83 | 135.82 | 147.43 | 126.01 | 35.40  | 67             | 79.98 | 112.35 | 153.18 | 117.02 | 47.10  | 1.05  | 0.298 |
| Maricopa             | 41                     | 76.50 | 94.54  | 113.95 | 100.41 | 39.70  | 50             | 78.55 | 103.78 | 142.32 | 111.04 | 47.00  | -1.19 | 0.245 |
| Mingo                | 39                     | 91.59 | 113.85 | 143.45 | 119.91 | 46.70  | 103            | 85.91 | 117.77 | 150.68 | 123.67 | 49.10  | -0.42 | 0.674 |
| <b>LOG VITAMIN A</b> |                        |       |        |        |        |        |                |       |        |        |        |        |       |       |
| Greene/Humphreys     | 10                     | 1.89  | 1.98   | 2.34   | 2.06   | 0.40   | 90             | 1.98  | 2.13   | 2.33   | 2.17   | 0.37   | -0.83 | 0.423 |
| St. Clair            | 32                     | 1.92  | 2.20   | 2.39   | 2.15   | 0.30   | 65             | 1.88  | 2.04   | 2.17   | 2.04   | 0.31   | 1.67  | 0.099 |
| Maricopa             | 41                     | 1.70  | 1.87   | 2.05   | 1.93   | 0.38   | 51             | 1.80  | 2.02   | 2.21   | 2.05   | 0.33   | -1.63 | 0.106 |
| Mingo                | 39                     | 1.90  | 2.09   | 2.36   | 2.13   | 0.30   | 99             | 1.87  | 2.06   | 2.26   | 2.07   | 0.35   | 1.13  | 0.263 |
| <b>VITAMIN A</b>     |                        |       |        |        |        |        |                |       |        |        |        |        |       |       |
| Greene/Humphreys     | 10                     | 77.68 | 98.22  | 217.27 | 178.14 | 215.00 | 90             | 95.07 | 134.91 | 214.37 | 227.40 | 295.00 | -0.66 | 0.522 |
| St. Clair            | 32                     | 83.68 | 160.33 | 247.89 | 173.69 | 101.00 | 65             | 76.19 | 109.54 | 149.18 | 143.33 | 128.00 | 1.27  | 0.208 |
| Maricopa             | 41                     | 50.24 | 74.77  | 111.41 | 130.74 | 161.00 | 51             | 63.01 | 104.97 | 160.71 | 155.43 | 153.00 | -0.75 | 0.457 |
| Mingo                | 39                     | 80.26 | 122.92 | 232.12 | 169.44 | 113.00 | 99             | 73.54 | 115.98 | 182.35 | 168.88 | 220.00 | 0.02  | 0.984 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6 -23 (continued)

Percent of Recommended Daily Intake Received for Posttested Head Start  
and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons  
Between those Absent on Day of Recall and Non-Head Start Children within Site

|                   | ABSENT FROM HEAD START |        |        |        |        |       | NON-HEAD START |        |        |        |        |        | T     | P     |
|-------------------|------------------------|--------|--------|--------|--------|-------|----------------|--------|--------|--------|--------|--------|-------|-------|
|                   | N                      | Q1     | MED    | Q3     | MEAN   | SD    | N              | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>THIAMIN</b>    |                        |        |        |        |        |       |                |        |        |        |        |        |       |       |
| Greene/Humphreys  | 10                     | 146.54 | 195.54 | 208.05 | 184.75 | 37.80 | 89             | 122.49 | 160.50 | 210.39 | 186.10 | 125.00 | -0.08 | 0.940 |
| St. Clair         | 31                     | 115.73 | 143.05 | 184.65 | 153.62 | 51.50 | 66             | 117.51 | 142.67 | 179.26 | 148.70 | 42.80  | 0.46  | 0.646 |
| Maricopa          | 39                     | 114.84 | 133.68 | 165.09 | 140.36 | 41.80 | 52             | 114.40 | 140.69 | 169.98 | 141.26 | 38.10  | -0.11 | 0.916 |
| Mingo             | 35                     | 114.52 | 145.81 | 181.25 | 151.04 | 44.30 | 99             | 111.92 | 133.04 | 160.94 | 139.42 | 40.10  | 1.37  | 0.178 |
| <b>RIBOFLAVIN</b> |                        |        |        |        |        |       |                |        |        |        |        |        |       |       |
| Greene/Humphreys  | 9                      | 114.47 | 184.74 | 228.83 | 172.72 | 57.90 | 85             | 132.37 | 169.36 | 225.07 | 181.61 | 63.80  | -0.43 | 0.674 |
| St. Clair         | 31                     | 132.02 | 163.81 | 188.60 | 165.31 | 46.60 | 67             | 125.53 | 154.61 | 198.67 | 164.18 | 58.10  | 0.10  | 0.918 |
| Maricopa          | 39                     | 139.11 | 179.05 | 218.74 | 184.11 | 60.10 | 51             | 148.91 | 191.76 | 220.07 | 184.60 | 50.20  | -0.04 | 0.967 |
| Mingo             | 37                     | 135.13 | 193.13 | 240.19 | 193.13 | 62.40 | 100            | 138.19 | 169.58 | 211.41 | 176.78 | 61.30  | 1.37  | 0.176 |
| <b>NIACIN</b>     |                        |        |        |        |        |       |                |        |        |        |        |        |       |       |
| Greene/Humphreys  | 10                     | 125.94 | 140.38 | 176.31 | 151.98 | 41.40 | 87             | 113.32 | 130.91 | 166.17 | 147.15 | 51.80  | 0.34  | 0.740 |
| St. Clair         | 28                     | 98.96  | 127.22 | 167.43 | 133.68 | 48.00 | 67             | 108.01 | 122.62 | 151.86 | 130.62 | 39.20  | 0.30  | 0.767 |
| Maricopa          | 39                     | 88.25  | 111.02 | 142.73 | 116.86 | 41.40 | 51             | 90.99  | 123.41 | 146.62 | 121.49 | 36.30  | -0.55 | 0.581 |
| Mingo             | 36                     | 89.53  | 129.71 | 170.19 | 131.99 | 48.10 | 98             | 80.42  | 107.12 | 135.02 | 112.67 | 44.90  | 2.10  | 0.040 |
| <b>VITAMIN B6</b> |                        |        |        |        |        |       |                |        |        |        |        |        |       |       |
| Greene/Humphreys  | 10                     | 56.23  | 107.96 | 138.23 | 104.12 | 48.40 | 83             | 81.29  | 115.22 | 147.13 | 118.39 | 50.20  | -0.88 | 0.399 |
| St. Clair         | 32                     | 72.19  | 105.85 | 176.47 | 127.70 | 73.00 | 68             | 67.81  | 96.70  | 143.59 | 106.53 | 50.00  | 1.48  | 0.145 |
| Maricopa          | 41                     | 46.38  | 68.23  | 103.31 | 81.40  | 42.20 | 51             | 57.23  | 86.54  | 112.38 | 87.81  | 41.10  | -0.73 | 0.466 |
| Mingo             | 36                     | 65.74  | 84.88  | 119.04 | 95.79  | 48.40 | 103            | 54.92  | 89.54  | 143.69 | 102.76 | 55.60  | -0.71 | 0.474 |

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Table 6-23 (continued)

Percent of Recommended Daily Intake Received for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Absent on Day of Recall and Non-Head Start Children within Site

|                     | ABSENT FROM HEAD START |        |        |        |        |        | NON-HEAD START |        |        |        |        |        | T     | P     |
|---------------------|------------------------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|-------|-------|
|                     | N                      | Q1     | MED    | Q3     | MEAN   | SD     | N              | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>LOG VIT. B12</b> |                        |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys    | 7                      | 1.76   | 1.92   | 2.10   | 1.91   | 0.26   | 88             | 1.89   | 2.10   | 2.23   | 2.09   | 0.32   | -1.71 | 0.131 |
| St. Clair           | 32                     | 2.09   | 2.16   | 2.38   | 2.20   | 0.22   | 66             | 2.00   | 2.11   | 2.24   | 2.09   | 0.21   | 2.39  | 0.020 |
| Maricopa            | 41                     | 1.91   | 2.07   | 2.18   | 2.06   | 0.28   | 51             | 1.91   | 2.09   | 2.26   | 2.06   | 0.27   | 0.04  | 0.969 |
| Mingo               | 38                     | 2.04   | 2.13   | 2.24   | 2.14   | 0.28   | 96             | 1.97   | 2.10   | 2.24   | 2.11   | 0.30   | 0.48  | 0.632 |
| <b>VITAMIN B12</b>  |                        |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys    | 7                      | 57.90  | 83.90  | 129.52 | 94.65  | 54.10  | 88             | 76.98  | 124.66 | 169.38 | 178.53 | 276.00 | -2.34 | 0.024 |
| St. Clair           | 32                     | 123.86 | 145.34 | 242.33 | 180.30 | 95.20  | 66             | 99.05  | 127.88 | 172.15 | 135.73 | 57.90  | 2.44  | 0.019 |
| Maricopa            | 41                     | 80.68  | 116.56 | 151.56 | 146.86 | 154.00 | 51             | 80.84  | 122.84 | 180.54 | 135.89 | 77.70  | 0.42  | 0.677 |
| Mingo               | 38                     | 109.44 | 135.85 | 175.12 | 163.66 | 111.00 | 96             | 92.84  | 127.17 | 176.01 | 186.28 | 343.00 | -0.57 | 0.567 |
| <b>VITAMIN C</b>    |                        |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys    | 10                     | 63.03  | 264.30 | 369.11 | 261.06 | 180.00 | 90             | 111.90 | 270.98 | 411.62 | 289.90 | 202.00 | -0.47 | 0.644 |
| St. Clair           | 31                     | 237.03 | 323.93 | 545.25 | 378.80 | 221.00 | 68             | 61.81  | 273.43 | 464.10 | 321.71 | 268.00 | 1.12  | 0.269 |
| Maricopa            | 39                     | 55.76  | 101.60 | 305.23 | 181.81 | 162.00 | 50             | 80.18  | 150.86 | 262.78 | 175.31 | 116.00 | 0.21  | 0.833 |
| Mingo               | 38                     | 88.32  | 182.13 | 255.13 | 200.16 | 152.00 | 100            | 62.47  | 142.17 | 233.21 | 178.12 | 153.00 | 0.76  | 0.451 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6 -24

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) across Sites

| Dependent Variable  | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup> |                 |
|---|-------------|--|----------------------|-----------------|
|   |             |  | b                    | se <sub>b</sub> |
| Site  |             |  |                      |                 |
| <u>Calories</u>   | <u>707</u>  | Greene & Humphreys                       | <u>-87.57</u>        | <u>31.59</u>    |
|   |             | St. Clair                                | <u>273.62***</u>     | <u>33.73</u>    |
|   |             | Maricopa                                 | <u>-220.29***</u>    | <u>39.11</u>    |
|   |             | Mingo                                    | <u>34.24***</u>      | <u>30.97</u>    |
| Program   |             |  |                      |                 |
|   |             | Head Start Present vs. Non-Head Start    | <u>173.04***</u>     | <u>39.96</u>    |
|   |             | Head Start Present vs. Head Start Absent | <u>237.00***</u>     | <u>52.57</u>    |
|   |             | Head Start Absent vs. Non-Head Start     | <u>-63.95</u>        | <u>52.67</u>    |
|   |             | Constant                                 | <u>1185.56</u>       |                 |
| Statistics F = <u>13.91</u> R <sup>2</sup> = <u>0.18</u> MS <sub>e</sub> = <u>216176.32</u> |             |  |                      |                 |
| Site  |             |  |                      |                 |
| <u>Protein</u>  | <u>712</u>  | Greene & Humphreys                       | <u>-0.94</u>         | <u>1.40</u>     |
|   |             | St. Clair                                | <u>1.07***</u>       | <u>1.48</u>     |
|   |             | Maricopa                                 | <u>-7.84***</u>      | <u>1.73</u>     |
|   |             | Mingo                                    | <u>0.28</u>          | <u>1.36</u>     |
| Program   |             |  |                      |                 |
|   |             | Head Start Present vs. Non-Head Start    | <u>10.54***</u>      | <u>1.76</u>     |
|   |             | Head Start Present vs. Head Start Absent | <u>12.09***</u>      | <u>2.34</u>     |
|   |             | Head Start Absent vs. Non-Head Start     | <u>-1.54</u>         | <u>2.34</u>     |
|   |             | Constant                                 | <u>43.77</u>         |                 |
| Statistics F = <u>11.92</u> R <sup>2</sup> = <u>0.16</u> MS <sub>e</sub> = <u>423.21</u>    |             |  |                      |                 |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -24 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) across Sites

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup> |   |
|--------------------|-------------|--|----------------------|---|
|                    |             |  | b                    | SE <sub>b</sub>   |
|                    |             | Site                                     |                      |   |
| Fat                | 705         | Greene & Humphreys                       | <u>-4.70*</u>        | <u>1.63</u>   |
|                    |             | St. Clair                                | <u>10.97***</u>      | <u>1.74</u>   |
|                    |             | Maricopa                                 | <u>-5.34**</u>       | <u>2.01</u>   |
|                    |             | Mingo                                    | <u>-0.88</u>         | <u>1.60</u>   |
|                    |             | Program                                  |                      |   |
|                    |             | Head Start Present vs. Non-Head Start    | <u>1.84</u>          | <u>2.06</u>   |
|                    |             | Head Start Present vs. Head Start Absent | <u>5.57*</u>         | <u>2.72</u>   |
|                    |             | Head Start Absent vs. Non-Head Start     | <u>-3.73</u>         | <u>2.73</u>   |
|                    |             | Constant                                 | <u>51.33</u>         |   |
|                    |             | Statistics                               | F = <u>7.99</u>      | R <sup>2</sup> = <u>0.11</u> MS <sub>e</sub> = <u>574.23</u>  |
|                    |             | Site                                     |                      |   |
| Carbohydrate       | 709         | Greene & Humphreys                       | <u>-10.70**</u>      | <u>4.21</u>   |
|                    |             | St. Clair                                | <u>36.65***</u>      | <u>4.50</u>   |
|                    |             | Maricopa                                 | <u>-36.95***</u>     | <u>5.21</u>   |
|                    |             | Mingo                                    | <u>11.00**</u>       | <u>4.12</u>   |
|                    |             | Program                                  |                      |   |
|                    |             | Head Start Present vs. Non-Head Start    | <u>29.47***</u>      | <u>5.33</u>   |
|                    |             | Head Start Present vs. Head Start Absent | <u>40.18***</u>      | <u>7.01</u>   |
|                    |             | Head Start Absent vs. Non-Head Start     | <u>-10.76</u>        | <u>38.65</u>  |
|                    |             | Constant                                 | <u>132.11</u>        |   |
|                    |             | Statistics                               | F = <u>15.47</u>     | R <sup>2</sup> = <u>0.20</u> MS <sub>e</sub> = <u>3857.27</u> |

<sup>a</sup> Significance shown as:

\*p < .05  
 \*\*p < .01  
 \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -24 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) across Sites

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup> |              |                    |
|--------------------|-------------|--|----------------------|--------------|--------------------|
|                    |             |  | $b$                  | $se_b$       |                    |
| Calcium            | 711         | Site                                     |                      |              |                    |
|                    |             | Greene & Humphreys                       | -52.87*              | 23.16        |                    |
|                    |             | St. Clair                                | 47.83                | 24.80        |                    |
|                    |             | Maricopa                                 | -86.95**             | 28.89        |                    |
|                    |             | Mingo                                    | 91.99***             | 22.68        |                    |
|                    |             | Program                                  |                      |              |                    |
|                    |             | Head Start Present vs. Non-Head Start    | 332.16***            | 29.30        |                    |
|                    |             | Head Start Present vs. Head Start Absent | 355.13***            | 38.57        |                    |
|                    |             | Head Start Absent vs. Non-Head Start     | -31.96               | 38.65        |                    |
|                    |             | Constant                                 | 477.92               |              |                    |
| Statistics         |             |  | $F = 19.42$          | $R^2 = 0.23$ | $MS_e = 116853.62$ |
| Iron               | 690         | Site                                     |                      |              |                    |
|                    |             | Greene & Humphreys                       | -0.23                | 0.26         |                    |
|                    |             | St. Clair                                | 1.94***              | 0.28         |                    |
|                    |             | Maricopa                                 | -1.67***             | 0.32         |                    |
|                    |             | Mingo                                    | -0.35                | 0.25         |                    |
|                    |             | Program                                  |                      |              |                    |
|                    |             | Head Start Present vs. Non-Head Start    | 0.74*                | 0.32         |                    |
|                    |             | Head Start Present vs. Head Start Absent | 1.20**               | 0.44         |                    |
|                    |             | Head Start Absent vs. Non-Head Start     | -0.45                | 0.44         |                    |
|                    |             | Constant                                 | 5.18                 |              |                    |
| Statistics         |             |  | $F = 9.60$           | $R^2 = 0.14$ | $MS_e = 14.00$     |

<sup>a</sup> Significance shown as:

\* $p < .05$   
 \*\* $p < .01$   
 \*\*\* $p < .001$

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.



Table 6 -24 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) across Sites

| Dependent Variable                       | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup> |                       |                             |       |
|--|-------------|--|----------------------|-----------------------|-----------------------------|-------|
|  |             |  | b                    | se <sub>b</sub>       |                             |       |
| Magnesium                                | 724         | Site                                     |                      |                       |                             |       |
|  |             | Greene & Humphreys                       | -11.09*              | 5.06                  |                             |       |
|  |             | St. Clair                                | 35.87***             | 5.57                  |                             |       |
|  |             | Maricopa                                 | -36.15***            | 6.44                  |                             |       |
|  |             | Mingo                                    | 12.20*               | 5.13                  |                             |       |
|  |             | Program                                  |                      |                       |                             |       |
|  |             | Head Start Present vs. Non-Head Start    | 50.55***             | 6.45                  |                             |       |
|  |             | Head Start Present vs. Head Start Absent | 62.09***             | 8.53                  |                             |       |
|  |             | Head Start Absent vs. Non-Head Start     | -11.52               | 8.54                  |                             |       |
|  |             | Constant                                 | 111.56               |                       |                             |       |
|  |             | Statistics                               | F = 18.02            | R <sup>2</sup> = 0.22 | MS <sub>e</sub> = 5958.56   |       |
|  |             | Phosphorus                               | 726                  | Site                  |                             |       |
|  |             |  |                      | Greene & Humphreys    | -69.92**                    | 25.76 |
| St. Clair                                | 90.49**     |  |                      | 28.46                 |                             |       |
| Maricopa                                 | -117.85***  |  |                      | 32.91                 |                             |       |
| Mingo                                    | 102.25***   |  |                      | 25.92                 |                             |       |
| Program                                  |             |  |                      |                       |                             |       |
| Head Start Present vs. Non-Head Start    | 263.84***   |  |                      | 32.33                 |                             |       |
| Head Start Present vs. Head Start Absent | 300.66***   |  |                      | 42.57                 |                             |       |
| Head Start Absent vs. Non-Head Start     | -36.80      |  |                      | 42.69                 |                             |       |
| Constant                                 | 687.92      |  |                      |                       |                             |       |
| Statistics                               | F = 13.53   |  |                      | R <sup>2</sup> = 0.17 | MS <sub>e</sub> = 155214.76 |       |

<sup>a</sup> Significance shown as:

\*p < .05  
 \*\*p < .01  
 \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -24 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) across Sites

| Dependent Variable  | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup> |                 |
|---|-------------|--|----------------------|-----------------|
|   |             |  | b                    | se <sub>b</sub> |
| Site  |             |  |                      |                 |
| Vitamin A<br>(LOG)  | 703         | Greene & Humphreys                       | 0.10***              | 0.02            |
|   |             | St. Clair                                | 0.37                 | 0.02            |
|   |             | Maricopa                                 | -0.12***             | 0.03            |
|   |             | Mingo                                    | -0.21                | 0.02            |
| Program   |             |  |                      |                 |
|   |             | Head Start Present vs. Non-Head Start    | 0.24**               | 0.03            |
|   |             | Head Start Present vs. Head Start Absent | 0.20***              | 0.04            |
|   |             | Head Start Absent vs. Non-Head Start     | 0.03                 | 0.04            |
|   |             | Constant                                 | 3.31                 |                 |
| Statistics F = 15.15 R <sup>2</sup> = 0.19 MS <sub>e</sub> = 0.11 |             |  |                      |                 |
| Site  |             |  |                      |                 |
| Thiamin   | 697         | Greene & Humphreys                       | 0.57**               | 0.03            |
|   |             | St. Clair                                | 0.25***              | 0.04            |
|   |             | Maricopa                                 | -0.26***             | 0.04            |
|   |             | Mingo                                    | 0.70                 | 0.03            |
| Program   |             |  |                      |                 |
|   |             | Head Start Present vs. Non-Head Start    | 0.10*                | 0.04            |
|   |             | Head Start Present vs. Head Start Absent | 0.10                 | 0.06            |
|   |             | Head Start Absent vs. Non-Head Start     | 0.00                 | 0.08            |
|   |             | Constant                                 | 0.77                 |                 |
| Statistics F = 8.5 R <sup>2</sup> = 0.12 MS <sub>e</sub> = 0.25   |             |  |                      |                 |

<sup>a</sup> Significance shown as:

\*p < .05  
 \*\*p < .01  
 \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -24 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) across Sites

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup> |   |
|--------------------|-------------|--|----------------------|---|
|                    |             |  | b                    | MS <sub>b</sub>   |
|                    |             | Site                                     |                      |   |
| <u>Riboflavin</u>  | <u>697</u>  | Greene & Humphreys                       | <u>-0.17</u>         | <u>0.05</u>   |
|                    |             | St. Clair                                | <u>0.21***</u>       | <u>0.05</u>   |
|                    |             | Maricopa                                 | <u>-0.25***</u>      | <u>0.06</u>   |
|                    |             | Mingo                                    | <u>0.54</u>          | <u>0.05</u>   |
|                    |             | Program                                  |                      |   |
|                    |             | Head Start Present vs. Non-Head Start    | <u>0.48***</u>       | <u>0.06</u>   |
|                    |             | Head Start Present vs. Head Start Absent | <u>0.49***</u>       | <u>0.08</u>   |
|                    |             | Head Start Absent vs. Non-Head Start     | <u>0.00</u>          | <u>0.00</u>   |
|                    |             | Constant                                 | <u>1.15</u>          |   |
|                    |             | Statistics                               | F = <u>12.43</u>     | R <sup>2</sup> = <u>0.17</u> MS <sub>e</sub> = <u>0.48</u>  |
|                    |             | Site                                     |                      |   |
| <u>Niacin</u>      | <u>698</u>  | Greene & Humphreys                       | <u>0.62**</u>        | <u>0.42</u>   |
|                    |             | St. Clair                                | <u>3.05***</u>       | <u>0.44</u>   |
|                    |             | Maricopa                                 | <u>-3.16***</u>      | <u>0.52</u>   |
|                    |             | Mingo                                    | <u>0.51</u>          | <u>0.41</u>   |
|                    |             | Program                                  |                      |   |
|                    |             | Head Start Present vs. Non-Head Start    | <u>0.75*</u>         | <u>0.52</u>   |
|                    |             | Head Start Present vs. Head Start Absent | <u>1.07</u>          | <u>0.71</u>   |
|                    |             | Head Start Absent vs. Non-Head Start     | <u>-0.31</u>         | <u>0.71</u>   |
|                    |             | Constant                                 | <u>9.78</u>          |   |
|                    |             | Statistics                               | F = <u>7.72</u>      | R <sup>2</sup> = <u>0.11</u> MS <sub>e</sub> = <u>36.79</u> |

<sup>a</sup> Significance shown as:

\*p < .05  
 \*\*p < .01  
 \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -24 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) across Sites

| Dependent Variable                       | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup> |                       |                        |      |
|--|-------------|--|----------------------|-----------------------|------------------------|------|
|  |             |  | b                    | MS <sub>b</sub>       |                        |      |
| Vitamin B6                               | 697         | Site                                     |                      |                       |                        |      |
|  |             | Greene & Humphreys                       | 0.17                 | 0.03                  |                        |      |
|  |             | St. Clair                                | 0.13**               | 0.04                  |                        |      |
|  |             | Maricopa                                 | -0.14**              | 0.05                  |                        |      |
|  |             | Mingo                                    | -0.21                | 0.04                  |                        |      |
|  |             | Program                                  |                      |                       |                        |      |
|  |             | Head Start Present vs. Non-Head Start    | 0.14**               | 0.05                  |                        |      |
|  |             | Head Start Present vs. Head Start Absent | 0.15*                | 0.06                  |                        |      |
|  |             | Head Start Absent vs. Non-Head Start     | 0.00                 | 0.06                  |                        |      |
|  |             | Constant                                 | 0.73                 |                       |                        |      |
|  |             | Statistics                               | F = 3.87             | R <sup>2</sup> = 0.06 | MS <sub>e</sub> = 0.31 |      |
|  |             | Vitamin B12 (LOG)                        | 698                  | Site                  |                        |      |
|  |             |  |                      | Greene & Humphreys    | -0.16                  | 0.02 |
|  |             |  |                      | St. Clair             | 0.48*                  | 0.02 |
| Maricopa                                 | -0.33       |  |                      | 0.02                  |                        |      |
| Mingo                                    | 0.14        |  |                      | 0.02                  |                        |      |
| Program                                  |             |  |                      |                       |                        |      |
| Head Start Present vs. Non-Head Start    | 0.16***     |  |                      | 0.02                  |                        |      |
| Head Start Present vs. Head Start Absent | 0.11***     |  |                      | 0.03                  |                        |      |
| Head Start Absent vs. Non-Head Start     | 0.05        |  |                      | 0.03                  |                        |      |
| Constant                                 | 0.33        |  |                      |                       |                        |      |
| Statistics                               | F = 7.41    |  |                      | R <sup>2</sup> = 0.11 | MS <sub>e</sub> = 0.07 |      |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -24 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) across Sites

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>   |  |
|--------------------|-------------|--|------------------------|--|
|                    |             |  | b                      | se <sub>b</sub>                                  |
|                    |             | Site                                     |                        |  |
| Vitamin C          | 704         | Greene & Humphreys                       | 2.82                   | 5.57   |
|                    |             | St. Clair                                | 51.17***               | 5.95   |
|                    |             | Maricopa                                 | -33.31***              | 6.93   |
|                    |             | Mingo                                    | -20.68***              | 5.52   |
|                    |             | Program                                  |                        |  |
|                    |             | Head Start Present vs. Non-Head Start    | 14.54*                 | 7.05   |
|                    |             | Head Start Present vs. Head Start Absent | 4.98                   | 9.32   |
|                    |             | Head Start Absent vs. Non-Head Start     | 9.56                   | 9.33   |
|                    |             | Constant                                 | 102.12                 |  |
|                    |             | Statistics                               | F = 11.40              | R <sup>2</sup> = 0.15 MS <sub>e</sub> = 6726.92  |
|                    |             | Site                                     |                        |  |
| Cholesterol        | 708         | Greene & Humphreys                       | -35.27*                | -0.13  |
|                    |             | St. Clair                                | 49.41***               | 14.75  |
|                    |             | Maricopa                                 | -5.13                  | 17.03  |
|                    |             | Mingo                                    | -9.00                  | 13.50  |
|                    |             | Program                                  |                        |  |
|                    |             | Head Start Present vs. Non-Head Start    | 9.34                   | 17.45  |
|                    |             | Head Start Present vs. Head Start Absent | Doesn't Enter Equation |  |
|                    |             | Head Start Absent vs. Non-Head Start     | 7.57                   | 23.07  |
|                    |             | Constant                                 | 307.13                 |  |
|                    |             | Statistics                               | F = 2.63               | R <sup>2</sup> = 0.04 MS <sub>e</sub> = 41401.27 |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -25

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>        |                 |
|--------------------|-------------|--|-----------------------------|-----------------|
|                    |             |  | b                           | SE <sub>b</sub> |
| Calories           | 196         | Greene & Humphreys                       |                             |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 72.90                       | 66.78           |
|                    |             | Head Start-Present vs. Head Start-Absent | 198.34                      | 144.00          |
|                    |             | Head Start-Absent vs. Non-Head Start     | -125.44                     | 145.16          |
|                    |             | Constant                                 | 952.34                      |                 |
| Statistics         |             | F = 2.71 R <sup>2</sup> = 0.09           | MS <sub>e</sub> = 183183.75 |                 |
|                    | 167         | St. Clair                                |                             |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 327.02 ***                  | 93.74           |
|                    |             | Head Start-Present vs. Head Start-Absent | 173.76                      | 113.04          |
|                    |             | Head Start-Absent vs. Non-Head Start     | 153.40                      | 111.80          |
|                    |             | Constant                                 | 1598.74                     |                 |
| Statistics         |             | F = 2.33 R <sup>2</sup> = 0.11           | MS <sub>e</sub> = 244556.78 |                 |
|                    | 144         | Maricopa                                 |                             |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 13.66                       | 91.32           |
|                    |             | Head Start-Present vs. Head Start-Absent | 202.06 *                    | 96.00           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -188.38                     | 100.32          |
|                    |             | Constant                                 | 3398.30                     |                 |
| Statistics         |             | F = 3.07 R <sup>2</sup> = 0.15           | MS <sub>e</sub> = 205978.94 |                 |
|                    | 200         | Mingo                                    |                             |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 293.50 ***                  | 79.58           |
|                    |             | Head Start-Present vs. Head Start-Absent | 375.04 ***                  | 99.16           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -81.54                      | 93.88           |
|                    |             | Constant                                 | 1275.38                     |                 |
| Statistics         |             | F = 4.67 R <sup>2</sup> = 0.16           | MS <sub>e</sub> = 220872.70 |                 |

<sup>a</sup>Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup>Adjusted for age, sex, employment status, participation in federal food assistances programs.

<sup>c</sup>Centered without weights.

Table 6 -25 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>     |                 |
|--------------------|-------------|--|--------------------------|-----------------|
|                    |             |  | b                        | SE <sub>b</sub> |
| Protein            | 196         | Greene & Humphreys                       |                          |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 5.58                     | 2.94            |
|                    |             | Head Start-Present vs. Head Start-Absent | 17.62 **                 | 6.68            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -12.02                   | 6.72            |
|                    |             | Constant                                 | 35.15                    |                 |
| Statistics         |             | F = 2.87 R <sup>2</sup> = 0.11           | MS <sub>e</sub> = 358.62 |                 |
|                    | 169         | St. Clair                                |                          |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 13.92 ***                | 4.10            |
|                    |             | Head Start-Present vs. Head Start-Absent | 5.20                     | 4.96            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 8.72                     | 4.90            |
|                    |             | Constant                                 | 60.85                    |                 |
| Statistics         |             | F = 2.68 R <sup>2</sup> = 0.12           | MS <sub>e</sub> = 472.37 |                 |
|                    | 143         | Maricopa                                 |                          |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 2.76                     | 3.82            |
|                    |             | Head Start-Present vs. Head Start-Absent | 8.52 *                   | 4.00            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 5.74                     | 4.12            |
|                    |             | Constant                                 | 72.29                    |                 |
| Statistics         |             | F = 3.15 R <sup>2</sup> = 0.16           | MS <sub>e</sub> = 355.42 |                 |
|                    |             | Mingo                                    |                          |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 18.18 ***                | 3.56            |
|                    |             | Head Start-Present vs. Head Start-Absent | 20.08 ***                | 4.54            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -1.90                    | 4.34            |
|                    |             | Constant                                 | 44.32                    |                 |
| Statistics         |             | F = 6.05 R <sup>2</sup> = 0.20           | MS <sub>e</sub> = 460.42 |                 |

<sup>a</sup>Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup>Adjusted for age, sex, employment status, participation in Federal food assistances programs.

<sup>c</sup>Centered without weights.

Table 6 -25 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>     |                 |  |
|--------------------|-------------|--|--------------------------|-----------------|--|
|                    |             |  | b                        | SE <sub>b</sub> |  |
| Fat                | 195         | Greene & Humphreys                       |                          |                 |  |
|                    |             | Head Start-Present vs. Non-Head Start    | -0.56                    | 3.52            |  |
|                    |             | Head Start-Present vs. Head Start-Absent | 5.12                     |                 |  |
|                    |             | Head Start-Absent vs. Non-Head Start     | -5.68                    | 7.64            |  |
|                    |             | Constant                                 | 39.65                    |                 |  |
| Statistics         | F = 1.89    | R <sup>2</sup> = 0.08                    | MS <sub>e</sub> = 511.82 |                 |  |
|                    | 167         | St. Clair                                |                          |                 |  |
|                    |             | Head Start-Present vs. Non-Head Start    | 5.04                     | 4.86            |  |
|                    |             | Head Start-Present vs. Head Start-Absent | -1.48                    | 5.92            |  |
|                    |             | Head Start-Absent vs. Non-Head Start     | 6.52                     | 5.88            |  |
|                    |             | Constant                                 | 64.77                    |                 |  |
| Statistics         | F = 1.57    | R <sup>2</sup> = 0.07                    | MS <sub>e</sub> = 661.42 |                 |  |
|                    | 145         | Maricopa                                 |                          |                 |  |
|                    |             | Head Start-Present vs. Non-Head Start    | -2.30                    | 5.00            |  |
|                    |             | Head Start-Present vs. Head Start-Absent | 8.00                     | 5.22            |  |
|                    |             | Head Start-Absent vs. Non-Head Start     | -10.30                   | 5.44            |  |
|                    |             | Constant                                 | 103.00                   |                 |  |
| Statistics         | F = 2.94    | R <sup>2</sup> = 0.15                    | MS <sub>e</sub> = 618.13 |                 |  |
|                    | 198         | Mingo                                    |                          |                 |  |
|                    |             | Head Start-Present vs. Non-Head Start    | 5.14                     | 3.80            |  |
|                    |             | Head Start-Present vs. Head Start-Absent | 9.08                     | 4.78            |  |
|                    |             | Head Start-Absent vs. Non-Head Start     | -3.96                    | 4.52            |  |
|                    |             | Constant                                 | 55.87                    |                 |  |
| Statistics         | F = 1.79    | R <sup>2</sup> = 0.07                    | MS <sub>e</sub> = 499.38 |                 |  |

<sup>a</sup>Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup>Adjusted for age, sex, employment status, participation in federal food assistances programs.

<sup>c</sup>Centered without weights.



Table 6 -25 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>           |                           |
|--------------------|-------------|--|--------------------------------|---------------------------|
|                    |             |  | b                              | SE <sub>b</sub>           |
| Carbohydrate       | 497         | Greene & Humphreys                       |                                |                           |
|                    |             | Head Start-Present vs. Non-Head Start    | 10.82                          | 8.60                      |
|                    |             | Head Start-Present vs. Head Start-Absent | 28.32                          | 18.44                     |
|                    |             | Head Start-Absent vs. Non-Head Start     | -17.50                         | 18.58                     |
|                    |             | Constant                                 | 119.72                         |                           |
| Statistics         |             | F = 2.04 R <sup>2</sup> = 0.07           | MS <sub>e</sub> = 3035.05      |                           |
|                    | 167         | St. Clair                                |                                |                           |
|                    |             | Head Start-Present vs. Non-Head Start    | 52.78 ***                      | 13.22                     |
|                    |             | Head Start-Present vs. Head Start-Absent | 49.02 **                       | 15.90                     |
|                    |             | Head Start-Absent vs. Non-Head Start     | 3.76                           | 15.72                     |
|                    |             | Constant                                 | 168.82                         |                           |
|                    |             | Statistics                               | F = 3.56 R <sup>2</sup> = 0.15 | MS <sub>e</sub> = 4837.80 |
|                    | 143         | Maricopa                                 |                                |                           |
|                    |             | Head Start-Present vs. Non-Head Start    | 6.38                           | 11.40                     |
|                    |             | Head Start-Present vs. Head Start-Absent | 16.28                          | 11.94                     |
|                    |             | Head Start-Absent vs. Non-Head Start     | 9.90                           | 12.50                     |
|                    |             | Constant                                 | 204.56                         |                           |
|                    |             | Statistics                               | F = 1.64 R <sup>2</sup> = 0.09 | MS <sub>e</sub> = 3180.85 |
|                    | 201         | Mingo                                    |                                |                           |
|                    |             | Head Start-Present vs. Non-Head Start    | 51.26 ***                      | 10.70                     |
|                    |             | Head Start-Present vs. Head Start-Absent | 68.64 ***                      | 13.38                     |
|                    |             | Head Start-Absent vs. Non-Head Start     | -17.38                         | 12.78                     |
|                    |             | Constant                                 | 140.57                         |                           |
|                    |             | Statistics                               | F = 6.91 R <sup>2</sup> = 0.22 | MS <sub>e</sub> = 4086.49 |

<sup>a</sup>Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup>Adjusted for age, sex, employment status, participation in federal food assistances programs.

<sup>c</sup>Centered without weights.

Table 6 -25 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>        |                 |
|--------------------|-------------|--|-----------------------------|-----------------|
|                    |             |  | b                           | SE <sub>b</sub> |
| Calcium            | 198         | Greene & Humphreys                       |                             |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 320.56 ***                  | 42.40           |
|                    |             | Head Start-Present vs. Head Start-Absent | 498.40 ***                  | 91.56           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -178.34                     | 92.24           |
|                    |             | Constant                                 | 340.79                      |                 |
| Statistics         | F = 13.84   | R <sup>2</sup> = 0.37                    | MS <sub>e</sub> = 74483.85  |                 |
|                    | 167         | St. Clair                                |                             |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 360.02 ***                  | 69.66           |
|                    |             | Head Start-Present vs. Head Start-Absent | 321.28 ***                  | 83.66           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 38.74                       | 82.74           |
|                    |             | Constant                                 | 483.09                      |                 |
| Statistics         | F = 8.34    | R <sup>2</sup> = 0.30                    | MS <sub>e</sub> = 133927.87 |                 |
|                    | 142         | Maricopa                                 |                             |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 138.06 *                    | 68.88           |
|                    |             | Head Start-Present vs. Head Start-Absent | 203.12 **                   | 71.32           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -65.06                      | 74.42           |
|                    |             | Constant                                 | 730.63                      |                 |
| Statistics         | F = 1.96    | R <sup>2</sup> = 0.11                    | MS <sub>e</sub> = 114232.89 |                 |
|                    | 204         | Mingo                                    |                             |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 373.88 ***                  | 62.50           |
|                    |             | Head Start-Present vs. Head Start-Absent | 421.38                      | 78.38           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -47.52                      | 74.90           |
|                    |             | Constant                                 | 612.51                      |                 |
| Statistics         | F = 7.13    | R <sup>2</sup> = 0.23                    | MS <sub>e</sub> = 140785.99 |                 |

<sup>a</sup>Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup>Adjusted for age, sex, employment status, participation in federal food assistances programs.

<sup>c</sup>Centered without weights.

Table 6 -25 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>    |                 |
|--------------------|-------------|--|-------------------------|-----------------|
|                    |             |  | b                       | SE <sub>b</sub> |
| Iron               | 187         | Greene & Humphreys                       |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.36                    | 0.60            |
|                    |             | Head Start-Present vs. Head Start-Absent | 1.82                    | 1.32            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -1.46                   | 1.32            |
|                    |             | Constant                                 | 4.49                    |                 |
| Statistics         |             | F = 1.96 R <sup>2</sup> = 0.08           | MS <sub>e</sub> = 13.77 |                 |
|                    | 164         | St. Clair                                |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 1.36                    | 0.80            |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.56                    | 1.00            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 0.80                    | 0.98            |
|                    |             | Constant                                 | 7.10                    |                 |
| Statistics         |             | F = 1.65 R <sup>2</sup> = 0.08           | MS <sub>e</sub> = 17.76 |                 |
|                    | 139         | Maricopa                                 |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -0.36                   | 0.66            |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.46                    | 0.68            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.82                   | 0.70            |
|                    |             | Constant                                 | 11.75                   |                 |
| Statistics         |             | F = 3.28 R <sup>2</sup> = 0.15           | MS <sub>e</sub> = 9.93  |                 |
|                    | 200         | Mingo                                    |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start *  | 1.68 ***                | 0.60            |
|                    |             | Head Start-Present vs. Head Start-Absent | 2.60 ***                | 0.80            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.90                   | 0.76            |
|                    |             | Constant                                 | 5.45                    |                 |
| Statistics         |             | F = 4.50 R <sup>2</sup> = 0.16           | MS <sub>e</sub> = 13.33 |                 |

<sup>a</sup>Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup>Adjusted for age, sex, employment status, participation in federal food assistances programs.

<sup>c</sup>Centered without weights.

Table 6 -25 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>      |                 |
|--------------------|-------------|--|---------------------------|-----------------|
|                    |             |  | b                         | SE <sub>b</sub> |
| Magnesium          | 211         | Greene & Humphreys                       |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 28.90 **                  | 11.18           |
|                    |             | Head Start-Present vs. Head Start-Absent | 58.08 **                  | 18.04           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -29.54                    | 24.32           |
|                    |             | Constant                                 | 60.62                     |                 |
| Statistics         |             | F = 6.25 R <sup>2</sup> = 0.20           | MS <sub>e</sub> = 6022.94 |                 |
|                    | 168         | St. Clair                                |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 83.00 ***                 | 15.32           |
|                    |             | Head Start-Present vs. Head Start-Absent | 69.06 ***                 | 18.56           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 13.96                     | 18.30           |
|                    |             | Constant                                 | 90.70                     |                 |
| Statistics         |             | F = 8.37 R <sup>2</sup> = 0.30           | MS <sub>e</sub> = 6600.46 |                 |
|                    | 144         | Maricopa                                 |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 24.92                     | 14.42           |
|                    |             | Head Start-Present vs. Head Start-Absent | 46.56 **                  | 15.16           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 21.84                     | 15.84           |
|                    |             | Constant                                 | 230.33                    |                 |
| Statistics         |             | F = 1.76 R <sup>2</sup> = 0.09           | MS <sub>e</sub> = 5132.60 |                 |
|                    | 201         | Mingo                                    |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 60.04 ***                 | 12.54           |
|                    |             | Head Start-Present vs. Head Start-Absent | 75.10 ***                 | 15.64           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -15.06                    | 14.92           |
|                    |             | Constant                                 | 178.56                    |                 |
| Statistics         |             | F = 5.31 R <sup>2</sup> = 0.18           | MS <sub>e</sub> = 5539.36 |                 |

<sup>a</sup>Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup>Adjusted for age, sex, employment status, participation in federal food assistances programs.

<sup>c</sup>Centered without weights.

Table 6 -25 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                         | Effects <sup>c</sup>               |                 |
|--------------------|-------------|--|------------------------------------|-----------------|
|                    |             |  | b                                  | SE <sub>b</sub> |
| Phosphorous        | 211         | Greene & Humphreys                           |                                    |                 |
|                    |             | Head Start-Present vs. Non-Head Start        | 238.32 ***                         | 55.74           |
|                    |             | Head Start-Present vs. Head Start-Absent     | 395.18 **                          | 120.46          |
|                    |             | Head Start-Absent vs. Non-Head Start         | -156.86                            | 121.30          |
|                    |             | Constant                                     | 510.46                             |                 |
| Statistics         |             | F = <u>6.83</u> R <sup>2</sup> = <u>0.21</u> | MS <sub>e</sub> = <u>166707.43</u> |                 |
|                    | 167         | St. Clair                                    |                                    |                 |
|                    |             | Head Start-Present vs. Non-Head Start        | 332.52 ***                         | 72.84           |
|                    |             | Head Start-Present vs. Head Start-Absent     | 236.54 **                          | 87.48           |
|                    |             | Head Start-Absent vs. Non-Head Start         | 95.98                              | 86.52           |
|                    |             | Constant                                     | 824.60                             |                 |
| Statistics         |             | F = <u>5.79</u> R <sup>2</sup> = <u>0.23</u> | MS <sub>e</sub> = <u>146440.38</u> |                 |
|                    | 144         | Maricopa                                     |                                    |                 |
|                    |             | Head Start-Present vs. Non-Head Start        | 92.94                              | 70.14           |
|                    |             | Head Start-Present vs. Head Start-Absent     | 202.38 **                          | 73.04           |
|                    |             | Head Start-Absent vs. Non-Head Start         | -109.44                            | 76.06           |
|                    |             | Constant                                     | 1096.69                            |                 |
| Statistics         |             | F = <u>2.40</u> R <sup>2</sup> = <u>0.13</u> | MS <sub>e</sub> = <u>120701.88</u> |                 |
|                    | 204         | Mingo  |                                    |                 |
|                    |             | Head Start-Present vs. Non-Head Start        | 304.12 ***                         | 67.30           |
|                    |             | Head Start-Present vs. Head Start-Absent     | 356.16 ***                         | 84.36           |
|                    |             | Head Start-Absent vs. Non-Head Start         | -52.02                             | 80.72           |
|                    |             | Constant                                     | 830.14                             |                 |
| Statistics         |             | F = <u>5.06</u> R <sup>2</sup> = <u>0.17</u> | MS <sub>e</sub> = <u>163166.35</u> |                 |

<sup>a</sup>Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup>Adjusted for age, sex, employment status, participation in federal food assistances programs.

<sup>c</sup>Centered without weights.

Table 6 -25 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>   |                 |
|--------------------|-------------|--|------------------------|-----------------|
|                    |             |  | b                      | SE <sub>b</sub> |
| Vitamin A<br>(Log) | 196         | Greene & Humphreys                       |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.28 ***               | 0.06            |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.04 **                | 0.12            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.10                  | 0.12            |
|                    |             | Constant                                 | 3.35                   |                 |
| Statistics         |             | F = 5.29 R <sup>2</sup> = 0.19           | MS <sub>e</sub> = 0.14 |                 |
|                    | 167         | St. Clair                                |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.32 ***               | 0.06            |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.20 **                | 0.08            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 0.10                   | 0.08            |
|                    |             | Constant                                 | 3.10                   |                 |
| Statistics         |             | F = 7.33 R <sup>2</sup> = 0.27           | MS <sub>e</sub> = 0.10 |                 |
|                    | 141         | Maricopa                                 |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.10                   | 0.06            |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.18 **                | 0.06            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.10                  | 3.74            |
|                    |             | Constant                                 | 3.74                   |                 |
| Statistics         |             | F = 3.56 R <sup>2</sup> = 0.16           | MS <sub>e</sub> = 0.09 |                 |
|                    | 200         | Mingo                                    |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.22 ***               | 0.04            |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.12 *                 | 0.06            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 0.10                   | 0.06            |
|                    |             | Constant                                 | 3.40                   |                 |
| Statistics         |             | F = 4.19 R <sup>2</sup> = 0.15           | MS <sub>e</sub> = 0.08 |                 |

<sup>a</sup>Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup>Adjusted for age, sex, employment status, participation in federal food assistances programs.

<sup>c</sup>Centered without weights.

Table 6 -25 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup> |                       |                        |
|--------------------|-------------|--|----------------------|-----------------------|------------------------|
|                    |             |  | b                    | SE <sub>b</sub>       |                        |
| Thiamin            | 193         | Greene & Humphreys                       |                      |                       |                        |
|                    |             | Head Start-Present vs. Non-Head Start    | -0.06                | 0.08                  |                        |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.28 **              | 0.10                  |                        |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.04                | 0.18                  |                        |
|                    |             | Constant                                 | 0.65                 |                       |                        |
|                    |             | Statistics                               | F = 1.21             | R <sup>2</sup> = 0.05 | MS <sub>e</sub> = 0.26 |
|                    | 167         | St. Clair                                |                      |                       |                        |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.10                 | 0.12                  |                        |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.04                 | 0.14                  |                        |
|                    |             | Head Start-Absent vs. Non-Head Start     | 0.06                 | 0.14                  |                        |
|                    |             | Constant                                 | 0.82                 |                       |                        |
|                    |             | Statistics                               | F = 1.51             | R <sup>2</sup> = 0.07 | MS <sub>e</sub> = 0.35 |
|                    | 139         | Maricopa                                 |                      |                       |                        |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.10                 | 0.08                  |                        |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.16                 | 0.08                  |                        |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.06                | 0.10                  |                        |
|                    |             | Constant                                 | 2.14                 |                       |                        |
|                    |             | Statistics                               | F = 2.75             | R <sup>2</sup> = 0.15 | MS <sub>e</sub> = 0.16 |
|                    | 198         | Mingo                                    |                      |                       |                        |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.28 ***             | 0.08                  |                        |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.22 *               | 0.10                  |                        |
|                    |             | Head Start-Absent vs. Non-Head Start     | 0.08                 | 0.10                  |                        |
|                    |             | Constant                                 | 0.83                 |                       |                        |
|                    |             | Statistics                               | F = 2.96             | R <sup>2</sup> = 0.11 | MS <sub>e</sub> = 0.22 |

<sup>a</sup>Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup>Adjusted for age, sex, employment status, participation in federal food assistances programs.

<sup>c</sup>Centered without weights.

Table 6 -25 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>   | Effects <sup>c</sup> |                 |
|--------------------|-------------|--|----------------------|-----------------|
|                    |             |  | b                    | SE <sub>b</sub> |
| <u>Riboflavin</u>  | <u>188</u>  | Greene & Humphreys   |                      |                 |
|                    |             | Head Start-Present vs. Non-Head Start                                      | 0.46 ***             | 0.12            |
|                    |             | Head Start-Present vs. Head Start-Absent                                   | 0.82 ***             | 0.24            |
|                    |             | Head Start-Absent vs. Non-Head Start                                       | -0.38                | 0.24            |
|                    |             | Constant   | 1.35                 |                 |
| Statistics         |             | F = <u>4.29</u> R <sup>2</sup> = <u>0.14</u> MS <sub>e</sub> = <u>0.47</u> |                      |                 |
|                    | <u>166</u>  | St. Clair  |                      |                 |
|                    |             | Head Start-Present vs. Non-Head Start                                      | 0.72 ***             | 0.14            |
|                    |             | Head Start-Present vs. Head Start-Absent                                   | 0.52 **              | 0.18            |
|                    |             | Head Start-Absent vs. Non-Head Start                                       | 0.20                 | 0.16            |
|                    |             | Constant   | 0.66                 |                 |
| Statistics         |             | F = <u>7.85</u> R <sup>2</sup> = <u>0.29</u> MS <sub>e</sub> = <u>0.55</u> |                      |                 |
|                    | <u>141</u>  | Maricopa   |                      |                 |
|                    |             | Head Start-Present vs. Non-Head Start                                      | 1.16                 | 0.12            |
|                    |             | Head Start-Present vs. Head Start-Absent                                   | 0.26                 | 0.14            |
|                    |             | Head Start-Absent vs. Non-Head Start                                       | -0.14                | 0.14            |
|                    |             | Constant   | 2.84                 |                 |
| Statistics         |             | F = <u>1.36</u> R <sup>2</sup> = <u>0.08</u> MS <sub>e</sub> = <u>0.40</u> |                      |                 |
|                    | <u>202</u>  | Mingo  |                      |                 |
|                    |             | Head Start-Present vs. Non-Head Start                                      | 0.50 ***             | 0.12            |
|                    |             | Head Start-Present vs. Head Start-Absent                                   | 0.54 ***             | 0.14            |
|                    |             | Head Start-Absent vs. Non-Head Start                                       | -0.02                | 0.14            |
|                    |             | Constant   | 1.14                 |                 |
| Statistics         |             | F = <u>4.44</u> R <sup>2</sup> = <u>0.16</u> MS <sub>e</sub> = <u>0.46</u> |                      |                 |

<sup>a</sup>Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup>Adjusted for age, sex, employment status, participation in federal food assistances programs.

<sup>c</sup>Centered without weights.



Table 6 -25 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>  |                         |
|--------------------|-------------|--|-----------------------|-------------------------|
|                    |             |  | b                     | SE <sub>b</sub>         |
| Niacin             | 191         | Greene & Humphreys                       |                       |                         |
|                    |             | Head Start-Present vs. Non-Head Start    | -1.06                 | 0.96                    |
|                    |             | Head Start-Present vs. Head Start-Absent | 1.98                  | 2.12                    |
|                    |             | Head Start-Absent vs. Non-Head Start     | -3.04                 | 2.14                    |
|                    |             | Constant                                 | 9.31                  |                         |
| Statistics         |             | F = 1.47                                 | R <sup>2</sup> = 0.05 | MS <sub>e</sub> = 35.78 |
|                    | 167         | St. Clair                                |                       |                         |
|                    |             | Head Start-Present vs. Non-Head Start    | 1.24                  | 1.30                    |
|                    |             | Head Start-Present vs. Head Start-Absent | -0.34                 | 1.60                    |
|                    |             | Head Start-Absent vs. Non-Head Start     | 1.58                  | 1.58                    |
|                    |             | Constant                                 | 9.27                  |                         |
| Statistics         |             | F = 1.49                                 | R <sup>2</sup> = 0.07 | MS <sub>e</sub> = 46.96 |
|                    | 140         | Maricopa                                 |                       |                         |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.68                  | 1.00                    |
|                    |             | Head Start-Present vs. Head Start-Absent | 1.48                  | 1.04                    |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.80                 | 1.10                    |
|                    |             | Constant                                 | 13.51                 |                         |
| Statistics         |             | F = 1.08                                 | R <sup>2</sup> = 0.05 | MS <sub>e</sub> = 23.63 |
|                    | 200         | Mingo                                    |                       |                         |
|                    |             | Head Start-Present vs. Non-Head Start    | 2.58 *                | 1.02                    |
|                    |             | Head Start-Present vs. Head Start-Absent | 2.68 *                | 1.34                    |
|                    |             | Head Start-Absent vs. Non-Head Start     | 1.20                  | 1.26                    |
|                    |             | Constant                                 | 9.87                  |                         |
| Statistics         |             | F = 1.72                                 | R <sup>2</sup> = 0.07 | MS <sub>e</sub> = 37.30 |

<sup>a</sup>Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup>Adjusted for age, sex, employment status, participation in federal food assistances programs.

<sup>c</sup>Centered without weights.

Table 6 -25 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable     | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>   |                 |
|------------------------|-------------|--|------------------------|-----------------|
|                        |             |  | b                      | SE <sub>b</sub> |
| Vitamin B <sub>6</sub> | 190         | Greene & Humphreys                       |                        |                 |
|                        |             | Head Start-Present vs. Non-Head Start    | -0.04                  | 0.08            |
|                        |             | Head Start-Present vs. Head Start-Absent | 0.28 **                | 0.10            |
|                        |             | Head Start-Absent vs. Non-Head Start     | -0.04                  | 0.18            |
|                        |             | Constant                                 | 0.65                   |                 |
| Statistics             |             | F = 1.13    R <sup>2</sup> = 0.05        | MS <sub>e</sub> = 0.25 |                 |
|                        | 163         | St. Clair                                |                        |                 |
|                        |             | Head Start-Present vs. Non-Head Start    | 0.36 **                | 3.10            |
|                        |             | Head Start-Present vs. Head Start-Absent | 0.22                   | 0.14            |
|                        |             | Head Start-Absent vs. Non-Head Start     | 0.14                   | 0.14            |
|                        |             | Constant                                 | 0.53                   |                 |
| Statistics             |             | F = 3.10    R <sup>2</sup> = 0.14        | MS <sub>e</sub> = 0.36 |                 |
|                        | 144         | Maricopa                                 |                        |                 |
|                        |             | Head Start-Present vs. Non-Head Start    | 0.02                   | 0.10            |
|                        |             | Head Start-Present vs. Head Start-Absent | 0.12                   | 0.12            |
|                        |             | Head Start-Absent vs. Non-Head Start     | -0.12                  | 0.12            |
|                        |             | Constant                                 | 2.63                   |                 |
| Statistics             |             | F = 1.34    R <sup>2</sup> = 0.07        | MS <sub>e</sub> = 0.29 |                 |
|                        | 200         | Mingo                                    |                        |                 |
|                        |             | Head Start-Present vs. Non-Head Start    | 0.24 *                 | 0.10            |
|                        |             | Head Start-Present vs. Head Start-Absent | 0.24 *                 | 0.12            |
|                        |             | Head Start-Absent vs. Non-Head Start     | 0.22                   | 0.12            |
|                        |             | Constant                                 | 0.74                   |                 |
| Statistics             |             | F = 1.97    R <sup>2</sup> = 0.08        | MS <sub>e</sub> = 0.33 |                 |

<sup>a</sup>Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup>Adjusted for age, sex, employment status, participation in federal food assistances programs.

<sup>c</sup>Centered without weights.

Table 6 -25 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable               | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>   |                 |
|----------------------------------|-------------|--|------------------------|-----------------|
|                                  |             |  | b                      | SE <sub>b</sub> |
| Vitamin B <sub>12</sub><br>(Log) | 181         | Greene & Humphreys                       |                        |                 |
|                                  |             | Head Start-Present vs. Non-Head Start    | 0.18 ***               | 0.04            |
|                                  |             | Head Start-Present vs. Head Start-Absent | 0.40 ***               | 0.10            |
|                                  |             | Head Start-Absent vs. Non-Head Start     | -0.22                  | 0.10            |
|                                  |             | Constant                                 | 0.22                   |                 |
| Statistics                       |             | F = 6.25 R <sup>2</sup> = 0.20           | MS <sub>e</sub> = 0.07 |                 |
|                                  | 162         | St. Clair                                |                        |                 |
|                                  |             | Head Start-Present vs. Non-Head Start    | 0.14 **                | 0.04            |
|                                  |             | Head Start-Present vs. Head Start-Absent | 0.02                   | 0.06            |
|                                  |             | Head Start-Absent vs. Non-Head Start     | 0.12 *                 | 0.06            |
|                                  |             | Constant                                 | 0.34                   |                 |
| Statistics                       |             | F = 3.88 R <sup>2</sup> = 0.17           | MS <sub>e</sub> = 0.05 |                 |
|                                  | 143         | Maricopa                                 |                        |                 |
|                                  |             | Head Start-Present vs. Non-Head Start    | 0.06                   | 0.06            |
|                                  |             | Head Start-Present vs. Head Start-Absent | 0.06                   | 0.06            |
|                                  |             | Head Start-Absent vs. Non-Head Start     | -0.24 *                | 0.10            |
|                                  |             | Constant                                 | 0.75                   |                 |
| Statistics                       |             | F = 1.57 R <sup>2</sup> = 0.09           | MS <sub>e</sub> = 0.07 |                 |
|                                  | 203         | Mingo                                    |                        |                 |
|                                  |             | Head Start-Present vs. Non-Head Start    | 0.20 ***               | 0.04            |
|                                  |             | Head Start-Present vs. Head Start-Absent | 0.10                   | 0.06            |
|                                  |             | Head Start-Absent vs. Non-Head Start     | 0.08                   | 0.06            |
|                                  |             | Constant                                 | 0.41                   |                 |
| Statistics                       |             | F = 3.27 R <sup>2</sup> = 0.12           | MS <sub>e</sub> = 0.07 |                 |

<sup>a</sup>Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup>Adjusted for age, sex, employment status, participation in federal food assistances programs.

<sup>c</sup>Centered without weights.

Table 6 -25 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>       |                 |
|--------------------|-------------|--|----------------------------|-----------------|
|                    |             |  | b                          | SE <sub>b</sub> |
| Vitamin C          | 198         | Greene & Humphreys                       |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -14.84                     | 12.90           |
|                    |             | Head Start-Present vs. Head Start-Absent | 5.92                       | 27.86           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -20.76                     | 28.00           |
|                    |             | Constant                                 | 51.43                      |                 |
| Statistics         |             | F = 1.06 R <sup>2</sup> = 0.04           | MS <sub>e</sub> = 6878.37  |                 |
|                    | 168         | St. Clair                                |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 44.50 *                    | 19.86           |
|                    |             | Head Start-Present vs. Head Start-Absent | 7.74                       | 24.08           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 36.76                      | 23.72           |
|                    |             | Constant                                 | 170.41                     |                 |
| Statistics         |             | F = 1.55 R <sup>2</sup> = 0.07           | MS <sub>e</sub> = 11094.88 |                 |
|                    | 141         | Maricopa                                 |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 9.80                       | 12.40           |
|                    |             | Head Start-Present vs. Head Start-Absent | 6.28                       | 13.12           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 3.52                       | 13.58           |
|                    |             | Constant                                 | 146.00                     |                 |
| Statistics         |             | F = 1.27 R <sup>2</sup> = 0.06           | MS <sub>e</sub> = 3772.05  |                 |
|                    | 197         | Mingo                                    |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 34.42 **                   | 11.62           |
|                    |             | Head Start-Present vs. Head Start-Absent | 17.94                      | 14.56           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 16.52                      | 13.86           |
|                    |             | Constant                                 | 101.76                     |                 |
| Statistics         |             | F = 1.61 R <sup>2</sup> = 0.06           | MS <sub>e</sub> = 4754.85  |                 |

<sup>a</sup>Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup>Adjusted for age, sex, employment status, participation in federal food assistances programs.

<sup>c</sup>Centered without weights.

Table 6 -25 (continued)

Regression Analyses<sup>a</sup> of 24-Hour Nutrient Intake for Posttested  
Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                         | Effects <sup>c</sup>              |                 |
|--------------------|-------------|--|-----------------------------------|-----------------|
|                    |             |  | b                                 | SE <sub>b</sub> |
| <u>Cholesterol</u> | <u>191</u>  | Greene & Humphreys                           |                                   |                 |
|                    |             | Head Start-Present vs. Non-Head Start        | <u>43.30</u>                      | <u>27.18</u>    |
|                    |             | Head Start-Present vs. Head Start-Absent     | <u>67.34</u>                      | <u>61.34</u>    |
|                    |             | Head Start-Absent vs. Non-Head Start         | <u>-24.04</u>                     | <u>61.72</u>    |
|                    |             | Constant                                     | <u>328.13</u>                     |                 |
| Statistics         |             | F = <u>1.05</u> R <sup>2</sup> = <u>0.04</u> | MS <sub>e</sub> = <u>30156.21</u> |                 |
|                    | <u>166</u>  | St. Clair                                    |                                   |                 |
|                    |             | Head Start-Present vs. Non-Head Start        | <u>75.48</u>                      | <u>42.46</u>    |
|                    |             | Head Start-Present vs. Head Start-Absent     | <u>25.62</u>                      | <u>51.32</u>    |
|                    |             | Head Start-Absent vs. Non-Head Start         | <u>49.86</u>                      | <u>50.60</u>    |
|                    |             | Constant                                     | <u>432.45</u>                     |                 |
| Statistics         |             | F = <u>0.60</u> R <sup>2</sup> = <u>0.03</u> | MS <sub>e</sub> = <u>50346.27</u> |                 |
|                    | <u>146</u>  | Maricopa                                     |                                   |                 |
|                    |             | Head Start-Present vs. Non-Head Start        | <u>-33.98</u>                     | <u>42.96</u>    |
|                    |             | Head Start-Present vs. Head Start-Absent     | <u>105.10</u>                     | <u>71.92</u>    |
|                    |             | Head Start-Absent vs. Non-Head Start         | <u>-31.40</u>                     | <u>46.82</u>    |
|                    |             | Constant                                     | <u>-122.94</u>                    |                 |
| Statistics         |             | F = <u>1.34</u> R <sup>2</sup> = <u>0.07</u> | MS <sub>e</sub> = <u>46171.16</u> |                 |
|                    | <u>205</u>  | Mingo  |                                   |                 |
|                    |             | Head Start-Present vs. Non-Head Start        | <u>-40.74</u>                     | <u>34.02</u>    |
|                    |             | Head Start-Present vs. Head Start-Absent     | <u>-47.22</u>                     | <u>42.58</u>    |
|                    |             | Head Start-Absent vs. Non-Head Start         | <u>6.46</u>                       | <u>40.92</u>    |
|                    |             | Constant                                     | <u>292.41</u>                     |                 |
| Statistics         |             | F = <u>0.78</u> R <sup>2</sup> = <u>0.03</u> | MS <sub>e</sub> = <u>41775.47</u> |                 |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6 -26

Distribution of Percent of Recommended Daily Intake Received in Reported 24-Hour Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Absent from Head Start on Day of Recall and Non-Head Start Children across Sites

|                |   | ABSENT         | NHS  |
|----------------|---|----------------|------|
| KILOCALORIES   |   | 122            | 314  |
| 0-33 Pct RDA   | n | 0              | 1    |
|                | % | 0.0            | 0.3  |
| 34-66 Pct RDA  | n | 16             | 24   |
|                | % | 13.1           | 7.6  |
| 67-100 Pct RDA | n | 40             | 79   |
|                | % | 32.8           | 25.2 |
| 100 Pct RDA    | n | 66             | 210  |
|                | % | 54.1           | 66.9 |
|                |   | CHI SO = 7.396 |      |
|                |   | DF = 3         |      |
|                |   | P = 0.060      |      |
| PROTEIN        |   | 122            | 314  |
| 0-33 Pct RDA   | n | 1              | 1    |
|                | % | 0.8            | 0.3  |
| 34-66 Pct RDA  | n | 3              | 9    |
|                | % | 2.5            | 2.9  |
| 67-100 Pct RDA | n | 11             | 29   |
|                | % | 9.0            | 9.3  |
| 100 Pct RDA    | n | 107            | 278  |
|                | % | 87.7           | 88.5 |
|                |   | CHI SO = 0.597 |      |
|                |   | DF = 3         |      |
|                |   | P = 0.897      |      |

|                |   | ABSENT         | NHS  |
|----------------|---|----------------|------|
| CALCIUM        |   | 122            | 314  |
| 0-33 Pct RDA   | n | 8              | 28   |
|                | % | 6.6            | 8.9  |
| 34-66 Pct RDA  | n | 39             | 93   |
|                | % | 32.0           | 29.6 |
| 67-100 Pct RDA | n | 41             | 89   |
|                | % | 33.6           | 28.3 |
| 100 Pct RDA    | n | 34             | 104  |
|                | % | 27.9           | 33.1 |
|                |   | CHI SO = 2.335 |      |
|                |   | DF = 3         |      |
|                |   | P = 0.508      |      |
| IRON           |   | 122            | 314  |
| 0-33 Pct RDA   | n | 1              | 14   |
|                | % | 0.8            | 4.5  |
| 34-66 Pct RDA  | n | 30             | 89   |
|                | % | 24.6           | 28.3 |
| 67-100 Pct RDA | n | 40             | 98   |
|                | % | 32.8           | 31.2 |
| 100 Pct RDA    | n | 51             | 113  |
|                | % | 41.8           | 36.0 |
|                |   | CHI SO = 4.695 |      |
|                |   | DF = 3         |      |
|                |   | P = 0.198      |      |

|                |   | ABSENT         | NHS  |
|----------------|---|----------------|------|
| MAGNESIUM      |   | 122            | 314  |
| 0-33 Pct RDA   | n | 3              | 8    |
|                | % | 2.5            | 2.5  |
| 34-66 Pct RDA  | n | 33             | 57   |
|                | % | 27.0           | 18.2 |
| 67-100 Pct RDA | n | 37             | 86   |
|                | % | 30.3           | 27.4 |
| 100 Pct RDA    | n | 49             | 163  |
|                | % | 40.2           | 51.9 |
|                |   | CHI SO = 6.134 |      |
|                |   | DF = 3         |      |
|                |   | P = 0.105      |      |
| PHOSPHORUS     |   | 122            | 314  |
| 0-33 Pct RDA   | n | 1              | 6    |
|                | % | 0.8            | 1.9  |
| 34-66 Pct RDA  | n | 15             | 32   |
|                | % | 12.3           | 10.2 |
| 67-100 Pct RDA | n | 37             | 90   |
|                | % | 30.3           | 28.7 |
| 100 Pct RDA    | n | 69             | 186  |
|                | % | 56.6           | 59.2 |
|                |   | CHI SO = 1.204 |      |
|                |   | DF = 3         |      |
|                |   | P = 0.752      |      |

|                |   | ABSENT         | NHS  |
|----------------|---|----------------|------|
| VITAMIN A      |   | 122            | 314  |
| 0-33 Pct RDA   | n | 9              | 15   |
|                | % | 7.4            | 4.8  |
| 34-66 Pct RDA  | n | 15             | 47   |
|                | % | 12.3           | 15.0 |
| 67-100 Pct RDA | n | 29             | 60   |
|                | % | 23.8           | 19.1 |
| 100 Pct RDA    | n | 69             | 192  |
|                | % | 56.6           | 61.1 |
|                |   | CHI SO = 2.765 |      |
|                |   | DF = 3         |      |
|                |   | P = 0.429      |      |
| THIAMIN        |   | 122            | 314  |
| 34-66 Pct RDA  | n | 1              | 4    |
|                | % | 0.8            | 1.3  |
| 67-100 Pct RDA | n | 12             | 38   |
|                | % | 9.8            | 12.1 |
| 100 Pct RDA    | n | 109            | 272  |
|                | % | 89.3           | 86.6 |
|                |   | CHI SO = 0.628 |      |
|                |   | DF = 2         |      |
|                |   | P = 0.731      |      |

Table 6 -26 (continued)

|                   |   | ABSENT         | NHS  |
|-------------------|---|----------------|------|
| <b>RIBOFLAVIN</b> |   | 122            | 314  |
| 34-66 Pct RDA     | n | 0              | 1    |
|                   | % | 0.0            | 0.3  |
| 67-100 Pct RDA    | n | 7              | 28   |
|                   | % | 5.7            | 9.2  |
| 100 Pct RDA       | n | 115            | 284  |
|                   | % | 94.3           | 90.4 |
|                   |   | CHI SQ = 1.830 |      |
|                   |   | DF = 2         |      |
|                   |   | P = 0.400      |      |
| <b>NIACIN</b>     |   | 122            | 314  |
| 34-66 Pct RDA     | n | 6              | 17   |
|                   | % | 4.9            | 5.4  |
| 67-100 Pct RDA    | n | 31             | 67   |
|                   | % | 25.4           | 21.3 |
| 100 Pct RDA       | n | 85             | 230  |
|                   | % | 69.7           | 73.2 |
|                   |   | CHI SQ = 0.848 |      |
|                   |   | DF = 2         |      |
|                   |   | P = 0.656      |      |

|                    |   | ABSENT         | NHS  |
|--------------------|---|----------------|------|
| <b>VITAMIN B6</b>  |   | 122            | 314  |
| 0-33 Pct RDA       | n | 4              | 14   |
|                    | % | 3.3            | 4.5  |
| 34-66 Pct RDA      | n | 36             | 65   |
|                    | % | 29.5           | 20.7 |
| 67-100 Pct RDA     | n | 32             | 78   |
|                    | % | 26.2           | 24.8 |
| 100 Pct RDA        | n | 50             | 157  |
|                    | % | 41.0           | 50.0 |
|                    |   | CHI SQ = 4.810 |      |
|                    |   | DF = 3         |      |
|                    |   | P = 0.186      |      |
| <b>VITAMIN B12</b> |   | 122            | 314  |
| 0-33 Pct RDA       | n | 6              | 15   |
|                    | % | 4.9            | 4.8  |
| 34-66 Pct RDA      | n | 11             | 39   |
|                    | % | 9.0            | 12.4 |
| 67-100 Pct RDA     | n | 18             | 53   |
|                    | % | 14.8           | 16.9 |
| 100 Pct RDA        | n | 87             | 207  |
|                    | % | 71.3           | 65.9 |
|                    |   | CHI SQ = 1.513 |      |
|                    |   | DF = 3         |      |
|                    |   | P = 0.679      |      |

|                  |   | ABSENT         | NHS  |
|------------------|---|----------------|------|
| <b>VITAMIN C</b> |   | 122            | 314  |
| 0-33 Pct RDA     | n | 12             | 34   |
|                  | % | 9.8            | 10.8 |
| 34-66 Pct RDA    | n | 10             | 34   |
|                  | % | 8.2            | 10.8 |
| 67-100 Pct RDA   | n | 11             | 22   |
|                  | % | 9.0            | 7.0  |
| 100 Pct RDA      | n | 89             | 224  |
|                  | % | 73.0           | 71.3 |
|                  |   | CHI SQ = 1.186 |      |
|                  |   | DF = 3         |      |
|                  |   | P = 0.756      |      |

Table 6 -27

Distribution of Percent of Recommended Daily Intake Received in Reported 24-Hour Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Absent from Head Start on Day of Recall and Non-Head Start Children within Site

|                     | Greene/Humphreys                      |                    | St. Clair                             |                    | Maricopa                              |                    | Mingo                                 |                    |
|---------------------|---------------------------------------|--------------------|---------------------------------------|--------------------|---------------------------------------|--------------------|---------------------------------------|--------------------|
|                     | ABSENT                                | NHS                | ABSENT                                | NHS                | ABSENT                                | NHS                | ABSENT                                | NHS                |
| <b>KILOCALORIES</b> | 10                                    | 90                 | 32                                    | 68                 | 41                                    | 52                 | 39                                    | 104                |
| 0-33 Pct RDA        | n = 0<br>% = 0.0                      | n = 0<br>% = 0.0   | n = 0<br>% = 0.0                      | n = 0<br>% = 0.0   | n = 0<br>% = 0.0                      | n = 1<br>% = 1.9   | n = 0<br>% = 0.0                      | n = 0<br>% = 0.0   |
| 34-66 Pct RDA       | n = 1<br>% = 10.0                     | n = 7<br>% = 7.8   | n = 0<br>% = 0.0                      | n = 0<br>% = 0.0   | n = 12<br>% = 29.3                    | n = 10<br>% = 19.2 | n = 3<br>% = 7.7                      | n = 7<br>% = 6.7   |
| 67-100 Pct RDA      | n = 4<br>% = 40.0                     | n = 16<br>% = 17.8 | n = 4<br>% = 12.5                     | n = 10<br>% = 14.7 | n = 19<br>% = 46.3                    | n = 19<br>% = 36.5 | n = 13<br>% = 33.3                    | n = 34<br>% = 32.7 |
| 100 Pct RDA         | n = 5<br>% = 50.0                     | n = 67<br>% = 74.4 | n = 28<br>% = 87.5                    | n = 58<br>% = 85.3 | n = 10<br>% = 24.4                    | n = 22<br>% = 42.3 | n = 23<br>% = 59.0                    | n = 63<br>% = 60.6 |
|                     | CHI SQ = 3.025<br>DF = 2<br>P = 0.220 |                    | CHI SQ = 0.088<br>DF = 1<br>P = 0.767 |                    | CHI SQ = 4.443<br>DF = 3<br>P = 0.217 |                    | CHI SQ = 0.053<br>DF = 2<br>P = 0.874 |                    |
| <b>PROTEIN</b>      | 10                                    | 90                 | 32                                    | 68                 | 41                                    | 52                 | 39                                    | 104                |
| 0-33 Pct RDA        | n = 0<br>% = 0.0                      | n = 1<br>% = 1.1   | n = 0<br>% = 0.0                      | n = 0<br>% = 0.0   | n = 1<br>% = 2.4                      | n = 0<br>% = 0.0   | n = 0<br>% = 0.0                      | n = 0<br>% = 0.0   |
| 34-66 Pct RDA       | n = 0<br>% = 0.0                      | n = 0<br>% = 0.0   | n = 0<br>% = 0.0                      | n = 0<br>% = 0.0   | n = 2<br>% = 4.9                      | n = 5<br>% = 9.6   | n = 1<br>% = 2.6                      | n = 4<br>% = 3.8   |
| 67-100 Pct RDA      | n = 2<br>% = 20.0                     | n = 4<br>% = 4.4   | n = 0<br>% = 0.0                      | n = 3<br>% = 4.4   | n = 7<br>% = 17.1                     | n = 8<br>% = 15.4  | n = 2<br>% = 5.1                      | n = 11<br>% = 10.6 |
| 100 Pct RDA         | n = 8<br>% = 80.0                     | n = 85<br>% = 94.4 | n = 32<br>% = 100.0                   | n = 65<br>% = 95.6 | n = 31<br>% = 75.6                    | n = 39<br>% = 75.0 | n = 36<br>% = 92.3                    | n = 89<br>% = 85.6 |
|                     | CHI SQ = 3.943<br>DF = 2<br>P = 0.139 |                    | CHI SQ = 1.455<br>DF = 1<br>P = 0.228 |                    | CHI SQ = 1.993<br>DF = 3<br>P = 0.574 |                    | CHI SQ = 1.207<br>DF = 2<br>P = 0.547 |                    |



Table 6 -27 (continued)

Distribution of Percent of Recommended Daily Intake Received in Reported 24-Hour Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Absent from Head Start on Day of Recall and Non-Head Start Children within Site

|                |   | Greene/Humphreys |      | St. Clair      |      | Maricopa       |      | Ningo          |      |
|----------------|---|------------------|------|----------------|------|----------------|------|----------------|------|
|                |   | ABSENT           | NHS  | ABSENT         | NHS  | ABSENT         | NHS  | ABSENT         | NHS  |
| <b>CALCIUM</b> |   | 10               | 90   | 32             | 68   | 41             | 52   | 39             | 104  |
| 0-33 Pct RDA   | n | 1                | 7    | 1              | 10   | 4              | 5    | 2              | 6    |
|                | % | 10.0             | 7.8  | 3.1            | 14.7 | 9.8            | 9.6  | 5.1            | 5.8  |
| 34-66 Pct RDA  | n | 6                | 36   | 8              | 15   | 14             | 14   | 11             | 28   |
|                | % | 60.0             | 40.0 | 25.0           | 22.1 | 34.1           | 26.9 | 28.2           | 26.9 |
| 67-100 Pct RDA | n | 3                | 23   | 14             | 20   | 13             | 11   | 11             | 35   |
|                | % | 30.0             | 25.8 | 43.8           | 29.4 | 31.7           | 21.2 | 28.2           | 33.7 |
| 100 Pct RDA    | n | 0                | 24   | 9              | 23   | 10             | 22   | 15             | 35   |
|                | % | 0.0              | 26.7 | 28.1           | 33.8 | 24.4           | 42.3 | 38.5           | 33.7 |
|                |   | CHI SQ = 3.648   |      | CHI SQ = 4.271 |      | CHI SQ = 3.526 |      | CHI SQ = 0.487 |      |
|                |   | DF = 3           |      | DF = 3         |      | DF = 3         |      | DF = 3         |      |
|                |   | P = 0.302        |      | P = 0.234      |      | P = 0.317      |      | P = 0.922      |      |
| <b>IRON</b>    |   | 10               | 90   | 32             | 68   | 41             | 52   | 39             | 104  |
| 0-33 Pct RDA   | n | 0                | 3    | 0              | 3    | 1              | 4    | 0              | 4    |
|                | % | 0.0              | 3.3  | 0.0            | 4.4  | 2.4            | 7.7  | 0.0            | 3.8  |
| 34-66 Pct RDA  | n | 3                | 28   | 4              | 15   | 12             | 5    | 11             | 41   |
|                | % | 30.0             | 31.1 | 12.5           | 22.1 | 29.3           | 9.6  | 28.2           | 39.4 |
| 67-100 Pct RDA | n | 5                | 26   | 6              | 22   | 13             | 17   | 16             | 33   |
|                | % | 50.0             | 28.9 | 18.8           | 32.4 | 31.7           | 32.7 | 41.0           | 31.7 |
| 100 Pct RDA    | n | 2                | 33   | 22             | 28   | 15             | 26   | 12             | 26   |
|                | % | 20.0             | 36.7 | 68.8           | 41.2 | 36.6           | 50.0 | 30.8           | 25.0 |
|                |   | CHI SQ = 2.345   |      | CHI SQ = 7.205 |      | CHI SQ = 6.963 |      | CHI SQ = 3.552 |      |
|                |   | DF = 3           |      | DF = 3         |      | DF = 3         |      | DF = 3         |      |
|                |   | P = 0.504        |      | P = 0.066      |      | P = 0.073      |      | P = 0.314      |      |

Table 6 -27 (continued)

Distribution of Percent of Recommended Daily Intake Received in Reported 24-Hour Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Absent from Head Start on Day of Recall and Non-Head Start Children within Site

|                   | Greene/Humphreys |          | St. Clair      |          | Maricopa       |          | Mingo          |          |
|-------------------|------------------|----------|----------------|----------|----------------|----------|----------------|----------|
|                   | ABSENT           | NHS      | ABSENT         | NHS      | ABSENT         | NHS      | ABSENT         | NHS      |
| <b>MAGNESIUM</b>  | 10               | 90       | 32             | 68       | 41             | 52       | 39             | 104      |
| 0-33 Pct RDA      | n = 0            | n = 2    | n = 0          | n = 1    | n = 3          | n = 4    | n = 0          | n = 1    |
|                   | % = 0.0          | % = 2.2  | % = 0.0        | % = 1.5  | % = 7.3        | % = 7.7  | % = 0.0        | % = 1.0  |
| 34-66 Pct RDA     | n = 3            | n = 13   | n = 4          | n = 10   | n = 16         | n = 17   | n = 10         | n = 17   |
|                   | % = 30.0         | % = 14.4 | % = 12.5       | % = 14.7 | % = 39.0       | % = 32.7 | % = 25.6       | % = 16.3 |
| 67-100 Pct RDA    | n = 4            | n = 24   | n = 7          | n = 21   | n = 13         | n = 16   | n = 13         | n = 25   |
|                   | % = 40.0         | % = 26.7 | % = 21.9       | % = 30.9 | % = 31.7       | % = 30.8 | % = 33.3       | % = 24.0 |
| 100 Pct RDA       | n = 3            | n = 51   | n = 21         | n = 36   | n = 9          | n = 15   | n = 16         | n = 61   |
|                   | % = 30.0         | % = 56.7 | % = 65.6       | % = 52.9 | % = 22.0       | % = 28.8 | % = 41.0       | % = 58.7 |
|                   | CHI SQ = 3.340   |          | CHI SQ = 1.791 |          | CHI SQ = 0.692 |          | CHI SQ = 4.232 |          |
|                   | DF = 3           |          | DF = 3         |          | DF = 3         |          | DF = 3         |          |
|                   | P = 0.342        |          | P = 0.617      |          | P = 0.875      |          | P = 0.238      |          |
| <b>PHOSPHORUS</b> | 10               | 90       | 32             | 68       | 41             | 52       | 39             | 104      |
| 0-33 Pct RDA      | n = 0            | n = 3    | n = 0          | n = 0    | n = 1          | n = 2    | n = 0          | n = 1    |
|                   | % = 0.0          | % = 3.3  | % = 0.0        | % = 0.0  | % = 2.4        | % = 3.8  | % = 0.0        | % = 1.0  |
| 34-66 Pct RDA     | n = 3            | n = 7    | n = 2          | n = 11   | n = 6          | n = 7    | n = 4          | n = 7    |
|                   | % = 30.0         | % = 7.8  | % = 6.3        | % = 16.2 | % = 14.6       | % = 13.5 | % = 10.3       | % = 6.7  |
| 67-100 Pct RDA    | n = 3            | n = 27   | n = 9          | n = 17   | n = 15         | n = 15   | n = 10         | n = 31   |
|                   | % = 30.0         | % = 30.0 | % = 28.1       | % = 25.0 | % = 36.6       | % = 28.8 | % = 25.6       | % = 29.8 |
| 100 Pct RDA       | n = 4            | n = 53   | n = 21         | n = 40   | n = 19         | n = 28   | n = 25         | n = 65   |
|                   | % = 40.0         | % = 58.9 | % = 65.6       | % = 58.8 | % = 46.3       | % = 53.8 | % = 64.1       | % = 62.5 |
|                   | CHI SQ = 5.341   |          | CHI SQ = 1.896 |          | CHI SQ = 0.844 |          | CHI SQ = 1.017 |          |
|                   | DF = 3           |          | DF = 2         |          | DF = 3         |          | DF = 3         |          |
|                   | P = 0.148        |          | P = 0.388      |          | P = 0.839      |          | P = 0.797      |          |

Table, 6 -27 (continued)

Distribution of Percent of Recommended Daily Intake Received in Reported 24-Hour Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Absent from Head Start on Day of Recall and Non-Head Start Children within Site

|                  | Greene/Humphreys                      |                    | St. Clair                             |                    | Maricopa                              |                    | Mingo                                 |                    |
|------------------|---------------------------------------|--------------------|---------------------------------------|--------------------|---------------------------------------|--------------------|---------------------------------------|--------------------|
|                  | ABSENT                                | NHS                | ABSENT                                | NHS                | ABSENT                                | NHS                | ABSENT                                | NHS                |
| <b>VITAMIN A</b> | 10                                    | 90                 | 32                                    | 68                 | 41                                    | 52                 | 39                                    | 104                |
| 0-33 Pct RDA     | n = 1<br>% = 10.0                     | n = 3<br>% = 3.3   | n = 2<br>% = 6.3                      | n = 3<br>% = 4.4   | n = 5<br>% = 12.2                     | n = 2<br>% = 3.8   | n = 1<br>% = 2.6                      | n = 7<br>% = 6.7   |
| 34-66 Pct RDA    | n = 1<br>% = 10.0                     | n = 6<br>% = 6.7   | n = 1<br>% = 3.1                      | n = 12<br>% = 17.6 | n = 9<br>% = 22.0                     | n = 13<br>% = 25.0 | n = 4<br>% = 10.3                     | n = 16<br>% = 15.4 |
| 67-100 Pct RDA   | n = 3<br>% = 30.0                     | n = 18<br>% = 20.0 | n = 6<br>% = 18.8                     | n = 14<br>% = 20.6 | n = 13<br>% = 31.7                    | n = 9<br>% = 17.3  | n = 7<br>% = 17.9                     | n = 18<br>% = 18.3 |
| 100 Pct RDA      | n = 5<br>% = 50.0                     | n = 63<br>% = 70.0 | n = 23<br>% = 71.9                    | n = 39<br>% = 57.4 | n = 14<br>% = 34.1                    | n = 28<br>% = 53.8 | n = 27<br>% = 69.2                    | n = 62<br>% = 59.6 |
|                  | CHI SQ = 2.101<br>DF = 3<br>P = 0.552 |                    | CHI SQ = 4.454<br>DF = 3<br>P = 0.216 |                    | CHI SQ = 6.182<br>DF = 3<br>P = 0.103 |                    | CHI SQ = 1.836<br>DF = 3<br>P = 0.607 |                    |
| <b>THIAMIN</b>   | 10                                    | 90                 | 32                                    | 68                 | 41                                    | 52                 | 39                                    | 104                |
| 34-66 Pct RDA    | n = 0<br>% = 0.0                      | n = 2<br>% = 2.2   | n = 0<br>% = 0.0                      | n = 1<br>% = 1.5   | n = 1<br>% = 2.4                      | n = 0<br>% = 0.0   | n = 0<br>% = 0.0                      | n = 1<br>% = 1.0   |
| 67-100 Pct RDA   | n = 0<br>% = 0.0                      | n = 8<br>% = 8.9   | n = 3<br>% = 9.4                      | n = 8<br>% = 11.8  | n = 6<br>% = 14.6                     | n = 9<br>% = 17.3  | n = 3<br>% = 7.7                      | n = 13<br>% = 12.5 |
| 100 Pct RDA      | n = 10<br>% = 100.0                   | n = 80<br>% = 88.9 | n = 29<br>% = 90.6                    | n = 59<br>% = 86.8 | n = 34<br>% = 82.9                    | n = 43<br>% = 82.7 | n = 36<br>% = 92.3                    | n = 90<br>% = 86.5 |
|                  | CHI SQ = 1.235<br>DF = 2<br>P = 0.539 |                    | CHI SQ = 0.620<br>DF = 2<br>P = 0.733 |                    | CHI SQ = 1.370<br>DF = 2<br>P = 0.504 |                    | CHI SQ = 1.068<br>DF = 2<br>P = 0.586 |                    |

Table 6 -27 (continued)

Distribution of Percent of Recommended Daily Intake Received in Reported 24-Hour Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Absent from Head Start on Day of Recall and Non-Head Start Children within Site

|                   | Greene/Humphreys                      |                    | St. Clair                             |                    | Maricopa                              |                    | Mingo                                 |                    |
|-------------------|---------------------------------------|--------------------|---------------------------------------|--------------------|---------------------------------------|--------------------|---------------------------------------|--------------------|
|                   | ABSENT                                | NHS                | ABSENT                                | NHS                | ABSENT                                | NHS                | ABSENT                                | NHS                |
| <b>RIBOFLAVIN</b> | 10                                    | 90                 | 32                                    | 68                 | 41                                    | 52                 | 39                                    | 104                |
| 34-66 Pct RDA     | n = 0<br>% = 0.0                      | n = 0<br>% = 0.0   | n = 0<br>% = 0.0                      | n = 0<br>% = 0.0   | n = 0<br>% = 0.0                      | n = 0<br>% = 0.0   | n = 0<br>% = 0.0                      | n = 1<br>% = 1.0   |
| 67-100 Pct RDA    | n = 0<br>% = 0.0                      | n = 5<br>% = 5.6   | n = 3<br>% = 9.4                      | n = 9<br>% = 13.2  | n = 2<br>% = 4.9                      | n = 4<br>% = 7.7   | n = 2<br>% = 5.1                      | n = 11<br>% = 10.6 |
| 100 Pct RDA       | n = 10<br>% = 100.0                   | n = 85<br>% = 94.4 | n = 29<br>% = 90.6                    | n = 59<br>% = 86.8 | n = 39<br>% = 95.1                    | n = 48<br>% = 92.3 | n = 37<br>% = 94.9                    | n = 92<br>% = 88.5 |
|                   | CHI SQ = 0.585<br>DF = 1<br>P = 0.444 |                    | CHI SQ = 0.307<br>DF = 1<br>P = 0.580 |                    | CHI SQ = 0.301<br>DF = 1<br>P = 0.583 |                    | CHI SQ = 1.430<br>DF = 2<br>P = 0.489 |                    |
| <b>NIACIN</b>     | 10                                    | 90                 | 32                                    | 68                 | 41                                    | 52                 | 39                                    | 104                |
| 34-66 Pct RDA     | n = 0<br>% = 0.0                      | n = 1<br>% = 1.1   | n = 1<br>% = 3.1                      | n = 3<br>% = 4.4   | n = 3<br>% = 7.3                      | n = 2<br>% = 3.8   | n = 2<br>% = 5.1                      | n = 11<br>% = 10.6 |
| 67-100 Pct RDA    | n = 1<br>% = 10.0                     | n = 9<br>% = 10.0  | n = 7<br>% = 21.9                     | n = 10<br>% = 14.7 | n = 13<br>% = 31.7                    | n = 15<br>% = 28.8 | n = 10<br>% = 25.6                    | n = 33<br>% = 31.7 |
| 100 Pct RDA       | n = 9<br>% = 90.0                     | n = 80<br>% = 88.9 | n = 24<br>% = 75.0                    | n = 55<br>% = 80.9 | n = 25<br>% = 61.0                    | n = 35<br>% = 67.3 | n = 27<br>% = 69.2                    | n = 60<br>% = 57.7 |
|                   | CHI SQ = 0.112<br>DF = 2<br>P = 0.945 |                    | CHI SQ = 0.843<br>DF = 2<br>P = 0.656 |                    | CHI SQ = 0.718<br>DF = 2<br>P = 0.698 |                    | CHI SQ = 1.897<br>DF = 2<br>P = 0.387 |                    |

Table 6 -27 (continued)

Distribution of Percent of Recommended Daily Intake Received in Reported 24-Hour Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Absent from Head Start on Day of Recall and Non-Head Start Children within Site

|                    |   | Greene/Humphreys |      | St. Clair      |      | Maricopa       |      | Mingo          |      |
|--------------------|---|------------------|------|----------------|------|----------------|------|----------------|------|
|                    |   | ABSENT           | NHS  | ABSENT         | NHS  | ABSENT         | NHS  | ABSENT         | NHS  |
| <b>VITAMIN B6</b>  |   | 10               | 90   | 32             | 68   | 41             | 52   | 39             | 104  |
| 0-33 Pct RDA       | n | 0                | 2    | 0              | 1    | 2              | 4    | 2              | 7    |
|                    | % | 0.0              | 2.2  | 0.0            | 1.5  | 4.9            | 7.7  | 5.1            | 6.7  |
| 34-66 Pct RDA      | n | 4                | 15   | 7              | 13   | 18             | 14   | 7              | 23   |
|                    | % | 40.0             | 16.7 | 21.9           | 19.1 | 43.9           | 26.9 | 17.9           | 22.1 |
| 67-100 Pct RDA     | n | 1                | 15   | 7              | 24   | 10             | 12   | 14             | 27   |
|                    | % | 10.0             | 16.7 | 21.9           | 35.3 | 24.4           | 23.1 | 35.9           | 26.0 |
| 100 Pct RDA        | n | 5                | 58   | 18             | 30   | 11             | 22   | 16             | 47   |
|                    | % | 50.0             | 64.4 | 56.3           | 44.1 | 26.8           | 42.3 | 41.0           | 45.2 |
|                    |   | CHI SQ = 3.349   |      | CHI SQ = 2.485 |      | CHI SQ = 3.767 |      | CHI SQ = 1.439 |      |
|                    |   | DF = 3           |      | DF = 3         |      | DF = 3         |      | DF = 3         |      |
|                    |   | P = 0.341        |      | P = 0.478      |      | P = 0.288      |      | P = 0.696      |      |
| <b>VITAMIN B12</b> |   | 10               | 90   | 32             | 68   | 41             | 52   | 39             | 104  |
| 0-33 Pct RDA       | n | 3                | 3    | 0              | 2    | 1              | 3    | 2              | 7    |
|                    | % | 30.0             | 3.3  | 0.0            | 2.9  | 2.4            | 5.8  | 5.1            | 6.7  |
| 34-66 Pct RDA      | n | 2                | 16   | 2              | 5    | 6              | 7    | 1              | 11   |
|                    | % | 20.0             | 17.8 | 6.3            | 7.4  | 14.6           | 13.5 | 2.6            | 10.6 |
| 67-100 Pct RDA     | n | 2                | 15   | 3              | 10   | 7              | 11   | 6              | 17   |
|                    | % | 20.0             | 16.7 | 9.4            | 14.7 | 17.1           | 21.2 | 15.4           | 16.3 |
| 100 Pct RDA        | n | 3                | 56   | 27             | 51   | 27             | 31   | 30             | 69   |
|                    | % | 30.0             | 62.2 | 84.4           | 75.0 | 65.9           | 59.6 | 76.9           | 66.3 |
|                    |   | CHI SQ = 12.334  |      | CHI SQ = 1.700 |      | CHI SQ = 0.954 |      | CHI SQ = 2.761 |      |
|                    |   | DF = 3           |      | DF = 3         |      | DF = 3         |      | DF = 3         |      |
|                    |   | P = 0.006        |      | P = 0.637      |      | P = 0.812      |      | P = 0.430      |      |

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Table 6 -27 (continued) =

Distribution of Percent of Recommended Daily Intake Received in Reported 24-Hour Intake for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Absent from Head Start on Day of Recall and Non-Head Start Children within Site

|                  | Greene/Humphreys |      | St. Clair      |      | Maricopa       |      | Mingo          |      |
|------------------|------------------|------|----------------|------|----------------|------|----------------|------|
|                  | ABSENT           | NHS  | ABSENT         | NHS  | ABSENT         | NHS  | ABSENT         | NHS  |
| VITAMIN C        | 10               | 90   | 32             | 68   | 41             | 52   | 39             | 104  |
| 0-33 Pct RDA . n | 2                | 6    | 1              | 8    | 6              | 5    | 3              | 15   |
| %                | 20.0             | 6.7  | 3.1            | 11.8 | 14.6           | 9.6  | 7.7            | 14.4 |
| 34-66 Pct RDA n  | 1                | 7    | 0              | 10   | 5              | 5    | 4              | 12   |
| %                | 10.0             | 7.8  | 0.0            | 14.7 | 12.2           | 9.6  | 10.3           | 11.5 |
| 67-100 Pct RDA n | 0                | 6    | 0              | 0    | 7              | 7    | 4              | 9    |
| %                | 0.0              | 6.7  | 0.0            | 0.0  | 17.1           | 13.5 | 10.3           | 8.7  |
| 100 Pct RDA n    | 7                | 71   | 31             | 50   | 23             | 35   | 28             | 68   |
| %                | 70.0             | 78.9 | 96.9           | 73.5 | 56.1           | 67.3 | 71.8           | 65.4 |
|                  | CHI SQ = 2.813   |      | CHI SQ = 7.975 |      | CHI SQ = 1.291 |      | CHI SQ = 1.316 |      |
|                  | DF = 3           |      | DF = 2         |      | DF = 3         |      | DF = 3         |      |
|                  | P = 0.421        |      | P = 0.018      |      | P = 0.731      |      | P = 0.725      |      |

Table 6 -28

Nutrient Density: Nutrient Intake Per 1000 Kilocalories for Posttested Head-Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Present on Day of Recall and Non-Head Start children across Sites

|                   | PRESENT IN HEAD START |        |        |        |        |        | NON-HEAD START |        |        |        |        |        | T    | P     |
|-------------------|-----------------------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|------|-------|
|                   | N                     | Q1     | MED    | Q3     | MEAN   | SD     | N              | Q1     | MED    | Q3     | MEAN   | SD     |      |       |
| PROTEIN (GM)      | 306                   | 33.23  | 37.77  | 42.94  | 38.10  | 7.17   | 309            | 28.41  | 34.48  | 41.40  | 34.93  | 8.95   | 4.85 | 0.000 |
| FAT (GM)          | 302                   | 35.51  | 39.59  | 43.44  | 39.61  | 5.88   | 310            | 36.08  | 41.79  | 47.67  | 41.80  | 8.43   | 3.73 | 0.000 |
| CARBOHYDRATE (GM) | 309                   | 114.04 | 124.96 | 135.97 | 125.17 | 16.70  | 306            | 105.36 | 122.62 | 137.79 | 122.75 | 23.90  | 1.45 | 0.147 |
| CALCIUM (MG)      | 307                   | 451.54 | 585.35 | 689.96 | 576.52 | 162.00 | 312            | 301.55 | 422.10 | 558.77 | 436.79 | 196.00 | 9.68 | 0.000 |
| IRON (MG)         | 309                   | 5.36   | 6.03   | 7.14   | 6.41   | 1.70   | 308            | 5.31   | 6.11   | 7.25   | 6.86   | 4.06   | 1.80 | 0.073 |
| MAGNESIUM (MG)    | 307                   | 116.74 | 134.56 | 154.60 | 136.02 | 28.20  | 310            | 89.89  | 112.57 | 134.05 | 116.49 | 36.90  | 7.10 | 0.000 |
| PHOSPHORUS (MG)   | 308                   | 604.89 | 687.38 | 767.76 | 686.48 | 133.00 | 310            | 476.30 | 576.66 | 712.22 | 600.69 | 180.00 | 6.75 | 0.000 |
| VITAMIN A (IU)    | 309                   | 1642.  | 2564.  | 4542.  | 4322.  | 5499.  | 305            | 1151.  | 1735.  | 2677.  | 2538.  | 2829.  | 5.06 | 0.000 |
| THIAMIN (MG)      | 304                   | 0.61   | 0.71   | 0.82   | 0.74   | 0.19   | 300            | 0.57   | 0.70   | 0.87   | 0.75   | 0.25   | 0.59 | 0.553 |
| RIBOFLAVIN (MG)   | 304                   | 0.92   | 1.13   | 1.32   | 1.20   | 0.48   | 306            | 0.73   | 0.92   | 1.20   | 1.02   | 0.52   | 4.48 | 0.000 |
| NIACIN (MG)       | 304                   | 6.43   | 7.80   | 9.62   | 8.29   | 2.84   | 301            | 6.26   | 7.92   | 10.10  | 8.70   | 3.72   | 1.29 | 0.199 |
| VITAMIN B6 (MG)   | 305                   | 0.61   | 0.72   | 0.89   | 0.78   | 0.28   | 311            | 0.52   | 0.69   | 0.93   | 0.79   | 0.50   | 0.53 | 0.599 |
| VITAMIN B12 (MCG) | 296                   | 1.81   | 2.27   | 2.74   | 3.40   | 6.06   | 289            | 1.31   | 1.83   | 2.50   | 2.52   | 4.34   | 2.02 | 0.041 |
| VITAMIN C (MG)    | 310                   | 39.89  | 67.43  | 107.74 | 76.94  | 49.60  | 314            | 26.17  | 53.78  | 104.88 | 71.69  | 58.50  | 1.21 | 0.227 |
| CHOLESTEROL (MG)  | 306                   | 116.56 | 160.70 | 238.49 | 191.98 | 97.80  | 308            | 106.18 | 154.61 | 290.11 | 208.13 | 139.00 | 1.67 | 0.096 |

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Table 6 -29

Nutrient Density: Nutrient Intake Per 1000 Kilocalories for Posttested Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between Groups Present and Absent on Day of Recall across Sites

|                   | PRESENT IN HEAD START |        |        |        |        |        | ABSENT FROM HEAD START |        |        |        |        |        | T     | P     |
|-------------------|-----------------------|--------|--------|--------|--------|--------|------------------------|--------|--------|--------|--------|--------|-------|-------|
|                   | N                     | Q1     | MED    | Q3     | MEAN   | SD     | N                      | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| PROTEIN (GM)      | 306                   | 33.23  | 37.77  | 42.91  | 38.10  | 7.17   | 121                    | 29.85  | 34.62  | 40.63  | 35.58  | 8.21   | -2.96 | 0.003 |
| FAT (GM)          | 302                   | 35.51  | 39.59  | 43.44  | 39.61  | 5.88   | 120                    | 35.93  | 41.47  | 46.86  | 41.88  | 8.55   | -2.67 | 0.008 |
| CARBOHYDRATE (GM) | 309                   | 114.04 | 124.96 | 135.97 | 125.17 | 16.70  | 121                    | 103.16 | 121.63 | 139.10 | 121.06 | 25.50  | 1.64  | 0.103 |
| CALCIUM (MG)      | 307                   | 451.54 | 585.35 | 689.96 | 576.52 | 162.00 | 122                    | 290.38 | 395.99 | 584.24 | 443.81 | 195.00 | 6.67  | 0.000 |
| IRON (MG)         | 309                   | 5.36   | 6.03   | 7.14   | 6.41   | 1.70   | 118                    | 5.52   | 6.49   | 7.74   | 7.04   | 2.74   | -2.31 | 0.022 |
| MAGNESIUM (MG)    | 307                   | 116.74 | 134.56 | 154.60 | 136.02 | 28.20  | 121                    | 88.82  | 108.32 | 134.12 | 115.89 | 42.80  | 4.78  | 0.000 |
| PHOSPHORUS (MG)   | 308                   | 604.89 | 687.38 | 767.76 | 686.48 | 133.00 | 121                    | 460.20 | 552.62 | 720.25 | 588.10 | 156.00 | 6.13  | 0.000 |
| VITAMIN A (IU)    | 309                   | 1642   | 2564   | 4542   | 4322   | 5499   | 121                    | 1183   | 1962   | 2991   | 2510   | 2410   | 4.74  | 0.000 |
| THIAMIN (MG)      | 304                   | 0.61   | 0.71   | 0.82   | 0.74   | 0.19   | 118                    | 0.58   | 0.73   | 0.96   | 0.80   | 0.34   | -1.94 | 0.055 |
| RIBOFLAVIN (MG)   | 304                   | 0.92   | 1.13   | 1.32   | 1.20   | 0.48   | 120                    | 0.75   | 1.01   | 1.26   | 1.04   | 0.41   | 3.36  | 0.001 |
| NIACIN (MG)       | 304                   | 6.43   | 7.80   | 9.62   | 8.29   | 2.84   | 116                    | 6.36   | 8.37   | 10.94  | 9.05   | 4.19   | -1.81 | 0.073 |
| VITAMIN B6 (MG)   | 305                   | 0.61   | 0.72   | 0.89   | 0.78   | 0.28   | 117                    | 0.54   | 0.70   | 0.96   | 0.79   | 0.38   | -0.36 | 0.721 |
| VITAMIN B12 (MCG) | 286                   | 1.81   | 2.27   | 2.74   | 3.40   | 6.06   | 118                    | 1.53   | 2.09   | 2.88   | 2.50   | 2.35   | 2.17  | 0.030 |
| VITAMIN C (MG)    | 310                   | 39.89  | 67.43  | 107.74 | 76.94  | 49.60  | 120                    | 28.40  | 62.61  | 108.00 | 74.77  | 57.60  | 0.36  | 0.716 |
| CHOLESTEROL (MG)  | 306                   | 116.56 | 160.70 | 238.49 | 191.88 | 97.80  | 121                    | 111.02 | 208.20 | 336.02 | 227.33 | 138.00 | -2.58 | 0.011 |

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Table 6 -30

Nutrient Density: Nutrient Intake Per 1000 Kilocalories for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Absent on Day of Recall and Non-Head Start Children across Sites

|                   | ABSENT IN HEAD START |        |        |        |        |        | NON-HEAD START |        |        |        |        |        | T     | P     |
|-------------------|----------------------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|-------|-------|
|                   | N                    | Q1     | MED    | Q3     | MEAN   | SD     | N              | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| PROTEIN (GM)      | 121                  | 29.85  | 34.62  | 40.63  | 35.58  | 8.21   | 309            | 28.41  | 34.48  | 41.40  | 34.93  | 8.95   | 0.72  | 0.475 |
| FAT (GM)          | 120                  | 35.93  | 41.47  | 46.86  | 41.88  | 8.55   | 310            | 36.08  | 41.79  | 47.67  | 41.80  | 8.43   | 0.09  | 0.926 |
| CARBOHYDRATE (GM) | 121                  | 103.16 | 121.63 | 139.10 | 121.06 | 25.50  | 306            | 105.36 | 122.62 | 137.79 | 122.75 | 23.90  | -0.63 | 0.530 |
| CALCIUM (MG)      | 122                  | 290.38 | 395.99 | 584.24 | 443.81 | 195.00 | 312            | 301.55 | 422.10 | 558.77 | 436.79 | 196.00 | -0.34 | 0.737 |
| IRON (MG)         | 118                  | 5.52   | 6.49   | 7.74   | 7.04   | 2.74   | 308            | 5.31   | 6.11   | 7.25   | 6.86   | 4.06   | 0.51  | 0.609 |
| MAGNESIUM (MG)    | 121                  | 88.82  | 108.32 | 134.12 | 115.89 | 42.80  | 310            | 89.89  | 112.57 | 134.05 | 116.49 | 36.90  | -0.13 | 0.893 |
| PHOSPHORUS (MG)   | 121                  | 460.20 | 552.62 | 720.25 | 588.10 | 156.00 | 310            | 476.30 | 576.66 | 712.22 | 600.69 | 180.00 | -0.72 | 0.471 |
| VITAMIN A (IU)    | 121                  | 1183   | 1962   | 2991   | 2510   | 2410   | 305            | 1151   | 1735   | 2677   | 2538   | 2829   | -0.10 | 0.919 |
| THIAMIN (MG)      | 118                  | 0.58   | 0.73   | 0.96   | 0.80   | 0.34   | 300            | 0.57   | 0.70   | 0.87   | 0.75   | 0.25   | 1.55  | 0.123 |
| RIBOFLAVIN (MG)   | 120                  | 0.75   | 1.01   | 1.26   | 1.04   | 0.41   | 306            | 0.72   | 0.92   | 1.20   | 1.02   | 0.52   | 0.50  | 0.614 |
| NIACIN (MG)       | 116                  | 6.36   | 8.37   | 10.94  | 9.05   | 4.19   | 301            | 6.26   | 7.92   | 10.10  | 8.70   | 4.72   | 0.75  | 0.456 |
| VITAMIN B6 (MG)   | 117                  | 0.54   | 0.70   | 0.96   | 0.79   | 0.38   | 311            | 0.52   | 0.69   | 0.93   | 0.79   | 0.50   | -0.08 | 0.940 |
| VITAMIN B12 (MCG) | 118                  | 1.53   | 2.09   | 2.88   | 2.50   | 2.35   | 289            | 1.31   | 1.83   | 2.50   | 2.52   | 4.34   | -0.06 | 0.953 |
| VITAMIN C (MG)    | 120                  | 28.40  | 62.61  | 108.00 | 74.77  | 57.60  | 314            | 26.17  | 53.78  | 104.88 | 71.69  | 58.50  | 0.50  | 0.620 |
| CHOLESTEROL (MG)  | 121                  | 111.02 | 208.20 | 336.02 | 227.33 | 138.00 | 308            | 106.18 | 154.61 | 290.11 | 208.13 | 139.00 | -1.30 | 0.196 |

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Table 6 -31

Nutrient Density: Nutrient Intake Per 1000 Kilocalories for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Present on Day of Recall and Non-Head Start Children within Site

|                          | PRESENT IN HEAD START |        |        |        |        |        | NON-HEAD START |        |        |        |        |        | T     | P     |
|--------------------------|-----------------------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|-------|-------|
|                          | N                     | Q1     | MED    | Q3     | MEAN   | SD     | N              | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>PROTEIN (GM)</b>      |                       |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys         | 109                   | 35.15  | 39.63  | 44.22  | 39.95  | 6.83   | 90             | 30.84  | 36.57  | 42.56  | 36.64  | 8.10   | 3.07  | 0.002 |
| St. Clair                | 70                    | 31.65  | 37.17  | 41.18  | 36.55  | 6.98   | 65             | 27.29  | 33.16  | 40.57  | 34.26  | 8.72   | 1.68  | 0.096 |
| Maricopa                 | 57                    | 34.99  | 37.66  | 42.94  | 37.97  | 7.45   | 50             | 27.11  | 34.01  | 41.61  | 35.27  | 9.44   | 1.63  | 0.107 |
| Mingo                    | 70                    | 31.64  | 36.23  | 41.65  | 36.87  | 7.12   | 104            | 26.67  | 32.81  | 40.84  | 33.70  | 9.42   | 2.52  | 0.013 |
| <b>FAT (MG)</b>          |                       |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys         | 107                   | 35.53  | 38.84  | 43.17  | 39.25  | 5.77   | 88             | 34.41  | 40.47  | 47.78  | 40.87  | 9.64   | -1.39 | 0.166 |
| St. Clair                | 71                    | 35.74  | 40.18  | 43.48  | 39.21  | 6.10   | 68             | 38.80  | 42.56  | 47.14  | 42.69  | 7.08   | -3.10 | 0.002 |
| Maricopa                 | 58                    | 38.53  | 41.98  | 45.83  | 42.09  | 6.13   | 51             | 37.81  | 42.98  | 49.13  | 43.06  | 7.46   | -0.73 | 0.464 |
| Mingo                    | 66                    | 34.60  | 38.15  | 41.55  | 38.44  | 5.03   | 103            | 35.92  | 41.49  | 47.48  | 41.37  | 8.57   | -2.79 | 0.006 |
| <b>CARBOHYDRATE (GM)</b> |                       |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys         | 110                   | 114.55 | 124.84 | 135.34 | 124.90 | 14.90  | 87             | 103.14 | 122.15 | 137.60 | 123.08 | 26.50  | 0.57  | 0.567 |
| St. Clair                | 71                    | 117.06 | 126.63 | 138.94 | 128.38 | 16.70  | 67             | 106.69 | 123.05 | 132.72 | 120.80 | 20.10  | 2.40  | 0.018 |
| Maricopa                 | 58                    | 110.11 | 119.25 | 130.08 | 118.86 | 18.70  | 50             | 100.84 | 116.53 | 132.31 | 119.14 | 23.50  | -0.07 | 0.946 |
| Mingo                    | 70                    | 116.85 | 126.37 | 139.88 | 127.58 | 16.60  | 102            | 106.77 | 123.34 | 140.69 | 125.53 | 24.10  | 0.66  | 0.510 |
| <b>CALCIUM (MG)</b>      |                       |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys         | 110                   | 503.64 | 605.38 | 677.64 | 596.60 | 145.00 | 90             | 290.90 | 369.28 | 519.37 | 406.89 | 181.00 | 8.05  | 0.000 |
| St. Clair                | 70                    | 423.48 | 541.46 | 654.10 | 536.47 | 168.00 | 68             | 223.32 | 368.31 | 494.84 | 381.27 | 179.00 | 5.25  | 0.000 |
| Maricopa                 | 58                    | 410.81 | 568.29 | 712.90 | 580.57 | 190.00 | 51             | 354.42 | 488.75 | 577.79 | 494.81 | 225.00 | 2.13  | 0.035 |
| Mingo                    | 69                    | 476.01 | 592.16 | 708.03 | 581.74 | 150.00 | 103            | 327.95 | 464.97 | 576.35 | 470.86 | 193.00 | 4.23  | 0.000 |

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Table 6 -31 (continued)

Nutrient Density: Nutrient Intake Per 1000 Kilocalories for Posttested Head Start and Non-head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Present on Day of Recall and Non-Head Start Children within Site

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|                        | PRESENT IN HEAD START |        |        |        |        |        | NON-HEAD START |        |        |        |        |        | T     | P     |
|------------------------|-----------------------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|-------|-------|
|                        | N                     | Q1     | MED    | Q3     | MEAN   | SD     | N              | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>IRON (MG)</b>       |                       |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys       | 109                   | 5.53   | 6.20   | 7.42   | 6.71   | 1.85   | 87             | 5.45   | 6.15   | 7.72   | 7.86   | 6.64   | -1.58 | 0.118 |
| St Clair               | 70                    | 5.33   | 5.88   | 6.90   | 6.26   | 1.33   | 68             | 5.35   | 5.98   | 7.04   | 6.58   | 2.32   | -1.01 | 0.317 |
| Maricopa               | 58                    | 5.43   | 6.04   | 7.62   | 6.53   | 2.07   | 50             | 5.69   | 6.70   | 7.35   | 6.85   | 2.31   | -0.74 | 0.459 |
| Mingo                  | 72                    | 5.13   | 5.82   | 6.61   | 6.02   | 1.37   | 103            | 4.97   | 5.79   | 6.97   | 6.21   | 2.23   | -0.70 | 0.488 |
| <b>MAGNESIUM (MG)</b>  |                       |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys       | 110                   | 123.94 | 139.99 | 160.04 | 141.59 | 25.20  | 89             | 96.71  | 114.16 | 129.76 | 120.67 | 37.80  | -4.48 | 0.000 |
| St Clair               | 71                    | 121.11 | 135.17 | 156.36 | 140.42 | 30.20  | 68             | 82.47  | 106.34 | 125.79 | 107.42 | 34.10  | 6.04  | 0.000 |
| Maricopa               | 58                    | 105.38 | 120.41 | 145.48 | 125.85 | 32.20  | 51             | 80.63  | 112.95 | 152.47 | 116.17 | 41.20  | 1.35  | 0.179 |
| Mingo                  | 68                    | 114.02 | 128.15 | 146.12 | 131.10 | 24.10  | 102            | 94.97  | 114.55 | 136.11 | 119.03 | 35.10  | 2.56  | 0.009 |
| <b>PHOSPHORUS (MG)</b> |                       |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys       | 109                   | 640.94 | 713.40 | 798.01 | 727.23 | 117.00 | 87             | 469.19 | 550.83 | 701.64 | 585.49 | 163.00 | 6.83  | 0.000 |
| St Clair               | 70                    | 563.35 | 665.94 | 725.74 | 646.29 | 139.00 | 68             | 386.10 | 529.56 | 660.08 | 535.05 | 175.00 | 4.13  | 0.000 |
| Maricopa               | 58                    | 604.81 | 667.25 | 764.60 | 675.60 | 134.00 | 51             | 482.53 | 580.88 | 728.10 | 623.57 | 183.00 | 1.68  | 0.097 |
| Mingo                  | 71                    | 576.45 | 677.23 | 753.17 | 672.42 | 135.00 | 104            | 521.88 | 629.47 | 769.79 | 645.10 | 163.00 | 1.14  | 0.258 |
| <b>VITAMIN A (IU)</b>  |                       |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys       | 107                   | 1847.  | 3372.  | 7024   | 6569.  | 8051.  | 89             | 1359.  | 2122.  | 3192.  | 3296.  | 3887.  | 3.72  | 0.000 |
| St Clair               | 72                    | 1865.  | 2820.  | 4322.  | 3983.  | 3818.  | 66             | 879.   | 1374.  | 2030.  | 1881.  | 1926.  | 4.15  | 0.000 |
| Maricopa               | 58                    | 1360.  | 1821.  | 3429.  | 2920.  | 2543.  | 52             | 1383.  | 1891.  | 2663.  | 2438.  | 1948.  | 1.12  | 0.265 |
| Mingo                  | 72                    | 1457.  | 2003.  | 3301   | 2441.  | 1313.  | 88             | 1073.  | 1710.  | 2705.  | 2345.  | 2458.  | 0.33  | 0.743 |

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Table 6 -31 (continued)

Nutrient Density: Nutrient Intake Per 1000 Kilocalories for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Present on Day of Recall and Non-Head Start Children within Site

|                        | PRESENT IN HEAD START |      |      |       |      |      | NON-HEAD, START |      |      |       |       |      | T     | P     |
|------------------------|-----------------------|------|------|-------|------|------|-----------------|------|------|-------|-------|------|-------|-------|
|                        | N                     | Q1   | MED  | Q3    | MEAN | SD   | N               | Q1   | MED  | Q3    | MEAN  | SD   |       |       |
| <b>THIAMIN (MG)</b>    |                       |      |      |       |      |      |                 |      |      |       |       |      |       |       |
| Greene/Humphreys       | 109                   | 0.64 | 0.72 | 0.83  | 0.76 | 0.19 | 84              | 0.60 | 0.78 | 0.98  | 0.82  | 0.30 | -1.68 | 0.096 |
| St. Clair              | 71                    | 0.59 | 0.72 | 0.86  | 0.75 | 0.22 | 66              | 0.59 | 0.71 | 0.90  | 0.74  | 0.21 | 0.10  | 0.923 |
| Maricopa               | 55                    | 0.57 | 0.69 | 0.79  | 0.71 | 0.21 | 48              | 0.56 | 0.69 | 0.80  | 0.69  | 0.18 | 0.64  | 0.526 |
| Mingo                  | 69                    | 0.61 | 0.71 | 0.81  | 0.72 | 0.16 | 102             | 0.56 | 0.67 | 0.86  | 0.72  | 0.25 | -0.15 | 0.884 |
| <b>RIBOFLAVIN (MG)</b> |                       |      |      |       |      |      |                 |      |      |       |       |      |       |       |
| Greene/Humphreys       | 106                   | 1.03 | 1.19 | 1.46  | 1.37 | 0.67 | 88              | 0.73 | 0.94 | 1.30  | 1.10  | 0.67 | 2.80  | 0.006 |
| St. Clair              | 71                    | 0.91 | 1.16 | 1.31  | 1.15 | 0.34 | 66              | 0.68 | 0.85 | 1.08  | 0.91  | 0.37 | 3.91  | 0.000 |
| Maricopa               | 56                    | 0.82 | 1.08 | 1.31  | 1.12 | 0.37 | 50              | 0.80 | 1.05 | 1.21  | 1.01  | 0.28 | 1.77  | 0.079 |
| Mingo                  | 71                    | 0.91 | 1.05 | 1.24  | 1.08 | 0.25 | 102             | 0.76 | 0.93 | 1.21  | 1.03  | 0.54 | 0.72  | 0.470 |
| <b>NIACIN (MG)</b>     |                       |      |      |       |      |      |                 |      |      |       |       |      |       |       |
| Greene/Humphreys       | 107                   | 7.00 | 8.42 | 10.71 | 9.20 | 3.36 | 88              | 7.48 | 8.66 | 11.08 | 10.64 | 7.29 | -1.72 | 0.088 |
| St. Clair              | 71                    | 6.65 | 7.83 | 9.35  | 8.21 | 2.17 | 67              | 7.13 | 8.09 | 10.02 | 8.62  | 2.59 | -1.01 | 0.312 |
| Maricopa               | 57                    | 5.94 | 7.50 | 9.19  | 7.84 | 2.76 | 48              | 6.00 | 8.05 | 9.56  | 7.81  | 2.25 | 0.04  | 0.964 |
| Mingo                  | 69                    | 5.99 | 6.92 | 8.37  | 7.35 | 2.18 | 98              | 5.31 | 7.07 | 8.91  | 7.44  | 2.96 | -0.23 | 0.821 |
| <b>VITAMIN B6 (MG)</b> |                       |      |      |       |      |      |                 |      |      |       |       |      |       |       |
| Greene/Humphreys       | 108                   | 0.64 | 0.77 | 0.93  | 0.81 | 0.24 | 87              | 0.63 | 0.74 | 1.01  | 0.98  | 0.76 | -2.06 | 0.042 |
| St. Clair              | 70                    | 0.62 | 0.72 | 0.93  | 0.78 | 0.27 | 68              | 0.43 | 0.63 | 0.78  | 0.66  | 0.27 | 2.80  | 0.006 |
| Maricopa               | 56                    | 0.57 | 0.67 | 0.93  | 0.78 | 0.38 | 52              | 0.56 | 0.79 | 0.99  | 0.80  | 0.30 | -0.21 | 0.837 |
| Mingo                  | 71                    | 0.58 | 0.70 | 0.77  | 0.72 | 0.24 | 104             | 0.44 | 0.63 | 0.98  | 0.72  | 0.37 | -0.17 | 0.865 |

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Table 5 -31 (continued)

Nutrient Density: Nutrient Intake Per 1000 Kilocalories for Posttested Head Start and Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Present on Day of Recall and Non-Head Start Children within Site.

|                          | PRESENT IN HEAD START |        |        |        |        |        | NON-HEAD START |        |        |        |        |        | T    | P     |
|--------------------------|-----------------------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|------|-------|
|                          | N                     | Q1     | MED    | Q3     | MEAN   | SD     | N              | Q1     | MED    | Q3     | MEAN   | SD     |      |       |
| <b>VITAMIN B12 (MCG)</b> |                       |        |        |        |        |        |                |        |        |        |        |        |      |       |
| Greene/Humphreys         | 102                   | 1.83   | 2.31   | 3.22   | 5.25   | 9.96   | 84             | 1.24   | 1.63   | 2.55   | 2.75   | 4.66   | 2.25 | 0.026 |
| St Clair                 | 67                    | 1.71   | 2.25   | 2.62   | 2.38   | 1.21   | 63             | 1.36   | 1.68   | 2.16   | 1.81   | 0.69   | 3.30 | 0.001 |
| Maricopa                 | 56                    | 1.83   | 2.44   | 3.14   | 2.70   | 1.54   | 48             | 1.60   | 1.97   | 3.01   | 2.34   | 1.12   | 1.42 | 0.160 |
| Mingo                    | 71                    | 1.80   | 2.09   | 2.49   | 2.25   | 0.80   | 94             | 1.28   | 1.92   | 2.50   | 2.88   | 6.13   | 0.99 | 0.327 |
| <b>VITAMIN C (MG)</b>    |                       |        |        |        |        |        |                |        |        |        |        |        |      |       |
| Greene/Humphreys         | 108                   | 35.23  | 68.14  | 106.68 | 75.49  | 49.90  | 90             | 39.47  | 78.60  | 121.89 | 84.15  | 54.90  | 1.15 | 0.252 |
| St Clair                 | 72                    | 62.52  | 89.15  | 115.45 | 97.89  | 48.40  | 68             | 17.85  | 70.39  | 111.28 | 80.45  | 63.50  | 1.81 | 0.073 |
| Maricopa                 | 58                    | 29.61  | 48.42  | 79.75  | 61.28  | 42.70  | 52             | 25.80  | 45.91  | 87.45  | 59.29  | 42.50  | 0.24 | 0.807 |
| Mingo                    | 72                    | 35.74  | 58.01  | 89.63  | 70.78  | 48.80  | 104            | 19.00  | 42.33  | 74.79  | 61.38  | 62.60  | 1.12 | 0.265 |
| <b>CHOLESTEROL (MG)</b>  |                       |        |        |        |        |        |                |        |        |        |        |        |      |       |
| Greene/Humphreys         | 105                   | 138.31 | 171.66 | 266.62 | 205.74 | 93.70  | 88             | 109.09 | 146.54 | 250.62 | 192.33 | 118.00 | 0.86 | 0.391 |
| St Clair                 | 71                    | 153.18 | 201.80 | 270.77 | 208.37 | 92.90  | 66             | 117.66 | 157.77 | 262.67 | 195.21 | 113.00 | 0.74 | 0.460 |
| Maricopa                 | 58                    | 114.98 | 142.64 | 250.71 | 192.22 | 119.00 | 52             | 94.05  | 204.21 | 322.71 | 231.72 | 161.00 | 1.45 | 0.151 |
| Mingo                    | 72                    | 107.08 | 130.14 | 185.78 | 155.56 | 80.50  | 102            | 101.33 | 153.80 | 316.05 | 218.10 | 157.00 | 3.44 | 0.001 |

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Table 6 -32

Nutrient Density: Nutrient Intake Per 1000 Kilocalories for Posttested Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between Groups Present and Absent Day of Recall within Site

|                          | PRESENT IN HEAD START |        |        |        |        |        | ABSENT, FROM HEAD START |        |        |        |        |        | T     | P     |
|--------------------------|-----------------------|--------|--------|--------|--------|--------|-------------------------|--------|--------|--------|--------|--------|-------|-------|
|                          | N                     | Q1     | MED    | Q3     | MEAN   | SD     | N                       | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>PROTEIN (GM)</b>      |                       |        |        |        |        |        |                         |        |        |        |        |        |       |       |
| Greene/Humphreys         | 109                   | 35.15  | 39.63  | 44.22  | 39.95  | 6.83   | 9                       | 25.40  | 34.87  | 41.97  | 34.51  | 9.24   | 1.73  | 0.118 |
| St Clair                 | 70                    | 31.65  | 37.17  | 41.18  | 36.55  | 6.98   | 32                      | 31.81  | 35.11  | 40.02  | 36.03  | 7.20   | 0.34  | 0.733 |
| Maricopa                 | 57                    | 34.99  | 37.66  | 42.94  | 37.97  | 7.45   | 41                      | 29.93  | 33.25  | 40.30  | 35.09  | 8.64   | 1.72  | 0.089 |
| Mingo                    | 70                    | 31.64  | 36.23  | 41.65  | 36.87  | 7.12   | 39                      | 28.62  | 37.45  | 41.07  | 35.97  | 8.55   | 0.56  | 0.578 |
| <b>FAT (MG)</b>          |                       |        |        |        |        |        |                         |        |        |        |        |        |       |       |
| Greene/Humphreys         | 107                   | 35.53  | 38.84  | 43.17  | 39.25  | 5.77   | 10                      | 27.45  | 42.46  | 47.94  | 39.50  | 10.40  | -0.08 | 0.941 |
| St Clair                 | 71                    | 35.74  | 40.18  | 43.48  | 39.21  | 6.10   | 31                      | 38.68  | 44.36  | 49.24  | 43.88  | 7.88   | -2.94 | 0.005 |
| Maricopa                 | 58                    | 38.53  | 41.98  | 45.83  | 42.09  | 6.13   | 41                      | 35.68  | 40.78  | 46.01  | 40.98  | 9.01   | 0.68  | 0.497 |
| Mingo                    | 66                    | 34.60  | 38.15  | 41.55  | 38.44  | 5.03   | 38                      | 36.19  | 40.66  | 45.88  | 41.85  | 8.05   | -2.36 | 0.022 |
| <b>CARBOHYDRATE (GM)</b> |                       |        |        |        |        |        |                         |        |        |        |        |        |       |       |
| Greene/Humphreys         | 110                   | 114.56 | 124.84 | 135.34 | 124.90 | 14.90  | 10                      | 109.31 | 118.14 | 165.22 | 126.80 | 32.00  | -0.19 | 0.856 |
| St Clair                 | 71                    | 117.06 | 126.63 | 138.94 | 128.38 | 16.70  | 32                      | 100.83 | 117.70 | 130.70 | 115.20 | 22.70  | 2.94  | 0.005 |
| Maricopa                 | 58                    | 110.11 | 119.26 | 130.08 | 118.86 | 18.70  | 40                      | 102.04 | 128.78 | 141.81 | 123.84 | 27.30  | -1.00 | 0.319 |
| Mingo                    | 70                    | 116.85 | 126.37 | 139.88 | 127.58 | 16.60  | 39                      | 108.35 | 120.31 | 134.80 | 121.55 | 24.10  | 1.39  | 0.169 |
| <b>CALCIUM (MG)</b>      |                       |        |        |        |        |        |                         |        |        |        |        |        |       |       |
| Greene/Humphreys         | 110                   | 503.64 | 605.38 | 677.64 | 596.60 | 145.00 | 10                      | 222.44 | 328.00 | 352.30 | 339.01 | 155.00 | 5.07  | 0.000 |
| St Clair                 | 70                    | 423.48 | 541.46 | 654.10 | 535.47 | 168.00 | 32                      | 244.06 | 300.06 | 567.26 | 384.04 | 180.00 | 0.05  | 0.000 |
| Maricopa                 | 58                    | 410.81 | 568.29 | 712.90 | 580.57 | 190.00 | 41                      | 302.09 | 477.23 | 646.85 | 480.22 | 197.00 | 2.53  | 0.013 |
| Mingo                    | 69                    | 476.01 | 592.16 | 708.03 | 581.74 | 150.00 | 39                      | 328.53 | 405.56 | 604.22 | 481.45 | 198.00 | 2.75  | 0.008 |

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Table 6 -32 (continued)

Nutrient Density: Nutrient Intake Per 1000 Kilocalories for Posttested Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between Groups Present and Absent Day of Recall within Site

|                        | PRESENT IN HEAD START |        |        |        |        |        | ABSENT FROM HEAD START |        |        |        |        |        | T     | P     |
|------------------------|-----------------------|--------|--------|--------|--------|--------|------------------------|--------|--------|--------|--------|--------|-------|-------|
|                        | N                     | Q1     | MED    | Q3     | MEAN   | SD     | N                      | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>IRON (MG)</b>       |                       |        |        |        |        |        |                        |        |        |        |        |        |       |       |
| Greene/Humphreys       | 109                   | 5.53   | 6.20   | 7.42   | 6.71   | 1.85   | 9                      | 6.35   | 6.72   | 8.22   | 6.88   | 1.26   | -0.38 | 0.710 |
| St. Clair              | 70                    | 5.33   | 5.88   | 6.90   | 6.26   | 1.33   | 30                     | 5.64   | 6.44   | 6.98   | 7.00   | 3.13   | -1.26 | 0.216 |
| Maricopa               | 58                    | 5.43   | 6.04   | 7.62   | 6.53   | 2.07   | 40                     | 5.53   | 6.70   | 7.72   | 6.79   | 1.88   | -0.63 | 0.528 |
| Mingo                  | 72                    | 5.13   | 5.82   | 6.61   | 6.02   | 1.37   | 39                     | 5.48   | 6.21   | 8.09   | 7.36   | 3.40   | -2.35 | 0.023 |
| <b>MAGNESIUM (MG)</b>  |                       |        |        |        |        |        |                        |        |        |        |        |        |       |       |
| Greene/Humphreys       | 110                   | 123.94 | 139.99 | 160.04 | 141.59 | 25.20  | 10                     | 89.08  | 112.34 | 125.75 | 117.56 | 37.20  | 2.00  | 0.073 |
| St. Clair              | 71                    | 121.11 | 135.17 | 156.36 | 140.42 | 30.20  | 32                     | 88.19  | 102.57 | 133.03 | 112.22 | 29.40  | 4.47  | 0.000 |
| Maricopa               | 58                    | 105.38 | 120.41 | 145.48 | 125.85 | 32.20  | 41                     | 83.95  | 100.05 | 140.19 | 117.78 | 61.20  | 0.77  | 0.443 |
| Mingo                  | 68                    | 114.02 | 128.15 | 146.12 | 131.10 | 24.10  | 38                     | 98.42  | 112.51 | 132.51 | 116.52 | 28.30  | 2.68  | 0.009 |
| <b>PHOSPHORUS (MG)</b> |                       |        |        |        |        |        |                        |        |        |        |        |        |       |       |
| Greene/Humphreys       | 109                   | 640.94 | 713.40 | 798.01 | 727.23 | 117.00 | 10                     | 399.67 | 518.54 | 599.78 | 526.62 | 118.00 | 5.14  | 0.000 |
| St. Clair              | 70                    | 563.35 | 665.94 | 725.74 | 646.29 | 139.00 | 31                     | 432.42 | 476.96 | 629.00 | 533.48 | 140.00 | 3.75  | 0.000 |
| Maricopa               | 58                    | 604.81 | 664.25 | 764.60 | 675.60 | 134.00 | 41                     | 465.37 | 603.92 | 725.48 | 606.18 | 166.00 | 2.22  | 0.029 |
| Mingo                  | 71                    | 576.45 | 677.23 | 753.17 | 672.42 | 135.00 | 38                     | 498.70 | 590.51 | 742.64 | 628.28 | 153.00 | 1.50  | 0.437 |
| <b>VITAMIN A (IU)</b>  |                       |        |        |        |        |        |                        |        |        |        |        |        |       |       |
| Greene/Humphreys       | 107                   | 1847   | 3372   | 7024   | 6569   | 8051   | 10                     | 957    | 2095   | 2792   | 2675   | 2184   | 3.74  | 0.001 |
| St. Clair              | 72                    | 1865   | 2820   | 4322   | 3993   | 3818   | 32                     | 1158   | 1954   | 2764   | 2125   | 1244   | 3.73  | 0.000 |
| Maricopa               | 58                    | 1360   | 1821   | 3429   | 2920   | 2543   | 40                     | 955    | 1490   | 2725   | 2526   | 3260   | 0.64  | 0.524 |
| Mingo                  | 72                    | 1457   | 2003   | 3001   | 2441   | 1313   | 39                     | 1328   | 2120   | 3437   | 2768   | 2201   | -0.85 | 0.399 |

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Table 6A-32 (continued)

Nutrient Density: Nutrient Intake Per 1000 Kilocalories for Posttested Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between Groups Present and Absent Day of Recall within Site

|                        | PRESENT IN HEAD START |      |      |       |      |      | ABSENT FROM HEAD START |      |      |       |      |      | t     | p     |
|------------------------|-----------------------|------|------|-------|------|------|------------------------|------|------|-------|------|------|-------|-------|
|                        | N                     | Q1   | MED  | Q3    | MEAN | SD   | N                      | Q1   | MED  | Q3    | MEAN | SD   |       |       |
| <b>THIAMIN (MG)</b>    |                       |      |      |       |      |      |                        |      |      |       |      |      |       |       |
| Greene/Humphreys       | 109                   | 0.64 | 0.72 | 0.83  | 0.76 | 0.19 | 10                     | 0.73 | 0.98 | 1.04  | 0.92 | 0.19 | -2.63 | 0.024 |
| St Clair               | 71                    | 0.59 | 0.72 | 0.86  | 0.75 | 0.22 | 32                     | 0.58 | 0.71 | 0.95  | 0.81 | 0.35 | -0.95 | 0.347 |
| Maricopa               | 55                    | 0.57 | 0.69 | 0.79  | 0.71 | 0.21 | 39                     | 0.57 | 0.67 | 0.84  | 0.74 | 0.33 | -0.53 | 0.597 |
| Mingo                  | 69                    | 0.61 | 0.71 | 0.81  | 0.72 | 0.16 | 37                     | 0.58 | 0.73 | 0.91  | 0.83 | 0.37 | -1.70 | 0.097 |
| <b>RIBOFLAVIN (MG)</b> |                       |      |      |       |      |      |                        |      |      |       |      |      |       |       |
| Greene/Humphreys       | 106                   | 1.03 | 1.19 | 1.46  | 1.37 | 0.67 | 10                     | 0.63 | 1.02 | 1.26  | 1.06 | 0.45 | 1.99  | 0.068 |
| St Clair               | 71                    | 0.91 | 1.16 | 1.31  | 1.15 | 0.34 | 31                     | 0.73 | 0.90 | 1.04  | 0.91 | 0.26 | 3.90  | 0.000 |
| Maricopa               | 56                    | 0.82 | 1.08 | 1.31  | 1.12 | 0.37 | 40                     | 0.76 | 1.00 | 1.22  | 1.08 | 0.46 | 0.68  | 0.501 |
| Mingo                  | 71                    | 0.91 | 1.05 | 1.24  | 1.08 | 0.25 | 39                     | 0.80 | 1.08 | 1.33  | 1.13 | 0.45 | 0.71  | 0.478 |
| <b>NIACIN (MG)</b>     |                       |      |      |       |      |      |                        |      |      |       |      |      |       |       |
| Greene/Humphreys       | 107                   | 7.00 | 8.42 | 10.74 | 9.20 | 3.36 | 9                      | 8.31 | 9.23 | 9.38  | 9.50 | 2.29 | -0.36 | 0.722 |
| St Clair               | 71                    | 6.65 | 7.83 | 9.35  | 8.23 | 2.17 | 28                     | 6.53 | 8.40 | 11.05 | 9.26 | 4.68 | -1.14 | 0.263 |
| Maricopa               | 57                    | 5.94 | 7.50 | 9.19  | 7.84 | 2.76 | 41                     | 5.86 | 7.37 | 10.49 | 8.36 | 3.95 | -0.74 | 0.464 |
| Mingo                  | 69                    | 5.99 | 6.92 | 8.37  | 7.35 | 2.19 | 38                     | 5.92 | 8.74 | 12.07 | 9.54 | 4.46 | -2.85 | 0.006 |
| <b>VITAMIN B6 (MG)</b> |                       |      |      |       |      |      |                        |      |      |       |      |      |       |       |
| Greene/Humphreys       | 108                   | 0.64 | 0.77 | 0.93  | 0.81 | 0.24 | 10                     | 0.70 | 0.84 | 1.03  | 0.88 | 0.25 | -0.87 | 0.405 |
| St Clair               | 70                    | 0.62 | 0.72 | 0.93  | 0.78 | 0.27 | 29                     | 0.41 | 0.68 | 0.83  | 0.68 | 0.29 | 1.71  | 0.093 |
| Maricopa               | 56                    | 0.57 | 0.67 | 0.93  | 0.78 | 0.38 | 41                     | 0.54 | 0.64 | 1.06  | 0.81 | 0.39 | -0.37 | 0.710 |
| Mingo                  | 71                    | 0.58 | 0.70 | 0.77  | 0.72 | 0.24 | 37                     | 0.54 | 0.72 | 0.96  | 0.83 | 0.45 | -1.13 | 0.460 |

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Table E -32 (continued)

Nutrient Density; Nutrient Intake Per 1000 Kilocalories for Posttested  
Head Start Children (Samples A, B, C) with Head Adjusted  
Comparisons Between Groups Present and Absent Day of Recall within Site

|                           | PRESENT IN HEAD START |        |        |        |        |        | ABSENT FROM HEAD START |        |        |        |        |        | T    | P     |
|---------------------------|-----------------------|--------|--------|--------|--------|--------|------------------------|--------|--------|--------|--------|--------|------|-------|
|                           | N                     | Q1     | MED    | Q3     | MEAN   | SD     | N                      | Q1     | MED    | Q3     | MEAN   | SD     |      |       |
| <b>VITAMIN B12 (MCG)</b>  |                       |        |        |        |        |        |                        |        |        |        |        |        |      |       |
| Greene/Humphreys          | 102                   | 1.83   | 2.31   | 3.22   | 5.25   | 9.96   | 8                      | 0.89   | 1.16   | 1.81   | 1.53   | 1.00   | 3.55 | 0.001 |
| St Clair                  | 67                    | 1.71   | 2.25   | 2.62   | 2.38   | 1.21   | 32                     | 1.51   | 1.98   | 2.61   | 2.22   | 1.27   | 0.56 | 0.578 |
| Maricopa                  | 56                    | 1.83   | 2.44   | 3.14   | 2.70   | 1.54   | 40                     | 1.64   | 2.24   | 3.21   | 2.94   | 3.65   | 0.38 | 0.703 |
| Mingo                     | 71                    | 1.80   | 2.09   | 2.49   | 2.25   | 0.80   | 38                     | 1.61   | 2.28   | 2.88   | 2.47   | 1.22   | 1.00 | 0.323 |
| <b>VITAMIN C (MG)</b>     |                       |        |        |        |        |        |                        |        |        |        |        |        |      |       |
| Greene/Humphreys          | 108                   | 35.23  | 68.14  | 106.68 | 75.49  | 49.90  | 10                     | 25.88  | 96.05  | 112.03 | 87.20  | 64.90  | 0.56 | 0.591 |
| St Clair                  | 72                    | 62.52  | 89.15  | 115.45 | 97.89  | 49.40  | 31                     | 53.10  | 88.89  | 119.66 | 92.53  | 55.50  | 0.46 | 0.844 |
| Maricopa                  | 58                    | 29.61  | 48.42  | 79.75  | 61.28  | 42.70  | 41                     | 23.02  | 40.78  | 112.95 | 69.81  | 65.50  | 0.73 | 0.467 |
| Mingo                     | 72                    | 35.74  | 58.01  | 89.63  | 70.78  | 48.80  | 38                     | 31.57  | 58.85  | 78.01  | 62.36  | 45.10  | 0.90 | 0.368 |
| <b>CHOLESTEROL (MG) %</b> |                       |        |        |        |        |        |                        |        |        |        |        |        |      |       |
| Greene/Humphreys          | 105                   | 138.31 | 171.66 | 266.62 | 209.74 | 93.70  | 9                      | 106.66 | 146.21 | 248.94 | 182.83 | 115.00 | 0.58 | 0.574 |
| St Clair                  | 71                    | 153.18 | 201.80 | 270.77 | 208.37 | 92.90  | 32                     | 108.75 | 166.91 | 307.08 | 206.47 | 105.00 | 0.09 | 0.930 |
| Maricopa                  | 58                    | 149.98 | 142.64 | 250.71 | 192.22 | 119.00 | 41                     | 112.35 | 211.15 | 347.44 | 249.05 | 172.00 | 1.83 | 0.072 |
| Mingo                     | 72                    | 107.08 | 130.14 | 185.78 | 155.56 | 80.50  | 39                     | 117.02 | 243.17 | 344.03 | 231.88 | 125.00 | 3.44 | 0.001 |

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Table 6-33

Nutrient Density: Nutrient Intake Per 1000 Kilocalories for Posttested Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Absent on Day of Recall and Non-Head Start Children within Site

|                          | ABSENT IN HEAD START |        |        |        |        |        | NON-HEAD START |        |        |        |        |        | T    | P     |
|--------------------------|----------------------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|------|-------|
|                          | N                    | Q1     | MED    | Q3     | MEAN   | SD     | N              | Q1     | MED    | Q3     | MEAN   | SD     |      |       |
| <b>PROTEIN (GM)</b>      |                      |        |        |        |        |        |                |        |        |        |        |        |      |       |
| Greene/Humphreys         | 9                    | 25.40  | 34.87  | 41.97  | 34.51  | 9.24   | 90             | 30.84  | 36.57  | 42.56  | 36.64  | 8.10   | 0.67 | 0.520 |
| St. Clair                | 32                   | 31.81  | 35.11  | 40.02  | 36.03  | 7.20   | 65             | 27.29  | 33.16  | 40.57  | 34.26  | 8.72   | 1.06 | 0.293 |
| Maricopa                 | 41                   | 29.93  | 33.25  | 40.30  | 35.09  | 8.64   | 50             | 27.11  | 34.01  | 41.81  | 35.27  | 9.44   | 0.10 | 0.923 |
| Mingo                    | 39                   | 28.62  | 37.45  | 41.07  | 35.97  | 8.55   | 104            | 26.67  | 32.81  | 40.84  | 33.70  | 9.42   | 1.37 | 0.174 |
| <b>FAT (MG)</b>          |                      |        |        |        |        |        |                |        |        |        |        |        |      |       |
| Greene/Humphreys         | 10                   | 27.45  | 42.46  | 47.94  | 39.50  | 10.40  | 88             | 34.41  | 40.47  | 47.78  | 40.87  | 9.64   | 0.40 | 0.697 |
| St. Clair                | 37                   | 38.68  | 44.36  | 49.24  | 43.88  | 7.88   | 68             | 38.80  | 42.56  | 47.14  | 42.69  | 7.08   | 0.72 | 0.476 |
| Maricopa                 | 41                   | 35.68  | 40.78  | 46.01  | 40.98  | 9.01   | 51             | 37.81  | 42.98  | 49.13  | 43.06  | 7.46   | 1.19 | 0.240 |
| Mingo                    | 38                   | 36.19  | 40.66  | 45.88  | 41.89  | 8.05   | 103            | 35.92  | 41.49  | 47.48  | 41.37  | 8.57   | 0.31 | 0.758 |
| <b>CARBOHYDRATE (GM)</b> |                      |        |        |        |        |        |                |        |        |        |        |        |      |       |
| Greene/Humphreys         | 10                   | 109.31 | 118.14 | 165.27 | 126.80 | 32.00  | 87             | 103.14 | 122.15 | 137.60 | 123.08 | 26.50  | 0.35 | 0.730 |
| St. Clair                | 32                   | 100.83 | 117.70 | 130.70 | 115.20 | 22.70  | 67             | 106.69 | 123.05 | 132.72 | 120.80 | 20.10  | 1.19 | 0.239 |
| Maricopa                 | 40                   | 102.04 | 128.78 | 141.81 | 123.84 | 27.30  | 50             | 100.84 | 116.53 | 132.31 | 119.14 | 23.50  | 0.86 | 0.391 |
| Mingo                    | 39                   | 108.35 | 120.31 | 134.80 | 121.55 | 24.10  | 102            | 106.77 | 123.34 | 140.69 | 125.53 | 24.10  | 0.88 | 0.382 |
| <b>CALCIUM (MG)</b>      |                      |        |        |        |        |        |                |        |        |        |        |        |      |       |
| Greene/Humphreys         | 10                   | 222.44 | 328.00 | 352.30 | 339.01 | 155.00 | 90             | 290.90 | 369.28 | 515.17 | 406.89 | 181.00 | 1.29 | 0.220 |
| St. Clair                | 32                   | 244.06 | 300.06 | 567.26 | 384.04 | 180.00 | 68             | 223.32 | 368.31 | 494.84 | 381.27 | 179.00 | 0.07 | 0.943 |
| Maricopa                 | 41                   | 302.09 | 477.23 | 646.85 | 480.22 | 197.00 | 51             | 354.42 | 488.75 | 527.79 | 494.81 | 225.00 | 0.33 | 0.741 |
| Mingo                    | 38                   | 328.53 | 405.56 | 604.22 | 481.45 | 198.00 | 103            | 327.95 | 464.97 | 576.35 | 470.86 | 193.00 | 0.29 | 0.775 |

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Table 6-33 (continued)

Nutrient Density: Nutrient Intake Per 1000 Kilocalories for Posttested Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Absent on Day of Recall and Non-Head Start Children within Site.

|                        | ABSENT IN HEAD START |        |        |        |        |        | NON-HEAD START |        |        |        |        |        | T     | P     |
|------------------------|----------------------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|-------|-------|
|                        | N                    | Q1     | MED    | Q3     | MEAN   | SD     | N              | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>IRON (MG)</b>       |                      |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys       | 9                    | 6.35   | 6.72   | 8.22   | 6.88   | 1.26   | 87             | 5.45   | 6.15   | 7.72   | 7.86   | 6.64   | -1.19 | 0.238 |
| St. Clair              | 30                   | 5.64   | 6.44   | 6.98   | 7.00   | 3.13   | 68             | 5.35   | 5.98   | 7.04   | 6.58   | 2.32   | 0.66  | 0.510 |
| Maricopa               | 40                   | 5.53   | 6.70   | 7.72   | 6.79   | 1.88   | 50             | 5.69   | 6.70   | 7.35   | 6.85   | 2.01   | -0.14 | 0.892 |
| Mingo                  | 39                   | 5.48   | 6.21   | 8.09   | 7.36   | 3.40   | 103            | 4.97   | 5.79   | 6.97   | 6.21   | 2.23   | 1.95  | 0.056 |
| <b>MAGNESIUM (MG)</b>  |                      |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys       | 10                   | 89.08  | 112.34 | 125.79 | 117.56 | 37.20  | 89             | 96.71  | 114.16 | 129.76 | 120.67 | 37.80  | -0.25 | 0.807 |
| St. Clair              | 32                   | 88.19  | 102.57 | 133.03 | 112.22 | 29.40  | 68             | 82.47  | 106.34 | 125.79 | 107.42 | 34.10  | 0.72  | 0.472 |
| Maricopa               | 41                   | 83.95  | 100.05 | 140.19 | 117.78 | 61.20  | 51             | 80.63  | 112.95 | 152.47 | 116.17 | 41.20  | 0.14  | 0.886 |
| Mingo                  | 38                   | 98.42  | 112.51 | 132.51 | 116.52 | 28.30  | 102            | 94.97  | 114.55 | 136.11 | 119.03 | 35.10  | -0.44 | 0.663 |
| <b>PHOSPHORUS (MG)</b> |                      |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys       | 10                   | 399.67 | 518.54 | 599.78 | 526.62 | 118.00 | 87             | 469.13 | 550.83 | 701.64 | 585.49 | 163.00 | -1.43 | 0.177 |
| St. Clair              | 31                   | 432.42 | 476.96 | 629.00 | 533.48 | 140.00 | 68             | 386.10 | 529.56 | 660.08 | 535.05 | 175.00 | -0.05 | 0.962 |
| Maricopa               | 41                   | 465.37 | 603.92 | 725.48 | 606.18 | 166.00 | 51             | 483.53 | 580.88 | 728.10 | 623.57 | 183.00 | -0.48 | 0.634 |
| Mingo                  | 39                   | 498.70 | 590.51 | 742.64 | 628.28 | 153.00 | 104            | 521.88 | 629.47 | 769.79 | 645.10 | 183.00 | -0.55 | 0.581 |
| <b>VITAMIN A (IU)</b>  |                      |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys       | 10                   | 957    | 2095   | 2792   | 2675   | 2184   | 89             | 1359   | 2122   | 3192   | 3296   | 3887   | -0.77 | 0.451 |
| St. Clair              | 32                   | 1158   | 1954   | 2764   | 2125   | 1244   | 66             | 879    | 1374   | 2030   | 1881   | 1926   | 0.75  | 0.453 |
| Maricopa               | 40                   | 955    | 1490   | 2725   | 2525   | 3260   | 52             | 1383   | 1891   | 2663   | 2438   | 1948   | 0.15  | 0.880 |
| Mingo                  | 39                   | 1328   | 2120   | 3437   | 2768   | 2201   | 98             | 1073   | 1710   | 2705   | 2345   | 2458   | 0.98  | 0.329 |

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Table 6-33 (continued)

Nutrient Density: Nutrient Intake Per 1000 Kilocalories for Posttested Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Absent on Day of Recall and Non-Head Start Children within Site

|                        | ABSENT IN HEAD START |      |      |       |      |      | NON-HEAD START |      |      |       |       |      | T    | P     |
|------------------------|----------------------|------|------|-------|------|------|----------------|------|------|-------|-------|------|------|-------|
|                        | N                    | Q1   | MED  | Q3    | MEAN | SD   | N              | Q1   | MED  | Q3    | MEAN  | SD   |      |       |
| <b>THIAMIN (MG)</b>    |                      |      |      |       |      |      |                |      |      |       |       |      |      |       |
| Greene/Humphreys       | 10                   | 0.73 | 0.98 | 1.04  | 0.92 | 0.19 | 84             | 0.60 | 0.78 | 0.98  | 0.82  | 0.30 | 1.48 | 0.160 |
| St Clair               | 32                   | 0.58 | 0.71 | 0.95  | 0.81 | 0.35 | 66             | 0.59 | 0.71 | 0.90  | 0.74  | 0.21 | 1.00 | 0.321 |
| Maricopa               | 39                   | 0.57 | 0.67 | 0.84  | 0.74 | 0.33 | 48             | 0.56 | 0.69 | 0.80  | 0.69  | 0.18 | 0.97 | 0.337 |
| Mingo                  | 37                   | 0.58 | 0.73 | 0.91  | 0.83 | 0.37 | 102            | 0.56 | 0.67 | 0.86  | 0.72  | 0.25 | 1.58 | 0.120 |
| <b>RIBOFLAVIN (MG)</b> |                      |      |      |       |      |      |                |      |      |       |       |      |      |       |
| Greene/Humphreys       | 10                   | 0.63 | 1.02 | 1.26  | 1.06 | 0.45 | 88             | 0.73 | 0.94 | 1.30  | 1.10  | 0.67 | 0.25 | 0.805 |
| St Clair               | 31                   | 0.73 | 0.90 | 1.04  | 0.91 | 0.26 | 66             | 0.68 | 0.85 | 1.09  | 0.91  | 0.37 | 0.07 | 0.987 |
| Maricopa               | 40                   | 0.76 | 1.00 | 1.22  | 1.06 | 0.46 | 50             | 0.80 | 1.05 | 1.21  | 1.01  | 0.28 | 0.64 | 0.528 |
| Mingo                  | 39                   | 0.80 | 1.08 | 1.33  | 1.13 | 0.45 | 102            | 0.76 | 0.93 | 1.21  | 1.03  | 0.54 | 1.11 | 0.269 |
| <b>NIACIN (MG)</b>     |                      |      |      |       |      |      |                |      |      |       |       |      |      |       |
| Greene/Humphreys       | 9                    | 8.31 | 8.23 | 9.38  | 9.50 | 2.29 | 88             | 7.48 | 8.66 | 11.08 | 10.64 | 7.29 | 1.05 | 0.301 |
| St Clair               | 28                   | 6.53 | 8.40 | 11.05 | 9.26 | 4.68 | 67             | 7.13 | 8.09 | 10.02 | 8.62  | 2.59 | 0.68 | 0.503 |
| Maricopa               | 41                   | 5.86 | 7.37 | 10.49 | 8.36 | 3.95 | 48             | 6.00 | 8.05 | 9.56  | 7.81  | 2.25 | 0.19 | 0.433 |
| Mingo                  | 38                   | 5.82 | 8.74 | 12.07 | 9.54 | 4.46 | 98             | 5.31 | 7.07 | 8.91  | 7.44  | 2.86 | 2.69 | 0.010 |
| <b>VITAMIN B6 (MG)</b> |                      |      |      |       |      |      |                |      |      |       |       |      |      |       |
| Greene/Humphreys       | 10                   | 0.70 | 0.84 | 1.03  | 0.88 | 0.25 | 87             | 0.63 | 0.74 | 1.01  | 0.98  | 0.76 | 0.92 | 0.363 |
| St Clair               | 29                   | 0.41 | 0.68 | 0.83  | 0.68 | 0.29 | 68             | 0.43 | 0.63 | 0.78  | 0.66  | 0.27 | 0.34 | 0.736 |
| Maricopa               | 41                   | 0.54 | 0.64 | 1.06  | 0.81 | 0.39 | 52             | 0.56 | 0.79 | 0.99  | 0.80  | 0.30 | 0.22 | 0.820 |
| Mingo                  | 37                   | 0.54 | 0.72 | 0.96  | 0.83 | 0.45 | 104            | 0.44 | 0.63 | 0.98  | 0.72  | 0.37 | 1.28 | 0.206 |

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Table 6-13 (continued)

Nutrient Density: Nutrient Intake Per 1000 Kilocalories for Posttested Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between those Absent on Day of Recall and Non-Head Start Children within Site

|                          | ABSENT IN HEAD START |        |        |        |        |        | NON-HEAD START |        |        |        |        |        | T     | P     |
|--------------------------|----------------------|--------|--------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|-------|-------|
|                          | N                    | Q1     | MED    | Q3     | MEAN   | SD     | N              | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>VITAMIN B12 (MCG)</b> |                      |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys         | 8                    | 0.89   | 1.16   | 1.81   | 1.53   | 1.00   | 84             | 1.24   | 1.63   | 2.55   | 2.75   | 4.66   | -1.97 | 0.054 |
| St. Clair                | 32                   | 1.51   | 1.98   | 2.61   | 2.22   | 1.27   | 63             | 1.36   | 1.68   | 2.16   | 1.81   | 0.69   | 1.72  | 0.094 |
| Maricopa                 | 40                   | 1.64   | 2.24   | 3.21   | 2.94   | 3.65   | 48             | 1.60   | 1.97   | 3.01   | 2.34   | 1.12   | 1.01  | 0.319 |
| Mingo                    | 38                   | 1.61   | 2.28   | 2.88   | 2.47   | 1.22   | 94             | 1.28   | 1.92   | 2.50   | 2.88   | 6.13   | -0.62 | 0.536 |
| <b>VITAMIN C (MG)</b>    |                      |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys         | 10                   | 25.88  | 96.05  | 112.03 | 87.20  | 64.90  | 90             | 39.47  | 78.60  | 121.89 | 84.15  | 54.90  | 0.14  | 0.889 |
| St. Clair                | 31                   | 53.10  | 88.89  | 119.66 | 92.53  | 55.50  | 68             | 47.85  | 70.39  | 111.28 | 80.45  | 63.50  | 0.96  | 0.341 |
| Maricopa                 | 41                   | 23.02  | 40.78  | 112.95 | 69.81  | 65.50  | 52             | 25.80  | 45.91  | 87.45  | 59.29  | 42.50  | 0.89  | 0.376 |
| Mingo                    | 38                   | 31.57  | 58.85  | 78.01  | 62.36  | 45.10  | 104            | 19.00  | 42.33  | 74.79  | 61.38  | 62.60  | 0.10  | 0.918 |
| <b>CHOLESTEROL (MG)</b>  |                      |        |        |        |        |        |                |        |        |        |        |        |       |       |
| Greene/Humphreys         | 9                    | 106.66 | 146.21 | 248.94 | 182.83 | 115.00 | 88             | 109.09 | 146.54 | 250.62 | 192.53 | 118.00 | -0.24 | 0.818 |
| St. Clair                | 32                   | 108.75 | 166.91 | 307.08 | 206.47 | 105.00 | 66             | 117.66 | 157.77 | 262.67 | 195.21 | 113.00 | 0.49  | 0.628 |
| Maricopa                 | 41                   | 112.35 | 211.15 | 347.44 | 249.05 | 172.00 | 52             | 94.05  | 204.21 | 322.71 | 231.72 | 161.00 | 0.50  | 0.621 |
| Mingo                    | 39                   | 117.02 | 243.17 | 344.03 | 231.88 | 125.00 | 102            | 101.33 | 153.80 | 316.05 | 218.10 | 157.00 | 0.54  | 0.588 |

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Table 6-34

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) across Sites

| Dependent Variable  | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup> |                 |
|---|-------------|--|----------------------|-----------------|
|   |             |  | b                    | se <sub>b</sub> |
| Protein   | 708         | Site                                     |                      |                 |
|   |             | Greene & Humphreys                       | 1.69**               | 0.59            |
|   |             | St. Clair                                | -1.01                | 0.59            |
|   |             | Maricopa                                 | 0.37                 | 0.68            |
|   |             | Mingo                                    | -1.05*               | 0.54            |
|   |             | Program                                  |                      |                 |
|   |             | Head Start Present vs. Non-Head Start    | 2.76***              | 0.68            |
|   |             | Head Start Present vs. Head Start Absent | 1.64                 | 0.90            |
|   |             | Head Start Absent vs. Non-Head Start     | 1.12                 | 0.90            |
|   |             | Constant                                 | 37.73                |                 |
| Statistics F = 3.76 R <sup>2</sup> = 0.06 MS <sub>e</sub> = 64.99 |             |  |                      |                 |
| Fat   | 705         | Site                                     |                      |                 |
|   |             | Greene & Humphreys                       | -0.86                | 0.51            |
|   |             | St. Clair                                | -0.12                | 0.55            |
|   |             | Maricopa                                 | 1.78**               | 0.63            |
|   |             | Mingo                                    | -0.79                | 0.50            |
|   |             | Program                                  |                      |                 |
|   |             | Head Start Present vs. Non-Head Start    | -2.30***             | 0.64            |
|   |             | Head Start Present vs. Head Start Absent | -1.96                | 0.86            |
|   |             | Head Start Absent vs. Non-Head Start     | -0.32                | 0.86            |
|   |             | Constant                                 | 42.64                |                 |
| Statistics F = 2.82 R <sup>2</sup> = 0.04 MS <sub>e</sub> = 56.61 |             |  |                      |                 |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6-34 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) across Sites

| Dependent Variable                       | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup> |                       |                            |       |
|--|-------------|--|----------------------|-----------------------|----------------------------|-------|
|  |             |  | b                    | se <sub>b</sub>       |                            |       |
| Carbohydrate                             | 709         | Site                                     |                      |                       |                            |       |
|  |             | Greene & Humphreys                       | 0.70                 | 1.46                  |                            |       |
|  |             | St. Clair                                | 1.14                 | 1.56                  |                            |       |
|  |             | Maricopa                                 | -4.79**              | 1.80                  |                            |       |
|  |             | Mingo                                    | 2.94*                | 1.42                  |                            |       |
|  |             | Program                                  |                      |                       |                            |       |
|  |             | Head Start Present vs. Non-Head Start    | 2.80                 | 1.84                  |                            |       |
|  |             | Head Start Present vs. Head Start Absent | 4.14                 | 2.42                  |                            |       |
|  |             | Head Start Absent vs. Non-Head Start     | -1.34                | 2.44                  |                            |       |
|  |             | Constant                                 | 118.07               |                       |                            |       |
|  |             | Statistics                               | F = 1.61             | R <sup>2</sup> = 0.03 | MS <sub>e</sub> = 461.14   |       |
|  |             | Calcium                                  | 713                  | Site                  |                            |       |
|  |             |  |                      | Greene & Humphreys    | -4.50                      | 12.19 |
| St. Clair                                | -50.11***   |  |                      | 13.06                 |                            |       |
| Maricopa                                 | 28.11       |  |                      | 15.09                 |                            |       |
| Mingo                                    | 26.50*      |  |                      | 11.97                 |                            |       |
| Program                                  |             |  |                      |                       |                            |       |
| Head Start Present vs. Non-Head Start    | 140.14***   |  |                      | 15.36                 |                            |       |
| Head Start Present vs. Head Start Absent | 131.74***   |  |                      | 20.22                 |                            |       |
| Head Start Absent vs. Non-Head Start     | 472.89      |  |                      |                       |                            |       |
| Constant                                 |             |  |                      |                       |                            |       |
| Statistics                               | F = 12.27   |  |                      | R <sup>2</sup> = 0.16 | MS <sub>e</sub> = 32466.59 |       |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance program.

<sup>c</sup> Centered without weights.

Table 6-34 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) across Sites

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup> |   |
|--------------------|-------------|--|----------------------|---|
|                    |             |  | b                    | ss <sub>D</sub>                                 |
|                    |             | Site                                     |                      |   |
| Iron               | 707         | Greene & Humphreys                       | 0.57**               | 0.20  |
|                    |             | St. Clair                                | -0.60                | 0.22  |
|                    |             | Maricopa                                 | -0.24                | 0.25  |
|                    |             | Mingo                                    | -0.27                | 0.20  |
|                    |             | Program                                  |                      |   |
|                    |             | Head Start Present vs. Non-Head Start    | -0.32*               | 0.16  |
|                    |             | Head Start Present vs. Head Start Absent | -0.40*               | 0.20  |
|                    |             | Head Start Absent vs. Non-Head Start     | 0.10                 | 0.20  |
|                    |             | Constant                                 | 5.21                 |   |
| Statistics         |             |  | F = 4.18             | R <sup>2</sup> = 0.06 MS <sub>e</sub> = 6.93    |
|                    |             | Site                                     |                      |   |
| Magnesium          | 710         | Greene & Humphreys                       | 4.29                 | 2.32  |
|                    |             | St. Clair                                | -1.27                | 2.47  |
|                    |             | Maricopa                                 | -4.59                | 2.86  |
|                    |             | Mingo                                    | 1.57                 | 2.29  |
|                    |             | Program                                  |                      |   |
|                    |             | Head Start Present vs. Non-Head Start    | 17.98***             | 2.74  |
|                    |             | Head Start Present vs. Head Start Absent | 19.16***             | 3.62  |
|                    |             | Head Start Absent vs. Non-Head Start     | 112.40               |   |
|                    |             | Constant                                 |                      |   |
| Statistics         |             |  | F = 8.71             | R <sup>2</sup> = 0.12 MS <sub>e</sub> = 1169.34 |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.



Table 6-34 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) across Sites

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup> |                       |                               |
|--------------------|-------------|--|----------------------|-----------------------|-------------------------------|
|                    |             |  | b                    | se <sub>b</sub>       |                               |
| Phosphorus         | 712         | Site                                     |                      |                       |                               |
|                    |             | Greene & Humphreys                       | 11.77                | 10.52                 |                               |
|                    |             | St. Clair                                | -53.53***            | 11.20                 |                               |
|                    |             | Maricopa                                 | 15.77                | 12.95                 |                               |
|                    |             | Mingo                                    | 25.99*               | 10.25                 |                               |
|                    |             | Program                                  |                      |                       |                               |
|                    |             | Head Start Present vs. Non-Head Start    | 90.90***             | 13.16                 |                               |
|                    |             | Head Start Present vs. Head Start Absent | 86.18***             | 17.34                 |                               |
|                    |             | Head Start Absent vs. Non-Head Start     | 4.72                 | 17.38                 |                               |
|                    |             | Constant                                 |                      | 645.89                |                               |
| Statistics         |             |  | F = 8.48             | R <sup>2</sup> = 0.12 | MS <sub>e</sub> = 24007.04    |
| Vitamin A          | 761         | Site                                     |                      |                       |                               |
|                    |             | Greene & Humphreys                       | 1222.13***           | 248.68                |                               |
|                    |             | St. Clair                                | -500.67              | 263.47                |                               |
|                    |             | Maricopa                                 | -253.03              | 304.51                |                               |
|                    |             | Mingo                                    | -442.95              | 267.78                |                               |
|                    |             | Program                                  |                      |                       |                               |
|                    |             | Head Start Present vs. Non-Head Start    | 1944.68***           | 332.84                |                               |
|                    |             | Head Start Present vs. Head Start Absent | 1331.82              | 436.72                |                               |
|                    |             | Head Start Absent vs. Non-Head Start     | 612.88               | 440.30                |                               |
|                    |             | Constant                                 |                      | 3871.72               |                               |
| Statistics         |             |  | F = 9.21             | R <sup>2</sup> = 0.12 | MS <sub>e</sub> = 14649054.35 |

<sup>a</sup> Significance shown as:

\*p < .05  
 \*\*p < .01  
 \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6-34 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) across Sites

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>   |                       |
|--------------------|-------------|--|------------------------|-----------------------|
|                    |             |  | b                      | se <sub>b</sub>       |
|                    |             | Site                                     |                        |                       |
| Thiamin            | 694         | Greene & Humphreys                       | 0.52**                 | 0.02                  |
|                    |             | St. Clair                                | 0.16                   | 0.02                  |
|                    |             | Maricopa                                 | -0.66**                | 0.02                  |
|                    |             | Mingo                                    | -0.16                  | 0.02                  |
|                    |             | Program                                  |                        |                       |
|                    |             | Head Start Present vs. Non-Head Start    | -0.02                  | 0.02                  |
|                    |             | Head Start Present vs. Head Start Absent | -0.06*                 | 0.02                  |
|                    |             | Head Start Absent vs. Non-Head Start     | 0.04                   | 0.02                  |
|                    |             | Constant                                 | 0.68                   |                       |
|                    |             | Statistics                               | F = 2.41               | R <sup>2</sup> = 0.04 |
|                    |             |  | MS <sub>e</sub> = 0.06 |                       |
|                    |             | Site                                     |                        |                       |
| Riboflavin         | 704         | Greene & Humphreys                       | 0.12***                | 0.03                  |
|                    |             | St. Clair                                | -0.62                  | 0.03                  |
|                    |             | Maricopa                                 | -0.44                  | 0.04                  |
|                    |             | Mingo                                    | -0.15                  | 0.03                  |
|                    |             | Program                                  |                        |                       |
|                    |             | Head Start Present vs. Non-Head Start    | 0.06***                | 0.04                  |
|                    |             | Head Start Present vs. Head Start Absent | 0.12**                 | 0.04                  |
|                    |             | Head Start Absent vs. Non-Head Start     | 0.06                   | 0.04                  |
|                    |             | Constant                                 | 1.05                   |                       |
|                    |             | Statistics                               | F = 6.17               | R <sup>2</sup> = 0.09 |
|                    |             |  | MS <sub>e</sub> = 0.21 |                       |

<sup>a</sup> Significance shown as:

\*p < .05  
 \*\*p < .01  
 \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6-34 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) across Sites

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup> |                       |                         |
|--------------------|-------------|--|----------------------|-----------------------|-------------------------|
|                    |             |  | b                    | se <sub>b</sub>       |                         |
|                    |             | Site                                     |                      |                       |                         |
| Niacin             | 695         | Greene & Humphreys                       | 1.30***              | 0.26                  |                         |
|                    |             | St. Clair                                | 0.18                 | 0.28                  |                         |
|                    |             | Maricopa                                 | -0.86**              | 0.33                  |                         |
|                    |             | Mingo                                    | -0.62*               | 0.26                  |                         |
|                    |             | Program                                  |                      |                       |                         |
|                    |             | Head Start Present vs. Non-Head Start    | -0.46                | 0.26                  |                         |
|                    |             | Head Start Present vs. Head Start Absent | -0.62                | 0.36                  |                         |
|                    |             | Head Start Absent vs. Non-Head Start     | 0.14                 | 0.36                  |                         |
|                    |             | Constant                                 | 8.53                 |                       |                         |
|                    |             | Statistics                               | F = 6.43             | R <sup>2</sup> = 0.09 | MS <sub>e</sub> = 14.61 |
|                    |             | Site                                     |                      |                       |                         |
| Vitamin B6         | 706         | Greene & Humphreys                       | 0.98***              | 0.03                  |                         |
|                    |             | St. Clair                                | -0.55                | 0.03                  |                         |
|                    |             | Maricopa                                 | -0.11                | 0.03                  |                         |
|                    |             | Mingo                                    | -0.33                | 0.03                  |                         |
|                    |             | Program                                  |                      |                       |                         |
|                    |             | Head Start Present vs. Non-Head Start    | 0.00                 | 0.02                  |                         |
|                    |             | Head Start Present vs. Head Start Absent | -0.02                | 0.04                  |                         |
|                    |             | Head Start Absent vs. Non-Head Start     | 0.02                 | 0.04                  |                         |
|                    |             | Constant                                 | 0.69                 |                       |                         |
|                    |             | Statistics                               | F = 3.50             | R <sup>2</sup> = 0.05 | MS <sub>e</sub> = 0.15  |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6-34 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) across Sites

| Dependent Variable  | Sample Size | Factors <sup>b</sup> | Effects <sup>c</sup> |                 |
|---|-------------|----------------------|----------------------|-----------------|
|   |             |                      | b                    | se <sub>b</sub> |
| Site  |             |                      |                      |                 |
| Vitamin B12   | 730         | Greene & Humphreys   | 0.84                 | 0.71            |
|   |             | St. Clair            | 0.77                 | 0.75            |
|   |             | Maricopa             | -0.60                | 0.86            |
|   |             | Mingo                | -1.35                | 0.70            |
| Program   |             |                      |                      |                 |
| Head Start Present vs. Non-Head Start                               |             |                      | 0.48***              | 0.12            |
| Head Start Present vs. Head Start Absent                            |             |                      | 0.14                 | 0.16            |
| Head Start Absent vs. Non-Head Start                                |             |                      | 0.34*                | 0.16            |
| Constant  |             |                      | 1.79                 |                 |
| Statistics F = 1.20 R <sup>2</sup> = 0.03 MS <sub>e</sub> = 111.88  |             |                      |                      |                 |
| Site  |             |                      |                      |                 |
| Vitamin C   | 717         | Greene & Humphreys   | 3.58                 | 3.61            |
|   |             | St. Clair            | 14.24***             | 3.91            |
|   |             | Maricopa             | -9.69*               | 4.48            |
|   |             | Mingo                | -8.14*               | 3.56            |
| Program   |             |                      |                      |                 |
| Head Start Present vs. Non-Head Start                               |             |                      | 2.44                 | 4.32            |
| Head Start Present vs. Head Start Absent                            |             |                      | -6.58                | 5.70            |
| Head Start Absent vs. Non-Head Start                                |             |                      | 9.00                 | 5.72            |
| Constant  |             |                      | 81.97                |                 |
| Statistics F = 3.77 R <sup>2</sup> = 0.05 MS <sub>e</sub> = 2918.36 |             |                      |                      |                 |

<sup>a</sup> Significance shown as:

\*p < .05  
 \*\*p < .01  
 \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6-34 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) across Sites

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup> |                       |                            |
|--------------------|-------------|--|----------------------|-----------------------|----------------------------|
|                    |             |  | b                    | se <sub>b</sub>       |                            |
|                    |             | Site                                     |                      |                       |                            |
| Cholesterol        | 708         | Greene & Humphreys                       | -6.94                | 8.23                  |                            |
|                    |             | St. Clair                                | -7.33                | 8.68                  |                            |
|                    |             | Maricopa                                 | 25.31*               | 10.02                 |                            |
|                    |             | Ningo                                    | -9.04                | 7.95                  |                            |
|                    |             | Program                                  |                      |                       |                            |
|                    |             | Head Start Present vs. Non-Head Start    | -15.40               | 10.26                 |                            |
|                    |             | Head Start Present vs. Head Start Absent | -35.44**             | 13.56                 |                            |
|                    |             | Head Start Absent vs. Non-Head Start     | 20.06                | 13.58                 |                            |
|                    |             | Constant                                 | 238.94               |                       |                            |
| Statistics         |             |  | F = 1.56             | R <sup>2</sup> = 0.02 | MS <sub>e</sub> = 14340.18 |

<sup>a</sup> Significance shown as:

\*p < .05  
 \*\*p < .01  
 \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6-35

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>    |                 |
|--------------------|-------------|--|-------------------------|-----------------|
|                    |             |  | b                       | SE <sub>b</sub> |
| Protein            | 196         | Greene & Humphreys                       |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 2.78 *                  | 1.14            |
|                    |             | Head Start-Present vs. Head Start-Absent | 4.44                    | 2.62            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 1.66                    | 2.62            |
|                    |             | Constant                                 | 26.81                   |                 |
| Statistics         |             | F = 1.93 R <sup>2</sup> = 0.08           | MS <sub>e</sub> = 54.78 |                 |
|                    | 169         | St. Clair                                |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 1.68                    | 1.42            |
|                    |             | Head Start-Present vs. Head Start-Absent | -0.92                   | 1.72            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -2.60                   | 1.70            |
|                    |             | Constant                                 | 42.32                   |                 |
| Statistics         |             | F = 1.73 R <sup>2</sup> = 0.08           | MS <sub>e</sub> = 56.98 |                 |
|                    | 143         | Maricopa                                 |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 2.12                    | 1.64            |
|                    |             | Head Start-Present vs. Head Start-Absent | 2.00                    | 1.70            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -5.16                   | 3.32            |
|                    |             | Constant                                 | 25.39                   |                 |
| Statistics         |             | F = 0.88 R <sup>2</sup> = 0.05           | MS <sub>e</sub> = 64.67 |                 |
|                    | 204         | Mingo                                    |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 3.12                    | 1.96            |
|                    |             | Head Start-Present vs. Head Start-Absent | 1.32                    | 0.07            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -1.80                   | 68.85           |
|                    |             | Constant                                 | 36.55                   |                 |
| Statistics         |             | F = 1.96 R <sup>2</sup> = 0.07           | MS <sub>e</sub> = 68.85 |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education.

<sup>c</sup> Centered without weights.

Table 6-35 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site.

| Dependent Variable <sup>1</sup> | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>    | SE <sub>b</sub> |
|---------------------------------|-------------|--|-------------------------|-----------------|
| Fat                             | 195         | Greene & Humphreys                       |                         |                 |
|                                 |             | Head Start-Present vs. Non-Head Start    | -1.20                   | 1.24            |
|                                 |             | Head Start-Present vs. Head Start-Absent | 0.50                    | 2.70            |
|                                 |             | Head Start-Absent vs. Non-Head Start     | 1.70                    | 2.72            |
|                                 |             | Constant                                 | 41.49                   |                 |
| Statistics                      | F = 1.00    | R <sup>2</sup> = 0.04                    | MS <sub>e</sub> = 64.52 |                 |
|                                 | 167         | St. Clair                                |                         |                 |
|                                 |             | Head Start-Present vs. Non-Head Start    | -3.98 **                | 1.24            |
|                                 |             | Head Start-Present vs. Head Start-Absent | -5.08 ***               | 1.52            |
|                                 |             | Head Start-Absent vs. Non-Head Start     | -1.10                   | 1.52            |
|                                 |             | Constant                                 | 42.69                   |                 |
| Statistics                      | F = 4.54    | R <sup>2</sup> = 0.19                    | MS <sub>e</sub> = 43.48 |                 |
|                                 | 145         | Maricopa                                 |                         |                 |
|                                 |             | Head Start-Present vs. Non-Head Start    | -1.66                   | 1.48            |
|                                 |             | Head Start Present vs. Head Start-Absent | 1.04                    | 1.56            |
|                                 |             | Head Start-Absent vs. Non-Head Start     | 1.35                    | 1.62            |
|                                 |             | Constant                                 | 37.00                   |                 |
| Statistics                      | F = 1.37    | R <sup>2</sup> = 0.07                    | MS <sub>e</sub> = 54.52 |                 |
|                                 | 198         | Mingo                                    |                         |                 |
|                                 |             | Head Start-Present vs. Non-Head Start    | -2.98 *                 | 1.30            |
|                                 |             | Head Start-Present vs. Head Start-Absent | -3.98 *                 | 1.62            |
|                                 |             | Head Start-Absent vs. Non-Head Start     | -0.98                   | 1.54            |
|                                 |             | Constant                                 | 44.18                   |                 |
| Statistics                      | F = 1.38    | R <sup>2</sup> = 0.06                    | MS <sub>e</sub> = 57.78 |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education.

<sup>c</sup> Centered without weights.

Table 6-35 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup><br>b | SE <sub>D</sub> |
|--------------------|-------------|--|---------------------------|-----------------|
| Carbohydrate       | 197         | Greene & Humphreys                       |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.60                      | 3.40            |
|                    |             | Head Start-Present vs. Head Start-Absent | -3.00                     | 7.32            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -3.60                     | 7.38            |
|                    |             | Constant                                 | 124.07                    |                 |
| Statistics         | F = 0.52    | R <sup>2</sup> = 0.02                    | MS <sub>e</sub> = 476.38  |                 |
|                    | 167         | St. Clair                                |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 8.78 *                    | 3.46            |
|                    |             | Head Start-Present vs. Head Start-Absent | 15.32 ***                 | 4.16            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 6.54                      | 4.12            |
|                    |             | Constant                                 | 110.46                    |                 |
| Statistics         | F = 5.16    | R <sup>2</sup> = 0.21                    | MS <sub>e</sub> = 331.04  |                 |
|                    | 143         | Maricopa                                 |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 1.86                      | 4.58            |
|                    |             | Head Start-Present vs. Head Start-Absent | -4.60                     | 4.80            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -6.46                     | 5.04            |
|                    |             | Constant                                 | 150.50                    |                 |
| Statistics         | F = 0.98    | R <sup>2</sup> = 0.06                    | MS <sub>e</sub> = 515.16  |                 |
|                    | 201         | Mingo                                    |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 2.62                      | 3.68            |
|                    |             | Head Start-Present vs. Head Start-Absent | 8.04                      | 4.60            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 5.44                      | 4.38            |
|                    |             | Constant                                 | 116.59                    |                 |
| Statistics         | F = 0.87    | R <sup>2</sup> = 0.03                    | MS <sub>e</sub> = 481.12  |                 |

<sup>a</sup> Significance shown as:

\*p<.05

\*\*p<.01

\*\*\*p<.001

<sup>b</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education.

<sup>c</sup> Centered without weights.



Table 6-35 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>       |                 |
|--------------------|-------------|--|----------------------------|-----------------|
|                    |             |  | b                          | SE <sub>b</sub> |
| Calcium            | 198         | Greene & Humphreys                       |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 189.26 ***                 | 24.96           |
|                    |             | Head Start-Present vs. Head Start-Absent | 251.04 ***                 | 53.90           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 61.74                      | 54.30           |
|                    |             | Constant                                 | 424.73                     |                 |
| Statistics         |             | F = 11.18 R <sup>2</sup> = 0.32          | MS <sub>e</sub> = 25812.65 |                 |
|                    | 167         | St. Clair                                |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 166.22 ***                 | 32.08           |
|                    |             | Head Start-Present vs. Head Start-Absent | 107.74 **                  | 38.52           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -8.48                      | 38.10           |
|                    |             | Constant                                 | 398.04                     |                 |
| Statistics         |             | F = 6.73 R <sup>2</sup> = 0.25           | MS <sub>e</sub> = 28413.09 |                 |
|                    | 142         | Maricopa                                 |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 81.08 *                    | 41.32           |
|                    |             | Head Start-Present vs. Head Start Absent | 77.44                      | 42.78           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 160.42                     | 86.32           |
|                    |             | Constant                                 | 486.43                     |                 |
| Statistics         |             | F = 1.34 R <sup>2</sup> = 0.07           | MS <sub>e</sub> = 41110.91 |                 |
|                    | 204         | Mingo                                    |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 107.16 ***                 | 30.34           |
|                    |             | Head Start-Present vs. Head Start-Absent | 102.22 **                  | 38.06           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -4.94                      | 36.36           |
|                    |             | Constant                                 | 512.86                     |                 |
| Statistics         |             | F = 2.53 R <sup>2</sup> = 0.09           | MS <sub>e</sub> = 33179.52 |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education.

<sup>c</sup> Centered without weights.

Table 6-35 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup><br>b | SE <sub>b</sub> |
|--------------------|-------------|--|---------------------------|-----------------|
| Iron               | 187         | Greene & Humphreys                       |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -0.04                     | 0.30            |
|                    |             | Head Start-Present vs. Head Start-Absent | -0.03                     | 0.66            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.30                     | 0.66            |
|                    |             | Constant                                 | 6.07                      |                 |
| Statistics         | F = 0.26    | R <sup>2</sup> = 0.01                    | MS <sub>e</sub> = 3.38    |                 |
|                    | 164         | St. Clair                                |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -1.00                     | 0.34            |
|                    |             | Head Start-Present vs. Head Start-Absent | -0.32                     | 0.42            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.18                     | 0.42            |
|                    |             | Constant                                 | 4.52                      |                 |
| Statistics         | F = 0.93    | R <sup>2</sup> = 0.05                    | MS <sub>e</sub> = 3.22    |                 |
|                    | 139         | Maricopa                                 |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -0.58                     | 1.30            |
|                    |             | Head Start-Present vs. Head Start-Absent | -0.62                     | 0.07            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.82                     | 3.60            |
|                    |             | Constant                                 | 6.78                      |                 |
| Statistics         | F = _____   | R <sup>2</sup> = _____                   | MS <sub>e</sub> = _____   |                 |
|                    | 200         | Mingò                                    |                           |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -0.28 <sup>*</sup>        | 0.24            |
|                    |             | Head Start-Present vs. Head Start-Absent | -0.48                     | 0.32            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.20                     | 0.32            |
|                    |             | Constant                                 | 4.77                      |                 |
| Statistics         | F = 3.47    | R <sup>2</sup> = 0.13                    | MS <sub>e</sub> = 2.18    |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education.

<sup>c</sup> Centered without weights.

Table 6-35 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>           |                           |
|--------------------|-------------|--|--------------------------------|---------------------------|
|                    |             |  | b                              | SE <sub>b</sub>           |
| Magnesium          | 211         | Greene & Humphreys                       |                                |                           |
|                    |             | Head Start-Present vs. Non-Head Start    | 16.52 ***                      | 4.96                      |
|                    |             | Head Start-Present vs. Head Start-Absent | 21.02 *                        | 10.70                     |
|                    |             | Head Start-Absent vs. Non-Head Start     | 4.52                           | 10.78                     |
|                    |             | Constant                                 | 101.39                         |                           |
| Statistics         |             | F = 3.98 R <sup>2</sup> = 0.14           | MS <sub>e</sub> = 1017.26      |                           |
|                    | 1.68        | St. Clair                                |                                |                           |
|                    |             | Head Start-Present vs. Non-Head Start    | 26.08 ***                      | 5.82                      |
|                    |             | Head Start-Present vs. Head Start-Absent | 24.06 ***                      | 7.06                      |
|                    |             | Head Start-Absent vs. Non-Head Start     | -2.02                          | 6.96                      |
|                    |             | Constant                                 | 0.27                           |                           |
|                    |             | Statistics                               | F = 7.49 R <sup>2</sup> = 0.27 | MS <sub>e</sub> = 955.55  |
|                    | 144         | Maricopa                                 |                                |                           |
|                    |             | Head Start-Present vs. Non-Head Start    | 14.02 *                        | 7.08                      |
|                    |             | Head Start-Present vs. Head Start-Absent | 16.44 **                       | 7.42                      |
|                    |             | Head Start-Absent vs. Non-Head Start     | 2.44                           | 7.78                      |
|                    |             | Constant                                 | 128.52                         |                           |
|                    |             | Statistics                               | F = 1.39 R <sup>2</sup> = 0.08 | MS <sub>e</sub> = 1235.19 |
|                    | 201         | Mingo                                    |                                |                           |
|                    |             | Head Start-Present vs. Non-Head Start    | 11.30 *                        | 4.98                      |
|                    |             | Head Start-Present vs. Head Start-Absent | 14.40                          | 6.20                      |
|                    |             | Head Start-Absent vs. Non-Head Start     | 3.10                           | 5.92                      |
|                    |             | Constant                                 | 138.75                         |                           |
|                    |             | Statistics                               | F = 4.18 R <sup>2</sup> = 0.15 | MS <sub>e</sub> = 872.65  |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6-35 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>       |                 |
|--------------------|-------------|--|----------------------------|-----------------|
|                    |             |  | b                          | SE <sub>b</sub> |
| Phosphorous        | 211         | Greene & Humphreys                       |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 138.48 ***                 | 21.20           |
|                    |             | Head Start-Present vs. Head Start-Absent | 188.94 ***                 | 45.82           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 50.46                      | 46.14           |
|                    |             | Constant                                 | 616.80                     |                 |
| Statistics         |             | F = 9.05    R <sup>2</sup> = 0.28        | MS <sub>e</sub> = 18653.28 |                 |
|                    | 167         | St. Clair                                |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 79.52 **                   | 28.74           |
|                    |             | Head Start-Present vs. Head Start-Absent | 56.68                      | 34.52           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -22.84                     | 34.14           |
|                    |             | Constant                                 | 590.51                     |                 |
| Statistics         |             | F = 5.43    R <sup>2</sup> = 0.22        | MS <sub>e</sub> = 22799.71 |                 |
|                    | 144         | Maricopa                                 |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 56.56                      | 31.42           |
|                    |             | Head Start-Present vs. Head Start-Absent | 60.82                      | 32.70           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 4.28                       | 34.06           |
|                    |             | Constant                                 | 562.14                     |                 |
| Statistics         |             | F = 1.22    R <sup>2</sup> = 0.07        | MS <sub>e</sub> = 24208.30 |                 |
|                    | 204         | Mingo                                    |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 31.58                      | 26.60           |
|                    |             | Head Start-Present vs. Head Start-Absent | 39.22                      | 33.34           |
|                    |             | Head Start-Absent vs. Non-Head Start     | 7.64                       | 31.90           |
|                    |             | Constant                                 | 687.98                     |                 |
| Statistics         |             | F = 1.60    R <sup>2</sup> = 0.06        | MS <sub>e</sub> = 25494.58 |                 |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6-35 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>   |                 |
|--------------------|-------------|--|------------------------|-----------------|
|                    |             |  | b                      | SE <sub>b</sub> |
| Vitamin A          | 196         | Greene & Humphreys                       |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.28 ***               | 0.06            |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.38 **                | 0.12            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 0.12                   | 0.12            |
|                    |             | Constant                                 | 3.35                   |                 |
| Statistics         |             | F = 5.29 R <sup>2</sup> = 0.18           | MS <sub>e</sub> = 0.14 |                 |
|                    | 167         | St. Clair                                |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.32 ***               | 0.06            |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.20 **                | 0.08            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.10                  | 0.08            |
|                    |             | Constant                                 | 3.10                   |                 |
| Statistics         |             | F = 7.33 R <sup>2</sup> = 0.27           | MS <sub>e</sub> = 0.10 |                 |
|                    | 141         | Maricopa                                 |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.10                   | 0.06            |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.18 **                | 0.06            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 0.10                   | 0.06            |
|                    |             | Constant                                 | 3.74                   |                 |
| Statistics         |             | F = 3.10 R <sup>2</sup> = 0.16           | MS <sub>e</sub> = 0.09 |                 |
|                    | 200         | Mingo                                    |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.22 ***               | 4.19            |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.12 *                 | 0.15            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.10                  | 0.08            |
|                    |             | Constant                                 | 3.40                   |                 |
| Statistics         |             | F = 4.19 R <sup>2</sup> = 0.15           | MS <sub>e</sub> = 0.08 |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6-35 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>   |                 |
|--------------------|-------------|--|------------------------|-----------------|
|                    |             |  | b                      | SE <sub>b</sub> |
| Thiamin            | 193         | Greene & Humphreys                       |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -0.08 *                | 0.04            |
|                    |             | Head Start-Present vs. Head Start-Absent | -0.16 *                | 0.08            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.10                  | 0.08            |
|                    |             | Constant                                 | 0.67                   |                 |
| Statistics         |             | F = 1.38 R <sup>2</sup> = 0.05           | MS <sub>e</sub> = 0.06 |                 |
|                    | 167         | St. Clair                                |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -0.06                  | 0.04            |
|                    |             | Head Start-Present vs. Head Start-Absent | -0.30                  | 0.06            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 0.04                   | 0.06            |
|                    |             | Constant                                 | 0.60*                  |                 |
| Statistics         |             | F = 1.94 R <sup>2</sup> = 0.08           | MS <sub>e</sub> = 0.57 |                 |
|                    | 139         | Maricopa                                 |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.04                   | 0.04            |
|                    |             | Head Start-Present vs. Head Start-Absent | -0.28                  | 0.14            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.38                  | 0.06            |
|                    |             | Constant                                 | 1.40                   |                 |
| Statistics         |             | F = 1.37 R <sup>2</sup> = 0.08           | MS <sub>e</sub> = 0.05 |                 |
|                    | 198         | Mingo                                    |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.02                   | 0.04            |
|                    |             | Head Start-Present vs. Head Start-Absent | -0.08                  | 0.04            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.08                  | 0.04            |
|                    |             | Constant                                 | 0.66                   |                 |
| Statistics         |             | F = 0.99 R <sup>2</sup> = 0.04           | MS <sub>e</sub> = 0.05 |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6-35 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>   |                 |
|--------------------|-------------|--|------------------------|-----------------|
|                    |             |  | b                      | SE <sub>b</sub> |
| Riboflavin         | 188         | Greene & Humphreys                       |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.24 ***               | 0.06            |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.30 *                 | 0.14            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 0.06                   | 0.14            |
|                    |             | Constant                                 | 1.28                   |                 |
| Statistics         |             | F = 2.39 R <sup>2</sup> = 0.10           | MS <sub>e</sub> = 0.17 |                 |
|                    | 166         | St. Clair                                |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.18 **                | 0.06            |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.14                   | 0.08            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.04                  | 0.08            |
|                    |             | Constant                                 | 0.63                   |                 |
| Statistics         |             | F = 5.04 R <sup>2</sup> = 0.20           | MS <sub>e</sub> = 0.11 |                 |
|                    | 141         | Maricopa                                 |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.08                   | 0.08            |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.06                   | 0.08            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.02                  | 0.08            |
|                    |             | Constant                                 | 1.35                   |                 |
| Statistics         |             | F = 0.57 R <sup>2</sup> = 0.03           | MS <sub>e</sub> = 0.11 |                 |
|                    | 202         | Mingo                                    |                        |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 0.84                   | 0.06            |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.02                   | 0.06            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.06                  | 0.06            |
|                    |             | Constant                                 | 0.99                   |                 |
| Statistics         |             | F = 1.41 R <sup>2</sup> = 0.06           | MS <sub>e</sub> = 0.10 |                 |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6-35 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>    |                 |
|--------------------|-------------|--|-------------------------|-----------------|
|                    |             |  | b                       | SE <sub>b</sub> |
| Niacin             | 191         | Greene & Humphreys                       |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -0.94                   | 0.54            |
|                    |             | Head Start-Present vs. Head Start-Absent | -0.70                   | 1.22            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 0.24                    | 1.24            |
|                    |             | Constant                                 | 9.84                    |                 |
| Statistics         |             | F = 1.22 R <sup>2</sup> = 0.05           | MS <sub>e</sub> = 11.95 |                 |
|                    | 167         | St. Clair                                |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -0.62                   | 0.48            |
|                    |             | Head Start-Present vs. Head Start-Absent | -0.78                   | 0.60            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.16                   | 0.60            |
|                    |             | Constant                                 | 6.80                    |                 |
| Statistics         |             | F = 1.42 R <sup>2</sup> = 0.07           | MS <sub>e</sub> = 6.63  |                 |
|                    | 140         | Maricopa                                 |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -0.30                   | 0.88            |
|                    |             | Head Start-Present vs. Head Start-Absent | 0.18                    | 0.56            |
|                    |             | Head Start-Absent vs. Non-Head Start     | 0.22                    | 0.58            |
|                    |             | Constant                                 | 6.09                    |                 |
| Statistics         |             | F = 0.37 R <sup>2</sup> = 0.02           | MS <sub>e</sub> = 6.83  |                 |
|                    | 200         | Mingo                                    |                         |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -0.10                   | 0.54            |
|                    |             | Head Start-Present vs. Head Start-Absent | -0.86                   | 0.70            |
|                    |             | Head Start-Absent vs. Non-Head Start     | -0.76                   | 0.66            |
|                    |             | Constant                                 | 7.78                    |                 |
| Statistics         |             | F = 0.00 R <sup>2</sup> = 0.03           | MS <sub>e</sub> = 0.43  |                 |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.



Table 6-35 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable     | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>   |                 |
|------------------------|-------------|--|------------------------|-----------------|
|                        |             |  | b                      | SE <sub>b</sub> |
| Vitamin B <sub>6</sub> | 190         | Greene & Humphreys                       |                        |                 |
|                        |             | Head Start-Present vs. Non-Head Start    | -0.06                  | 0.04            |
|                        |             | Head Start-Present vs. Head Start-Absent | -0.10                  | 0.10            |
|                        |             | Head Start-Absent vs. Non-Head Start     | -0.04                  | 0.10            |
|                        |             | Constant                                 | 0.73                   |                 |
| Statistics             |             | F = 0.87 R <sup>2</sup> = 0.03           | MS <sub>e</sub> = 0.08 |                 |
|                        | 163         | St. Clair                                |                        |                 |
|                        |             | Head Start-Present vs. Non-Head Start    | 0.08                   | 0.06            |
|                        |             | Head Start-Present vs. Head Start-Absent | 0.08                   | 0.06            |
|                        |             | Head Start-Absent vs. Non-Head Start     | 0.02                   | 0.06            |
|                        |             | Constant                                 | 0.49                   |                 |
| Statistics             |             | F = 1.65 R <sup>2</sup> = 0.08           | MS <sub>e</sub> = 0.07 |                 |
|                        | 144         | Maricopa                                 |                        |                 |
|                        |             | Head Start-Present vs. Non-Head Start    | -0.20                  | 0.12            |
|                        |             | Head Start-Present vs. Head Start-Absent | -0.02                  | 0.08            |
|                        |             | Head Start-Absent vs. Non-Head Start     | -0.02                  | 0.08            |
|                        |             | Constant                                 | 1.20                   |                 |
| Statistics             |             | F = 1.08 R <sup>2</sup> = 0.05           | MS <sub>e</sub> = 0.12 |                 |
|                        | 200         | Mingo                                    |                        |                 |
|                        |             | Head Start-Present vs. Non-Head Start    | -0.22 *                | 0.10            |
|                        |             | Head Start-Present vs. Head Start-Absent | -0.04                  | 0.06            |
|                        |             | Head Start-Absent vs. Non-Head Start     | -0.04                  | 0.06            |
|                        |             | Constant                                 | 0.63                   |                 |
| Statistics             |             | F = 1.63 R <sup>2</sup> = 0.06           | MS <sub>e</sub> = 0.10 |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6-35 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable      | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>   |                 |
|-------------------------|-------------|--|------------------------|-----------------|
|                         |             |  | b                      | SE <sub>b</sub> |
| Vitamin B <sub>12</sub> | 181         | Greene & Humphreys                       |                        |                 |
|                         |             | Head Start-Present vs. Non-Head Start    | 0.18 ***               | 0.04            |
|                         |             | Head Start-Present vs. Head Start-Absent | 0.40 ***               | 0.10            |
|                         |             | Head Start-Absent vs. Non-Head Start     | 0.22 *                 | 0.10            |
|                         |             | Constant                                 | 0.22                   |                 |
| Statistics              |             | F = 5.43 R <sup>2</sup> = 0.20           | MS <sub>e</sub> = 0.07 |                 |
|                         | 162         | St. Clair                                |                        |                 |
|                         |             | Head Start-Present vs. Non-Head Start    | 0.14 **                | 0.04            |
|                         |             | Head Start-Present vs. Head Start-Absent | 0.02                   | 0.06            |
|                         |             | Head Start-Absent vs. Non-Head Start     | -0.12                  | 0.06            |
|                         |             | Constant                                 | 0.34                   |                 |
| Statistics              |             | F = 3.88 R <sup>2</sup> = 0.17           | MS <sub>e</sub> = 0.05 |                 |
|                         | 143         | Maricopa                                 |                        |                 |
|                         |             | Head Start-Present vs. Non-Head Start    | 0.06                   | 0.06            |
|                         |             | Head Start-Present vs. Head Start-Absent | 0.06                   | 0.06            |
|                         |             | Head Start-Absent vs. Non-Head Start     | -0.24 *                | 0.10            |
|                         |             | Constant                                 | 0.75                   |                 |
| Statistics              |             | F = 1.81 R <sup>2</sup> = 0.09           | MS <sub>e</sub> = 0.07 |                 |
|                         | 203         | Mingo                                    |                        |                 |
|                         |             | Head Start-Present vs. Non-Head Start    | 0.20 ***               | 0.04            |
|                         |             | Head Start-Present vs. Head Start-Absent | 0.10                   | 0.06            |
|                         |             | Head Start-Absent vs. Non-Head Start     | -0.08                  | 0.06            |
|                         |             | Constant                                 | 0.41                   |                 |
| Statistics              |             | F = 3.27 R <sup>2</sup> = 0.12           | MS <sub>e</sub> = 0.07 |                 |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6-35 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable                       | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>      |                 |
|--|-------------|--|---------------------------|-----------------|
|  |             |  | b                         | SE <sub>b</sub> |
| Vitamin C                                | 198         | Greene & Humphreys                       |                           |                 |
|  |             | Head Start-Present vs. Non-Head Start    | -10.24                    | 8.14            |
|  |             | Head Start-Present vs. Head Start-Absent | -9.66                     | 17.60           |
|  |             | Head Start-Absent vs. Non-Head Start     | 0.22                      | 16.48           |
|  |             | Constant                                 | 63.08                     |                 |
| Statistics                               |             | F = 1.12 R <sup>2</sup> = 0.05           | MS <sub>e</sub> = 2742.38 |                 |
|  | 168         | St. Clair                                |                           |                 |
| Head Start-Present vs. Non-Head Start    |             | 15.88                                    | 10.68                     |                 |
| Head Start-Present vs. Head Start-Absent |             | -2.02                                    | 12.94                     |                 |
| Head Start-Absent vs. Non-Head Start     |             | -17.90                                   | 12.76                     |                 |
| Constant                                 |             | 110.81                                   |                           |                 |
| Statistics                               |             | F = 1.32 R <sup>2</sup> = 0.06           | MS <sub>e</sub> = 3208.36 |                 |
|  | 141         | Maricopa                                 |                           |                 |
| Head Start-Present vs. Non-Head Start    |             | 5.70                                     | 9.40                      |                 |
| Head Start-Present vs. Head Start-Absent |             | -2.26                                    | 9.86                      |                 |
| Head Start-Absent vs. Non-Head Start     |             | -7.96                                    | 10.28                     |                 |
| Constant                                 |             | 99.05                                    |                           |                 |
| Statistics                               |             | F = 0.74 R <sup>2</sup> = 0.04           | MS <sub>e</sub> = 2129.33 |                 |
|  | 197         | Mingo                                    |                           |                 |
| Head Start-Present vs. Non-Head Start    |             | 8.80                                     | 7.64                      |                 |
| Head Start-Present vs. Head Start-Absent |             | -4.58                                    | 9.52                      |                 |
| Head Start-Absent vs. Non-Head Start     |             | -13.38                                   | 9.06                      |                 |
| Constant                                 |             | 71.68                                    |                           |                 |
| Statistics                               |             | F = 1.19 R <sup>2</sup> = 0.05           | MS <sub>e</sub> = 2031.47 |                 |

<sup>a</sup> Significance shown as:

\*p < .05

\*\*p < .01

\*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6-35 (continued)

Regression Analyses<sup>a</sup> of Nutrient Density for Posttested Head Start and Non-Head Start Children (Samples A, B, C) within Site

| Dependent Variable | Sample Size | Factors <sup>b</sup>                     | Effects <sup>c</sup>       |                 |
|--------------------|-------------|--|----------------------------|-----------------|
|                    |             |  | b                          | SE <sub>b</sub> |
| Cholesterol        | 191         | Greene & Humphreys                       |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 21.60                      | 16.40           |
|                    |             | Head Start-Present vs. Head Start-Absent | 24.56                      | 37.00           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -28.14                     | 20.92           |
|                    |             | Constant                                 | 265.67                     |                 |
| Statistics         |             | F = 0.64 R <sup>2</sup> = 0.03           | MS <sub>e</sub> = 1097.73  |                 |
|                    | 166         | St. Clair                                |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | 13.08                      | 19.70           |
|                    |             | Head Start-Present vs. Head Start-Absent | -4.60                      | 23.82           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -17.64                     | 23.48           |
|                    |             | Constant                                 | 277.76                     |                 |
| Statistics         |             | F = 0.45 R <sup>2</sup> = 0.02           | MS <sub>e</sub> = 10844.99 |                 |
|                    | 146         | Maricopa                                 |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -35.52                     | 29.76           |
|                    |             | Head Start-Present vs. Head Start-Absent | -47.08                     | 31.24           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -11.58                     | 32.42           |
|                    |             | Constant                                 | -246.92                    |                 |
| Statistics         |             | F = 1.36 R <sup>2</sup> = 0.74           | MS <sub>e</sub> = 22134.81 |                 |
|                    | 205         | Mingo                                    |                            |                 |
|                    |             | Head Start-Present vs. Non-Head Start    | -59.52 **                  | 19.86           |
|                    |             | Head Start-Present vs. Head Start-Absent | -81.76 ***                 | 24.84           |
|                    |             | Head Start-Absent vs. Non-Head Start     | -22.24                     | 23.88           |
|                    |             | Constant                                 | 237.07                     |                 |
| Statistics         |             | F = 2.58 R <sup>2</sup> = 0.10           | MS <sub>e</sub> = 14219.91 |                 |

<sup>a</sup> Significance shown as:

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

<sup>b</sup> Adjusted for age, sex, employment status, participation in federal food assistance programs.

<sup>c</sup> Centered without weights.

Table 6-36

Total 24-Hour Nutrient Intake for Combined Groups of Head Start and Non-Head Start Children with Unadjusted Comparisons Among Samples within Site

|                          | Greene/Humphreys |         |        | St. Clair |         |        | Maricopa |         |        | Mingo |         |        |
|--------------------------|------------------|---------|--------|-----------|---------|--------|----------|---------|--------|-------|---------|--------|
|                          | N                | MEAN    | SD     | N         | MEAN    | SD     | N        | MEAN    | SD     | N     | MEAN    | SD     |
| <b>KILOCALORIES</b>      |                  |         |        |           |         |        |          |         |        |       |         |        |
| Sample A                 | 67               | 1550.42 | 480.32 | 37        | 1875.55 | 473.00 | 50       | 1423.31 | 477.16 | 34    | 1651.43 | 484.17 |
| Sample B                 | 49               | 1540.57 | 435.26 | 38        | 1909.88 | 436.65 | 10       | 1495.53 | 389.96 | 30    | 1667.16 | 425.18 |
| Sample C                 | 91               | 1624.88 | 448.04 | 95        | 1946.37 | 546.91 | 89       | 1476.34 | 501.18 | 145   | 1669.66 | 540.35 |
|                          | F=               | P=      |        | F=        | P=      |        | F=       | P=      |        | F=    | P=      |        |
|                          | 0.76             | 0.467   |        | 0.27      | 0.761   |        | 0.22     | 0.804   |        | 0.02  | 0.983   |        |
| <b>PROTEIN (GM)</b>      |                  |         |        |           |         |        |          |         |        |       |         |        |
| Sample A                 | 67               | 60.22   | 20.78  | 38        | 67.14   | 24.13  | 52       | 52.91   | 21.00  | 35    | 63.23   | 23.96  |
| Sample B                 | 49               | 60.36   | 18.99  | 38        | 64.36   | 20.78  | 9        | 53.82   | 13.86  | 30    | 60.65   | 17.30  |
| Sample C                 | 91               | 59.92   | 19.62  | 96        | 71.14   | 22.34  | 87       | 51.80   | 20.62  | 148   | 58.43   | 24.80  |
|                          | F=               | P=      |        | F=        | P=      |        | F=       | P=      |        | F=    | P=      |        |
|                          | 0.01             | 0.991   |        | 1.37      | 0.256   |        | 0.07     | 0.928   |        | 0.62  | 0.541   |        |
| <b>FAT (GM)</b>          |                  |         |        |           |         |        |          |         |        |       |         |        |
| Sample A                 | 66               | 62.29   | 21.38  | 37        | 77.89   | 25.64  | 51       | 62.73   | 29.20  | 33    | 67.87   | 22.67  |
| Sample B                 | 49               | 61.64   | 24.42  | 38        | 78.55   | 20.07  | 10       | 67.76   | 22.66  | 30    | 69.89   | 21.14  |
| Sample C                 | 90               | 64.99   | 22.93  | 95        | 81.39   | 28.07  | 89       | 62.12   | 24.97  | 144   | 66.25   | 23.38  |
|                          | F=               | P=      |        | F=        | P=      |        | F=       | P=      |        | F=    | P=      |        |
|                          | 0.44             | 0.643   |        | 0.31      | 0.737   |        | 0.21     | 0.814   |        | 0.34  | 0.713   |        |
| <b>CARBOHYDRATE (GM)</b> |                  |         |        |           |         |        |          |         |        |       |         |        |
| Sample A                 | 67               | 186.88  | 59.50  | 37        | 230.38  | 70.06  | 50       | 168.34  | 55.27  | 35    | 200.42  | 64.44  |
| Sample B                 | 49               | 191.64  | 56.18  | 38        | 239.87  | 69.51  | 10       | 161.02  | 49.95  | 30    | 203.07  | 63.47  |
| Sample C                 | 91               | 201.04  | 55.10  | 95        | 237.54  | 76.50  | 88       | 177.16  | 60.55  | 146   | 213.72  | 76.07  |
|                          | F=               | P=      |        | F=        | P=      |        | F=       | P=      |        | F=    | P=      |        |
|                          | 1.27             | 0.284   |        | 0.18      | 0.838   |        | 0.60     | 0.552   |        | 0.63  | 0.532   |        |

Table 6-36 (continued)

Total 24-Hour Nutrient Intake for Combined Groups of Head Start and Non-Head Start Children with Unadjusted Comparisons Among Samples within Site

|                        | Greene/Humphreys |         |        | St. Clair |         |        | Maricopa |        |        | Mingo |         |        |
|------------------------|------------------|---------|--------|-----------|---------|--------|----------|--------|--------|-------|---------|--------|
|                        | N                | MEAN    | SD     | N         | MEAN    | SD     | N        | MEAN   | SD     | N     | MEAN    | SD     |
| <b>CALCIUM (MG)</b>    |                  |         |        |           |         |        |          |        |        |       |         |        |
| Sample A               | 68               | 759.30  | 321.60 | 38        | 781.65  | 425.91 | 50       | 722.05 | 344.19 | 36    | 946.06  | 437.24 |
| Sample B               | 49               | 830.60  | 372.86 | 37        | 709.69  | 324.72 | 10       | 751.12 | 173.29 | 29    | 775.97  | 315.77 |
| Sample C               | 92               | 781.36  | 313.24 | 95        | 939.88  | 436.84 | 87       | 754.48 | 371.05 | 148   | 869.10  | 432.80 |
|                        | F=               | P=      |        | F=        | P=      |        | F=       | P=     |        | F=    | P=      |        |
|                        | 0.68             | 0.510   |        | 4.90      | 0.008   |        | 0.14     | 0.872  |        | 1.32  | 0.270   |        |
| <b>IRON (MG)</b>       |                  |         |        |           |         |        |          |        |        |       |         |        |
| Sample A               | 63               | 10.48   | 4.12   | 37        | 12.33   | 4.28   | 49       | 8.76   | 3.02   | 34    | 11.00   | 4.24   |
| Sample B               | 48               | 10.15   | 4.36   | 38        | 13.20   | 4.31   | 10       | 10.74  | 3.21   | 30    | 10.35   | 3.10   |
| Sample C               | 88               | 10.59   | 3.39   | 92        | 11.96   | 4.20   | 85       | 9.41   | 3.53   | 145   | 10.12   | 4.06   |
|                        | F=               | P=      |        | F=        | P=      |        | F=       | P=     |        | F=    | P=      |        |
|                        | 0.20             | 0.818   |        | 1.14      | 0.321   |        | 1.61     | 0.203  |        | 0.67  | 0.511   |        |
| <b>MAGNESIUM (MG)</b>  |                  |         |        |           |         |        |          |        |        |       |         |        |
| Sample A               | 68               | 193.83  | 68.56  | 38        | 222.45  | 85.33  | 52       | 157.79 | 67.81  | 35    | 212.52  | 73.75  |
| Sample B               | 48               | 209.32  | 66.12  | 38        | 219.84  | 92.24  | 10       | 181.53 | 53.80  | 30    | 202.92  | 85.05  |
| Sample C               | 93               | 221.57  | 84.40  | 95        | 250.39  | 96.67  | 87       | 179.60 | 79.26  | 145   | 203.40  | 82.91  |
|                        | F=               | P=      |        | F=        | P=      |        | F=       | P=     |        | F=    | P=      |        |
|                        | 2.65             | 0.073   |        | 2.08      | 0.128   |        | 1.50     | 0.227  |        | 0.18  | 0.831   |        |
| <b>PHOSPHORUS (MG)</b> |                  |         |        |           |         |        |          |        |        |       |         |        |
| Sample A               | 68               | 1036.48 | 409.86 | 38        | 1039.73 | 414.54 | 52       | 901.95 | 373.38 | 36    | 1214.68 | 486.39 |
| Sample B               | 48               | 1061.30 | 336.35 | 37        | 1000.32 | 335.81 | 10       | 977.09 | 241.39 | 30    | 1049.60 | 386.27 |
| Sample C               | 93               | 1066.90 | 404.39 | 95        | 1201.51 | 440.63 | 87       | 935.93 | 374.08 | 147   | 1083.06 | 430.89 |
|                        | F=               | P=      |        | F=        | P=      |        | F=       | P=     |        | F=    | P=      |        |
|                        | 0.13             | 0.883   |        | 4.09      | 0.018   |        | 0.24     | 0.78   |        | 1.56  | 0.212   |        |

Table 6-36 (continued)

Total 24-Hour Nutrient Intake for Combined Groups of Head Start and Non-Head Start Children with Unadjusted Comparisons Among Samples within Site

|                           | Greene/Humphreys |         |          | St. Clair |         |         | Maricopa |         |         | Ningo |         |         |
|---------------------------|------------------|---------|----------|-----------|---------|---------|----------|---------|---------|-------|---------|---------|
|                           | N                | MEAN    | SD       | N         | MEAN    | SD      | N        | MEAN    | SD      | N     | MEAN    | SD      |
| <b>LOG VITAMIN A (IU)</b> |                  |         |          |           |         |         |          |         |         |       |         |         |
| Sample A                  | 65               | 3.64    | 0.43     | 38        | 3.51    | 0.38    | 52       | 3.99    | 0.28    | 33    | 3.49    | 0.29    |
| Sample B                  | 49               | 3.70    | 0.38     | 38        | 3.55    | 0.38    | 10       | 3.60    | 0.21    | 29    | 3.46    | 0.28    |
| Sample C                  | 93               | 3.68    | 0.42     | 93        | 3.62    | 0.36    | 83       | 3.43    | 0.33    | 146   | 3.49    | 0.31    |
|                           | F=               | P=      |          | F=        | P=      |         | F=       | P=      |         | F=    | P=      |         |
|                           | 0.29             | 0.751   |          | 1.42      | 0.243   |         | 2.12     | 0.124   |         | 0.13  | 0.883   |         |
| <b>VITAMIN A (IU)</b>     |                  |         |          |           |         |         |          |         |         |       |         |         |
| Sample A                  | 65               | 7717.53 | 10450.71 | 38        | 4476.09 | 3874.96 | 52       | 3010.58 | 2212.77 | 33    | 3760.22 | 2651.66 |
| Sample B                  | 49               | 8020.50 | 10924.15 | 38        | 5439.81 | 6678.06 | 10       | 4476.20 | 2593.74 | 29    | 3499.36 | 2303.56 |
| Sample C                  | 93               | 7717.72 | 8364.00  | 93        | 5880.96 | 5734.89 | 83       | 3631.14 | 3125.14 | 146   | 3898.23 | 2648.58 |
|                           | F=               | P=      |          | F=        | P=      |         | F=       | P=      |         | F=    | P=      |         |
|                           | 0.02             | 0.982   |          | 0.84      | 0.431   |         | 1.49     | 0.230   |         | 0.29  | 0.745   |         |
| <b>THIAMIN (MG)</b>       |                  |         |          |           |         |         |          |         |         |       |         |         |
| Sample A                  | 68               | 1.29    | 0.55     | 38        | 1.43    | 0.58    | 50       | 0.98    | 0.42    | 35    | 1.27    | 0.57    |
| Sample B                  | 49               | 1.16    | 0.51     | 38        | 1.54    | 0.58    | 10       | 1.03    | 0.32    | 30    | 1.16    | 0.39    |
| Sample C                  | 87               | 1.27    | 0.48     | 94        | 1.47    | 0.62    | 84       | 1.03    | 0.44    | 142   | 1.20    | 0.48    |
|                           | F=               | P=      |          | F=        | P=      |         | F=       | P=      |         | F=    | P=      |         |
|                           | 1.02             | 0.362   |          | 0.35      | 0.707   |         | 0.21     | 0.813   |         | 0.47  | 0.628   |         |
| <b>RIBOFLAVIN (MG)</b>    |                  |         |          |           |         |         |          |         |         |       |         |         |
| Sample A                  | 64               | 1.82    | 0.77     | 38        | 1.83    | 0.77    | 49       | 1.40    | 0.56    | 34    | 1.87    | 0.70    |
| Sample B                  | 46               | 1.75    | 0.71     | 38        | 1.85    | 0.83    | 10       | 1.66    | 0.33    | 30    | 1.63    | 0.56    |
| Sample C                  | 89               | 1.80    | 0.72     | 93        | 2.06    | 0.89    | 87       | 1.58    | 0.70    | 146   | 1.74    | 0.76    |
|                           | F=               | P=      |          | F=        | P=      |         | F=       | P=      |         | F=    | P=      |         |
|                           | 0.12             | 0.885   |          | 1.50      | 0.226   |         | 1.43     | 0.243   |         | 0.86  | 0.425   |         |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6-36 (continued)

Total 24-Hour Nutrient Intake for Combined Groups of Head Start and Non-Head Start Children with Unadjusted Comparisons Among Samples within Site

|                           | Greene/Humphreys |       |      | St. Clair |       |      | Maricopa |       |      | Mingo |       |      |
|---------------------------|------------------|-------|------|-----------|-------|------|----------|-------|------|-------|-------|------|
|                           | N                | MEAN  | SD   | N         | MEAN  | SD   | N        | MEAN  | SD   | N     | MEAN  | SD   |
| <b>NIACIN (MG)</b>        |                  |       |      |           |       |      |          |       |      |       |       |      |
| Sample A                  | 65               | 14.85 | 6.31 | 37        | 16.27 | 6.76 | 50       | 10.57 | 5.03 | 34    | 14.32 | 8.02 |
| Sample B                  | 49               | 15.08 | 6.72 | 38        | 17.08 | 6.89 | 10       | 13.60 | 4.96 | 30    | 12.98 | 3.72 |
| Sample C                  | 88               | 14.20 | 5.41 | 95        | 16.76 | 6.97 | 85       | 11.36 | 4.95 | 145   | 12.99 | 6.12 |
|                           | F=               | P=    |      | F=        | P=    |      | F=       | P=    |      | F=    | P=    |      |
|                           | 0.41             | 0.666 |      | 0.13      | 0.877 |      | 1.59     | 0.207 |      | 0.66  | 0.517 |      |
| <b>VITAMIN B6 (MG)</b>    |                  |       |      |           |       |      |          |       |      |       |       |      |
| Sample A                  | 65               | 1.29  | 0.54 | 36        | 1.29  | 0.64 | 51       | 1.09  | 0.55 | 35    | 1.33  | 0.59 |
| Sample B                  | 47               | 1.38  | 0.51 | 37        | 1.32  | 0.82 | 10       | 1.31  | 0.65 | 30    | 1.11  | 0.37 |
| Sample C                  | 88               | 1.27  | 0.46 | 93        | 1.41  | 0.63 | 88       | 1.14  | 0.53 | 144   | 1.19  | 0.60 |
|                           | F=               | P=    |      | F=        | P=    |      | F=       | P=    |      | F=    | P=    |      |
|                           | 0.03             | 0.966 |      | 0.64      | 0.527 |      | 0.70     | 0.499 |      | 1.24  | 0.292 |      |
| <b>LOG VIT. B12 (MCQ)</b> |                  |       |      |           |       |      |          |       |      |       |       |      |
| Sample A                  | 59               | 0.47  | 0.27 | 38        | 0.52  | 0.21 | 52       | 0.47  | 0.23 | 34    | 0.55  | 0.21 |
| Sample B                  | 45               | 0.47  | 0.28 | 37        | 0.50  | 0.24 | 9        | 0.59  | 0.22 | 30    | 0.51  | 0.21 |
| Sample C                  | 86               | 0.48  | 0.30 | 90        | 0.56  | 0.25 | 87       | 0.45  | 0.28 | 146   | 0.46  | 0.30 |
|                           | F=               | P=    |      | F=        | P=    |      | F=       | P=    |      | F=    | P=    |      |
|                           | 0.07             | 0.935 |      | 1.06      | 0.347 |      | 1.14     | 0.323 |      | 1.73  | 0.180 |      |
| <b>VITAMIN B12 (MCG)</b>  |                  |       |      |           |       |      |          |       |      |       |       |      |
| Sample A                  | 59               | 3.52  | 2.44 | 38        | 3.68  | 1.70 | 52       | 3.33  | 1.71 | 34    | 3.93  | 1.78 |
| Sample B                  | 45               | 3.62  | 2.55 | 37        | 3.69  | 2.25 | 9        | 4.39  | 2.18 | 30    | 3.58  | 1.65 |
| Sample C                  | 86               | 3.93  | 3.47 | 90        | 4.22  | 2.19 | 87       | 3.43  | 1.98 | 146   | 3.46  | 2.02 |
|                           | F=               | P=    |      | F=        | P=    |      | F=       | P=    |      | F=    | P=    |      |
|                           | 0.36             | 0.697 |      | 1.34      | 0.265 |      | 1.19     | 0.306 |      | 0.79  | 0.453 |      |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.



Table 6-36 (continued)

Total 24-Hour Nutrient Intake for Combined Groups of Head Start and Non-Head Start Children with Unadjusted Comparisons Among Samples within Site

|                         | Greene/Humphreys |        |          | St. Clair |        |          | Maricopa |        |          | Mingo   |        |          |
|-------------------------|------------------|--------|----------|-----------|--------|----------|----------|--------|----------|---------|--------|----------|
|                         | N                | MEAN   | SD       | N         | MEAN   | SD       | N        | MEAN   | SD       | N       | MEAN   | SD       |
| <b>VITAMIN C (MG)</b>   |                  |        |          |           |        |          |          |        |          |         |        |          |
| Sample A                | 68               | 128.51 | 82.52    | 37        | 186.67 | 107.75   | 50       | 89.61  | 65.95    | 36      | 89.82  | 73.11    |
| Sample B                | 48               | 115.14 | 81.75    | 38        | 166.91 | 112.60   | 10       | 72.53  | 62.22    | 29      | 77.29  | 65.54    |
| Sample C                | 92               | 123.98 | 85.26    | 96        | 165.17 | 103.47   | 86       | 81.81  | 58.71    | 140     | 98.41  | 69.29    |
|                         | F= 0.36          |        | P= 0.695 | F= 0.57   |        | P= 0.568 | F= 0.44  |        | P= 0.647 | F= 1.18 |        | P= 0.308 |
| <b>CHOLESTERDL (MG)</b> |                  |        |          |           |        |          |          |        |          |         |        |          |
| Sample A                | 63               | 320.54 | 174.89   | 38        | 366.79 | 199.47   | 52       | 335.59 | 219.85   | 35      | 328.53 | 212.18   |
| Sample B                | 49               | 310.94 | 163.20   | 38        | 363.36 | 238.66   | 10       | 268.71 | 150.44   | 30      | 343.20 | 202.24   |
| Sample C                | 90               | 300.58 | 186.09   | 93        | 420.42 | 222.39   | 89       | 316.42 | 220.35   | 148     | 397.98 | 206.76   |
|                         | F= 0.24          |        | P= 0.789 | F= 1.31   |        | P= 0.272 | F= 0.43  |        | P= 0.653 | F= 0.07 |        | P= 0.933 |

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Table 6-37

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Present in Head Start on Day of Recall with Unadjusted Comparisons Between  
Age Groups across Sites

|                    | 2-4 YEAR OLDS |        |        |        |        |        | 4-6 YEAR OLDS |        |        |        |        |        | T     | P     |
|--------------------|---------------|--------|--------|--------|--------|--------|---------------|--------|--------|--------|--------|--------|-------|-------|
|                    | N             | Q1     | MED    | Q3     | MEAN   | SD     | N             | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| KILOCALORIES       | 80            | 1379.  | 1526.  | 1925.  | 1655.  | 397.   | 225           | 1435.  | 1755.  | 2213.  | 1819.  | 529.   | -2.90 | 0.004 |
| PROTEIN (GM)       | 81            | 52.19  | 61.69  | 71.70  | 63.96  | 17.80  | 226           | 51.45  | 66.01  | 83.57  | 68.81  | 22.50  | -1.96 | 0.052 |
| FAT (GM)           | 80            | 49.11  | 59.93  | 77.38  | 63.82  | 18.10  | 222           | 54.69  | 68.11  | 88.91  | 72.56  | 24.40  | -3.35 | 0.001 |
| CARBOHYDRATE (GM)  | 81            | 172.60 | 201.23 | 247.46 | 214.87 | 60.60  | 228           | 176.03 | 214.24 | 270.69 | 226.40 | 69.90  | -1.41 | 0.160 |
| CALCIUM (MG)       | 81            | 788.   | 944.   | 1161.  | 994.   | 331.   | 226           | 745.   | 980.   | 1239.  | 1023.  | 375.   | -0.65 | 0.515 |
| IRON (MG)          | 80            | 8.27   | 10.00  | 12.19  | 10.63  | 3.58   | 224           | 8.39   | 10.94  | 14.04  | 11.50  | 4.02   | -1.81 | 0.073 |
| MAGNESIUM (MG)     | 81            | 180.96 | 216.75 | 268.57 | 230.50 | 64.80  | 226           | 184.03 | 235.13 | 293.97 | 246.15 | 86.60  | -1.70 | 0.091 |
| PHOSPHORUS (MG)    | 81            | 889.   | 1101.  | 1289.  | 1163.  | 319.   | 228           | 920.   | 1211.  | 1507.  | 1247.  | 420.   | -1.85 | 0.065 |
| LOG VITAMIN A (IU) | 81            | 3.42   | 3.73   | 3.99   | 3.75   | 0.42   | 228           | 3.45   | 3.65   | 3.92   | 3.68   | 0.34   | 1.44  | 0.151 |
| VITAMIN A (IU)     | 81            | 2617.  | 5377.  | 9886.  | 9363.  | 11053. | 228           | 2802.  | 4430.  | 8359.  | 6635.  | 6790.  | 2.09  | 0.039 |
| THIAMIN (MG)       | 81            | 0.86   | 1.19   | 1.43   | 1.22   | 0.45   | 225           | 0.96   | 1.24   | 1.69   | 1.36   | 0.52   | -2.28 | 0.024 |
| RIBOFLAVIN (MG)    | 79            | 1.58   | 1.92   | 2.60   | 2.12   | 0.74   | 222           | 1.50   | 1.97   | 2.46   | 2.06   | 0.76   | 0.63  | 0.529 |
| NIACIN (MG)        | 81            | 10.65  | 13.99  | 16.87  | 14.53  | 5.52   | 224           | 9.85   | 13.39  | 18.52  | 14.78  | 6.16   | -0.35 | 0.730 |
| VITAMIN B6 (MG)    | 78            | 1.03   | 1.20   | 1.50   | 1.27   | 0.40   | 224           | 0.96   | 1.25   | 1.71   | 1.38   | 0.56   | -1.79 | 0.075 |
| LOG VIT. B12 (MCG) | 70            | 0.48   | 0.56   | 0.69   | 0.58   | 0.19   | 218           | 0.46   | 0.61   | 0.72   | 0.58   | 0.24   | -0.02 | 0.984 |
| VITAMIN B12 (MCG)  | 70            | 3.00   | 3.62   | 4.93   | 4.27   | 2.34   | 218           | 2.90   | 4.12   | 5.22   | 4.44   | 2.66   | -0.51 | 0.611 |
| VITAMIN C (MG)     | 80            | 67.30  | 119.92 | 179.16 | 131.37 | 81.30  | 222           | 62.39  | 111.89 | 181.29 | 128.23 | 81.70  | 0.30  | 0.768 |
| CHOLESTEROL (MG)   | 81            | 200.21 | 287.12 | 427.12 | 332.28 | 173.00 | 225           | 185.01 | 293.65 | 458.59 | 346.81 | 201.00 | -0.62 | 0.535 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6-38

Total 24-Hour Nutrient Intake for Posttested Non-Head Start Children  
(Samples A, B, C) with Unadjusted Comparisons Between Age Groups across Sites

|                    | 2-4 YEAR OLDS |        |        |        |        |        | 4-6 YEAR OLDS |        |        |        |        |        | T     | P     |
|--------------------|---------------|--------|--------|--------|--------|--------|---------------|--------|--------|--------|--------|--------|-------|-------|
|                    | N             | Q1     | MED    | Q3     | MEAN   | SD     | N             | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| KILOCALORIES       | 126           | 1234.  | 1502.  | 1791.  | 1568.  | 518.   | 183           | 1241.  | 1597.  | 1930.  | 1595.  | 490.   | -0.46 | 0.649 |
| PROTEIN (GM)       | 128           | 37.72  | 51.92  | 69.21  | 55.66  | 21.50  | 185           | 38.67  | 54.09  | 69.34  | 55.61  | 22.20  | 0.02  | 0.985 |
| FAT (GM)           | 126           | 48.96  | 64.96  | 81.87  | 66.55  | 25.40  | 184           | 47.23  | 67.26  | 82.68  | 67.25  | 26.20  | -0.23 | 0.816 |
| CARBOHYDRATE (GM)  | 125           | 135.84 | 175.76 | 227.57 | 187.72 | 69.00  | 181           | 153.19 | 191.60 | 235.20 | 194.80 | 64.80  | -0.90 | 0.367 |
| CALCIUM (MG)       | 128           | 432.   | 583.   | 787.   | 628.   | 294.   | 182           | 424.   | 587.   | 931.   | 717.   | 375.   | -2.34 | 0.020 |
| IRON (MG)          | 128           | 7.06   | 9.25   | 11.99  | 10.02  | 4.29   | 176           | 7.54   | 9.91   | 12.71  | 10.29  | 3.80   | -0.55 | 0.584 |
| MAGNESIUM (MG)     | 128           | 132.83 | 169.90 | 211.10 | 180.34 | 69.60  | 183           | 125.30 | 176.31 | 236.69 | 188.25 | 84.90  | -0.91 | 0.366 |
| PHOSPHORUS (MG)    | 127           | 668.   | 888.   | 1124.  | 928.   | 356.   | 183           | 654.   | 902.   | 1222.  | 960.   | 407.   | -0.71 | 0.477 |
| LOG VITAMIN A (IU) | 122           | 3.21   | 3.40   | 3.58   | 3.42   | 0.33   | 178           | 3.26   | 3.44   | 3.61   | 3.45   | 0.32   | -0.81 | 0.420 |
| VITAMIN A (IU)     | 122           | 1620.  | 2487.  | 3844.  | 3684.  | 4608.  | 178           | 1836.  | 2732.  | 4074.  | 3751.  | 3775.  | -0.13 | 0.896 |
| THIAMIN (MG)       | 126           | 0.76   | 1.09   | 1.48   | 1.19   | 0.54   | 176           | 0.79   | 1.12   | 1.48   | 1.18   | 0.53   | 0.23  | 0.820 |
| RIBOFLAVIN (MG)    | 125           | 1.04   | 1.38   | 1.81   | 1.45   | 0.61   | 180           | 1.03   | 1.52   | 2.03   | 1.61   | 0.73   | -2.02 | 0.045 |
| NIACIN (MG)        | 128           | 9.07   | 12.22  | 17.71  | 13.77  | 6.57   | 180           | 8.55   | 12.67  | 17.12  | 13.60  | 6.54   | 0.23  | 0.821 |
| VITAMIN B6 (MG)    | 125           | 0.68   | 1.06   | 1.44   | 1.09   | 0.50   | 181           | 0.71   | 1.18   | 1.62   | 1.22   | 0.60   | -2.00 | 0.046 |
| LOG VIT. B12 (MCG) | 123           | 0.25   | 0.41   | 0.53   | 0.36   | 0.27   | 182           | 0.29   | 0.47   | 0.63   | 0.44   | 0.27   | -2.60 | 0.010 |
| VITAMIN B12 (MCG)  | 123           | 1.79   | 2.55   | 3.39   | 2.71   | 1.58   | 182           | 1.94   | 2.95   | 4.25   | 3.28   | 1.87   | -2.90 | 0.004 |
| VITAMIN C (MG)     | 126           | 30.78  | 92.29  | 168.36 | 112.01 | 83.60  | 182           | 36.08  | 82.90  | 148.71 | 106.77 | 90.10  | 0.49  | 0.625 |
| CHOLESTEROL (MG)   | 124           | 147.60 | 264.90 | 492.55 | 336.01 | 218.00 | 184           | 140.31 | 271.07 | 467.22 | 323.10 | 217.00 | 0.51  | 0.610 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6-39

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Absent from Head Start on Day of Recall with Unadjusted Comparisons  
Between Age Groups across Sites

|                    | 2-4 YEAR OLDS |        |        |        |        |        | 4-6 YEAR OLDS |        |        |        |        |        | T     | P     |
|--------------------|---------------|--------|--------|--------|--------|--------|---------------|--------|--------|--------|--------|--------|-------|-------|
|                    | N             | Q1     | MED    | Q3     | MEAN   | SD     | N             | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| KILOCALORIES       | 19            | 1214.  | 1514.  | 1920.  | 1638.  | 516.   | 102           | 1148.  | 1495.  | 1873.  | 1546.  | 534.   | 0.71  | 0.483 |
| PROTEIN (GM)       | 19            | 42.30  | 54.68  | 71.29  | 56.65  | 21.10  | 101           | 40.06  | 50.28  | 65.28  | 54.18  | 21.10  | 0.47  | 0.645 |
| FAT (GM)           | 18            | 47.37  | 59.44  | 75.22  | 69.53  | 30.00  | 102           | 43.74  | 58.20  | 85.34  | 65.09  | 27.30  | 0.59  | 0.562 |
| CARBOHYDRATE (GM)  | 19            | 151.89 | 174.98 | 221.60 | 188.85 | 55.00  | 102           | 144.00 | 173.94 | 231.50 | 186.30 | 70.90  | 0.18  | 0.861 |
| CALCIUM (MG)       | 19            | 437.   | 590.   | 973.   | 729.   | 377.   | 103           | 446.   | 619.   | 800.   | 656.   | 301.   | 0.79  | 0.436 |
| IRON (MG)          | 17            | 7.73   | 9.00   | 9.41   | 9.36   | 3.45   | 96            | 7.16   | 9.27   | 11.98  | 10.08  | 4.01   | -0.77 | 0.446 |
| MAGNESIUM (MG)     | 19            | 139.53 | 164.53 | 211.74 | 182.25 | 70.80  | 102           | 109.06 | 166.41 | 221.07 | 174.47 | 74.50  | 0.44  | 0.666 |
| PHOSPHORUS (MG)    | 19            | 733.   | 911.   | 1159.  | 982.   | 411.   | 103           | 656.   | 834.   | 1120.  | 903.   | 350.   | 0.79  | 0.439 |
| LOG VITAMIN A (IU) | 19            | 3.22   | 3.37   | 3.68   | 3.42   | 0.36   | 101           | 3.24   | 3.42   | 3.73   | 3.45   | 0.33   | -0.36 | 0.720 |
| VITAMIN A (IU)     | 19            | 1652.  | 2360.  | 4770.  | 3538.  | 2692.  | 101           | 1757.  | 2657.  | 5325.  | 3743.  | 3076.  | -0.30 | 0.767 |
| THIAMIN (MG)       | 18            | 0.86   | 1.11   | 1.31   | 1.09   | 0.38   | 99            | 0.79   | 1.10   | 1.52   | 1.22   | 0.58   | -1.17 | 0.252 |
| RIBOFLAVIN (MG)    | 19            | 1.16   | 1.57   | 1.72   | 1.46   | 0.48   | 100           | 1.12   | 1.39   | 2.00   | 1.56   | 0.68   | -0.79 | 0.437 |
| NIACIN (MG)        | 18            | 8.92   | 11.67  | 15.79  | 12.82  | 6.02   | 95            | 8.37   | 10.94  | 16.87  | 13.24  | 6.94   | -0.26 | 0.794 |
| VITAMIN B6 (MG)    | 18            | 0.55   | 0.89   | 1.23   | 1.02   | 0.61   | 98            | 0.68   | 1.10   | 1.61   | 1.21   | 0.62   | -1.23 | 0.229 |
| LOG VIT. B12 (MCG) | 19            | 0.32   | 0.48   | 0.62   | 0.47   | 0.29   | 101           | 0.35   | 0.48   | 0.61   | 0.47   | 0.27   | -0.07 | 0.942 |
| VITAMIN B12 (MCG)  | 19            | 2.09   | 3.05   | 4.18   | 3.57   | 2.52   | 101           | 2.24   | 3.01   | 4.09   | 3.55   | 2.18   | 0.03  | 0.978 |
| VITAMIN C (MG)     | 19            | 69.62  | 97.20  | 148.35 | 114.85 | 77.00  | 101           | 39.75  | 90.04  | 173.65 | 114.51 | 95.30  | 0.02  | 0.987 |
| CHOLESTEROL (MG)   | 19            | 210.87 | 365.41 | 439.17 | 343.78 | 173.00 | 102           | 160.20 | 335.78 | 491.25 | 346.74 | 219.00 | -0.07 | 0.948 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base-10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6-40

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Present in Head Start on Day of Recall with Unadjusted Comparisons  
Between Age Groups within Site

|                          | 2-4 YEAR OLDS |        |        |        |        |       | 4-6 YEAR OLDS |        |        |        |        |       | T     | P     |
|--------------------------|---------------|--------|--------|--------|--------|-------|---------------|--------|--------|--------|--------|-------|-------|-------|
|                          | N             | Q1     | MED    | Q3     | MEAN   | SD    | N             | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>KILOCALORIES</b>      |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 38            | 1317.  | 1456.  | 1691.  | 1503.  | 286.  | 71            | 1380.  | 1602.  | 1918.  | 1679.  | 456.  | -2.47 | 0.015 |
| St. Clair                | 24            | 1486.  | 1780.  | 2220.  | 1838.  | 486.  | 47            | 1773.  | 2096.  | 2593.  | 2180.  | 502.  | -2.77 | 0.008 |
| Maricopa                 | 0             |        |        |        |        |       | 58            | 1274.  | 1490.  | 1844.  | 1555.  | 429.  |       |       |
| Mingo                    | 18            | 1446.  | 1673.  | 2038.  | 1731.  | 360.  | 49            | 1621.  | 1975.  | 2376.  | 1990.  | 522.  | -2.29 | 0.027 |
| <b>PROTEIN (GM)</b>      |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 38            | 49.62  | 61.05  | 69.02  | 60.36  | 14.40 | 70            | 50.91  | 62.34  | 79.26  | 65.07  | 18.30 | -1.48 | 0.143 |
| St. Clair                | 24            | 54.79  | 65.17  | 87.35  | 69.40  | 19.60 | 48            | 61.24  | 75.51  | 97.68  | 78.88  | 23.20 | -1.82 | 0.075 |
| Maricopa                 | 0             |        |        |        |        |       | 56            | 45.34  | 56.31  | 67.92  | 57.52  | 19.00 |       |       |
| Mingo                    | 19            | 46.86  | 61.16  | 72.73  | 64.30  | 20.70 | 52            | 63.51  | 77.67  | 90.89  | 76.72  | 23.90 | -2.15 | 0.038 |
| <b>FAT (GM)</b>          |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 38            | 48.73  | 58.08  | 65.59  | 58.47  | 15.10 | 68            | 50.66  | 63.62  | 80.67  | 65.91  | 21.80 | -2.07 | 0.041 |
| St. Clair                | 24            | 49.72  | 66.40  | 88.79  | 70.12  | 21.70 | 47            | 65.49  | 80.84  | 109.63 | 87.53  | 27.80 | -2.90 | 0.005 |
| Maricopa                 | 0             |        |        |        |        |       | 58            | 51.44  | 63.28  | 80.51  | 66.10  | 23.00 |       |       |
| Mingo                    | 18            | 54.07  | 63.18  | 81.01  | 66.72  | 16.30 | 48            | 64.49  | 76.80  | 90.62  | 75.26  | 19.40 | -1.79 | 0.081 |
| <b>CARBOHYDRATE (GM)</b> |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 38            | 162.77 | 189.47 | 215.49 | 190.12 | 40.00 | 72            | 169.63 | 203.77 | 235.78 | 207.26 | 50.80 | -1.94 | 0.056 |
| St. Clair                | 24            | 181.62 | 224.68 | 307.28 | 238.39 | 70.50 | 47            | 219.16 | 280.66 | 331.79 | 276.85 | 67.10 | -2.21 | 0.032 |
| Maricopa                 | 0             |        |        |        |        |       | 58            | 160.92 | 182.08 | 213.99 | 182.49 | 49.70 |       |       |
| Mingo                    | 19            | 185.55 | 235.99 | 265.05 | 234.67 | 65.20 | 51            | 199.77 | 255.79 | 314.77 | 256.87 | 73.90 | -1.22 | 0.230 |

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Table 6-40 (continued)

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Present in Head Start on Day of Recall with Unadjusted Comparisons  
Between Age Groups within Site

|                        | 2-4 YEAR OLDS |        |        |        |        |       | 4-6 YEAR OLDS |        |        |        |        |       | T     | P     |
|------------------------|---------------|--------|--------|--------|--------|-------|---------------|--------|--------|--------|--------|-------|-------|-------|
|                        | N             | Q1     | MED    | Q3     | MEAN   | SD    | N             | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>CALCIUM (MG)</b>    |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys       | 28            | 788.   | 908.   | 1032.  | 922.   | 217.  | 72            | 783.   | 950.   | 1175.  | 968.   | 296.  | -0.92 | 0.360 |
| St. Clair              | 24            | 777.   | 1040.  | 1253.  | 1042.  | 398.  | 47            | 829.   | 1022.  | 1382.  | 1131.  | 428.  | -0.87 | 0.390 |
| Maricopa               | 0             |        |        |        |        |       | 56            | 623.   | 860.   | 1105.  | 863.   | 332.  |       |       |
| Mingo                  | 19            | 808.   | 994.   | 1308.  | 1078.  | 409.  | 51            | 913.   | 1173.  | 1439.  | 1178.  | 387.  | -0.93 | 0.361 |
| <b>IRON (MG)</b>       |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys       | 38            | 8.23   | 9.90   | 12.16  | 10.41  | 3.71  | 70            | 8.28   | 9.93   | 13.10  | 10.95  | 3.90  | -0.71 | 0.480 |
| St. Clair              | 23            | 8.20   | 10.86  | 14.28  | 11.35  | 4.18  | 47            | 11.03  | 12.93  | 15.78  | 13.63  | 3.78  | -2.21 | 0.033 |
| Maricopa               | 0             |        |        |        |        |       | 55            | 7.11   | 9.63   | 11.07  | 9.43   | 3.07  |       |       |
| Mingo                  | 19            | 9.01   | 9.68   | 11.10  | 10.20  | 2.36  | 52            | 9.56   | 12.71  | 15.02  | 12.52  | 4.14  | -2.94 | 0.005 |
| <b>MAGNESIUM (MG)</b>  |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys       | 38            | 181.42 | 209.53 | 238.93 | 214.34 | 45.70 | 72            | 188.39 | 223.89 | 271.15 | 236.10 | 75.00 | -1.89 | 0.062 |
| St. Clair              | 24            | 179.82 | 250.17 | 325.75 | 253.41 | 82.70 | 47            | 240.14 | 302.50 | 374.08 | 308.52 | 85.00 | -2.63 | 0.011 |
| Maricopa               | 0             |        |        |        |        |       | 56            | 144.98 | 177.99 | 239.41 | 194.98 | 69.50 |       |       |
| Mingo                  | 19            | 186.30 | 220.20 | 275.32 | 233.88 | 66.30 | 49            | 207.75 | 250.27 | 332.73 | 261.65 | 82.50 | -1.44 | 0.157 |
| <b>PHOSPHORUS (MG)</b> |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys       | 38            | 998.   | 1061.  | 1238.  | 1111.  | 210.  | 72            | 994.   | 1145.  | 1414.  | 1218.  | 401.  | -1.83 | 0.070 |
| St. Clair              | 24            | 968.   | 1169.  | 1471.  | 1224.  | 386.  | 47            | 1098.  | 1367.  | 1675.  | 1387.  | 405.  | -1.65 | 0.105 |
| Maricopa               | 0             |        |        |        |        |       | 57            | 786.   | 997.   | 1273.  | 1034.  | 345.  |       |       |
| Mingo                  | 19            | 894.   | 1179.  | 1379.  | 1191.  | 401.  | 52            | 1106.  | 1417.  | 1688.  | 1394.  | 437.  | -1.84 | 0.075 |

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Table 6-40 (continued)

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Present in Head Start on Day of Recall with Unadjusted Comparisons  
Between Age Groups within Site

|                           | 2-4 YEAR OLDS |       |       |        |        |        | 4-6 YEAR OLDS |       |       |        |       |       | T     | P     |
|---------------------------|---------------|-------|-------|--------|--------|--------|---------------|-------|-------|--------|-------|-------|-------|-------|
|                           | N             | Q1    | MED   | Q3     | MEAN   | SD     | N             | Q1    | MED   | Q3     | MEAN  | SD    |       |       |
| <b>LOG VITAMIN A (IU)</b> |               |       |       |        |        |        |               |       |       |        |       |       |       |       |
| Greene/Humphreys          | 38            | 3.46  | 3.79  | 4.30   | 3.85   | 0.47   | 70            | 3.46  | 3.73  | 4.05   | 3.79  | 0.37  | 0.75  | 0.454 |
| St. Clair                 | 24            | 3.41  | 3.76  | 4.00   | 3.75   | 0.40   | 48            | 3.60  | 3.80  | 3.96   | 3.78  | 0.32  | -0.34 | 0.734 |
| Maricopa                  | 0             |       |       |        |        |        | 57            | 3.32  | 3.52  | 3.64   | 3.51  | 0.29  |       |       |
| Mingo                     | 19            | 3.39  | 3.51  | 3.75   | 3.56   | 0.23   | 53            | 3.47  | 3.59  | 3.84   | 3.63  | 0.28  | -1.07 | 0.289 |
| <b>VITAMIN A (IU)</b>     |               |       |       |        |        |        |               |       |       |        |       |       |       |       |
| Greene/Humphreys          | 38            | 2903. | 6234. | 20064. | 12503. | 13788. | 70            | 2908. | 5343. | 11291. | 9071. | 9763. | 1.36  | 0.179 |
| St. Clair                 | 24            | 2570. | 5766. | 10046. | 8500.  | 8707.  | 48            | 3991. | 6338. | 9097.  | 7813. | 6361. | 0.34  | 0.733 |
| Maricopa                  | 0             |       |       |        |        |        | 57            | 2100. | 3312. | 4376.  | 3994. | 2858. |       |       |
| Mingo                     | 19            | 2483. | 3235. | 5669.  | 4173.  | 2248.  | 53            | 2929. | 3903. | 6883.  | 5191. | 3223. | -1.50 | 0.141 |
| <b>THIAMIN (MG)</b>       |               |       |       |        |        |        |               |       |       |        |       |       |       |       |
| Greene/Humphreys          | 38            | 0.83  | 1.07  | 1.26   | 1.12   | 0.42   | 71            | 0.96  | 1.19  | 1.62   | 1.30  | 0.46  | -2.08 | 0.041 |
| St. Clair                 | 24            | 0.99  | 1.31  | 1.61   | 1.35   | 0.52   | 47            | 1.11  | 1.55  | 2.06   | 1.66  | 0.62  | -2.17 | 0.034 |
| Maricopa                  | 0             |       |       |        |        |        | 57            | 0.81  | 1.02  | 1.27   | 1.11  | 0.44  |       |       |
| Mingo                     | 19            | 1.01  | 1.27  | 1.48   | 1.26   | 0.38   | 50            | 1.12  | 1.42  | 1.77   | 1.45  | 0.46  | -1.78 | 0.082 |
| <b>RIBOFLAVIN (MG)</b>    |               |       |       |        |        |        |               |       |       |        |       |       |       |       |
| Greene/Humphreys          | 36            | 1.51  | 1.96  | 2.70   | 2.13   | 0.72   | 67            | 1.50  | 1.91  | 2.31   | 1.96  | 0.67  | 1.14  | 0.259 |
| St. Clair                 | 24            | 1.63  | 2.15  | 2.86   | 2.24   | 0.90   | 48            | 1.73  | 2.38  | 3.15   | 2.48  | 0.86  | -1.08 | 0.285 |
| Maricopa                  | 0             |       |       |        |        |        | 55            | 1.17  | 1.69  | 2.11   | 1.67  | 0.63  |       |       |
| Mingo                     | 19            | 1.65  | 1.89  | 2.37   | 1.94   | 0.50   | 52            | 1.78  | 2.18  | 2.65   | 2.19  | 0.69  | -1.58 | 0.100 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6-40 (continued)

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Present in Head Start on Day of Recall with Unadjusted Comparisons  
Between Age Groups within Site

|                           | 2-4 YEAR OLDS |       |       |       |       |      | 4-6 YEAR OLDS |       |       |       |       |      | T     | P     |
|---------------------------|---------------|-------|-------|-------|-------|------|---------------|-------|-------|-------|-------|------|-------|-------|
|                           | N             | Q1    | MED   | Q3    | MEAN  | SD   | N             | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>NIACIN (MG)</b>        |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 38            | 10.82 | 14.44 | 16.90 | 14.50 | 5.37 | 68            | 10.07 | 13.18 | 17.53 | 14.33 | 5.57 | 0.15  | 0.884 |
| St. Clair                 | 24            | 12.02 | 14.58 | 18.05 | 15.62 | 6.29 | 48            | 13.28 | 17.70 | 22.41 | 18.14 | 6.39 | -1.59 | 0.118 |
| Maricopa                  | 0             |       |       |       |       |      | 57            | 8.73  | 11.12 | 13.67 | 11.97 | 5.04 |       |       |
| Mingo                     | 19            | 9.71  | 12.12 | 15.04 | 13.21 | 4.72 | 51            | 10.14 | 14.32 | 20.94 | 15.37 | 6.33 | -1.54 | 0.131 |
| <b>VITAMIN B6 (MG)</b>    |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 36            | 1.09  | 1.20  | 1.42  | 1.18  | 0.31 | 70            | 0.97  | 1.22  | 1.56  | 1.32  | 0.47 | -1.71 | 0.091 |
| St. Clair                 | 23            | 1.02  | 1.20  | 1.71  | 1.41  | 0.51 | 46            | 1.17  | 1.56  | 1.99  | 1.65  | 0.63 | -1.70 | 0.096 |
| Maricopa                  | 0             |       |       |       |       |      | 57            | 0.81  | 1.15  | 1.43  | 1.19  | 0.55 |       |       |
| Mingo                     | 19            | 1.02  | 1.22  | 1.53  | 1.27  | 0.35 | 51            | 1.04  | 1.27  | 1.75  | 1.42  | 0.54 | -1.38 | 0.173 |
| <b>LOG VIT. B12 (MCG)</b> |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 29            | 0.46  | 0.50  | 0.70  | 0.58  | 0.20 | 65            | 0.49  | 0.58  | 0.67  | 0.58  | 0.25 | 0.00  | 0.996 |
| St. Clair                 | 22            | 0.45  | 0.59  | 0.76  | 0.59  | 0.24 | 45            | 0.51  | 0.67  | 0.80  | 0.63  | 0.24 | -0.68 | 0.501 |
| Maricopa                  | 0             |       |       |       |       |      | 56            | 0.38  | 0.54  | 0.68  | 0.52  | 0.24 |       |       |
| Mingo                     | 19            | 0.49  | 0.57  | 0.64  | 0.57  | 0.11 | 52            | 0.53  | 0.64  | 0.73  | 0.61  | 0.21 | -0.95 | 0.345 |
| <b>VITAMIN B12 (MCG)</b>  |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 29            | 2.87  | 3.16  | 4.96  | 4.36  | 2.86 | 65            | 2.72  | 3.81  | 4.66  | 4.69  | 3.82 | -0.46 | 0.643 |
| St. Clair                 | 22            | 2.81  | 3.90  | 5.82  | 4.50  | 2.45 | 45            | 3.27  | 4.64  | 6.29  | 4.84  | 2.20 | -0.55 | 0.585 |
| Maricopa                  | 0             |       |       |       |       |      | 56            | 2.48  | 3.46  | 4.85  | 3.80  | 1.94 |       |       |
| Mingo                     | 19            | 3.13  | 3.74  | 4.36  | 3.86  | 1.02 | 52            | 3.42  | 4.37  | 5.44  | 4.46  | 1.67 | -1.83 | 0.072 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.



Table 6-40 (continued)

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Present in Head Start on Day of Recall with Unadjusted Comparisons  
Between Age Groups within Site

|                         | 2-4 YEAR OLDS |        |        |        |        |        | 4-6 YEAR OLDS |        |        |        |        |        | T     | P     |
|-------------------------|---------------|--------|--------|--------|--------|--------|---------------|--------|--------|--------|--------|--------|-------|-------|
|                         | N             | Q1     | MED    | Q3     | MEAN   | SD     | N             | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>VITAMIN C (MG)</b>   |               |        |        |        |        |        |               |        |        |        |        |        |       |       |
| Greene/Humphreys        | 37            | 56.18  | 81.11  | 144.88 | 105.46 | 71.30  | 71            | 58.04  | 115.24 | 171.33 | 124.70 | 79.50  | -1.28 | 0.205 |
| St. Clair               | 24            | 125.72 | 164.30 | 246.44 | 185.25 | 84.30  | 47            | 124.84 | 190.01 | 258.59 | 193.37 | 85.40  | -0.38 | 0.704 |
| Maricopa                | 0             |        |        |        |        |        | 57            | 42.88  | 69.09  | 116.71 | 89.58  | 60.40  |       |       |
| Mingo                   | 19            | 74.56  | 93.03  | 156.94 | 113.78 | 64.80  | 47            | 64.34  | 109.29 | 155.06 | 115.31 | 65.90  | -0.09 | 0.932 |
| <b>CHOLESTERDL (MG)</b> |               |        |        |        |        |        |               |        |        |        |        |        |       |       |
| Greene/Humphreys        | 38            | 200.81 | 319.68 | 427.23 | 338.99 | 162.00 | 67            | 184.60 | 284.03 | 407.59 | 316.83 | 159.00 | 0.68  | 0.500 |
| St. Clair               | 24            | 244.05 | 298.59 | 558.00 | 392.04 | 211.00 | 47            | 321.44 | 438.26 | 540.56 | 447.73 | 213.00 | -1.05 | 0.289 |
| Maricopa                | 0             |        |        |        |        |        | 58            | 146.53 | 220.08 | 423.64 | 311.33 | 227.00 |       |       |
| Mingo                   | 19            | 174.32 | 237.56 | 293.87 | 243.35 | 91.80  | 53            | 209.79 | 290.03 | 449.34 | 334.05 | 183.00 | -2.77 | 0.007 |

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Table 6-41

Total 24-Hour Nutrient Intake for Posttested Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between Age Groups within Site

|                          | 2-4 YEAR OLDS |        |        |        |        |       | 4-6 YEAR OLDS |        |        |        |        |       | T     | P     |
|--------------------------|---------------|--------|--------|--------|--------|-------|---------------|--------|--------|--------|--------|-------|-------|-------|
|                          | N             | Q1     | MED    | Q3     | MEAN   | SD    | N             | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>KILOCALORIES</b>      |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 41            | 1246   | 1447   | 1589   | 1482   | 455   | 47            | 1307   | 1646   | 1930   | 1608   | 530   | -1.20 | 0.234 |
| St. Clair                | 32            | 1365   | 1602   | 2124   | 1748   | 560   | 35            | 1591   | 1751   | 2001   | 1775   | 337   | -0.24 | 0.812 |
| Maricopa                 | 0             |        |        |        |        |       | 51            | 1097   | 1389   | 1917   | 1475   | 568   |       |       |
| Mingo                    | 53            | 1207   | 1477   | 1708   | 1526   | 521   | 50            | 1225   | 1545   | 1805   | 1579   | 426   | -0.56 | 0.575 |
| <b>PROTEIN (GM)</b>      |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 42            | 38.32  | 50.76  | 68.45  | 54.68  | 20.30 | 48            | 42.27  | 59.92  | 73.00  | 59.93  | 23.10 | -1.14 | 0.256 |
| St. Clair                | 32            | 48.00  | 63.35  | 74.38  | 61.39  | 21.20 | 36            | 45.35  | 58.65  | 69.87  | 60.55  | 20.50 | 0.16  | 0.870 |
| Maricopa                 | 0             |        |        |        |        |       | 51            | 85.18  | 46.34  | 66.29  | 51.46  | 23.10 |       |       |
| Mingo                    | 54            | 36.47  | 50.62  | 67.42  | 53.02  | 22.30 | 50            | 37.43  | 50.50  | 66.73  | 52.15  | 20.60 | 0.21  | 0.837 |
| <b>FAT (GM)</b>          |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 41            | 48.40  | 57.71  | 74.52  | 61.25  | 21.60 | 47            | 50.10  | 66.51  | 85.62  | 65.74  | 26.90 | -0.87 | 0.388 |
| St. Clair                | 32            | 56.66  | 73.38  | 96.75  | 76.97  | 27.50 | 38            | 65.16  | 75.10  | 83.77  | 75.62  | 21.00 | 0.22  | 0.823 |
| Maricopa                 | 0             |        |        |        |        |       | 51            | 40.70  | 61.11  | 83.58  | 54.62  | 30.40 |       |       |
| Mingo                    | 53            | 48.85  | 61.99  | 78.67  | 64.37  | 25.50 | 50            | 47.82  | 65.85  | 76.49  | 65.32  | 23.80 | -0.20 | 0.845 |
| <b>CARBOHYDRATE (GM)</b> |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 41            | 131.95 | 175.76 | 226.30 | 179.45 | 60.70 | 46            | 139.35 | 188.99 | 243.47 | 194.50 | 71.90 | -1.06 | 0.293 |
| St. Clair                | 32            | 157.02 | 192.25 | 233.33 | 205.34 | 81.80 | 35            | 191.58 | 213.59 | 246.34 | 221.26 | 53.10 | -0.93 | 0.354 |
| Maricopa                 | 0             |        |        |        |        |       | 50            | 129.04 | 165.99 | 221.95 | 171.58 | 64.40 |       |       |
| Mingo                    | 52            | 135.33 | 168.57 | 228.45 | 183.40 | 66.00 | 50            | 165.38 | 190.98 | 235.20 | 199.78 | 59.30 | -1.32 | 0.190 |

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Table 6-41 (continued)

Total 24-Hour Nutrient Intake for Posttested Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between Age Groups within Site

|                        | 2-4 YEAR OLDS |        |        |        |        |       | 4-6 YEAR OLDS |        |        |        |        |       | T     | P     |
|------------------------|---------------|--------|--------|--------|--------|-------|---------------|--------|--------|--------|--------|-------|-------|-------|
|                        | N             | Q1     | MED    | Q3     | MEAN   | SD    | N             | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>CALCIUM (MG)</b>    |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys       | 42            | 349.   | 488.   | 720.   | 544.   | 245.  | 47            | 466.   | 672.   | 871.   | 682.   | 326.  | -2.27 | 0.026 |
| St. Clair              | 32            | 495.   | 624.   | 798.   | 629.   | 209.  | 35            | 295.   | 663.   | 920.   | 682.   | 415.  | -0.67 | 0.505 |
| Maricopa               | 0             |        |        |        |        |       | 50            | 397.   | 710.   | 931.   | 706.   | 367.  |       |       |
| Mingo                  | 54            | 436.   | 659.   | 809.   | 691.   | 355.  | 50            | 439.   | 715.   | 1103.  | 784.   | 397.  | -1.26 | 0.212 |
| <b>IRON (MG)</b>       |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys       | 41            | 7.25   | 9.40   | 11.53  | 9.60   | 3.39  | 41            | 6.85   | 10.96  | 14.48  | 10.75  | 4.45  | -1.32 | 0.191 |
| St. Clair              | 32            | 8.21   | 9.85   | 14.24  | 11.52  | 5.16  | 36            | 9.61   | 10.60  | 14.08  | 11.66  | 3.38  | -0.13 | 0.893 |
| Maricopa               | 0             |        |        |        |        |       | 49            | 7.19   | 9.65   | 11.34  | 9.51   | 3.60  |       |       |
| Mingo                  | 53            | 6.41   | 8.54   | 11.76  | 9.45   | 4.20  | 50            | 7.24   | 9.21   | 11.62  | 9.68   | 3.84  | -0.29 | 0.771 |
| <b>MAGNESIUM (MG)</b>  |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys       | 42            | 132.27 | 166.96 | 204.75 | 175.78 | 70.20 | 47            | 144.72 | 196.59 | 240.13 | 204.19 | 89.00 | -1.68 | 0.097 |
| St. Clair              | 32            | 119.48 | 163.09 | 235.08 | 176.14 | 69.70 | 36            | 152.58 | 195.99 | 228.52 | 205.56 | 86.10 | -1.56 | 0.125 |
| Maricopa               | 0             |        |        |        |        |       | 51            | 105.77 | 154.36 | 218.33 | 167.27 | 79.90 |       |       |
| Mingo                  | 54            | 152.57 | 173.02 | 213.20 | 186.38 | 67.50 | 49            | 114.80 | 171.56 | 236.17 | 182.08 | 82.00 | 0.29  | 0.773 |
| <b>PHOSPHORUS (MG)</b> |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys       | 42            | 606.   | 844.   | 1086.  | 864.   | 358.  | 47            | 726.   | 938.   | 1142.  | 891.   | 404.  | -1.58 | 0.119 |
| St. Clair              | 32            | 738.   | 866.   | 1200.  | 928.   | 314.  | 35            | 532.   | 902.   | 1228.  | 844.   | 431.  | -0.17 | 0.865 |
| Maricopa               | 0             |        |        |        |        |       | 51            | 629.   | 848.   | 1169.  | 806.   | 393.  |       |       |
| Mingo                  | 53            | 739.   | 942.   | 1142.  | 981.   | 376.  | 50            | 638.   | 923.   | 1382.  | 998.   | 413.  | -0.21 | 0.834 |

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Table 6-41 (continued)

Total 24-Hour Nutrient Intake for Posttested Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between Age Groups within Site

|                           | 2-4 YEAR OLDS |       |       |       |       |       | 4-6 YEAR OLDS |       |       |       |       |       | T     | P     |
|---------------------------|---------------|-------|-------|-------|-------|-------|---------------|-------|-------|-------|-------|-------|-------|-------|
|                           | N             | Q1    | MED   | Q3    | MEAN  | SD    | N             | Q1    | MED   | Q3    | MEAN  | SD    |       |       |
| <b>LOG VITAMIN A (IU)</b> |               |       |       |       |       |       |               |       |       |       |       |       |       |       |
| Greene/Humphreys          | 41            | 3.28  | 3.45  | 3.67  | 3.50  | 0.39  | 48            | 3.38  | 3.53  | 3.69  | 3.57  | 0.33  | -0.88 | 0.383 |
| St. Clair                 | 30            | 3.18  | 3.34  | 3.49  | 3.35  | 0.26  | 35            | 3.25  | 3.45  | 3.56  | 3.43  | 0.35  | -1.09 | 0.281 |
| Maricopa                  | 0             |       |       |       |       |       | 49            | 3.20  | 3.41  | 3.59  | 3.42  | 0.29  |       |       |
| Mingo                     | 51            | 3.18  | 3.43  | 3.59  | 3.39  | 0.31  | 46            | 3.20  | 3.39  | 3.61  | 3.37  | 0.27  | 0.39  | 0.700 |
| <b>VITAMIN A (IU)</b>     |               |       |       |       |       |       |               |       |       |       |       |       |       |       |
| Greene/Humphreys          | 41            | 1921. | 2844. | 4722. | 5160. | 7238. | 48            | 2428. | 3373. | 4912. | 5141. | 5636. | 0.01  | 0.989 |
| St. Clair                 | 30            | 1524. | 2168. | 3118. | 2704. | 2026. | 35            | 1793. | 2797. | 3634. | 3757. | 3719. | -1.44 | 0.155 |
| Maricopa                  | 0             |       |       |       |       |       | 49            | 1872. | 2601. | 3859. | 3299. | 2511. |       |       |
| Mingo                     | 51            | 1531. | 2679. | 3929. | 3074. | 2087. | 46            | 1584. | 2442. | 4104. | 2775. | 1559. | 0.80  | 0.423 |
| <b>THIAMIN (MG)</b>       |               |       |       |       |       |       |               |       |       |       |       |       |       |       |
| Greene/Humphreys          | 42            | 0.80  | 1.18  | 1.48  | 1.23  | 0.56  | 43            | 0.80  | 1.30  | 1.68  | 1.31  | 0.64  | -0.64 | 0.523 |
| St. Clair                 | 32            | 0.84  | 1.33  | 1.78  | 1.36  | 0.62  | 36            | 1.08  | 1.30  | 1.73  | 1.39  | 0.53  | -0.21 | 0.835 |
| Maricopa                  | 0             |       |       |       |       |       | 48            | 0.63  | 0.92  | 1.32  | 0.97  | 0.42  |       |       |
| Mingo                     | 52            | 0.74  | 0.97  | 1.29  | 1.06  | 0.44  | 49            | 0.79  | 1.07  | 1.40  | 1.11  | 0.44  | -0.56 | 0.576 |
| <b>RIBOFLAVIN (MG)</b>    |               |       |       |       |       |       |               |       |       |       |       |       |       |       |
| Greene/Humphreys          | 42            | 1.00  | 1.34  | 1.68  | 1.43  | 0.62  | 45            | 1.19  | 1.67  | 2.16  | 1.72  | 0.78  | -1.95 | 0.055 |
| St. Clair                 | 30            | 1.04  | 1.35  | 1.73  | 1.42  | 0.48  | 35            | 1.09  | 1.53  | 2.07  | 1.62  | 0.69  | -1.36 | 0.178 |
| Maricopa                  | 0             |       |       |       |       |       | 51            | 0.96  | 1.31  | 1.95  | 1.51  | 0.70  |       |       |
| Mingo                     | 53            | 1.05  | 1.41  | 1.86  | 1.49  | 0.67  | 49            | 1.04  | 1.46  | 1.98  | 1.60  | 0.74  | -0.80 | 0.427 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

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Table 6-41 (continued)

Total 24-Hour Nutrient Intake for Posttested Non-Head Start  
Children (Samples A, B, C) with Unadjusted Comparisons  
Between Age Groups within Site

|                           | 2-4 YEAR OLDS |       |       |       |       |      | 4-6 YEAR OLDS |       |       |       |       |      | T     | P     |
|---------------------------|---------------|-------|-------|-------|-------|------|---------------|-------|-------|-------|-------|------|-------|-------|
|                           | N             | Q1    | MED   | Q3    | MEAN  | SD   | N             | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>NIACIN (MG)</b>        |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 42            | 10.39 | 12.93 | 17.44 | 14.00 | 5.26 | 45            | 9.37  | 15.01 | 22.13 | 16.17 | 7.89 | -1.52 | 0.133 |
| St. Clair                 | 32            | 9.39  | 13.72 | 20.27 | 15.38 | 8.00 | 36            | 12.14 | 14.88 | 17.34 | 15.77 | 5.14 | -0.24 | 0.814 |
| Maricopa                  | 0             |       |       |       |       |      | 49            | 7.69  | 10.27 | 13.53 | 11.16 | 5.00 |       |       |
| Mingo                     | 54            | 7.53  | 10.59 | 17.40 | 12.64 | 6.46 | 50            | 7.36  | 11.42 | 15.39 | 12.11 | 6.28 | 0.42  | 0.672 |
| <b>VITAMIN B6 (MG)</b>    |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 40            | 0.76  | 1.17  | 1.43  | 1.16  | 0.51 | 44            | 0.97  | 1.39  | 1.85  | 1.40  | 0.58 | -2.02 | 0.046 |
| St. Clair                 | 32            | 0.68  | 0.96  | 1.42  | 1.08  | 0.47 | 36            | 0.75  | 1.15  | 1.56  | 1.23  | 0.60 | -1.22 | 0.226 |
| Maricopa                  | 0             |       |       |       |       |      | 51            | 0.74  | 1.13  | 1.46  | 1.14  | 0.53 |       |       |
| Mingo                     | 53            | 0.67  | 1.01  | 1.45  | 1.06  | 0.52 | 50            | 0.61  | 0.93  | 1.52  | 1.13  | 0.64 | -0.66 | 0.513 |
| <b>LOG VIT. B12 (MCG)</b> |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 41            | 0.09  | 0.35  | 0.45  | 0.30  | 0.27 | 46            | 0.28  | 0.48  | 0.63  | 0.47  | 0.27 | -2.98 | 0.004 |
| St. Clair                 | 30            | 0.32  | 0.43  | 0.57  | 0.42  | 0.18 | 36            | 0.35  | 0.47  | 0.61  | 0.46  | 0.24 | -0.84 | 0.402 |
| Maricopa                  | 0             |       |       |       |       |      | 52            | 0.29  | 0.48  | 0.65  | 0.43  | 0.31 |       |       |
| Mingo                     | 52            | 0.27  | 0.40  | 0.55  | 0.37  | 0.31 | 48            | 0.23  | 0.43  | 0.60  | 0.41  | 0.26 | -0.59 | 0.557 |
| <b>VITAMIN B12 (MCG)</b>  |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 41            | 1.24  | 2.23  | 2.84  | 2.36  | 1.40 | 46            | 1.93  | 3.00  | 4.27  | 3.55  | 2.24 | -3.01 | 0.004 |
| St. Clair                 | 30            | 2.10  | 2.69  | 3.69  | 2.81  | 0.96 | 36            | 2.25  | 2.97  | 4.05  | 3.30  | 1.64 | -1.50 | 0.138 |
| Maricopa                  | 0             |       |       |       |       |      | 52            | 1.95  | 3.01  | 4.51  | 3.33  | 1.97 |       |       |
| Mingo                     | 52            | 1.85  | 2.54  | 3.57  | 2.92  | 1.84 | 48            | 1.70  | 2.68  | 4.00  | 2.96  | 1.49 | -0.10 | 0.917 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6-41 (continued)

Total 24-Hour Nutrient Intake for Posttested Non-Head Start Children (Samples A, B, C) with Unadjusted Comparisons Between Age Groups within Site

|                         | 2-4 YEAR OLDS |        |        |        |        |        | 4-6 YEAR OLDS |        |        |        |        |        | T     | P     |
|-------------------------|---------------|--------|--------|--------|--------|--------|---------------|--------|--------|--------|--------|--------|-------|-------|
|                         | N             | Q1     | MED    | Q3     | MEAN   | SD     | N             | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>VITAMIN C (MG)</b>   |               |        |        |        |        |        |               |        |        |        |        |        |       |       |
| Greene/Humphreys        | 42            | 53.69  | 116.10 | 178.82 | 121.79 | 77.50  | 48            | 48.07  | 123.17 | 194.90 | 138.03 | 101.00 | -0.86 | 0.393 |
| St. Clair               | 32            | 26.30  | 127.28 | 227.78 | 145.57 | 123.00 | 36            | 46.87  | 121.20 | 196.94 | 143.98 | 120.00 | 0.06  | 0.955 |
| Maricopa                | 0             |        |        |        |        |        | 50            | 36.08  | 67.89  | 118.25 | 78.89  | 52.20  |       |       |
| Mingo                   | 52            | 24.65  | 64.14  | 109.31 | 83.39  | 78.10  | 48            | 31.75  | 63.40  | 98.00  | 76.65  | 60.80  | 0.49  | 0.625 |
| <b>CHOLESTEROL (MG)</b> |               |        |        |        |        |        |               |        |        |        |        |        |       |       |
| Greene/Humphreys        | 41            | 143.21 | 210.88 | 312.85 | 273.18 | 177.00 | 47            | 152.24 | 265.74 | 437.01 | 314.34 | 201.00 | -1.02 | 0.309 |
| St. Clair               | 30            | 175.93 | 428.11 | 644.33 | 396.54 | 235.00 | 36            | 155.06 | 242.10 | 481.76 | 323.13 | 215.00 | 1.31  | 0.194 |
| Maricopa                | 0             |        |        |        |        |        | 52            | 119.05 | 310.34 | 507.96 | 332.56 | 223.00 |       |       |
| Mingo                   | 53            | 149.42 | 269.23 | 502.02 | 350.35 | 228.00 | 49            | 139.70 | 286.15 | 441.56 | 321.44 | 232.00 | 0.63  | 0.528 |

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Table 6-42

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, R, C)  
Absent/From Head Start on Day of Recall with Unadjusted Comparisons  
Between Age Groups within Site

|                          | 2-4 YEAR OLDS |        |        |        |        |       | 4-6 YEAR OLDS |        |        |        |        |       | T     | P     |
|--------------------------|---------------|--------|--------|--------|--------|-------|---------------|--------|--------|--------|--------|-------|-------|-------|
|                          | N             | Q1     | MED    | Q3     | MEAN   | SD    | N             | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>KILOCALORIES</b>      |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 1             | -----  | 1096   | -----  | 1096   | ----- | 9             | 1096   | 1299   | 1946   | 1499   | 535   | -2.26 | 0.053 |
| St. Clair                | 8             | 1569   | 1983   | 2401   | 1973   | 518   | 24            | 1542   | 1940   | 2359   | 1937   | 504   | 0.17  | 0.869 |
| Maricopa                 | 0             |        |        |        |        |       | 40            | 1010   | 1301   | 1526   | 1304   | 412   |       |       |
| Mingo                    | 10            | 1062   | 1482   | 1767   | 1425   | 375   | 29            | 1166   | 1651   | 1824   | 1571   | 535   | -0.95 | 0.354 |
| <b>PROTEIN (GM)</b>      |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 1             | -----  | 50.12  | -----  | 50.12  | ----- | 8             | 28.55  | 44.00  | 58.68  | 46.59  | 21.50 | 0.46  | 0.657 |
| St. Clair                | 8             | 52.78  | 73.47  | 88.93  | 69.66  | 23.20 | 24            | 55.25  | 64.82  | 82.75  | 69.71  | 21.50 | -0.01 | 0.996 |
| Maricopa                 | 0             |        |        |        |        |       | 41            | 39.82  | 44.93  | 64.38  | 46.26  | 16.80 |       |       |
| Mingo                    | 10            | 36.81  | 45.56  | 54.88  | 46.89  | 14.60 | 28            | 39.26  | 54.08  | 66.10  | 54.63  | 19.80 | -1.30 | 0.207 |
| <b>FAT (GM)</b>          |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 1             | -----  | 45.57  | -----  | 45.57  | ----- | 9             | 36.78  | 51.91  | 93.27  | 62.71  | 36.80 | -1.40 | 0.200 |
| St. Clair                | 7             | 62.29  | 75.22  | 115.46 | 86.94  | 32.20 | 24            | 65.25  | 78.42  | 105.08 | 83.80  | 25.40 | 0.24  | 0.818 |
| Maricopa                 | 0             |        |        |        |        |       | 41            | 37.06  | 50.67  | 74.27  | 55.51  | 24.00 |       |       |
| Mingo                    | 10            | 44.31  | 57.38  | 68.92  | 59.75  | 24.50 | 28            | 47.58  | 58.27  | 78.68  | 63.84  | 22.90 | -0.46 | 0.651 |
| <b>CARBOHYDRATE (GM)</b> |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 1             | -----  | 120.16 | -----  | 120.16 | ----- | 9             | 157.61 | 159.84 | 212.69 | 181.55 | 43.40 | -4.24 | 0.003 |
| St. Clair                | 8             | 168.13 | 205.00 | 247.02 | 210.77 | 49.20 | 24            | 162.70 | 224.83 | 281.00 | 227.97 | 78.90 | -0.73 | 0.477 |
| Maricopa                 | 0             |        |        |        |        |       | 40            | 109.03 | 161.92 | 200.35 | 161.35 | 60.10 |       |       |
| Mingo                    | 10            | 129.69 | 172.32 | 220.90 | 178.19 | 55.50 | 29            | 145.51 | 182.90 | 235.76 | 187.72 | 71.20 | -0.43 | 0.669 |

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Table 6-42 (continued)

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Absent from Head Start on Day of Recall with Unadjusted Comparisons  
Between Age Groups within Site

|                        | 2-4 YEAR OLDS |        |        |        |        |       | 4-6 YEAR OLDS |        |        |        |        |       | T     | P.    |
|------------------------|---------------|--------|--------|--------|--------|-------|---------------|--------|--------|--------|--------|-------|-------|-------|
|                        | N             | Q1     | MED    | Q3     | MEAN   | SD    | N             | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>CALCIUM (MG)</b>    |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys       | 1             | -----  | 343.   | -----  | 343.   | ----- | 9             | 332.   | 422.   | 583.   | 474.   | 175.  | -2.24 | 0.056 |
| St. Clair              | 8             | 538.   | 807.   | 1224.  | 857.   | 411.  | 24            | 498.   | 654.   | 789.   | 677.   | 280.  | 1.15  | 0.279 |
| Maricopa               | 0             |        |        |        |        |       | 41            | 445.   | 599.   | 777.   | 626.   | 309.  |       |       |
| Mingo                  | 10            | 401.   | 570.   | 816.   | 665.   | 343.  | 29            | 500.   | 750.   | 884.   | 739.   | 318.  | -0.60 | 0.569 |
| <b>IRON (MG)</b>       |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys       | 1             | -----  | 9.00   | -----  | 9.00   | ----- | 8             | 7.17   | 8.58   | 9.21   | 9.19   | 3.41  | -0.16 | 0.881 |
| St. Clair              | 7             | 7.82   | 11.33  | 14.50  | 11.60  | 4.26  | 22            | 10.08  | 12.85  | 16.49  | 13.10  | 4.67  | -0.84 | 0.417 |
| Maricopa               | 0             |        |        |        |        |       | 40            | 6.43   | 8.51   | 11.10  | 8.81   | 3.47  |       |       |
| Mingo                  | 9             | 5.67   | 8.36   | 9.28   | 7.73   | 1.80  | 25            | 7.77   | 9.29   | 10.11  | 9.76   | 3.13  | -2.36 | 0.026 |
| <b>MAGNESIUM (MG)</b>  |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys       | 1             | -----  | 119.60 | -----  | 119.60 | ----- | 9             | 99.03  | 192.81 | 227.58 | 176.68 | 74.10 | -2.31 | 0.050 |
| St. Clair              | 8             | 158.02 | 189.06 | 255.44 | 209.13 | 71.00 | 24            | 166.25 | 214.47 | 273.91 | 220.92 | 81.00 | -0.39 | 0.701 |
| Maricopa               | 0             |        |        |        |        |       | 40            | 105.15 | 135.21 | 176.94 | 145.14 | 64.40 |       |       |
| Mingo                  | 10            | 125.54 | 159.73 | 184.74 | 167.00 | 69.00 | 29            | 121.23 | 169.28 | 213.68 | 175.79 | 64.80 | -0.35 | 0.729 |
| <b>PHOSPHORUS (MG)</b> |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys       | 1             | -----  | 605.   | -----  | 605.   | ----- | 9             | 519.   | 752.   | 941.   | 810.   | 409.  | -1.51 | 0.170 |
| St. Clair              | 8             | 869.   | 1159.  | 1316.  | 1190.  | 473.  | 24            | 732.   | 1055.  | 1167.  | 995.   | 285.  | 1.10  | 0.299 |
| Maricopa               | 0             |        |        |        |        |       | 41            | 612.   | 756.   | 912.   | 803.   | 317.  |       |       |
| Mingo                  | 10            | 715.   | 844.   | 1060.  | 853.   | 303.  | 29            | 753.   | 965.   | 1219.  | 996.   | 393.  | -1.18 | 0.251 |

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Table 6-42 (continued)

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Absent from Head Start on Day of Recall with Unadjusted Comparisons  
Between Age Groups within Site

|                           | 2-4 YEAR OLDS |       |       |       |       |       | 4-6 YEAR OLDS |       |       |       |       |       | T     | P     |
|---------------------------|---------------|-------|-------|-------|-------|-------|---------------|-------|-------|-------|-------|-------|-------|-------|
|                           | N             | Q1    | MED   | Q3    | MEAN  | SD    | N             | Q1    | MED   | Q3    | MEAN  | SD    |       |       |
| <b>LOG VITAMIN A (IU)</b> |               |       |       |       |       |       |               |       |       |       |       |       |       |       |
| Greene/Humphreys          | 1             | ----- | 3.37  | ----- | 3.37  | ----- | 9             | 3.29  | 3.29  | 3.73  | 3.46  | 0.43  | -0.60 | 0.565 |
| St. Clair                 | 8             | 3.18  | 3.40  | 3.73  | 3.41  | 0.38  | 24            | 3.37  | 3.64  | 3.79  | 3.56  | 0.28  | -1.07 | 0.311 |
| Maricopa                  | 0             |       |       |       |       |       | 39            | 3.11  | 3.27  | 3.44  | 3.32  | 0.33  |       |       |
| Mingo                     | 10            | 3.21  | 3.43  | 3.67  | 3.43  | 0.39  | 29            | 3.30  | 3.49  | 3.76  | 3.53  | 0.27  | -0.74 | 0.471 |
| <b>VITAMIN A (IU)</b>     |               |       |       |       |       |       |               |       |       |       |       |       |       |       |
| Greene/Humphreys          | 1             | ----- | 2360. | ----- | 2360. | ----- | 9             | 1942. | 1961. | 5432. | 4621. | 5680. | -1.19 | 0.267 |
| St. Clair                 | 8             | 1541. | 2527. | 5384. | 3425. | 2561. | 24            | 2364. | 4365. | 6197. | 4362. | 2334. | -0.92 | 0.379 |
| Maricopa                  | 0             |       |       |       |       |       | 39            | 1301. | 1869. | 2757. | 2908. | 3013. |       |       |
| Mingo                     | 10            | 1613. | 2773. | 4712. | 3745. | 3029. | 29            | 1997. | 3073. | 5698. | 4083. | 2472. | -0.32 | 0.756 |
| <b>THIAMIN (MG)</b>       |               |       |       |       |       |       |               |       |       |       |       |       |       |       |
| Greene/Humphreys          | 1             | ----- | 1.28  | ----- | 1.28  | ----- | 9             | 1.00  | 1.23  | 1.49  | 1.28  | 0.30  | -0.02 | 0.981 |
| St. Clair                 | 8             | 1.11  | 1.22  | 1.43  | 1.22  | 0.38  | 23            | 1.22  | 1.65  | 2.07  | 1.62  | 0.68  | -2.09 | 0.049 |
| Maricopa                  | 0             |       |       |       |       |       | 39            | 0.61  | 0.85  | 1.16  | 0.93  | 0.40  |       |       |
| Mingo                     | 9             | 0.69  | 0.97  | 1.10  | 0.96  | 0.38  | 28            | 0.90  | 1.11  | 1.50  | 1.26  | 0.57  | -1.79 | 0.087 |
| <b>RIBOFLAVIN (MG)</b>    |               |       |       |       |       |       |               |       |       |       |       |       |       |       |
| Greene/Humphreys          | 1             | ----- | 1.55  | ----- | 1.55  | ----- | 8             | 0.95  | 1.10  | 1.32  | 1.18  | 0.37  | 2.80  | 0.026 |
| St. Clair                 | 8             | 1.45  | 1.62  | 1.99  | 1.62  | 0.49  | 24            | 1.25  | 1.88  | 2.40  | 1.92  | 0.80  | -1.27 | 0.219 |
| Maricopa                  | 0             |       |       |       |       |       | 40            | 0.92  | 1.27  | 1.58  | 1.35  | 0.55  |       |       |
| Mingo                     | 9             | 1.00  | 1.55  | 1.63  | 1.31  | 0.48  | 28            | 1.26  | 1.54  | 2.02  | 1.66  | 0.66  | -1.77 | 0.093 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6-42 (continued)

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Absent from Head Start on Day of Recall with Unadjusted Comparisons  
Between Age Groups within Site

|                           | 2-4 YEAR OLDS |      |       |       |       |      | 4-6 YEAR OLDS |       |       |       |       |      | T     | P     |
|---------------------------|---------------|------|-------|-------|-------|------|---------------|-------|-------|-------|-------|------|-------|-------|
|                           | N             | Q1   | MED   | Q3    | MEAN  | SD   | N             | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>NIACIN (MG)</b>        |               |      |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 1             |      | 15.79 |       | 15.79 |      | 8             | 9.61  | 10.41 | 14.77 | 12.03 | 3.39 | 3.13  | 0.017 |
| St. Clair                 | 8             | 9.05 | 12.98 | 18.27 | 14.85 | 7.23 | 22            | 14.10 | 17.04 | 23.90 | 19.05 | 8.62 | -1.33 | 0.202 |
| Maricopa                  | 0             |      |       |       |       |      | 39            | 5.97  | 9.64  | 13.45 | 10.28 | 4.90 |       |       |
| Mingo                     | 9             | 7.17 | 11.38 | 13.02 | 10.69 | 4.57 | 26            | 8.36  | 11.85 | 17.02 | 13.14 | 5.91 | -1.28 | 0.217 |
| <b>VITAMIN B6 (MG)</b>    |               |      |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 1             |      | 1.48  |       | 1.48  |      | 9             | 0.73  | 1.25  | 1.58  | 1.27  | 0.60 | 1.09  | 0.306 |
| St. Clair                 | 8             | 0.61 | 0.86  | 1.32  | 0.97  | 0.51 | 21            | 0.90  | 1.30  | 1.91  | 1.48  | 0.75 | -2.07 | 0.052 |
| Maricopa                  | 0             |      |       |       |       |      | 41            | 0.60  | 0.88  | 1.34  | 1.06  | 0.55 |       |       |
| Mingo                     | 9             | 0.55 | 0.89  | 1.12  | 1.00  | 0.74 | 27            | 0.91  | 1.10  | 1.46  | 1.22  | 0.59 | -0.79 | 0.446 |
| <b>LOG VIT. B12 (MCG)</b> |               |      |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 1             |      | 0.22  |       | 0.22  |      | 8             | -0.12 | 0.16  | 0.48  | 0.19  | 0.32 | 0.27  | 0.786 |
| St. Clair                 | 8             | 0.45 | 0.56  | 0.68  | 0.53  | 0.20 | 24            | 0.45  | 0.54  | 0.79  | 0.59  | 0.23 | -0.69 | 0.500 |
| Maricopa                  | 0             |      |       |       |       |      | 40            | 0.30  | 0.46  | 0.56  | 0.44  | 0.24 |       |       |
| Mingo                     | 10            | 0.28 | 0.45  | 0.56  | 0.44  | 0.35 | 28            | 0.44  | 0.48  | 0.61  | 0.51  | 0.29 | -0.52 | 0.612 |
| <b>VITAMIN B12 (MCG)</b>  |               |      |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 1             |      | 1.68  |       | 1.68  |      | 8             | 0.76  | 1.45  | 3.24  | 1.99  | 1.47 | -0.59 | 0.571 |
| St. Clair                 | 8             | 2.83 | 3.68  | 4.78  | 3.67  | 1.38 | 24            | 2.84  | 3.51  | 6.15  | 4.48  | 2.59 | -1.12 | 0.275 |
| Maricopa                  | 0             |      |       |       |       |      | 40            | 1.98  | 2.87  | 3.62  | 3.13  | 1.72 |       |       |
| Mingo                     | 10            | 1.96 | 2.85  | 3.60  | 3.68  | 3.28 | 28            | 2.74  | 3.09  | 4.06  | 3.80  | 2.26 | -0.11 | 0.915 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6-42 (continued)

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Absent from Head Start on Day of Recall with Unadjusted Comparisons  
Between Age Groups within Site

|                         | 2-4 YEAR OLDS |        |        |        |        |        | 4-6 YEAR OLDS |        |        |        |        |        | T     | P     |
|-------------------------|---------------|--------|--------|--------|--------|--------|---------------|--------|--------|--------|--------|--------|-------|-------|
|                         | N             | Q1     | MED    | Q3     | MEAN   | SD     | N             | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>VITAMIN C (MG)</b>   |               |        |        |        |        |        |               |        |        |        |        |        |       |       |
| Greene/Humphreys        | 1             | -----  | 28.36  | -----  | 28.36  | -----  | 9             | 108.39 | 129.48 | 166.10 | 127.38 | 79.50  | -3.74 | 0.006 |
| St. Clair               | 8             | 90.45  | 121.44 | 219.54 | 151.26 | 77.90  | 24            | 106.66 | 169.52 | 250.21 | 188.20 | 117.00 | -1.01 | 0.325 |
| Maricopa                | 0             |        |        |        |        |        | 39            | 25.09  | 45.72  | 137.35 | 81.81  | 73.10  |       |       |
| Mingo                   | 10            | 57.29  | 85.36  | 133.51 | 94.37  | 68.30  | 29            | 39.75  | 86.64  | 114.81 | 93.51  | 73.50  | 0.03  | 0.974 |
| <b>CHOLESTEROL (MG)</b> |               |        |        |        |        |        |               |        |        |        |        |        |       |       |
| Greene/Humphreys        | 1             | -----  | 390.38 | -----  | 390.38 | -----  | 8             | 102.30 | 151.93 | 330.48 | 251.08 | 241.00 | 1.63  | 0.146 |
| St. Clair               | 8             | 303.75 | 439.17 | 521.52 | 422.36 | 184.00 | 24            | 196.15 | 331.98 | 545.31 | 395.20 | 244.00 | 0.33  | 0.745 |
| Maricopa                | 0             |        |        |        |        |        | 41            | 147.58 | 327.68 | 408.98 | 315.83 | 193.00 |       |       |
| Mingo                   | 10            | 158.59 | 315.18 | 365.61 | 276.26 | 151.00 | 29            | 167.29 | 388.86 | 527.97 | 376.73 | 220.00 | -1.60 | 0.124 |

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Table 6-43

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Present in Head Start on Day of Recall with Unadjusted Comparisons  
Between Males and Females across Sites

|                    | MALES |        |        |        |        |        | FEMALES |        |        |        |        |        | T     | P     |
|--------------------|-------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|-------|-------|
|                    | N     | Q1     | MED    | Q3     | MEAN   | SD     | N       | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| KILOCALORIES       | 151   | 1478.  | 1807.  | 2286.  | 1874.  | 512.   | 154     | 1374.  | 1584.  | 1968.  | 1680.  | 475.   | 3.42  | 0.001 |
| PROTEIN (GM)       | 154   | 55.74  | 68.28  | 86.08  | 70.86  | 22.50  | 153     | 49.50  | 62.86  | 73.20  | 64.18  | 19.70  | 2.77  | 0.006 |
| FAT (GM)           | 150   | 58.46  | 70.76  | 91.30  | 75.10  | 23.60  | 152     | 49.94  | 62.08  | 79.30  | 65.45  | 22.00  | 3.68  | 0.000 |
| CARBOHYDRATE (GM)  | 153   | 182.99 | 225.93 | 285.20 | 234.44 | 70.10  | 156     | 169.84 | 199.40 | 246.59 | 212.53 | 63.60  | 2.88  | 0.004 |
| CALCIUM (MG)       | 151   | 791.   | 1005.  | 1271.  | 1050.  | 386.   | 156     | 748.   | 939.   | 1181.  | 982.   | 339.   | 1.62  | 0.106 |
| IRON (MG)          | 150   | 9.05   | 11.36  | 14.29  | 11.92  | 4.04   | 154     | 7.89   | 10.15  | 12.77  | 10.64  | 3.72   | 2.89  | 0.004 |
| MAGNESIUM (MG)     | 152   | 185.57 | 234.83 | 324.98 | 252.96 | 86.90  | 155     | 180.57 | 224.66 | 267.98 | 231.29 | 74.80  | 2.34  | 0.020 |
| PHOSPHORUS (MG)    | 153   | 979.   | 1242.  | 1553.  | 1274.  | 411.   | 156     | 914.   | 1121.  | 1363.  | 1177.  | 378.   | 2.15  | 0.033 |
| LOG VITAMIN A (IU) | 154   | 3.45   | 3.65   | 3.93   | 3.69   | 0.36   | 155     | 3.41   | 3.68   | 3.93   | 3.71   | 0.37   | -0.42 | 0.673 |
| VITAMIN A (IU)     | 154   | 2854.  | 4453.  | 8528.  | 7142.  | 8326.  | 155     | 2599.  | 4788.  | 8553.  | 7556.  | 8084.  | -0.44 | 0.658 |
| THIAMIN (MG)       | 153   | 0.97   | 1.28   | 1.69   | 1.40   | 0.55   | 153     | 0.94   | 1.17   | 1.52   | 1.25   | 0.45   | 2.50  | 0.013 |
| RIBOFLAVIN (MG)    | 149   | 1.53   | 2.03   | 2.56   | 2.12   | 0.78   | 152     | 1.50   | 1.89   | 2.43   | 2.03   | 0.72   | 1.07  | 0.283 |
| NIACIN (MG)        | 152   | 10.56  | 14.27  | 19.07  | 15.34  | 6.36   | 153     | 9.67   | 13.40  | 17.43  | 14.09  | 5.55   | 1.83  | 0.068 |
| VITAMIN B6 (MG)    | 150   | 1.01   | 1.27   | 1.72   | 1.40   | 0.54   | 152     | 0.97   | 1.20   | 1.55   | 1.30   | 0.51   | 1.59  | 0.114 |
| LOG VIT. B12 (MCG) | 146   | 0.48   | 0.62   | 0.73   | 0.60   | 0.23   | 142     | 0.46   | 0.57   | 0.69   | 0.57   | 0.22   | 1.12  | 0.263 |
| VITAMIN B12 (MCG)  | 146   | 3.02   | 4.15   | 5.33   | 4.53   | 2.45   | 142     | 2.87   | 3.71   | 4.88   | 4.25   | 2.71   | 0.91  | 0.364 |
| VITAMIN C (MG)     | 148   | 62.19  | 110.97 | 192.12 | 127.42 | 78.30  | 154     | 65.13  | 117.20 | 174.22 | 130.64 | 84.60  | -0.34 | 0.732 |
| CHOLESTEROL (MG)   | 153   | 199.31 | 299.74 | 461.22 | 348.68 | 186.00 | 153     | 185.01 | 287.12 | 433.09 | 337.25 | 201.00 | 0.52  | 0.607 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

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Table 6-44

**Total 24-Hour Nutrient Intake for Posttested Non-Head Start Children  
(Samples A, B, C) with Unadjusted Comparisons  
Between Males and Females across Sites**

|                    | MALES |        |        |        |        |        | FEMALES |        |        |        |        |        | T     | P     |
|--------------------|-------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|-------|-------|
|                    | N     | Q1     | MED    | Q3     | MEAN   | SD     | N       | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| KILOCALORIES       | 150   | 1333.  | 1578.  | 1899.  | 1640.  | 495.   | 158     | 1191.  | 1505.  | 1900.  | 1531.  | 502.   | 1.93  | 0.055 |
| PROTEIN (GM)       | 154   | 39.73  | 57.35  | 69.57  | 58.08  | 22.20  | 158     | 37.20  | 51.66  | 68.44  | 53.26  | 21.30  | 1.96  | 0.051 |
| FAT (GM)           | 150   | 51.11  | 69.11  | 84.40  | 69.04  | 25.50  | 160     | 46.42  | 65.08  | 77.49  | 65.02  | 26.20  | 1.37  | 0.172 |
| CARBOHYDRATE (GM)  | 148   | 148.11 | 193.33 | 237.17 | 196.71 | 64.40  | 158     | 139.54 | 178.75 | 227.57 | 187.41 | 68.50  | 1.23  | 0.221 |
| CALCIUM (MG)       | 152   | 408.   | 637.   | 850.   | 670.   | 353.   | 158     | 439.   | 640.   | 900.   | 689.   | 340.   | -0.49 | 0.628 |
| IRON (MG)          | 150   | 7.59   | 9.81   | 13.17  | 10.49  | 3.85   | 152     | 7.05   | 9.67   | 12.05  | 9.86   | 4.25   | 1.35  | 0.177 |
| MAGNESIUM (MG)     | 153   | 128.24 | 169.09 | 220.55 | 182.00 | 76.00  | 158     | 132.27 | 175.78 | 236.89 | 187.90 | 81.20  | -0.66 | 0.509 |
| PHOSPHORUS (MG)    | 154   | 672.   | 898.   | 1152.  | 966.   | 406.   | 156     | 636.   | 899.   | 1167.  | 929.   | 368.   | 0.84  | 0.399 |
| LOG VITAMIN A (IU) | 150   | 3.21   | 3.37   | 3.56   | 3.40   | 0.29   | 150     | 3.28   | 3.47   | 3.65   | 3.47   | 0.34   | -1.97 | 0.050 |
| VITAMIN A (IU)     | 150   | 1620.  | 2358.  | 3640.  | 3292.  | 3577.  | 150     | 1891.  | 2946.  | 4494.  | 4156.  | 4583.  | -1.82 | 0.070 |
| THIAMIN (MG)       | 151   | 0.82   | 1.14   | 1.50   | 1.21   | 0.50   | 151     | 0.74   | 1.08   | 1.47   | 1.16   | 0.57   | 0.77  | 0.444 |
| RIBOFLAVIN (MG)    | 151   | 1.02   | 1.45   | 1.89   | 1.52   | 0.63   | 154     | 1.05   | 1.43   | 2.00   | 1.57   | 0.74   | -0.74 | 0.457 |
| NIACIN (MG)        | 152   | 8.78   | 13.09  | 17.41  | 13.94  | 6.19   | 156     | 8.38   | 11.94  | 17.22  | 13.40  | 6.89   | 0.72  | 0.474 |
| VITAMIN B6 (MG)    | 151   | 0.71   | 1.09   | 1.52   | 1.15   | 0.53   | 155     | 0.69   | 1.18   | 1.56   | 1.19   | 0.60   | -0.54 | 0.593 |
| LOG VIT. B12 (MCG) | 152   | 0.27   | 0.43   | 0.58   | 0.41   | 0.25   | 153     | 0.28   | 0.43   | 0.58   | 0.41   | 0.30   | 0.10  | 0.916 |
| VITAMIN B12 (MCG)  | 152   | 1.88   | 2.69   | 3.80   | 2.99   | 1.64   | 153     | 1.89   | 2.68   | 3.84   | 3.11   | 1.93   | -0.60 | 0.547 |
| VITAMIN C (MG)     | 151   | 28.89  | 86.18  | 152.35 | 106.41 | 89.90  | 157     | 43.63  | 85.66  | 150.99 | 111.32 | 93.20  | -0.47 | 0.638 |
| CHOLESTERDL (MG)   | 150   | 152.50 | 306.31 | 516.18 | 345.12 | 220.00 | 158     | 141.15 | 246.71 | 443.41 | 312.32 | 214.00 | 1.33  | 0.186 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t-test.

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Table 6-45

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Absent from Head Start on Day of Recall with Unadjusted Comparisons  
Between Males and Females across Sites

|                    | MALES |        |        |        |        |        | FEMALES |        |        |        |        |        | T     | P     |
|--------------------|-------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|-------|-------|
|                    | N     | Q1     | MED    | Q3     | MEAN   | SD     | N       | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| KILCALORIES        | 66    | 1115.  | 1560.  | 2000.  | 1618.  | 552.   | 55      | 1165.  | 1450.  | 1776.  | 1492.  | 499.   | 1.32  | 0.188 |
| PROTEIN (GM)       | 65    | 41.25  | 52.18  | 67.11  | 56.52  | 21.00  | 55      | 39.55  | 50.28  | 62.29  | 52.26  | 21.00  | 1.11  | 0.271 |
| FAT (GM)           | 65    | 47.37  | 62.82  | 88.41  | 69.73  | 29.00  | 55      | 44.24  | 57.12  | 75.89  | 61.06  | 25.30  | 1.75  | 0.083 |
| CARBOHYDRATE (GM)  | 66    | 144.00 | 177.13 | 235.76 | 189.22 | 73.40  | 55      | 145.88 | 168.77 | 226.27 | 183.68 | 62.40  | 0.45  | 0.655 |
| CALCIUM (MG)       | 66    | 449.   | 586.   | 784.   | 634.   | 281.   | 56      | 429.   | 668.   | 917.   | 707.   | 346.   | -1.27 | 0.206 |
| IRON (MG)          | 62    | 7.84   | 9.28   | 12.18  | 10.31  | 3.81   | 51      | 6.53   | 9.01   | 11.19  | 9.56   | 4.05   | 1.02  | 0.312 |
| MAGNESIUM (MG)     | 66    | 109.79 | 163.06 | 227.25 | 173.40 | 76.90  | 55      | 120.41 | 169.28 | 212.81 | 178.44 | 70.20  | -0.38 | 0.707 |
| PHOSPHORUS (MG)    | 66    | 664.   | 875.   | 1125.  | 903.   | 311.   | 56      | 631.   | 836.   | 1149.  | 929.   | 412.   | -0.38 | 0.704 |
| LOG VITAMIN A (IU) | 64    | 3.22   | 3.42   | 3.68   | 3.42   | 0.32   | 56      | 3.27   | 3.42   | 3.76   | 3.48   | 0.34   | -1.11 | 0.271 |
| VITAMIN A (IU)     | 64    | 1644.  | 2646.  | 4764.  | 3434.  | 2805.  | 56      | 1849.  | 2642.  | 5713.  | 4028.  | 3119.  | -1.07 | 0.285 |
| THIAMIN (MG)       | 64    | 0.80   | 1.11   | 1.52   | 1.22   | 0.56   | 53      | 0.78   | 1.10   | 1.35   | 1.17   | 0.56   | 0.45  | 0.657 |
| RIBOFLAVIN (MG)    | 64    | 1.15   | 1.44   | 1.92   | 1.57   | 0.66   | 54      | 1.00   | 1.43   | 1.88   | 1.53   | 0.64   | 0.31  | 0.755 |
| NIACIN (MG)        | 63    | 8.85   | 12.26  | 17.83  | 14.13  | 7.08   | 50      | 7.86   | 9.99   | 15.79  | 11.98  | 6.23   | 1.71  | 0.089 |
| VITAMIN B6 (MG)    | 64    | 0.73   | 1.08   | 1.60   | 1.18   | 0.61   | 52      | 0.66   | 1.03   | 1.49   | 1.18   | 0.65   | 0.03  | 0.976 |
| LOG VIT. B12 (MCG) | 64    | 0.43   | 0.52   | 0.61   | 0.51   | 0.24   | 56      | 0.29   | 0.44   | 0.59   | 0.43   | 0.31   | 1.72  | 0.088 |
| VITAMIN B12 (MCG)  | 64    | 2.72   | 3.31   | 4.35   | 3.76   | 2.09   | 56      | 1.95   | 2.76   | 3.93   | 3.32   | 2.37   | 1.07  | 0.287 |
| VITAMIN C (MG)     | 66    | 32.28  | 83.66  | 173.65 | 108.31 | 91.70  | 54      | 51.36  | 96.08  | 163.48 | 122.21 | 93.40  | -0.82 | 0.415 |
| CHOLESTEROL (MG)   | 65    | 161.78 | 359.08 | 477.03 | 362.13 | 219.00 | 56      | 153.80 | 310.63 | 487.80 | 327.88 | 203.00 | 0.89  | 0.374 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6-46

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Present in Head Start on Day of Recall with Unadjusted Comparisons  
Between Males and Females within Site

|                          | MALES |        |        |        |        |       | FEMALES |        |        |        |        |       | T     | P     |
|--------------------------|-------|--------|--------|--------|--------|-------|---------|--------|--------|--------|--------|-------|-------|-------|
|                          | N     | Q1     | MED    | Q3     | MEAN   | SD    | N       | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>KILOCALORIES</b>      |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys         | 46    | 1319   | 1563   | 1856   | 1610   | 409   | 63      | 1391   | 1526   | 1867   | 1623   | 417   | -0.16 | 0.871 |
| St. Clair                | 36    | 1882   | 2108   | 2577   | 2186   | 487   | 38      | 1501   | 1787   | 2323   | 1938   | 529   | 2.04  | 0.045 |
| Maricopa                 | 32    | 1385   | 1574   | 2037   | 1675   | 439   | 26      | 1183   | 1441   | 1622   | 1407   | 374   | 2.51  | 0.015 |
| Mingo                    | 37    | 1621   | 2223   | 2425   | 2070   | 474   | 30      | 1356   | 1719   | 2038   | 1735   | 463   | 2.92  | 0.005 |
| <b>PROTEIN (GM)</b>      |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys         | 46    | 49.82  | 60.70  | 73.49  | 63.07  | 17.80 | 62      | 50.91  | 63.20  | 73.17  | 63.66  | 18.60 | -0.18 | 0.861 |
| St. Clair                | 37    | 62.55  | 80.51  | 96.56  | 79.71  | 23.80 | 35      | 58.59  | 66.31  | 88.13  | 71.50  | 20.40 | 1.58  | 0.119 |
| Maricopa                 | 31    | 48.20  | 59.02  | 74.59  | 60.96  | 19.80 | 25      | 44.39  | 50.41  | 65.88  | 53.25  | 17.30 | 1.55  | 0.126 |
| Mingo                    | 40    | 64.56  | 78.04  | 93.26  | 79.32  | 22.40 | 31      | 50.55  | 63.49  | 78.41  | 65.75  | 23.20 | 2.48  | 0.016 |
| <b>FAT (GM)</b>          |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys         | 45    | 52.45  | 60.15  | 72.25  | 62.93  | 18.90 | 62      | 48.73  | 58.06  | 78.09  | 63.52  | 20.80 | -0.15 | 0.878 |
| St. Clair                | 36    | 67.28  | 86.04  | 109.63 | 88.77  | 26.20 | 35      | 55.39  | 68.36  | 88.79  | 74.33  | 26.30 | 2.37  | 0.023 |
| Maricopa                 | 32    | 54.58  | 64.60  | 90.77  | 71.72  | 23.70 | 26      | 40.00  | 61.24  | 68.16  | 59.19  | 20.40 | 2.16  | 0.035 |
| Mingo                    | 37    | 64.66  | 82.42  | 91.30  | 79.54  | 17.50 | 29      | 52.19  | 67.94  | 78.12  | 64.49  | 17.40 | 3.48  | 0.001 |
| <b>CARBOHYDRATE (GM)</b> |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys         | 46    | 160.76 | 189.19 | 235.08 | 199.42 | 49.20 | 64      | 172.75 | 198.76 | 224.26 | 202.72 | 47.30 | -0.35 | 0.726 |
| St. Clair                | 36    | 224.02 | 283.10 | 335.95 | 274.98 | 65.30 | 35      | 190.99 | 245.87 | 312.94 | 252.40 | 74.00 | 1.36  | 0.178 |
| Maricopa                 | 32    | 165.23 | 198.72 | 232.84 | 196.87 | 50.20 | 26      | 117.73 | 173.46 | 188.62 | 164.78 | 43.70 | 2.60  | 0.012 |
| Mingo                    | 39    | 215.56 | 256.05 | 323.67 | 269.15 | 73.00 | 31      | 174.39 | 235.89 | 269.39 | 227.81 | 64.30 | 2.52  | 0.014 |

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Table 6-46 (continued)

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Present in Head Start on Day of Recall with Unadjusted Comparisons  
Between Males and Females within Site

|                        | MALES |        |        |        |        |       | FEMALES |        |        |        |        |       | T     | P     |
|------------------------|-------|--------|--------|--------|--------|-------|---------|--------|--------|--------|--------|-------|-------|-------|
|                        | N     | Q1     | MED    | Q3     | MEAN   | SD    | N       | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>CALCIUM (MG)</b>    |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys       | 46    | 773    | 932    | 1060   | 929    | 260   | 64      | 815    | 933    | 1175   | 968    | 280   | -0.75 | 0.456 |
| St. Clair              | 36    | 810    | 1187   | 1461   | 1142   | 453   | 35      | 790    | 970    | 1223   | 1058   | 379   | 0.85  | 0.396 |
| Maricopa               | 30    | 610    | 877    | 1099   | 879    | 365   | 26      | 630    | 800    | 1111   | 844    | 297   | 0.40  | 0.691 |
| Mingo                  | 39    | 1000   | 1191   | 1530   | 1237   | 365   | 31      | 805    | 994    | 1382   | 1043   | 406   | 2.08  | 0.042 |
| <b>IRON (MG)</b>       |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys       | 45    | 7.96   | 9.98   | 12.40  | 10.74  | 3.93  | 63      | 8.36   | 9.88   | 12.72  | 10.77  | 3.78  | -0.05 | 0.963 |
| St. Clair              | 35    | 10.68  | 13.40  | 15.69  | 13.61  | 4.02  | 35      | 8.74   | 11.86  | 14.92  | 12.14  | 3.86  | 1.55  | 0.127 |
| Maricopa               | 29    | 8.32   | 10.12  | 12.45  | 10.19  | 3.10  | 26      | 5.98   | 8.03   | 10.63  | 8.57   | 2.86  | 2.02  | 0.049 |
| Mingo                  | 41    | 10.00  | 12.54  | 15.33  | 13.00  | 3.88  | 30      | 7.70   | 10.38  | 12.88  | 10.39  | 3.19  | 3.06  | 0.003 |
| <b>MAGNESIUM (MG)</b>  |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys       | 46    | 177.39 | 210.44 | 262.27 | 221.75 | 58.40 | 64      | 188.78 | 223.50 | 266.40 | 233.50 | 72.50 | -0.94 | 0.350 |
| St. Clair              | 36    | 220.47 | 314.41 | 386.39 | 306.56 | 94.50 | 35      | 197.23 | 264.17 | 342.44 | 272.75 | 77.60 | 1.65  | 0.104 |
| Maricopa               | 32    | 151.36 | 203.85 | 267.90 | 207.88 | 77.40 | 26      | 138.04 | 170.38 | 209.46 | 179.11 | 55.70 | 1.64  | 0.106 |
| Mingo                  | 38    | 211.13 | 281.74 | 356.00 | 277.91 | 82.40 | 30      | 182.22 | 231.99 | 263.29 | 223.46 | 63.10 | 3.09  | 0.003 |
| <b>PHOSPHORUS (MG)</b> |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys       | 46    | 979    | 1103   | 1331   | 1165   | 342   | 64      | 1008   | 1140   | 1344   | 1192   | 357   | -0.41 | 0.680 |
| St. Clair              | 36    | 1087   | 1352   | 1714   | 1381   | 433   | 35      | 967    | 1221   | 1497   | 1281   | 370   | 1.05  | 0.286 |
| Maricopa               | 31    | 826    | 1027   | 1401   | 1089   | 383   | 26      | 786    | 952    | 1207   | 970    | 288   | 1.33  | 0.188 |
| Mingo                  | 40    | 1180   | 1463   | 1720   | 1446   | 401   | 31      | 885    | 1198   | 1429   | 1203   | 442   | 2.39  | 0.020 |

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Table 6-46 (continued)

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Present in Head Start on Day of Recall with Unadjusted Comparisons  
Between Males and Females within Site

|                           | MALES |       |       |        |        |        | FEMALES |       |       |        |       |       | T     | P     |
|---------------------------|-------|-------|-------|--------|--------|--------|---------|-------|-------|--------|-------|-------|-------|-------|
|                           | N     | Q1    | MED   | Q3     | MEAN   | SD     | N       | Q1    | MED   | Q3     | MEAN  | SD    |       |       |
| <b>LOG VITAMIN A (IU)</b> |       |       |       |        |        |        |         |       |       |        |       |       |       |       |
| Greene/Humphreys          | 45    | 3.48  | 3.80  | 4.09   | 3.84   | 0.43   | 63      | 3.44  | 3.73  | 4.13   | 3.79  | 0.40  | 0.69  | 0.494 |
| St. Clair                 | 37    | 3.54  | 3.79  | 3.95   | 3.75   | 0.30   | 35      | 3.53  | 3.78  | 3.95   | 3.80  | 0.38  | -0.60 | 0.553 |
| Maricopa                  | 31    | 3.25  | 3.52  | 3.61   | 3.46   | 0.30   | 26      | 3.33  | 3.53  | 3.74   | 3.56  | 0.27  | -1.36 | 0.179 |
| Mingo                     | 41    | 3.46  | 3.60  | 3.84   | 3.65   | 0.26   | 31      | 3.42  | 3.59  | 3.75   | 3.57  | 0.27  | 1.19  | 0.239 |
| <b>VITAMIN A (IU)</b>     |       |       |       |        |        |        |         |       |       |        |       |       |       |       |
| Greene/Humphreys          | 45    | 2898. | 6280. | 12197. | 11515. | 13485. | 63      | 2736. | 5336. | 13561. | 9395. | 9658. | 0.90  | 0.370 |
| St. Clair                 | 37    | 3440. | 6204. | 8949.  | 6853.  | 4072.  | 35      | 3422. | 6030. | 8849.  | 9298. | 9312. | -1.93 | 0.160 |
| Maricopa                  | 31    | 1835. | 3312. | 4066.  | 3576.  | 2426.  | 26      | 2164. | 3387. | 5446.  | 4482. | 3279. | -1.18 | 0.244 |
| Mingo                     | 41    | 2864. | 3975. | 6912.  | 5301.  | 3301.  | 31      | 2654. | 3857. | 5669.  | 4421. | 2557. | 1.27  | 0.207 |
| <b>THIAMIN (MG)</b>       |       |       |       |        |        |        |         |       |       |        |       |       |       |       |
| Greene/Humphreys          | 46    | 0.85  | 1.09  | 1.45   | 1.19   | 0.45   | 63      | 0.97  | 1.19  | 1.47   | 1.27  | 0.45  | -0.89 | 0.376 |
| St. Clair                 | 37    | 1.16  | 1.55  | 2.20   | 1.68   | 0.67   | 34      | 1.07  | 1.28  | 1.75   | 1.42  | 0.49  | -1.89 | 0.063 |
| Maricopa                  | 31    | 0.85  | 1.15  | 1.39   | 1.21   | 0.47   | 26      | 0.80  | 0.88  | 1.07   | 1.00  | 0.38  | 1.83  | 0.073 |
| Mingo                     | 39    | 1.22  | 1.43  | 1.87   | 1.52   | 0.45   | 30      | 0.94  | 1.17  | 1.64   | 1.25  | 0.39  | 2.71  | 0.009 |
| <b>RIBOFLAVIN (MG)</b>    |       |       |       |        |        |        |         |       |       |        |       |       |       |       |
| Greene/Humphreys          | 42    | 1.41  | 1.80  | 2.30   | 1.96   | 0.69   | 61      | 1.52  | 1.96  | 2.46   | 2.06  | 0.68  | -0.72 | 0.474 |
| St. Clair                 | 37    | 1.72  | 2.46  | 3.07   | 2.44   | 0.93   | 35      | 1.74  | 2.27  | 2.86   | 2.36  | 0.83  | 0.41  | 0.682 |
| Maricopa                  | 30    | 1.15  | 1.70  | 2.49   | 1.75   | 0.75   | 25      | 1.30  | 1.61  | 1.81   | 1.57  | 0.43  | 1.11  | 0.271 |
| Mingo                     | 40    | 1.86  | 2.22  | 2.61   | 2.26   | 0.59   | 31      | 1.55  | 1.89  | 2.43   | 1.95  | 0.69  | 2.03  | 0.047 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6-46 (continued)

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Present in Head Start on Day of Recall with Unadjusted Comparisons  
Between Males and Females within Site

|                           | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|---------------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                           | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>NIACIN (MG)</b>        |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          | 45    | 10.65 | 13.78 | 16.87 | 14.43 | 5.80 | 61      | 10.35 | 14.09 | 17.80 | 14.37 | 5.27 | 0.05  | 0.957 |
| St. Clair                 | 37    | 13.32 | 17.97 | 22.16 | 18.40 | 6.80 | 35      | 12.02 | 15.18 | 20.32 | 16.13 | 5.88 | 1.52  | 0.134 |
| Maricopa                  | 31    | 9.04  | 12.61 | 14.57 | 12.54 | 4.85 | 26      | 8.39  | 11.00 | 13.00 | 11.29 | 5.26 | 0.93  | 0.359 |
| Mingo                     | 39    | 10.15 | 14.51 | 20.94 | 15.73 | 6.52 | 31      | 9.73  | 12.24 | 17.03 | 13.59 | 5.08 | 1.54  | 0.127 |
| <b>VITAMIN B6 (MG)</b>    |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          | 45    | 1.05  | 1.20  | 1.44  | 1.27  | 0.40 | 61      | 0.97  | 1.20  | 1.51  | 1.27  | 0.45 | -0.01 | 0.988 |
| St. Clair                 | 34    | 1.05  | 1.53  | 1.85  | 1.58  | 0.62 | 35      | 1.02  | 1.37  | 1.99  | 1.56  | 0.59 | 0.14  | 0.888 |
| Maricopa                  | 31    | 0.89  | 1.17  | 1.54  | 1.28  | 0.57 | 26      | 0.79  | 1.04  | 1.23  | 1.09  | 0.50 | 1.31  | 0.196 |
| Mingo                     | 40    | 1.03  | 1.33  | 1.85  | 1.48  | 0.53 | 30      | 1.03  | 1.22  | 1.49  | 1.25  | 0.41 | 2.07  | 0.043 |
| <b>LOG VIT. B12 (MCG)</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          | 38    | 0.41  | 0.55  | 0.66  | 0.56  | 0.22 | 56      | 0.45  | 0.58  | 0.71  | 0.60  | 0.24 | -0.97 | 0.335 |
| St. Clair                 | 36    | 0.53  | 0.67  | 0.82  | 0.64  | 0.29 | 31      | 0.49  | 0.60  | 0.70  | 0.60  | 0.16 | 0.59  | 0.556 |
| Maricopa                  | 31    | 0.36  | 0.57  | 0.73  | 0.54  | 0.26 | 25      | 0.42  | 0.52  | 0.63  | 0.49  | 0.21 | 0.79  | 0.434 |
| Mingo                     | 41    | 0.58  | 0.64  | 0.72  | 0.65  | 0.12 | 30      | 0.38  | 0.57  | 0.68  | 0.53  | 0.24 | 2.45  | 0.019 |
| <b>VITAMIN B12 (MCG)</b>  |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          | 38    | 2.60  | 3.54  | 4.57  | 4.22  | 3.15 | 56      | 2.83  | 3.83  | 5.10  | 4.84  | 3.78 | -0.86 | 0.392 |
| St. Clair                 | 36    | 3.37  | 4.67  | 6.59  | 5.13  | 2.69 | 31      | 3.12  | 3.98  | 5.02  | 4.26  | 1.56 | 1.63  | 0.109 |
| Maricopa                  | 31    | 2.30  | 3.74  | 5.35  | 4.10  | 2.30 | 25      | 2.65  | 3.31  | 4.26  | 3.42  | 1.33 | 1.39  | 0.169 |
| Mingo                     | 41    | 3.81  | 4.35  | 5.24  | 4.63  | 1.30 | 30      | 2.40  | 3.73  | 4.80  | 3.86  | 1.75 | 2.03  | 0.047 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

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Table 6-46 (continued)

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Present in Head Start on Day of Recall with Unadjusted Comparisons  
Between Males and Females within Site

|                         | MALES |        |        |        |        |        | FEMALES |        |        |        |        |        | T     | P     |
|-------------------------|-------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|-------|-------|
|                         | N     | Q1     | MED    | Q3     | MEAN   | SD     | N       | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>VITAMIN C (MG)</b>   |       |        |        |        |        |        |         |        |        |        |        |        |       |       |
| Greene/Humphreys        | 45    | 49.28  | 81.11  | 152.00 | 110.97 | 83.30  | 63      | 66.43  | 120.51 | 168.20 | 123.20 | 72.40  | -0.79 | 0.430 |
| St. Clair               | 36    | 128.21 | 172.96 | 224.48 | 180.15 | 70.70  | 35      | 122.24 | 190.01 | 281.99 | 201.39 | 96.60  | -1.06 | 0.295 |
| Maricopa                | 31    | 58.38  | 69.80  | 137.73 | 101.37 | 65.00  | 26      | 42.63  | 57.18  | 105.03 | 75.53  | 52.30  | 1.66  | 0.102 |
| Mingo                   | 36    | 62.76  | 110.19 | 159.55 | 117.70 | 67.20  | 30      | 71.81  | 94.89  | 154.79 | 111.46 | 63.40  | 0.39  | 0.700 |
| <b>CHOLESTEROL (MG)</b> |       |        |        |        |        |        |         |        |        |        |        |        |       |       |
| Greene/Humphreys        | 44    | 194.62 | 294.53 | 442.72 | 327.20 | 159.00 | 61      | 188.82 | 288.03 | 407.17 | 323.16 | 161.00 | 0.13  | 0.899 |
| St. Clair               | 36    | 255.15 | 410.16 | 540.00 | 404.13 | 186.00 | 35      | 275.77 | 435.26 | 571.21 | 454.39 | 236.00 | -0.99 | 0.324 |
| Maricopa                | 32    | 154.26 | 219.20 | 577.46 | 340.88 | 250.00 | 26      | 137.49 | 222.36 | 343.90 | 274.95 | 194.00 | -1.13 | 0.263 |
| Mingo                   | 41    | 218.74 | 293.35 | 449.34 | 329.12 | 148.00 | 31      | 173.32 | 216.97 | 343.17 | 284.98 | 194.00 | 1.07  | 0.290 |

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Table 6-47

Total 24-Hour Nutrient Intake for Posttested Non-Head Start Children  
(Samples A, B, C) with Unadjusted Comparisons  
Between Males and Females within Site

|                          | MALES |        |        |        |        |       | FEMALES |        |        |        |        |       | T     | P     |
|--------------------------|-------|--------|--------|--------|--------|-------|---------|--------|--------|--------|--------|-------|-------|-------|
|                          | N     | Q1     | MED    | Q3     | MEAN   | SD    | N       | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>KILOCALORIES</b>      |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys         | 48    | 1278   | 1507   | 1900   | 1607   | 529   | 40      | 1233   | 1510   | 1843   | 1480   | 455   | 1.22  | 0.227 |
| St. Clair                | 35    | 1433   | 1712   | 1969   | 1748   | 456   | 32      | 1494   | 1683   | 2100   | 1777   | 458   | -0.25 | 0.801 |
| Maricopa                 | 19    | 1297   | 1466   | 1913   | 1559   | 526   | 32      | 997    | 1259   | 1949   | 1425   | 594   | 0.84  | 0.405 |
| Mingo                    | 48    | 1346   | 1574   | 1840   | 1626   | 478   | 55      | 1187   | 1464   | 1761   | 1486   | 469   | 1.49  | 0.139 |
| <b>PROTEIN (GM)</b>      |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys         | 50    | 41.87  | 51.61  | 74.63  | 61.07  | 23.10 | 40      | 38.78  | 52.10  | 64.63  | 53.00  | 19.60 | 1.79  | 0.076 |
| St. Clair                | 35    | 45.67  | 59.38  | 69.08  | 59.71  | 22.20 | 33      | 47.82  | 61.85  | 71.78  | 62.26  | 19.10 | -0.51 | 0.613 |
| Maricopa                 | 20    | 37.39  | 58.15  | 67.90  | 58.17  | 21.60 | 31      | 29.84  | 42.71  | 61.89  | 47.13  | 23.30 | 1.73  | 0.091 |
| Mingo                    | 49    | 38.47  | 51.21  | 67.17  | 53.84  | 21.40 | 55      | 34.88  | 50.18  | 68.78  | 51.51  | 21.50 | 0.55  | 0.581 |
| <b>FAT (GM)</b>          |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys         | 48    | 49.40  | 65.24  | 86.00  | 66.16  | 24.40 | 40      | 46.94  | 62.09  | 73.54  | 60.63  | 24.60 | 1.05  | 0.295 |
| St. Clair                | 35    | 57.38  | 76.47  | 93.65  | 76.65  | 25.40 | 33      | 62.27  | 71.45  | 83.15  | 75.83  | 23.10 | 2.14  | 0.889 |
| Maricopa                 | 19    | 44.90  | 73.84  | 83.58  | 69.91  | 30.30 | 32      | 40.14  | 52.01  | 81.72  | 61.47  | 30.50 | 0.96  | 0.344 |
| Mingo                    | 48    | 50.83  | 66.05  | 77.55  | 66.01  | 24.10 | 55      | 45.79  | 65.28  | 77.49  | 63.79  | 25.20 | 0.46  | 0.649 |
| <b>CARBOHYDRATE (GM)</b> |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys         | 47    | 140.96 | 178.51 | 240.38 | 189.56 | 67.10 | 40      | 135.61 | 178.80 | 224.98 | 184.87 | 67.40 | 0.32  | 0.747 |
| St. Clair                | 35    | 176.63 | 201.44 | 231.19 | 206.27 | 61.40 | 32      | 166.24 | 205.91 | 260.19 | 221.74 | 75.20 | -0.92 | 0.363 |
| Maricopa                 | 19    | 130.25 | 171.57 | 226.20 | 178.33 | 62.20 | 31      | 132.37 | 159.68 | 219.49 | 167.45 | 66.30 | 0.59  | 0.562 |
| Mingo                    | 47    | 158.01 | 192.77 | 245.95 | 204.18 | 64.10 | 55      | 135.92 | 175.83 | 224.36 | 180.53 | 60.60 | 1.91  | 0.060 |

Table 6-47 (continued)

Total 24-Hour Nutrient Intake for Posttested Non-Head Start Children  
(Samples A, B, C) with Unadjusted Comparisons  
Between Males and Females within Site

|                        | MALES |        |        |        |        |       | FEMALES |        |        |        |        |       | T    | P     |
|------------------------|-------|--------|--------|--------|--------|-------|---------|--------|--------|--------|--------|-------|------|-------|
|                        | N     | Q1     | MED    | Q3     | MEAN   | SD    | N       | Q1     | MED    | Q3     | MEAN   | SD    |      |       |
| <b>CALCIUM (MG)</b>    |       |        |        |        |        |       |         |        |        |        |        |       |      |       |
| Greene/Humphreys       | 49    | 384    | 603    | 780    | 618    | 300   | 40      | 428    | 547    | 856    | 616    | 298   | 0.03 | 0.976 |
| St. Clair              | 35    | 347    | 632    | 845    | 625    | 353   | 32      | 492    | 657    | 869    | 692    | 309   | 0.82 | 0.417 |
| Maricopa               | 19    | 470    | 734    | 910    | 710    | 317   | 31      | 382    | 628    | 956    | 703    | 400   | 0.07 | 0.945 |
| Mingo                  | 49    | 414    | 673    | 851    | 739    | 408   | 55      | 471    | 687    | 988    | 734    | 351   | 0.07 | 0.944 |
| <b>IRON (MG)</b>       |       |        |        |        |        |       |         |        |        |        |        |       |      |       |
| Greene/Humphreys       | 47    | 7.31   | 10.04  | 14.33  | 10.63  | 4.01  | 35      | 6.72   | 9.67   | 11.80  | 9.57   | 3.89  | 1.21 | 0.232 |
| St. Clair              | 35    | 8.37   | 9.85   | 13.99  | 11.13  | 3.79  | 33      | 9.77   | 11.08  | 14.56  | 12.09  | 4.75  | 0.91 | 0.364 |
| Maricopa               | 19    | 9.58   | 10.65  | 13.01  | 11.16  | 3.48  | 30      | 6.66   | 8.57   | 10.93  | 8.46   | 3.32  | 2.69 | 0.011 |
| Mingo                  | 49    | 7.23   | 8.88   | 11.50  | 9.65   | 3.83  | 54      | 6.41   | 8.88   | 11.88  | 9.47   | 4.21  | 0.23 | 0.819 |
| <b>MAGNESIUM (MG)</b>  |       |        |        |        |        |       |         |        |        |        |        |       |      |       |
| Greene/Humphreys       | 50    | 129.35 | 168.11 | 232.89 | 190.69 | 86.20 | 39      | 146.40 | 179.31 | 237.91 | 190.90 | 76.20 | 0.01 | 0.990 |
| St. Clair              | 35    | 119.48 | 172.23 | 216.60 | 179.06 | 73.80 | 33      | 138.20 | 189.57 | 242.56 | 205.13 | 84.40 | 1.35 | 0.181 |
| Maricopa               | 20    | 113.89 | 140.17 | 216.49 | 168.40 | 82.60 | 31      | 103.87 | 181.21 | 218.33 | 166.55 | 79.60 | 0.08 | 0.937 |
| Mingo                  | 48    | 139.16 | 173.02 | 209.63 | 180.76 | 63.90 | 55      | 127.83 | 170.95 | 235.24 | 187.46 | 83.00 | 0.46 | 0.645 |
| <b>PHOSPHORUS (MG)</b> |       |        |        |        |        |       |         |        |        |        |        |       |      |       |
| Greene/Humphreys       | 50    | 671    | 871    | 1124   | 955    | 426   | 39      | 642    | 904    | 1088   | 900    | 332   | 0.68 | 0.497 |
| St. Clair              | 35    | 547    | 846    | 1188   | 893    | 413   | 32      | 760    | 916    | 1278   | 984    | 334   | 1.00 | 0.322 |
| Maricopa               | 20    | 737    | 917    | 1236   | 977    | 373   | 31      | 596    | 740    | 1135   | 880    | 404   | 1.05 | 0.300 |
| Mingo                  | 49    | 745    | 946    | 1244   | 1026   | 396   | 54      | 638    | 909    | 1167   | 957    | 390   | 0.89 | 0.376 |

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Table 6-47 (continued)

Total 24-Hour Nutrient Intake for Posttested Non-Head Start Children  
(Samples A, B, C) with Unadjusted Comparisons  
Between Males and Females within Site

|                           | MALES |      |      |      |      |      | FEMALES |      |      |      |      |      | T     | P     |
|---------------------------|-------|------|------|------|------|------|---------|------|------|------|------|------|-------|-------|
|                           | N     | Q1   | MED  | Q3   | MEAN | SD   | N       | Q1   | MED  | Q3   | MEAN | SD   |       |       |
| <b>LOG VITAMIN A (IU)</b> |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| Greene/Humphreys          | 50    | 3.29 | 3.44 | 3.60 | 3.48 | 0.31 | 39      | 3.37 | 3.53 | 3.80 | 3.61 | 0.40 | -1.71 | 0.092 |
| St Clair                  | 34    | 3.19 | 3.34 | 3.52 | 3.37 | 0.30 | 31      | 3.23 | 3.42 | 3.55 | 3.42 | 0.32 | -0.61 | 0.545 |
| Maricopa                  | 19    | 3.15 | 3.38 | 3.56 | 3.39 | 0.30 | 30      | 3.24 | 3.42 | 3.61 | 3.43 | 0.29 | -0.47 | 0.638 |
| Mingo                     | 47    | 3.15 | 3.32 | 3.51 | 3.34 | 0.26 | 50      | 3.23 | 3.50 | 3.62 | 3.42 | 0.31 | -1.40 | 0.166 |
| <b>VITAMIN A (IU)</b>     |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| Greene/Humphreys          | 50    | 1967 | 2763 | 3963 | 4142 | 5166 | 39      | 2349 | 3429 | 6428 | 6442 | 7548 | -1.63 | 0.108 |
| St Clair                  | 34    | 1547 | 2168 | 3345 | 3073 | 2893 | 31      | 1707 | 2658 | 3555 | 3488 | 3208 | -0.54 | 0.593 |
| Maricopa                  | 19    | 1423 | 2379 | 3631 | 3166 | 2595 | 30      | 1751 | 2654 | 4074 | 3383 | 2497 | -0.29 | 0.773 |
| Mingo                     | 47    | 1421 | 2085 | 3249 | 2596 | 1625 | 50      | 1701 | 3143 | 4189 | 3249 | 2008 | -1.77 | 0.081 |
| <b>THIAMIN (MG)</b>       |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| Greene/Humphreys          | 49    | 0.85 | 1.27 | 1.74 | 1.34 | 0.59 | 36      | 0.76 | 1.11 | 1.46 | 1.18 | 0.60 | 1.23  | 0.223 |
| St Clair                  | 35    | 0.94 | 1.19 | 1.45 | 1.24 | 0.46 | 33      | 1.07 | 1.38 | 1.92 | 1.52 | 0.64 | -2.00 | 0.050 |
| Maricopa                  | 18    | 0.70 | 0.85 | 1.34 | 1.07 | 0.41 | 30      | 0.62 | 0.89 | 1.24 | 0.91 | 0.42 | 1.28  | 0.209 |
| Mingo                     | 49    | 0.80 | 1.00 | 1.26 | 1.10 | 0.43 | 52      | 0.72 | 0.98 | 1.42 | 1.06 | 0.45 | 0.39  | 0.700 |
| <b>RIBOFLAVIN (MG)</b>    |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| Greene/Humphreys          | 49    | 1.14 | 1.44 | 1.99 | 1.57 | 0.64 | 38      | 1.13 | 1.43 | 1.93 | 1.59 | 0.81 | -0.18 | 0.893 |
| St Clair                  | 35    | 0.99 | 1.49 | 1.82 | 1.49 | 0.62 | 30      | 1.15 | 1.50 | 1.96 | 1.57 | 0.60 | -0.53 | 0.601 |
| Maricopa                  | 19    | 1.01 | 1.68 | 1.85 | 1.53 | 0.58 | 32      | 0.90 | 1.25 | 2.06 | 1.49 | 0.77 | 0.20  | 0.844 |
| Mingo                     | 48    | 0.99 | 1.42 | 1.77 | 1.47 | 0.65 | 54      | 1.05 | 1.51 | 2.06 | 1.61 | 0.75 | -1.01 | 0.314 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test

Table 6-47 (continued)

Total 24-Hour Nutrient Intake for Posttested Non-Head Start Children  
(Samples A, B, C) with Unadjusted Comparisons  
Between Males and Females within Site

|                           | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|---------------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                           | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>NIACIN (MG)</b>        |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          | 49    | 10.54 | 14.99 | 19.87 | 15.87 | 6.32 | 38      | 8.68  | 12.39 | 17.75 | 14.17 | 7.35 | 1.14  | 0.260 |
| St. Clair                 | 35    | 11.22 | 13.81 | 16.92 | 14.62 | 5.51 | 33      | 11.28 | 15.50 | 19.58 | 16.60 | 7.53 | -1.23 | 0.223 |
| Maricopa                  | 19    | 8.78  | 12.90 | 16.72 | 13.01 | 5.64 | 30      | 7.39  | 9.33  | 12.65 | 9.99  | 4.24 | 2.01  | 0.053 |
| Mingo                     | 49    | 7.35  | 10.51 | 15.04 | 11.88 | 6.19 | 55      | 8.16  | 11.54 | 17.71 | 12.82 | 6.52 | -0.75 | 0.454 |
| <b>VITAMIN B6 (MG)</b>    |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          | 48    | 0.91  | 1.32  | 1.85  | 1.35  | 0.58 | 36      | 0.79  | 1.20  | 1.53  | 1.20  | 0.55 | 1.25  | 0.216 |
| St. Clair                 | 35    | 0.77  | 0.88  | 1.52  | 1.11  | 0.49 | 33      | 0.68  | 1.25  | 1.44  | 1.21  | 0.59 | -0.78 | 0.439 |
| Maricopa                  | 19    | 0.78  | 1.26  | 1.42  | 1.15  | 0.43 | 32      | 0.62  | 1.06  | 1.59  | 1.13  | 0.60 | 0.13  | 0.895 |
| Mingo                     | 49    | 0.61  | 0.89  | 1.16  | 0.98  | 0.49 | 54      | 0.65  | 1.17  | 1.68  | 1.19  | 0.64 | -1.87 | 0.065 |
| <b>LOG VIT. B12 (MCG)</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          | 50    | 0.23  | 0.37  | 0.56  | 0.38  | 0.25 | 37      | 0.28  | 0.44  | 0.56  | 0.40  | 0.32 | -0.29 | 0.771 |
| St. Clair                 | 35    | 0.31  | 0.43  | 0.56  | 0.44  | 0.23 | 31      | 0.37  | 0.48  | 0.58  | 0.48  | 0.19 | -1.42 | 0.162 |
| Maricopa                  | 20    | 0.43  | 0.52  | 0.68  | 0.53  | 0.20 | 32      | 0.15  | 0.36  | 0.61  | 0.38  | 0.36 | 1.93  | 0.060 |
| Mingo                     | 47    | 0.22  | 0.45  | 0.57  | 0.39  | 0.28 | 53      | 0.26  | 0.40  | 0.57  | 0.39  | 0.30 | 0.12  | 0.904 |
| <b>VITAMIN B12 (MCG)</b>  |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          | 50    | 1.68  | 2.35  | 3.60  | 2.84  | 1.75 | 37      | 1.92  | 2.73  | 3.63  | 3.19  | 2.25 | -0.78 | 0.440 |
| St. Clair                 | 35    | 2.03  | 2.70  | 3.61  | 2.87  | 1.32 | 31      | 2.32  | 3.02  | 3.85  | 3.30  | 1.44 | -1.25 | 0.218 |
| Maricopa                  | 20    | 2.70  | 3.33  | 4.79  | 3.66  | 1.49 | 32      | 1.43  | 2.31  | 4.09  | 3.13  | 2.22 | 1.04  | 0.301 |
| Mingo                     | 47    | 1.66  | 2.80  | 3.74  | 2.94  | 1.67 | 53      | 1.83  | 2.51  | 3.73  | 2.94  | 1.80 | 0.01  | 0.992 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6-47 (continued)

Total 24-Hour Nutrient Intake for Posttested Non-Head Start Children  
(Samples A, B, C) with Unadjusted Comparisons  
Between Males and Females within Site

|                         | MALES |        |        |        |        |        | FEMALES |        |        |        |        |        | T     | P     |
|-------------------------|-------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|-------|-------|
|                         | N     | Q1     | MED    | Q3     | MEAN   | SD     | N       | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>VITAMIN C (MG)</b>   |       |        |        |        |        |        |         |        |        |        |        |        |       |       |
| Greene/Humphreys        | 50    | 52.06  | 124.54 | 186.60 | 134.72 | 92.50  | 40      | 44.37  | 116.10 | 182.63 | 125.12 | 89.70  | 0.50  | 0.620 |
| St Clair                | 35    | 22.98  | 115.12 | 165.97 | 117.08 | 105.00 | 33      | 73.23  | 132.31 | 250.54 | 174.14 | 130.00 | -1.98 | 0.052 |
| Maricopa                | 19    | 34.64  | 66.44  | 86.09  | 68.42  | 48.90  | 31      | 43.33  | 85.66  | 125.25 | 85.31  | 53.90  | -1.14 | 0.261 |
| Mingo                   | 47    | 23.37  | 60.60  | 118.16 | 83.70  | 78.30  | 53      | 41.96  | 65.45  | 88.79  | 77.01  | 58.90  | 0.48  | 0.636 |
| <b>CHOLESTEROL (MG)</b> |       |        |        |        |        |        |         |        |        |        |        |        |       |       |
| Greene/Humphreys        | 48    | 149.96 | 212.31 | 423.86 | 307.48 | 204.00 | 40      | 140.77 | 241.84 | 372.11 | 280.39 | 173.00 | 0.67  | 0.502 |
| St Clair                | 35    | 171.33 | 368.27 | 616.79 | 383.36 | 233.00 | 31      | 170.11 | 219.29 | 490.55 | 326.17 | 217.00 | 1.03  | 0.306 |
| Maricopa                | 20    | 122.89 | 367.86 | 606.87 | 380.00 | 241.00 | 32      | 108.98 | 292.77 | 426.62 | 302.91 | 209.00 | 1.18  | 0.247 |
| Mingo                   | 47    | 154.40 | 348.69 | 460.06 | 340.26 | 217.00 | 55      | 140.70 | 262.74 | 466.25 | 333.22 | 242.00 | 0.16  | 0.877 |

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Table 6-48

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Absent from Head Start on Day of Recall with Unadjusted Comparisons  
Between Males and Females within Site.

|                          | MALES |        |        |        |        |       | FEMALES |        |        |        |        |       | T     | P     |
|--------------------------|-------|--------|--------|--------|--------|-------|---------|--------|--------|--------|--------|-------|-------|-------|
|                          | N     | Q1     | MED    | Q3     | MEAN   | SD    | N       | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>KILOCALORIES</b>      |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys         | 6     | 1198   | 1416   | 2049   | 1605   | 537   | 4       | 961    | 1032   | 1521   | 1241   | 474   | 1.13  | 0.297 |
| St. Clair                | 19    | 1673   | 2079   | 2559   | 2059   | 516   | 13      | 1386   | 1813   | 2123   | 1781   | 441   | 1.63  | 0.115 |
| Maricopa                 | 21    | 1015   | 1355   | 1678   | 1344   | 462   | 19      | 1069   | 1264   | 1422   | 1259   | 355   | 0.65  | 0.519 |
| Mingo                    | 20    | 1067   | 1475   | 1848   | 1492   | 441   | 19      | 1252   | 1518   | 1776   | 1578   | 561   | -0.53 | 0.597 |
| <b>PROTEIN (GM)</b>      |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys         | 5     | 40.06  | 47.93  | 49.51  | 51.25  | 20.60 | 4       | 24.30  | 37.25  | 58.98  | 41.64  | 21.30 | 0.68  | 0.520 |
| St. Clair                | 19    | 56.92  | 76.05  | 84.53  | 73.76  | 19.70 | 13      | 49.80  | 59.77  | 75.84  | 63.77  | 23.60 | 1.26  | 0.222 |
| Maricopa                 | 21    | 39.82  | 46.10  | 52.82  | 44.82  | 12.90 | 20      | 37.07  | 42.98  | 55.76  | 47.77  | 20.30 | -0.55 | 0.585 |
| Mingo                    | 20    | 39.26  | 43.23  | 64.99  | 53.75  | 19.80 | 18      | 36.81  | 54.08  | 59.97  | 51.31  | 17.90 | 0.40  | 0.691 |
| <b>FAT (GM)</b>          |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys         | 5     | 38.94  | 54.68  | 112.28 | 69.74  | 37.30 | 4       | 26.31  | 36.06  | 69.42  | 49.87  | 31.60 | 1.00  | 0.352 |
| St. Clair                | 18    | 72.67  | 93.90  | 110.78 | 90.03  | 28.50 | 13      | 58.39  | 71.21  | 86.24  | 76.86  | 22.30 | 1.44  | 0.160 |
| Maricopa                 | 21    | 41.12  | 53.03  | 77.45  | 58.32  | 22.40 | 20      | 36.63  | 47.02  | 57.86  | 52.55  | 25.90 | 0.76  | 0.451 |
| Mingo                    | 20    | 43.33  | 56.29  | 78.60  | 63.43  | 25.30 | 18      | 53.06  | 59.44  | 77.50  | 62.03  | 20.90 | 0.19  | 0.852 |
| <b>CARBOHYDRATE (GM)</b> |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys         | 6     | 144.00 | 167.07 | 219.16 | 183.97 | 51.00 | 4       | 138.89 | 158.73 | 186.27 | 162.58 | 38.00 | 0.76  | 0.470 |
| St. Clair                | 19    | 173.58 | 206.57 | 287.53 | 231.85 | 81.80 | 13      | 162.82 | 222.31 | 252.39 | 241.71 | 56.50 | 0.82  | 0.417 |
| Maricopa                 | 21    | 102.52 | 159.48 | 193.01 | 161.94 | 59.90 | 19      | 122.92 | 164.37 | 202.92 | 160.70 | 48.80 | 0.07  | 0.948 |
| Mingo                    | 20    | 126.41 | 180.51 | 214.40 | 178.95 | 59.40 | 19      | 146.54 | 169.67 | 234.83 | 191.93 | 75.10 | -0.60 | 0.555 |

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Table 6-48 (continued)

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
Absent from Head Start on Day of Recall with Unadjusted Comparisons  
Between Males and Females within Site

|                        | MALES |        |        |        |        |       | FEMALES |        |        |        |        |       | T     | P     |
|------------------------|-------|--------|--------|--------|--------|-------|---------|--------|--------|--------|--------|-------|-------|-------|
|                        | N     | Q1     | MED    | Q3     | MEAN   | SD    | N       | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>CALCIUM (MG)</b>    |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys       | 6     | 422    | 520    | 678    | 531    | 190   | 4       | 331    | 337    | 378    | 355    | 40    | 2.21  | 0.069 |
| St. Clair              | 19    | 505    | 635    | 789    | 697    | 316   | 13      | 631    | 739    | 841    | 758    | 336   | -0.52 | 0.605 |
| Maricopa               | 21    | 448    | 588    | 734    | 589    | 261   | 20      | 444    | 601    | 868    | 664    | 356   | -0.76 | 0.451 |
| Mingo                  | 20    | 443    | 591    | 831    | 651    | 292   | 19      | 530    | 878    | 982    | 792    | 342   | -1.38 | 0.178 |
| <b>IRON (MG)</b>       |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys       | 5     | 8.24   | 9.15   | 9.26   | 10.34  | 3.87  | 4       | 6.47   | 7.71   | 8.96   | 7.71   | 1.44  | 1.40  | 0.221 |
| St. Clair              | 16    | 10.37  | 14.04  | 16.07  | 13.39  | 4.02  | 13      | 9.01   | 10.09  | 13.97  | 11.88  | 5.17  | 0.87  | 0.396 |
| Maricopa               | 21    | 6.57   | 8.41   | 10.01  | 8.63   | 3.49  | 19      | 6.43   | 8.72   | 11.19  | 9.00   | 3.53  | -0.33 | 0.741 |
| Mingo                  | 20    | 8.12   | 9.22   | 10.07  | 9.61   | 2.52  | 15      | 6.20   | 8.98   | 9.63   | 8.74   | 3.49  | 0.82  | 0.420 |
| <b>MAGNESIUM (MG)</b>  |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys       | 6     | 168.98 | 210.20 | 236.80 | 203.45 | 66.90 | 4       | 85.18  | 102.50 | 159.34 | 122.26 | 53.70 | 2.12  | 0.067 |
| St. Clair              | 19    | 173.85 | 227.25 | 270.20 | 226.65 | 83.60 | 13      | 164.53 | 190.23 | 240.62 | 205.30 | 69.40 | 0.79  | 0.438 |
| Maricopa               | 21    | 79.19  | 128.54 | 178.88 | 136.99 | 66.00 | 19      | 106.83 | 151.66 | 173.61 | 154.14 | 63.20 | -0.84 | 0.407 |
| Mingo                  | 20    | 111.36 | 154.58 | 184.20 | 152.03 | 52.90 | 19      | 143.92 | 184.95 | 228.83 | 196.17 | 70.20 | -2.21 | 0.034 |
| <b>PHOSPHORUS (MG)</b> |       |        |        |        |        |       |         |        |        |        |        |       |       |       |
| Greene/Humphreys       | 6     | 655    | 783    | 1229   | 932    | 414   | 4       | 379    | 492    | 773    | 576    | 266   | 1.66  | 0.136 |
| St. Clair              | 19    | 837    | 1115   | 1198   | 1047   | 275   | 13      | 752    | 1023   | 1185   | 1039   | 438   | 0.05  | 0.958 |
| Maricopa               | 21    | 656    | 756    | 884    | 777    | 268   | 20      | 580    | 759    | 959    | 830    | 367   | -0.52 | 0.603 |
| Mingo                  | 20    | 611    | 862    | 1038   | 891    | 317   | 19      | 794    | 1060   | 1273   | 1031   | 421   | -1.17 | 0.250 |

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Table 6-48 (continued)

Total 24-Hour Nutrient Intake for Posttested Children (Samples A, B, C)  
 Absent from Head Start on Day of Recall with Unadjusted Comparisons  
 Between Males and Females within Site

|                           | MALES |      |      |      |      |      | FEMALES |      |      |      |      |      | T     | P     |
|---------------------------|-------|------|------|------|------|------|---------|------|------|------|------|------|-------|-------|
|                           | N     | Q1   | MED  | Q3   | MEAN | SD   | N       | Q1   | MED  | Q3   | MEAN | SD   |       |       |
| <b>LOG VITAMIN A (IU)</b> |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| Greene/Humphreys          | 6     | 3.01 | 3.45 | 3.74 | 3.47 | 0.51 | 4       | 3.29 | 3.33 | 3.55 | 3.42 | 0.21 | 0.20  | 0.815 |
| St. Clair                 | 19    | 3.45 | 3.67 | 3.80 | 3.61 | 0.26 | 13      | 3.26 | 3.42 | 3.64 | 3.40 | 0.35 | 1.87  | 0.083 |
| Maricopa                  | 19    | 3.06 | 3.24 | 3.33 | 3.22 | 0.27 | 20      | 3.19 | 3.35 | 3.53 | 3.42 | 0.36 | -2.05 | 0.048 |
| Mingo                     | 20    | 3.25 | 3.42 | 3.53 | 3.41 | 0.27 | 19      | 3.38 | 3.71 | 3.85 | 3.61 | 0.30 | -2.27 | 0.030 |
| <b>VITAMIN A (IU)</b>     |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| Greene/Humphreys          | 6     | 1020 | 2990 | 5468 | 5377 | 6924 | 4       | 1944 | 2153 | 3896 | 2920 | 1686 | 0.83  | 0.437 |
| St. Clair                 | 19    | 2816 | 4700 | 6344 | 4722 | 2367 | 13      | 1809 | 2657 | 4358 | 3261 | 2220 | 1.78  | 0.086 |
| Maricopa                  | 19    | 1153 | 1724 | 2137 | 1984 | 1400 | 20      | 1552 | 2265 | 4321 | 3786 | 3826 | -1.97 | 0.050 |
| Mingo                     | 20    | 1792 | 2664 | 3428 | 3004 | 1749 | 19      | 2407 | 5182 | 7108 | 5040 | 2945 | -2.61 | 0.014 |
| <b>THIAMIN (MG)</b>       |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| Greene/Humphreys          | 6     | 1.04 | 1.46 | 1.55 | 1.38 | 0.31 | 4       | 1.00 | 1.12 | 1.26 | 1.13 | 0.15 | 1.73  | 0.122 |
| St. Clair                 | 18    | 1.20 | 1.63 | 1.98 | 1.67 | 0.59 | 13      | 0.97 | 1.25 | 1.79 | 1.32 | 0.66 | 1.51  | 0.145 |
| Maricopa                  | 20    | 0.48 | 0.82 | 1.09 | 0.83 | 0.38 | 19      | 0.77 | 0.85 | 1.26 | 1.04 | 0.41 | -1.68 | 0.102 |
| Mingo                     | 20    | 0.93 | 1.02 | 1.37 | 1.16 | 0.43 | 17      | 0.78 | 0.93 | 1.63 | 1.22 | 0.66 | -0.32 | 0.752 |
| <b>RIBOFLAVIN (MG)</b>    |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| Greene/Humphreys          | 5     | 0.93 | 1.27 | 1.38 | 1.25 | 0.46 | 4       | 0.98 | 1.10 | 1.38 | 1.18 | 0.27 | 0.25  | 0.800 |
| St. Clair                 | 19    | 1.57 | 1.90 | 2.23 | 1.99 | 0.74 | 13      | 1.24 | 1.65 | 2.07 | 1.64 | 0.72 | 1.37  | 0.183 |
| Maricopa                  | 20    | 0.87 | 1.22 | 1.44 | 1.25 | 0.53 | 20      | 1.02 | 1.36 | 1.74 | 1.46 | 0.57 | -1.17 | 0.248 |
| Mingo                     | 20    | 1.20 | 1.51 | 1.75 | 1.55 | 0.56 | 17      | 1.13 | 1.58 | 2.04 | 1.61 | 0.73 | -0.27 | 0.786 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6-48 (continued)

Total 24-hour Nutrient Intake for Posttested Children (Samples A, B, C),  
Absent from Head Start on Day of Recall with Unadjusted Comparisons  
Between Males and Females within Site

|                           | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|---------------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                           | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>NIACIN (MG)</b>        |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          | 5     | 10.38 | 10.45 | 13.36 | 12.46 | 3.27 | 4       | 8.90  | 12.36 | 15.98 | 12.44 | 4.09 | 0.01  | 0.993 |
| St. Clair                 | 18    | 15.30 | 19.54 | 24.77 | 20.02 | 8.06 | 12      | 8.67  | 14.26 | 18.32 | 14.80 | 8.14 | 1.73  | 0.097 |
| Maricopa                  | 20    | 5.54  | 8.53  | 12.81 | 9.57  | 4.73 | 19      | 6.71  | 9.85  | 15.86 | 11.03 | 5.10 | -0.93 | 0.358 |
| Mingo                     | 20    | 9.83  | 12.07 | 17.42 | 13.80 | 5.03 | 15      | 7.31  | 9.74  | 13.60 | 10.79 | 6.10 | 1.56  | 0.132 |
| <b>VITAMIN B6 (MG)</b>    |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          | 6     | 0.77  | 1.42  | 1.80  | 1.41  | 0.63 | 4       | 0.67  | 1.08  | 1.52  | 1.10  | 0.48 | 0.90  | 0.396 |
| St. Clair                 | 17    | 0.80  | 1.51  | 1.91  | 1.53  | 0.68 | 12      | 0.55  | 0.90  | 1.30  | 1.06  | 0.71 | 1.77  | 0.089 |
| Maricopa                  | 21    | 0.57  | 0.74  | 1.13  | 0.88  | 0.49 | 20      | 0.67  | 1.19  | 1.73  | 1.24  | 0.56 | -2.20 | 0.034 |
| Mingo                     | 20    | 0.82  | 1.08  | 1.37  | 1.13  | 0.51 | 16      | 0.64  | 0.98  | 1.46  | 1.20  | 0.77 | -0.33 | 0.744 |
| <b>LOG VIT. B12 (MCG)</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          | 5     | 0.12  | 0.20  | 0.61  | 0.29  | 0.32 | 4       | -0.14 | 0.04  | 0.30  | 0.08  | 0.26 | 1.11  | 0.305 |
| St. Clair                 | 18    | 0.54  | 0.65  | 0.83  | 0.67  | 0.21 | 13      | 0.30  | 0.44  | 0.54  | 0.43  | 0.16 | 3.69  | 0.001 |
| Maricopa                  | 20    | 0.30  | 0.46  | 0.56  | 0.44  | 0.26 | 20      | 0.29  | 0.45  | 0.57  | 0.43  | 0.22 | 0.09  | 0.929 |
| Mingo                     | 20    | 0.45  | 0.47  | 0.56  | 0.49  | 0.12 | 19      | 0.34  | 0.54  | 0.71  | 0.49  | 0.42 | 6.03  | 0.974 |
| <b>VITAMIN B12 (MCG)</b>  |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          | 5     | 1.32  | 1.58  | 4.10  | 2.42  | 1.65 | 4       | 0.72  | 1.20  | 2.03  | 1.37  | 0.81 | 1.24  | 0.260 |
| St. Clair                 | 18    | 3.45  | 4.43  | 6.70  | 5.25  | 2.55 | 13      | 2.02  | 2.75  | 3.48  | 2.86  | 0.94 | 3.74  | 0.001 |
| Maricopa                  | 20    | 2.02  | 2.92  | 3.62  | 3.23  | 1.94 | 20      | 1.95  | 2.84  | 3.72  | 3.04  | 1.51 | 0.35  | 0.727 |
| Mingo                     | 20    | 2.82  | 2.99  | 3.62  | 3.21  | 0.83 | 19      | 2.21  | 3.44  | 5.14  | 4.35  | 3.45 | -1.40 | 0.176 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6-48 (continued)

Total 24-Hour Nutrient Intake for Posttested Children (Groups A, B, C)  
Absent from Head Start on Day of Recall with Unadjusted Comparisons  
Between Males and Females within Site

|                         | MALES |        |        |        |        |        | FEMALES |        |        |        |        |        | T     | P     |
|-------------------------|-------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|-------|-------|
|                         | N     | Q1     | MED    | Q3     | MEAN   | SD     | N       | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>VITAMIN C (MG)</b>   |       |        |        |        |        |        |         |        |        |        |        |        |       |       |
| Greene/Humphreys        | 6     | 13.54  | 147.79 | 203.29 | 127.69 | 98.50  | 4       | 68.38  | 108.39 | 135.93 | 102.16 | 55.60  | 0.52  | 0.616 |
| St. Clair               | 18    | 119.91 | 167.82 | 224.81 | 176.74 | 94.00  | 13      | 72.81  | 130.87 | 246.69 | 182.21 | 132.00 | -0.13 | 0.899 |
| Maricopa                | 21    | 16.53  | 38.19  | 66.71  | 70.46  | 76.10  | 18      | 41.79  | 72.17  | 138.28 | 95.06  | 69.20  | -1.06 | 0.297 |
| Mingo                   | 20    | 19.72  | 70.92  | 112.18 | 77.23  | 65.80  | 19      | 57.53  | 93.46  | 138.65 | 111.11 | 74.50  | -1.50 | 0.142 |
| <b>CHOLESTEROL (MG)</b> |       |        |        |        |        |        |         |        |        |        |        |        |       |       |
| Greene/Humphreys        | 5     | 143.65 | 160.20 | 176.60 | 263.93 | 277.00 | 4       | 102.30 | 246.63 | 437.37 | 269.83 | 197.00 | -0.04 | 0.971 |
| St. Clair               | 19    | 235.40 | 421.09 | 560.06 | 441.78 | 226.00 | 13      | 190.02 | 266.27 | 457.25 | 343.82 | 228.00 | 1.20  | 0.244 |
| Maricopa                | 21    | 161.78 | 359.08 | 395.38 | 318.52 | 188.00 | 20      | 115.45 | 310.63 | 433.00 | 313.01 | 203.00 | 0.09  | 0.929 |
| Mingo                   | 20    | 152.06 | 349.48 | 468.88 | 356.79 | 220.00 | 18      | 177.82 | 365.41 | 513.38 | 344.84 | 200.00 | 0.18  | 0.860 |

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Table 6-49

Total 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start  
Males (Samples A, B, C) with Unadjusted Comparisons  
Between Age Groups across Sites

|                    | 2-4 YEAR OLDS |        |        |        |        |        | 4-6 YEAR OLDS |        |        |         |        |        | T     | P     |
|--------------------|---------------|--------|--------|--------|--------|--------|---------------|--------|--------|---------|--------|--------|-------|-------|
|                    | N             | Q1     | MED    | Q3     | MEAN   | SD     | N             | Q1     | MED    | Q3      | MEAN   | SD     |       |       |
| KILOCALORIES       | 107           | 1315   | 1539   | 1876   | 1646   | 504    | 260           | 1374   | 1752   | 2134    | 1768   | 530    | -2.06 | 0.040 |
| PROTEIN (GM)       | 109           | 42.15  | 56.20  | 69.69  | 58.88  | 21.60  | 264           | 46.29  | 63.26  | 80.42   | 64.82  | 23.40  | -2.36 | 0.019 |
| FAT (GM)           | 106           | 51.11  | 63.27  | 82.89  | 67.97  | 24.90  | 289           | 54.79  | 71.92  | 88.99   | 73.16  | 25.60  | -1.79 | 0.074 |
| CARBOHYDRATE (GM)  | 106           | 151.32 | 187.32 | 245.80 | 199.30 | 66.60  | 261           | 165.38 | 209.44 | 258.38  | 215.89 | 72.50  | -2.11 | 0.036 |
| CALCIUM (MG)       | 109           | 467.90 | 701.87 | 931.31 | 730.94 | 361.00 | 260           | 540.96 | 801.16 | 1134.57 | 855.73 | 416.00 | -2.89 | 0.004 |
| IRON (MG)          | 106           | 7.55   | 9.09   | 11.99  | 10.26  | 4.03   | 256           | 8.62   | 10.69  | 14.16   | 11.39  | 3.92   | -2.44 | 0.015 |
| MAGNESIUM (MG)     | 109           | 151.51 | 180.38 | 234.60 | 194.32 | 77.70  | 262           | 146.55 | 204.83 | 269.62  | 215.87 | 91.90  | -2.30 | 0.022 |
| PHOSPHORUS (MG)    | 109           | 770    | 979    | 1179   | 1001   | 373    | 264           | 772    | 1063   | 1401    | 1114   | 440    | -2.53 | 0.012 |
| LOG VITAMIN A (IU) | 108           | 3.23   | 3.45   | 3.73   | 3.50   | 0.38   | 260           | 3.31   | 3.51   | 3.75    | 3.54   | 0.34   | -0.89 | 0.376 |
| VITAMIN A (IU)     | 108           | 1702   | 2802   | 5350   | 5149   | 7713   | 260           | 2045   | 3275   | 5647    | 4836   | 5548   | 0.38  | 0.702 |
| THIAMIN (MG)       | 109           | 0.81   | 1.10   | 1.45   | 1.19   | 0.50   | 259           | 0.93   | 1.26   | 1.66    | 1.33   | 0.55   | -2.40 | 0.017 |
| RIBOFLAVIN (MG)    | 107           | 1.17   | 1.50   | 1.88   | 1.61   | 0.70   | 257           | 1.23   | 1.73   | 2.35    | 1.84   | 0.77   | -2.69 | 0.008 |
| NIACIN (MG)        | 109           | 9.02   | 12.04  | 17.40  | 13.97  | 6.52   | 258           | 10.03  | 13.58  | 18.37   | 14.80  | 6.40   | -1.13 | 0.261 |
| VITAMIN B6 (MG)    | 105           | 0.70   | 1.05   | 1.43   | 1.10   | 0.49   | 260           | 0.88   | 1.25   | 1.72    | 1.32   | 0.57   | -3.79 | 0.000 |
| LOG VIT. B12 (MCG) | 104           | 0.31   | 0.45   | 0.57   | 0.42   | 0.25   | 258           | 0.40   | 0.56   | 0.69    | 0.54   | 0.25   | -3.87 | 0.000 |
| VITAMIN B12 (MCG)  | 104           | 2.06   | 2.83   | 3.71   | 3.09   | 1.76   | 258           | 2.53   | 3.62   | 4.91    | 4.01   | 2.28   | -4.12 | 0.000 |
| VITAMIN C (MG)     | 107           | 39.34  | 95.38  | 174.83 | 115.67 | 91.80  | 258           | 44.77  | 102.72 | 170.16  | 115.41 | 83.80  | 0.05  | 0.956 |
| CHOLESTERDL (MG)   | 107           | 175.91 | 306.42 | 480.04 | 342.95 | 198.00 | 261           | 169.48 | 324.04 | 475.29  | 352.33 | 209.00 | -0.41 | 0.685 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

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Table 6-50

Total 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Males (Samples A, B, C) with Unadjusted Comparisons Between Age Groups within Site

|                          | 2-4 YEAR OLDS |        |        |        |        |       | 4-6 YEAR OLDS |        |        |        |        |       | T     | P     |
|--------------------------|---------------|--------|--------|--------|--------|-------|---------------|--------|--------|--------|--------|-------|-------|-------|
|                          | N             | Q1     | MED    | Q3     | MEAN   | SD    | N             | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>KILOCALORIES</b>      |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 39            | 1269.  | 1374.  | 1692.  | 1493.  | 431.  | 61            | 1334.  | 1654.  | 1933.  | 1682.  | 486.  | -2.04 | 0.014 |
| St. Clair                | 30            | 1495.  | 1765.  | 2248.  | 1855.  | 524.  | 60            | 1713.  | 2023.  | 2420.  | 2056.  | 503.  | -1.74 | 0.087 |
| Maricopa                 | 0             |        |        |        |        |       | 72            | 1260.  | 1520.  | 1868.  | 1548.  | 484.  |       |       |
| Mingo                    | 38            | 1365.  | 1542.  | 1876.  | 1639.  | 513.  | 67            | 1462.  | 1782.  | 2289.  | 1824.  | 520.  | -1.76 | 0.082 |
| <b>PROTEIN (GM)</b>      |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 40            | 41.81  | 52.50  | 69.21  | 56.50  | 19.50 | 61            | 47.93  | 62.75  | 79.81  | 64.78  | 21.00 | -2.02 | 0.046 |
| St. Clair                | 30            | 50.65  | 66.58  | 79.82  | 64.92  | 23.20 | 61            | 54.97  | 74.63  | 91.45  | 73.66  | 23.90 | -1.67 | 0.100 |
| Maricopa                 | 0             |        |        |        |        |       | 72            | 39.37  | 54.75  | 65.19  | 55.48  | 19.60 |       |       |
| Mingo                    | 39            | 40.66  | 51.99  | 68.49  | 56.69  | 22.10 | 70            | 44.63  | 66.18  | 84.17  | 66.79  | 25.30 | -2.17 | 0.033 |
| <b>FAT (MG)</b>          |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 39            | 49.40  | 57.71  | 70.51  | 60.19  | 18.70 | 60            | 50.86  | 64.66  | 83.77  | 67.98  | 24.80 | -1.78 | 0.079 |
| St. Clair                | 29            | 56.91  | 75.31  | 98.40  | 79.03  | 28.10 | 60            | 77.21  | 83.32  | 108.16 | 86.78  | 25.90 | -1.25 | 0.217 |
| Maricopa                 | 0             |        |        |        |        |       | 72            | 50.09  | 63.55  | 83.94  | 67.33  | 25.60 |       |       |
| Mingo                    | 38            | 48.96  | 64.02  | 82.89  | 67.51  | 25.30 | 67            | 59.27  | 72.80  | 86.61  | 71.86  | 21.80 | -0.89 | 0.377 |
| <b>CARBOHYDRATE (GM)</b> |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 39            | 147.50 | 175.76 | 227.66 | 184.40 | 60.50 | 60            | 157.07 | 201.24 | 235.64 | 199.92 | 56.40 | -1.28 | 0.204 |
| St. Clair                | 30            | 171.91 | 205.00 | 268.16 | 218.80 | 71.20 | 60            | 198.04 | 234.47 | 309.23 | 249.33 | 73.30 | -1.90 | 0.062 |
| Maricopa                 | 0             |        |        |        |        |       | 72            | 149.18 | 180.64 | 230.47 | 181.79 | 60.70 |       |       |
| Mingo                    | 37            | 149.27 | 185.96 | 243.05 | 199.20 | 66.60 | 69            | 183.82 | 235.20 | 291.29 | 236.26 | 77.10 | -2.58 | 0.012 |

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Table 6-50 (continued)

Total 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Males (Samples A, B, C) with Unadjusted Comparisons Between Age Groups within Site

|                        | 2-4 YEAR OLDS |        |        |        |        |        | 4-6 YEAR OLDS |        |        |         |        |        | T     | P     |
|------------------------|---------------|--------|--------|--------|--------|--------|---------------|--------|--------|---------|--------|--------|-------|-------|
|                        | N             | Q1     | MED    | Q3     | MEAN   | SD     | N             | Q1     | MED    | Q3      | MEAN   | SD     |       |       |
| <b>CALCIUM (MG)</b>    |               |        |        |        |        |        |               |        |        |         |        |        |       |       |
| Greene/Humphreys       | 40            | 432.11 | 752.14 | 928.48 | 687.50 | 285.00 | 61            | 537.83 | 773.24 | 963.86  | 798.47 | 334.00 | -1.79 | 0.077 |
| St. Clair              | 30            | 493.50 | 697.82 | 973.47 | 767.71 | 379.00 | 60            | 546.54 | 810.07 | 1206.11 | 897.90 | 487.00 | -1.44 | 0.155 |
| Maricopa               | 0             |        |        |        |        |        | 70            | 492.41 | 731.91 | 962.86  | 746.29 | 343.00 |       |       |
| Mingo                  | 39            | 454.59 | 674.32 | 971.23 | 754.91 | 417.00 | 69            | 617.42 | 934.12 | 1275.81 | 985.91 | 448.00 | -2.69 | 0.009 |
| <b>IRON (MG)</b>       |               |        |        |        |        |        |               |        |        |         |        |        |       |       |
| Greene/Humphreys       | 38            | 7.31   | 8.67   | 11.63  | 9.78   | 3.94   | 58            | 8.24   | 10.69  | 14.48   | 11.26  | 3.84   | -1.83 | 0.070 |
| St. Clair              | 28            | 8.37   | 10.04  | 14.89  | 11.80  | 4.50   | 58            | 10.08  | 12.79  | 15.07   | 12.93  | 3.82   | -1.14 | 0.261 |
| Maricopa               | 0             |        |        |        |        |        | 69            | 7.38   | 9.93   | 11.91   | 9.99   | 3.42   |       |       |
| Mingo                  | 38            | 7.20   | 8.94   | 11.30  | 9.62   | 3.53   | 71            | 8.79   | 10.28  | 14.18   | 11.59  | 4.10   | -2.63 | 0.010 |
| <b>MAGNESIUM (MG)</b>  |               |        |        |        |        |        |               |        |        |         |        |        |       |       |
| Greene/Humphreys       | 40            | 150.57 | 181.19 | 223.19 | 188.65 | 72.80  | 62            | 166.22 | 213.29 | 258.64  | 216.28 | 74.40  | -1.86 | 0.067 |
| St. Clair              | 30            | 133.59 | 183.57 | 277.63 | 207.78 | 92.20  | 60            | 194.87 | 236.36 | 343.19  | 256.27 | 103.00 | -2.26 | 0.027 |
| Maricopa               | 0             |        |        |        |        |        | 73            | 125.05 | 163.84 | 245.31  | 176.67 | 80.60  |       |       |
| Mingo                  | 39            | 154.89 | 177.19 | 218.36 | 189.77 | 71.00  | 67            | 152.14 | 205.17 | 298.48  | 222.04 | 82.30  | -2.02 | 0.047 |
| <b>PHOSPHORUS (MG)</b> |               |        |        |        |        |        |               |        |        |         |        |        |       |       |
| Greene/Humphreys       | 40            | 768.   | 990.   | 1135.  | 955.   | 345.   | 62            | 791.   | 1054.  | 1320.   | 1108.  | 424.   | -1.99 | 0.049 |
| St. Clair              | 30            | 760.   | 1080   | 1226.  | 1003.  | 375.   | 60            | 790.   | 1197.  | 1481.   | 1179.  | 476.   | -1.91 | 0.060 |
| Maricopa               | 0             |        |        |        |        |        | 72            | 719.   | 888    | 1251.   | 967.   | 370.   |       |       |
| Mingo                  | 39            | 804.   | 973.   | 1190.  | 1045.  | 402.   | 70            | 844.   | 1214.  | 1578.   | 1216.  | 457.   | -2.03 | 0.046 |

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Table 6-50 (continued)

Total 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start  
Males (Samples A, B, C) with Unadjusted Comparisons  
Between Age Groups within Site

|                           | 2-4 YEAR OLDS |       |       |       |       |        | 4-6 YEAR OLDS |       |       |       |       |       | T     | P     |
|---------------------------|---------------|-------|-------|-------|-------|--------|---------------|-------|-------|-------|-------|-------|-------|-------|
|                           | N             | Q1    | MED   | Q3    | MEAN  | SD     | N             | Q1    | MED   | Q3    | MEAN  | SD    |       |       |
| <b>LOG VITAMIN A (IU)</b> |               |       |       |       |       |        |               |       |       |       |       |       |       |       |
| Greene/Humphreys          | 40            | 3.23  | 3.47  | 3.85  | 3.60  | 0.48   | 61            | 3.40  | 3.60  | 3.83  | 3.67  | 0.37  | -0.79 | 0.429 |
| St. Clair                 | 30            | 3.28  | 3.40  | 3.63  | 3.48  | 0.31   | 60            | 3.39  | 3.67  | 3.88  | 3.62  | 0.34  | -2.02 | 0.047 |
| Maricopa                  | 0             |       |       |       |       |        | 69            | 3.16  | 3.38  | 3.56  | 3.38  | 0.30  |       |       |
| Mingo                     | 38            | 3.21  | 3.40  | 3.56  | 3.41  | 0.30   | 70            | 3.30  | 3.46  | 3.71  | 3.50  | 0.29  | -1.58 | 0.120 |
| <b>VITAMIN A (IU)</b>     |               |       |       |       |       |        |               |       |       |       |       |       |       |       |
| Greene/Humphreys          | 40            | 1712. | 2943. | 7084. | 7876. | 11681. | 61            | 2535. | 3954. | 6767. | 7254. | 9604. | 0.28  | 0.780 |
| St. Clair                 | 30            | 1918. | 2536. | 4241. | 4010. | 3649.  | 60            | 2443. | 4700. | 7684. | 5458. | 3728. | -1.76 | 0.083 |
| Maricopa                  | 0             |       |       |       |       |        | 69            | 1456. | 2388. | 3607. | 3025. | 2312. |       |       |
| Mingo                     | 38            | 1610. | 2505. | 3640. | 3179. | 2169.  | 70            | 2000. | 2913. | 5192. | 3981. | 2943. | -1.61 | 0.110 |
| <b>THIAMIN (MG)</b>       |               |       |       |       |       |        |               |       |       |       |       |       |       |       |
| Greene/Humphreys          | 40            | 0.83  | 1.06  | 1.28  | 1.15  | 0.52   | 61            | 0.94  | 1.34  | 1.69  | 1.36  | 0.51  | -2.01 | 0.048 |
| St. Clair                 | 30            | 0.89  | 1.25  | 1.65  | 1.33  | 0.55   | 60            | 1.13  | 1.48  | 1.94  | 1.60  | 0.62  | -2.08 | 0.041 |
| Maricopa                  | 0             |       |       |       |       |        | 69            | 0.75  | 1.02  | 1.31  | 1.06  | 0.45  |       |       |
| Mingo                     | 39            | 0.79  | 1.00  | 1.38  | 1.12  | 0.43   | 69            | 0.98  | 1.26  | 1.68  | 1.34  | 0.49  | -2.42 | 0.018 |
| <b>RIBOFLAVIN (MG)</b>    |               |       |       |       |       |        |               |       |       |       |       |       |       |       |
| Greene/Humphreys          | 39            | 1.17  | 1.47  | 1.90  | 1.65  | 0.77   | 57            | 1.32  | 1.79  | 2.16  | 1.78  | 0.63  | -0.83 | 0.407 |
| St. Clair                 | 30            | 1.17  | 1.61  | 2.15  | 1.72  | 0.74   | 61            | 1.49  | 2.01  | 2.87  | 2.11  | 0.92  | -2.22 | 0.030 |
| Maricopa                  | 0             |       |       |       |       |        | 69            | 1.05  | 1.41  | 1.95  | 1.55  | 0.67  |       |       |
| Mingo                     | 38            | 1.16  | 1.47  | 1.83  | 1.50  | 0.57   | 70            | 1.35  | 1.89  | 2.45  | 1.93  | 0.73  | -3.42 | 0.001 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

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Table 6-50 (continued)

Total 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Males (Samples A, B, C) with Unadjusted Comparisons Between Age Groups within Site

|                           | 2-4 YEAR OLDS |       |       |       |       |      | 4-6 YEAR OLDS |       |       |       |       |      | T     | P     |
|---------------------------|---------------|-------|-------|-------|-------|------|---------------|-------|-------|-------|-------|------|-------|-------|
|                           | N             | Q1    | MED   | Q3    | MEAN  | SD   | N             | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>NIACIN (MG)</b>        |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 40            | 10.35 | 12.93 | 18.00 | 14.17 | 5.83 | 59            | 11.24 | 14.65 | 18.49 | 15.63 | 6.08 | -1.20 | 0.232 |
| St. Clair                 | 30            | 10.31 | 14.75 | 22.16 | 16.01 | 7.35 | 60            | 13.15 | 16.54 | 21.39 | 17.88 | 6.63 | -1.17 | 0.247 |
| Maricopa                  | 0             |       |       |       |       |      | 70            | 7.63  | 11.33 | 14.93 | 11.82 | 5.18 |       |       |
| Mingo                     | 39            | 7.84  | 10.51 | 14.77 | 12.19 | 6.17 | 69            | 8.50  | 13.11 | 18.82 | 14.44 | 6.28 | -1.81 | 0.074 |
| <b>VITAMIN B6 (MG)</b>    |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 37            | 0.75  | 1.15  | 1.37  | 1.12  | 0.48 | 62            | 1.09  | 1.38  | 1.82  | 1.44  | 0.48 | -3.19 | 0.002 |
| St. Clair                 | 29            | 0.84  | 1.10  | 1.51  | 1.18  | 0.48 | 57            | 0.91  | 1.47  | 1.91  | 1.48  | 0.66 | -2.46 | 0.016 |
| Maricopa                  | 0             |       |       |       |       |      | 71            | 0.74  | 1.13  | 1.43  | 1.13  | 0.53 |       |       |
| Mingo                     | 39            | 0.62  | 1.01  | 1.29  | 1.02  | 0.49 | 70            | 0.89  | 1.19  | 1.71  | 1.29  | 0.56 | -2.59 | 0.011 |
| <b>LOG VIT. B12 (MCG)</b> |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 36            | 0.21  | 0.41  | 0.49  | 0.36  | 0.25 | 57            | 0.32  | 0.55  | 0.64  | 0.50  | 0.25 | -2.57 | 0.009 |
| St. Clair                 | 30            | 0.32  | 0.48  | 0.61  | 0.48  | 0.25 | 60            | 0.48  | 0.59  | 0.81  | 0.59  | 0.28 | -2.00 | 0.050 |
| Maricopa                  | 0             |       |       |       |       |      | 71            | 0.38  | 0.51  | 0.67  | 0.51  | 0.25 |       |       |
| Mingo                     | 38            | 0.35  | 0.47  | 0.57  | 0.44  | 0.25 | 70            | 0.47  | 0.59  | 0.69  | 0.54  | 0.22 | -2.12 | 0.037 |
| <b>VITAMIN B12 (MCG)</b>  |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 36            | 1.63  | 2.57  | 3.10  | 2.67  | 1.58 | 57            | 2.10  | 3.52  | 4.33  | 3.83  | 2.86 | -2.50 | 0.014 |
| St. Clair                 | 30            | 2.11  | 3.08  | 4.08  | 3.48  | 2.09 | 60            | 2.99  | 3.91  | 6.46  | 4.67  | 2.57 | -2.33 | 0.023 |
| Maricopa                  | 0             |       |       |       |       |      | 71            | 2.42  | 3.25  | 4.66  | 3.73  | 2.01 |       |       |
| Mingo                     | 38            | 2.25  | 2.95  | 3.74  | 3.17  | 1.59 | 70            | 2.95  | 3.89  | 4.90  | 3.88  | 1.57 | -2.23 | 0.029 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

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Table 6-50 (continued)

Total 24-hour Nutrient Intake for Posttested Head Start and Non-Head Start Males (Samples A, B, C) with Unadjusted Comparisons Between Age Groups within Site

|                         | 2-4 YEAR OLDS |        |        |        |        |        | 4-6 YEAR OLDS |        |        |        |        |        | T     | P     |
|-------------------------|---------------|--------|--------|--------|--------|--------|---------------|--------|--------|--------|--------|--------|-------|-------|
|                         | N             | Q1     | MED    | Q3     | MEAN   | SD     | N             | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>VITAMIN C (MG)</b>   |               |        |        |        |        |        |               |        |        |        |        |        |       |       |
| Greene/Humphreys        | 39            | 50.42  | 95.38  | 169.60 | 113.00 | 78.70  | 62            | 49.28  | 117.68 | 202.52 | 130.47 | 84.40  | -1.00 | 0.318 |
| St. Clair               | 30            | 71.42  | 133.83 | 225.17 | 145.82 | 104.00 | 60            | 105.54 | 148.42 | 217.94 | 159.44 | 89.40  | -0.61 | 0.542 |
| Maricopa                | 0             |        |        |        |        |        | 71            | 36.13  | 62.39  | 119.08 | 83.41  | 65.80  |       |       |
| Ningo                   | 38            | 22.89  | 63.19  | 133.51 | 94.62  | 90.10  | 65            | 37.62  | 83.23  | 132.66 | 94.16  | 62.80  | 0.03  | 0.978 |
| <b>CHOLESTEROL (MG)</b> |               |        |        |        |        |        |               |        |        |        |        |        |       |       |
| Greene/Humphreys        | 39            | 158.05 | 263.71 | 417.11 | 288.80 | 155.00 | 58            | 166.59 | 249.70 | 448.97 | 331.25 | 206.00 | -1.16 | 0.251 |
| St. Clair               | 30            | 186.09 | 394.68 | 644.40 | 404.33 | 231.00 | 60            | 226.70 | 407.87 | 512.88 | 403.84 | 204.00 | 0.01  | 0.932 |
| Maricopa                | 0             |        |        |        |        |        | 73            | 152.74 | 284.69 | 533.15 | 345.16 | 229.00 |       |       |
| Ningo                   | 38            | 178.11 | 350.78 | 469.12 | 350.08 | 200.00 | 70            | 198.39 | 294.63 | 449.34 | 333.13 | 190.00 | 0.43  | 0.669 |

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Table 6-51

Total 24-hour Nutrient Intake for Posttested Head Start and Non-Head Start  
Females (Samples A, B, C) with Unadjusted Comparisons  
Between Age Groups across Site

|                    | 2-4 YEAR OLDS |        |        |         |        |        | 4-6 YEAR OLDS |        |        |         |        |        | P     |       |
|--------------------|---------------|--------|--------|---------|--------|--------|---------------|--------|--------|---------|--------|--------|-------|-------|
|                    | N             | Q1     | MED    | Q3      | MEAN   | SD     | N             | Q1     | MED    | Q3      | MEAN   | SD     |       |       |
| KILOCALORIES       | 118           | 1234.  | 1509.  | 1820.   | 1567.  | 452.   | 250           | 1248.  | 1527.  | 1846.   | 1597.  | 516.   | -0.57 | 0.572 |
| PROTEIN (GM)       | 119           | 46.26  | 58.56  | 70.58   | 58.52  | 19.50  | 248           | 41.80  | 55.04  | 70.61   | 57.25  | 22.10  | 0.56  | 0.579 |
| FAT (GM)           | 118           | 48.64  | 60.65  | 76.63   | 63.88  | 22.00  | 249           | 46.61  | 64.36  | 78.70   | 64.95  | 25.40  | -0.41 | 0.682 |
| CARBOHYDRATE (GM)  | 119           | 153.50 | 186.34 | 226.97  | 196.07 | 65.80  | 250           | 155.49 | 188.71 | 240.79  | 198.14 | 67.20  | -0.28 | 0.779 |
| CALCIUM (MG)       | 118           | 534.54 | 774.08 | 1000.23 | 788.39 | 353.00 | 251           | 526.81 | 819.75 | 1096.59 | 823.68 | 376.00 | -0.63 | 0.530 |
| IRON (MG)          | 117           | 7.26   | 9.56   | 12.07   | 10.13  | 3.97   | 240           | 7.24   | 9.86   | 12.35   | 10.16  | 4.04   | -0.08 | 0.935 |
| MAGNESIUM (MG)     | 119           | 158.52 | 188.57 | 241.53  | 201.99 | 65.00  | 248           | 146.40 | 198.40 | 250.27  | 206.09 | 86.50  | -0.51 | 0.613 |
| PHOSPHORUS (MG)    | 118           | 797.   | 1011.  | 1239.   | 1032.  | 356.   | 250           | 740.   | 1002.  | 1320.   | 1035.  | 416.   | -0.07 | 0.946 |
| LOG VITAMIN A (IU) | 114           | 3.34   | 3.55   | 3.77    | 3.58   | 0.41   | 247           | 3.34   | 3.55   | 3.79    | 3.57   | 0.35   | 0.20  | 0.840 |
| VITAMIN A (IU)     | 114           | 2199.  | 3523.  | 5902.   | 6307.  | 8257.  | 247           | 2175.  | 3569.  | 6115.   | 5268.  | 5328.  | 1.23  | 0.220 |
| THIAMIN (MG)       | 116           | 0.82   | 1.17   | 1.44    | 1.20   | 0.50   | 241           | 0.82   | 1.10   | 1.55    | 1.20   | 0.53   | -0.04 | 0.967 |
| RIBOFLAVIN (MG)    | 115           | 1.24   | 1.69   | 2.15    | 1.76   | 0.74   | 245           | 1.19   | 1.67   | 2.23    | 1.76   | 0.76   | 0.06  | 0.950 |
| NIACIN (MG)        | 118           | 9.45   | 13.70  | 17.26   | 13.86  | 5.85   | 241           | 8.61   | 11.76  | 15.80   | 13.27  | 6.47   | 1.02  | 0.310 |
| VITAMIN B6 (MG)    | 116           | 0.89   | 1.20   | 1.49    | 1.20   | 0.48   | 243           | 0.81   | 1.17   | 1.63    | 1.25   | 0.61   | -0.89 | 0.372 |
| LOG VIT. B12 (MCG) | 108           | 0.34   | 0.48   | 0.62    | 0.46   | 0.29   | 243           | 0.34   | 0.51   | 0.67    | 0.48   | 0.28   | -0.64 | 0.520 |
| VITAMIN B12 (MCG)  | 108           | 2.21   | 3.05   | 4.14    | 3.50   | 2.33   | 243           | 2.19   | 3.21   | 4.64    | 3.66   | 2.43   | -0.57 | 0.567 |
| VITAMIN C (MG)     | 118           | 65.25  | 99.71  | 173.24  | 122.27 | 85.10  | 247           | 50.93  | 98.45  | 163.24  | 120.52 | 92.30  | 0.18  | 0.858 |
| CHOLESTEROL (MG)   | 117           | 180.19 | 267.06 | 433.35  | 328.33 | 199.00 | 250           | 161.28 | 266.96 | 456.54  | 323.57 | 211.00 | 0.21  | 0.834 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

Table 6-52

**Total 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start  
Females (Samples A, B, C) with Unadjusted Comparisons  
Between Age Groups within Site**

|                          | 2-4 YEAR OLDS |        |        |        |        |       | 4-6 YEAR OLDS |        |        |        |        |       | T     | P     |
|--------------------------|---------------|--------|--------|--------|--------|-------|---------------|--------|--------|--------|--------|-------|-------|-------|
|                          | N             | Q1     | MED    | Q3     | MEAN   | SD    | N             | Q1     | MED    | Q3     | MEAN   | SD    |       |       |
| <b>KILOCALORIES</b>      |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 41            | 1317.  | 1478.  | 1556.  | 1482.  | 333.  | 66            | 1288.  | 1530.  | 1920.  | 1601.  | 391.  | -1.49 | 0.139 |
| St. Clair                | 34            | 1443.  | 1599.  | 2191.  | 1770.  | 531.  | 46            | 1583.  | 1791.  | 2208.  | 1907.  | 451.  | -1.21 | 0.231 |
| Maricopa                 | 0             |        |        |        |        |       | 77            | 1115.  | 1299.  | 1597.  | 1378.  | 473.  |       |       |
| Mingo                    | 43            | 1210.  | 1499.  | 1765.  | 1488.  | 441.  | 61            | 1319.  | 1576.  | 1975.  | 1636.  | 519.  | -1.57 | 0.120 |
| <b>PROTEIN (GM)</b>      |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 41            | 48.44  | 60.00  | 67.07  | 58.07  | 16.10 | 65            | 44.33  | 56.75  | 73.28  | 59.28  | 20.50 | -0.34 | 0.736 |
| St. Clair                | 34            | 52.19  | 62.69  | 83.60  | 65.87  | 19.00 | 47            | 52.62  | 62.23  | 73.81  | 66.94  | 21.90 | -0.23 | 0.816 |
| Maricopa                 | 0             |        |        |        |        |       | 76            | 33.64  | 46.21  | 64.51  | 49.31  | 20.60 |       |       |
| Mingo                    | 44            | 36.64  | 51.76  | 64.82  | 53.25  | 21.40 | 60            | 39.57  | 55.16  | 75.89  | 57.53  | 22.80 | -0.98 | 0.330 |
| <b>FAT (MG)</b>          |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 41            | 47.98  | 58.05  | 71.47  | 59.31  | 18.80 | 65            | 48.45  | 61.95  | 81.31  | 63.44  | 24.80 | -0.97 | 0.334 |
| St. Clair                | 34            | 51.46  | 71.51  | 89.98  | 72.43  | 24.20 | 47            | 62.54  | 69.42  | 82.68  | 77.46  | 24.10 | -0.92 | 0.358 |
| Maricopa                 | 0             |        |        |        |        |       | 78            | 39.88  | 53.49  | 70.84  | 56.42  | 26.20 |       |       |
| Mingo                    | 43            | 49.73  | 60.68  | 77.96  | 61.50  | 21.70 | 59            | 51.06  | 66.67  | 77.42  | 65.27  | 22.70 | -0.85 | 0.398 |
| <b>CARBOHYDRATE (GM)</b> |               |        |        |        |        |       |               |        |        |        |        |       |       |       |
| Greene/Humphreys         | 41            | 161.29 | 190.39 | 214.21 | 183.19 | 42.90 | 67            | 160.19 | 198.25 | 235.23 | 201.62 | 61.80 | -1.83 | 0.071 |
| St. Clair                | 34            | 161.15 | 196.01 | 276.43 | 218.07 | 78.30 | 46            | 191.57 | 243.33 | 292.41 | 244.94 | 66.90 | -1.60 | 0.115 |
| Maricopa                 | 0             |        |        |        |        |       | 76            | 125.69 | 168.19 | 202.32 | 164.85 | 54.60 |       |       |
| Mingo                    | 44            | 143.25 | 179.96 | 237.24 | 191.07 | 69.10 | 61            | 154.33 | 187.31 | 242.74 | 200.50 | 66.00 | -0.70 | 0.484 |

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Table 6-52 (continued)

Total 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Females (Samples A, B, C) with Unadjusted Comparisons Between Age Groups within Site

|                        | 2-4 YEAR OLDS |        |        |         |        |        | 4-6 YEAR OLDS |        |        |         |        |        | T     | P     |
|------------------------|---------------|--------|--------|---------|--------|--------|---------------|--------|--------|---------|--------|--------|-------|-------|
|                        | N             | Q1     | MED    | Q3      | MEAN   | SD     | N             | Q1     | MED    | Q3      | MEAN   | SD     |       |       |
| <b>CALCIUM (MG)</b>    |               |        |        |         |        |        |               |        |        |         |        |        |       |       |
| Greene/Humphreys       | 41            | 490.43 | 758.73 | 944.21  | 749.65 | 314.00 | 67            | 550.97 | 874.91 | 1139.03 | 854.84 | 350.00 | -1.62 | 0.110 |
| St. Clair              | 34            | 605.03 | 790.07 | 1105.81 | 860.45 | 356.00 | 46            | 634.57 | 815.98 | 1102.62 | 864.12 | 406.00 | -0.04 | 0.966 |
| Maricopa               | 0             |        |        |         |        |        | 77            | 476.26 | 695.42 | 950.05  | 740.43 | 360.00 |       |       |
| Mingo                  | 44            | 535.59 | 764.60 | 1011.71 | 795.85 | 384.00 | 61            | 523.60 | 860.85 | 1129.50 | 863.95 | 391.00 | -0.89 | 0.376 |
| <b>IRON (MG)</b>       |               |        |        |         |        |        |               |        |        |         |        |        |       |       |
| Greene/Humphreys       | 41            | 8.23   | 9.82   | 11.89   | 10.16  | 3.12   | 61            | 6.98   | 9.53   | 12.77   | 10.29  | 4.23   | -0.17 | 0.864 |
| St. Clair              | 34            | 7.27   | 10.83  | 14.24   | 11.16  | 4.81   | 47            | 9.98   | 12.08  | 15.12   | 12.73  | 4.07   | -1.54 | 0.128 |
| Maricopa               | 0             |        |        |         |        |        | 75            | 6.43   | 8.54   | 10.86   | 8.64   | 3.19   |       |       |
| Mingo                  | 42            | 6.41   | 9.26   | 10.96   | 9.25   | 3.84   | 57            | 7.24   | 9.79   | 12.24   | 9.92   | 3.82   | -0.86 | 0.394 |
| <b>MAGNESIUM (MG)</b>  |               |        |        |         |        |        |               |        |        |         |        |        |       |       |
| Greene/Humphreys       | 41            | 164.44 | 201.85 | 230.56  | 197.59 | 51.40  | 66            | 179.66 | 220.29 | 265.04  | 223.89 | 89.10  | -1.93 | 0.056 |
| St. Clair              | 34            | 160.45 | 189.80 | 270.64  | 210.53 | 73.50  | 47            | 180.17 | 229.63 | 337.92  | 251.63 | 89.60  | -2.26 | 0.026 |
| Maricopa               | 0             |        |        |         |        |        | 76            | 111.72 | 162.91 | 207.37  | 167.74 | 67.90  |       |       |
| Mingo                  | 44            | 155.80 | 174.86 | 237.00  | 199.49 | 70.10  | 60            | 133.63 | 203.49 | 249.63  | 199.39 | 81.40  | 0.01  | 0.995 |
| <b>PHOSPHORUS (MG)</b> |               |        |        |         |        |        |               |        |        |         |        |        |       |       |
| Greene/Humphreys       | 41            | 804.   | 1025.  | 1161.   | 997.   | 299.   | 66            | 800.   | 1090.  | 1330.   | 1104.  | 423.   | -1.53 | 0.130 |
| St. Clair              | 34            | 852.   | 1081.  | 1311.   | 1132.  | 391.   | 46            | 821.   | 1106.  | 1409.   | 1116.  | 393.   | 0.18  | 0.855 |
| Maricopa               | 0             |        |        |         |        |        | 77            | 614.   | 847.   | 1117.   | 890.   | 359.   |       |       |
| Mingo                  | 43            | 706.   | 948.   | 1159.   | 987.   | 370.   | 61            | 760.   | 1065.  | 1384.   | 1084.  | 454.   | -1.20 | 0.234 |

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Table 6-52 (continued)

Total 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start  
Females (Samples A, B, C) with Unadjusted Comparisons  
Between Age Groups within Site

|                           | 2-4 YEAR OLDS |       |       |        |       |        | 4-6 YEAR OLDS |       |       |       |       |       | T     | P     |
|---------------------------|---------------|-------|-------|--------|-------|--------|---------------|-------|-------|-------|-------|-------|-------|-------|
|                           | N             | Q1    | MED   | Q3     | MEAN  | SD     | N             | Q1    | MED   | Q3    | MEAN  | SD    |       |       |
| <b>LOG VITAMIN A (IU)</b> |               |       |       |        |       |        |               |       |       |       |       |       |       |       |
| Greene/Humphreys          | 40            | 3.39  | 3.66  | 4.01   | 3.73  | 0.44   | 66            | 3.41  | 3.64  | 3.95  | 3.69  | 0.38  | 0.52  | 0.607 |
| St. Clair                 | 32            | 3.28  | 3.48  | 3.78   | 3.54  | 0.44   | 47            | 3.37  | 3.55  | 3.85  | 3.61  | 0.37  | -0.72 | 0.476 |
| Maricopa                  | 0             |       |       |        |       |        | 76            | 3.26  | 3.44  | 3.67  | 3.48  | 0.31  |       |       |
| Mingo                     | 42            | 3.35  | 3.50  | 3.67   | 3.46  | 0.31   | 58            | 3.37  | 3.59  | 3.72  | 3.53  | 0.30  | -1.08 | 0.283 |
| <b>VITAMIN A (IU)</b>     |               |       |       |        |       |        |               |       |       |       |       |       |       |       |
| Greene/Humphreys          | 40            | 2445. | 4601. | 11032. | 9350. | 11172. | 66            | 2544. | 4377. | 8910. | 7286. | 7128. | 1.05  | 0.300 |
| St. Clair                 | 32            | 1896. | 3066. | 6007.  | 6007. | 7896.  | 47            | 2348. | 3539. | 7111. | 6037. | 6688. | -0.02 | 0.986 |
| Maricopa                  | 0             |       |       |        |       |        | 76            | 1819. | 2738. | 4724. | 3869. | 3152. |       |       |
| Mingo                     | 42            | 2217. | 3149. | 4702.  | 3637. | 2374.  | 58            | 2350. | 3896. | 5261. | 4182. | 2532. | -1.10 | 0.274 |
| <b>THIAMIN (MG)</b>       |               |       |       |        |       |        |               |       |       |       |       |       |       |       |
| Greene/Humphreys          | 41            | 0.85  | 1.19  | 1.43   | 1.20  | 0.48   | 62            | 0.95  | 1.17  | 1.60  | 1.25  | 0.52  | -0.42 | 0.674 |
| St. Clair                 | 34            | 1.01  | 1.30  | 1.71   | 1.35  | 0.57   | 46            | 1.07  | 1.30  | 1.92  | 1.51  | 0.59  | -1.23 | 0.223 |
| Maricopa                  | 0             |       |       |        |       |        | 75            | 0.76  | 0.89  | 1.20  | 0.97  | 0.40  |       |       |
| Mingo                     | 41            | 0.74  | 1.02  | 1.32   | 1.07  | 0.43   | 58            | 0.83  | 1.14  | 1.65  | 1.20  | 0.51  | -1.41 | 0.162 |
| <b>RIBOFLAVIN (MG)</b>    |               |       |       |        |       |        |               |       |       |       |       |       |       |       |
| Greene/Humphreys          | 40            | 1.32  | 1.69  | 2.34   | 1.85  | 0.72   | 63            | 1.31  | 1.76  | 2.32  | 1.86  | 0.80  | -0.10 | 0.920 |
| St. Clair                 | 32            | 1.18  | 1.68  | 2.35   | 1.81  | 0.81   | 46            | 1.41  | 1.97  | 2.39  | 2.02  | 0.82  | -1.13 | 0.261 |
| Maricopa                  | 0             |       |       |        |       |        | 77            | 1.06  | 1.45  | 1.84  | 1.51  | 0.62  |       |       |
| Mingo                     | 43            | 1.20  | 1.69  | 2.06   | 1.65  | 0.70   | 59            | 1.09  | 1.78  | 2.30  | 1.76  | 0.76  | -0.77 | 0.443 |

Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.

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Table 6-52 (continued)

Total 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start Females (Samples A, B, C) with Unadjusted Comparisons Between Age Groups within Site

|                           | 2-4 YEAR OLDS |       |       |       |       |      | 4-6 YEAR OLDS |       |       |       |       |      | T     | P     |
|---------------------------|---------------|-------|-------|-------|-------|------|---------------|-------|-------|-------|-------|------|-------|-------|
|                           | N             | Q1    | MED   | Q3    | MEAN  | SD   | N             | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>NIACIN (MG)</b>        |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 41            | 11.65 | 14.15 | 16.90 | 14.34 | 4.70 | 62            | 8.87  | 12.19 | 18.04 | 14.14 | 6.83 | 0.18  | 0.860 |
| St. Clair                 | 34            | 9.34  | 13.50 | 16.31 | 14.86 | 7.13 | 46            | 11.43 | 16.76 | 21.44 | 17.06 | 6.62 | -1.40 | 0.165 |
| Maricopa                  | 0             |       |       |       |       |      | 75            | 7.17  | 9.91  | 12.99 | 10.70 | 4.80 |       |       |
| Mingo                     | 43            | 9.11  | 11.80 | 17.77 | 12.89 | 5.70 | 58            | 8.16  | 11.56 | 15.53 | 12.65 | 6.35 | 0.20  | 0.846 |
| <b>VITAMIN B6 (MG)</b>    |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 40            | 1.08  | 1.22  | 1.50  | 1.23  | 0.36 | 61            | 0.89  | 1.11  | 1.62  | 1.25  | 0.55 | -0.20 | 0.812 |
| St. Clair                 | 34            | 0.81  | 1.14  | 1.44  | 1.19  | 0.55 | 46            | 1.00  | 1.34  | 1.82  | 1.45  | 0.68 | -1.91 | 0.060 |
| Maricopa                  | 0             |       |       |       |       |      | 78            | 0.68  | 1.08  | 1.49  | 1.15  | 0.55 |       |       |
| Mingo                     | 42            | 0.77  | 1.14  | 1.49  | 1.18  | 0.53 | 58            | 0.71  | 1.19  | 1.63  | 1.24  | 0.65 | -0.51 | 0.608 |
| <b>LOG VIT. B12 (MCG)</b> |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 35            | 0.40  | 0.48  | 0.61  | 0.47  | 0.30 | 62            | 0.37  | 0.53  | 0.67  | 0.53  | 0.31 | -0.90 | 0.373 |
| St. Clair                 | 30            | 0.39  | 0.54  | 0.61  | 0.52  | 0.19 | 45            | 0.43  | 0.51  | 0.67  | 0.53  | 0.18 | -0.24 | 0.814 |
| Maricopa                  | 0             |       |       |       |       |      | 77            | 0.29  | 0.47  | 0.61  | 0.43  | 0.28 |       |       |
| Mingo                     | 43            | 0.28  | 0.44  | 0.62  | 0.42  | 0.33 | 59            | 0.35  | 0.50  | 0.67  | 0.47  | 0.30 | -0.87 | 0.387 |
| <b>VITAMIN B12 (MCG)</b>  |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys          | 35            | 2.50  | 3.05  | 4.05  | 3.67  | 2.84 | 62            | 2.34  | 3.42  | 4.66  | 4.29  | 3.58 | -0.94 | 0.352 |
| St. Clair                 | 30            | 2.43  | 3.46  | 4.04  | 3.59  | 1.62 | 45            | 2.71  | 3.27  | 4.68  | 3.64  | 1.46 | -0.13 | 0.901 |
| Maricopa                  | 0             |       |       |       |       |      | 77            | 1.97  | 2.86  | 4.12  | 3.20  | 1.78 |       |       |
| Mingo                     | 43            | 1.91  | 2.78  | 4.18  | 3.29  | 2.33 | 59            | 2.24  | 3.19  | 4.67  | 3.60  | 2.18 | -0.68 | 0.500 |

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Note: Vitamin A and Vitamin B12 have been transformed to the logarithmic scale (base 10) for analysis because of substantial skewness, which tends to invalidate the assumptions underlying the t test.



Table 6-52 (continued)

Total 24-Hour Nutrient Intake for Posttested Head Start and Non-Head Start  
Females (Samples A, B, C) with Unadjusted Comparisons  
Between Age Groups within Site

|                         | 2-4 YEAR OLDS |        |        |        |        |        | 4-6 YEAR OLDS |        |        |        |        |        | T     | P     |
|-------------------------|---------------|--------|--------|--------|--------|--------|---------------|--------|--------|--------|--------|--------|-------|-------|
|                         | N             | Q1     | MED    | Q3     | MEAN   | SD     | N             | Q1     | MED    | Q3     | MEAN   | SD     |       |       |
| <b>VITAMIN C (MG)</b>   |               |        |        |        |        |        |               |        |        |        |        |        |       |       |
| Greene/Humphreys        | 41            | 56.71  | 97.69  | 155.73 | 113.14 | 71.90  | 66            | 69.23  | 123.42 | 168.99 | 129.34 | 82.00  | -1.07 | 0.286 |
| St. Clair               | 34            | 101.74 | 151.30 | 244.22 | 174.78 | 106.00 | 47            | 108.01 | 165.52 | 298.08 | 196.20 | 124.00 | -0.84 | 0.406 |
| Maricopa                | 0             |        |        |        |        |        | 75            | 72.28  | 67.32  | 125.25 | 84.26  | 57.10  |       |       |
| Mingo                   | 43            | 56.74  | 77.70  | 115.07 | 89.44  | 54.50  | 59            | 50.73  | 71.81  | 124.57 | 96.44  | 72.80  | -0.56 | 0.580 |
| <b>CHOLESTEROL (MG)</b> |               |        |        |        |        |        |               |        |        |        |        |        |       |       |
| Greene/Humphreys        | 41            | 188.82 | 262.95 | 421.81 | 322.18 | 186.00 | 64            | 170.79 | 264.96 | 389.24 | 293.72 | 154.00 | 0.82  | 0.416 |
| St. Clair               | 32            | 214.86 | 368.37 | 529.80 | 392.32 | 207.00 | 47            | 191.36 | 274.51 | 528.50 | 381.50 | 252.00 | 0.21  | 0.835 |
| Maricopa                | 0             |        |        |        |        |        | 78            | 122.50 | 254.51 | 414.22 | 286.18 | 201.00 |       |       |
| Mingo                   | 44            | 145.93 | 234.77 | 366.79 | 287.54 | 199.00 | 61            | 165.44 | 286.15 | 498.49 | 345.27 | 232.00 | -1.37 | 0.175 |

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**CHAPTER SEVEN**

**APPENDIX TABLES**

Table 7-1

**Out-of-Range Hematology Values of Children  
Excluded from Analyses by Biochemical Indicator,  
Head Start/Non-Head Start and Race**

| Biochemical Indicator | Posttested Children (Samples A, B, C) |                      |                          |                          |                          |          |
|-----------------------|---------------------------------------|----------------------|--------------------------|--------------------------|--------------------------|----------|
|                       | Head Start                            |                      |                          | Non-Head Start           |                          |          |
|                       | White                                 | Black                | Hispanic                 | White                    | Black                    | Hispanic |
| Hematocrit %          |                                       | 45                   |                          |                          |                          |          |
| Hemoglobin gm./dl.    |                                       | 16                   |                          | 8                        | 10                       |          |
| FEP mcg/dl.           | 56                                    | 58<br>59             |                          | 56<br>57                 | 61<br>100<br>64          |          |
| Cholesterol mg/dl.    | 296<br>77                             | 292                  | 284                      |                          |                          |          |
| Vitamin A mcg/dl.     | 61<br>60<br>105                       | 143                  | 370                      | 70                       | 10<br>52                 |          |
| B-Carotene mcg/dl.    | 200<br>174                            |                      | 193<br>215               |                          |                          |          |
| Vitamin C mg/dl.      |                                       |                      |                          |                          |                          |          |
| TIBC mcg/dl.          | 425<br>481<br>460<br>460              |                      | 464<br>215<br>425<br>216 | 483<br>151<br>461<br>459 | 473<br>216<br>425<br>192 |          |
| Serum Iron mcg/dl.    | 142<br>154                            | 145<br>153<br>90     | 177<br>161<br>158        | 146                      | 150<br>156<br>96         |          |
| TS                    | 41<br>57                              | 43<br>42<br>41<br>44 | 63<br>51                 | 39<br>46<br>51<br>48     | 46<br>44                 |          |
| MCHC %                | 40                                    | 47<br>30<br>45       |                          | 42<br>22<br>25           | 37                       |          |
| Ferritin ng/ml.       |                                       | 137<br>134<br>98     |                          | 105<br>84<br>75          | 88<br>88                 | 84       |

Table 7-2

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS  
OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS AMONG SAMPLES WITHIN SITE

|                           | Greene/Humphreys |       |      | St. Clair |       |       | Maricopa |       |      | Mingo |       |      |
|---------------------------|------------------|-------|------|-----------|-------|-------|----------|-------|------|-------|-------|------|
|                           | N                | MEAN  | SD   | N         | MEAN  | SD    | N        | MEAN  | SD   | N     | MEAN  | SD   |
| <b>HEMATOCRIT (%)</b>     |                  |       |      |           |       |       |          |       |      |       |       |      |
| Sample A                  | 73               | 35.68 | 2.96 | 42        | 34.65 | 2.83  | 54       | 36.38 | 2.23 | 35    | 38.21 | 2.12 |
| Sample B                  | 52               | 35.99 | 2.45 | 37        | 35.88 | 2.18  | 11       | 37.09 | 1.28 | 31    | 38.48 | 1.70 |
| Sample C                  | 88               | 35.62 | 1.96 | 103       | 35.50 | 1.69  | 90       | 36.53 | 2.31 | 158   | 37.68 | 2.30 |
|                           | F=               | P=    |      | F=        | P=    |       | F=       | P=    |      | F=    | P=    |      |
|                           | 0.38             | 0.681 |      | 3.62      | 0.029 |       | 0.47     | 0.626 |      | 2.23  | 0.110 |      |
| <b>HEMOGLOBIN (GM/DL)</b> |                  |       |      |           |       |       |          |       |      |       |       |      |
| Sample A                  | 72               | 12.57 | 1.09 | 42        | 12.31 | 1.07  | 53       | 13.09 | 0.62 | 35    | 13.24 | 0.83 |
| Sample B                  | 52               | 12.77 | 1.03 | 37        | 12.91 | 1.07  | 11       | 13.38 | 0.53 | 31    | 13.32 | 0.59 |
| Sample C                  | 88               | 12.78 | 0.81 | 103       | 12.56 | 0.83  | 88       | 13.00 | 0.83 | 153   | 13.18 | 0.87 |
|                           | F=               | P=    |      | F=        | P=    |       | F=       | P=    |      | F=    | P=    |      |
|                           | 1.06             | 0.347 |      | 4.06      | 0.019 |       | 1.33     | 0.267 |      | 0.45  | 0.640 |      |
| <b>FEP (MCG/DL)</b>       |                  |       |      |           |       |       |          |       |      |       |       |      |
| Sample A                  | 72               | 18.49 | 8.38 | 40        | 20.55 | 10.63 | 54       | 23.31 | 7.33 | 33    | 17.36 | 9.76 |
| Sample B                  | 50               | 19.60 | 9.59 | 38        | 26.84 | 12.12 | 11       | 25.45 | 9.03 | 28    | 15.25 | 6.30 |
| Sample C                  | 89               | 19.29 | 7.94 | 101       | 20.58 | 8.25  | 90       | 23.36 | 7.44 | 154   | 16.77 | 8.65 |
|                           | F=               | P=    |      | F=        | P=    |       | F=       | P=    |      | F=    | P=    |      |
|                           | 0.30             | 0.744 |      | 6.22      | 0.002 |       | 0.40     | 0.668 |      | 0.50  | 0.606 |      |
| <b>MCHC (%)</b>           |                  |       |      |           |       |       |          |       |      |       |       |      |
| Sample A                  | 72               | 35.24 | 1.77 | 42        | 35.56 | 1.71  | 53       | 35.89 | 1.75 | 35    | 34.67 | 1.45 |
| Sample B                  | 52               | 35.47 | 1.49 | 37        | 35.71 | 1.76  | 11       | 36.08 | 0.92 | 31    | 34.66 | 1.67 |
| Sample C                  | 88               | 35.92 | 1.81 | 102       | 35.30 | 1.87  | 86       | 35.60 | 1.75 | 149   | 34.96 | 1.41 |
|                           | F=               | P=    |      | F=        | P=    |       | F=       | P=    |      | F=    | P=    |      |
|                           | 3.17             | 0.044 |      | 0.79      | 0.457 |       | 0.71     | 0.491 |      | 0.96  | 0.386 |      |

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Table 7-2 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS  
OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS AMONG SAMPLES WITHIN SITE

|                            | Greene/Humphreys |        |       | St. Clair |        |       | Maricopa |        |       | Mingo |        |       |
|----------------------------|------------------|--------|-------|-----------|--------|-------|----------|--------|-------|-------|--------|-------|
|                            | N                | MEAN   | SD    | N         | MEAN   | SD    | N        | MEAN   | SD    | N     | MEAN   | SD    |
| <b>TIBC (MCG/DL)</b>       |                  |        |       |           |        |       |          |        |       |       |        |       |
| Sample A                   | 59               | 330.29 | 39.91 | 36        | 319.14 | 40.13 | 51       | 333.84 | 43.17 | 29    | 308.55 | 37.73 |
| Sample B                   | 45               | 333.51 | 44.14 | 36        | 327.42 | 32.21 | 11       | 341.45 | 34.56 | 30    | 323.07 | 36.35 |
| Sample C                   | 75               | 334.23 | 43.06 | 89        | 320.51 | 32.82 | 83       | 339.96 | 50.91 | 139   | 316.78 | 38.13 |
|                            | F=               | P=     |       | F=        | P=     |       | F=       | P=     |       | F=    | P=     |       |
|                            | 0.15             | 0.858  |       | 0.65      | 0.524  |       | 0.30     | 0.743  |       | 1.10  | 0.336  |       |
| <b>SERUM IRON (MCG/DL)</b> |                  |        |       |           |        |       |          |        |       |       |        |       |
| Sample A                   | 64               | 67.14  | 21.84 | 37        | 66.70  | 28.20 | 53       | 78.64  | 30.46 | 31    | 66.10  | 23.50 |
| Sample B                   | 47               | 64.21  | 22.27 | 36        | 72.39  | 22.59 | 11       | 69.55  | 29.04 | 31    | 66.23  | 24.73 |
| Sample C                   | 79               | 65.46  | 26.43 | 91        | 75.29  | 24.09 | 86       | 83.10  | 27.45 | 139   | 67.99  | 24.58 |
|                            | F=               | P=     |       | F=        | P=     |       | F=       | P=     |       | F=    | P=     |       |
|                            | 0.21             | 0.810  |       | 1.58      | 0.208  |       | 1.27     | 0.284  |       | 0.12  | 0.886  |       |
| <b>TS (%)</b>              |                  |        |       |           |        |       |          |        |       |       |        |       |
| Sample A                   | 57               | 20.38  | 6.15  | 34        | 21.75  | 8.43  | 52       | 23.43  | 8.87  | 28    | 20.89  | 7.20  |
| Sample B                   | 44               | 19.48  | 6.47  | 36        | 22.26  | 7.32  | 11       | 20.43  | 8.43  | 30    | 19.73  | 6.98  |
| Sample C                   | 76               | 19.26  | 7.87  | 87        | 23.08  | 6.83  | 83       | 24.20  | 8.23  | 135   | 21.64  | 7.92  |
|                            | F=               | P=     |       | F=        | P=     |       | F=       | P=     |       | F=    | P=     |       |
|                            | 0.44             | 0.645  |       | 0.46      | 0.634  |       | 0.98     | 0.378  |       | 0.79  | 0.454  |       |
| <b>FERRITIN (NG/DL)</b>    |                  |        |       |           |        |       |          |        |       |       |        |       |
| Sample A                   | 59               | 23.24  | 9.54  | 37        | 36.24  | 49.23 | 51       | 20.51  | 12.21 | 28    | 19.86  | 10.10 |
| Sample B                   | 40               | 25.27  | 12.71 | 37        | 26.30  | 12.25 | 10       | 18.40  | 5.34  | 30    | 20.77  | 9.41  |
| Sample C                   | 75               | 26.96  | 11.87 | 89        | 29.36  | 16.32 | 77       | 20.90  | 10.27 | 136   | 22.74  | 11.97 |
|                            | F=               | P=     |       | F=        | P=     |       | F=       | P=     |       | F=    | P=     |       |
|                            | 1.70             | 0.186  |       | 1.36      | 0.259  |       | 0.24     | 0.788  |       | 0.96  | 0.383  |       |

Table 7-2 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS  
OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS AMONG SAMPLES WITHIN SITE

|                            | Greene/Humphreys |         |          | St. Clair |         |          | Maricopa |         |          | Mingo |         |          |
|----------------------------|------------------|---------|----------|-----------|---------|----------|----------|---------|----------|-------|---------|----------|
|                            | N                | MEAN    | SD       | N         | MEAN    | SD       | N        | MEAN    | SD       | N     | MEAN    | SD       |
| <b>B-CAROTENE (MCG/DL)</b> |                  |         |          |           |         |          |          |         |          |       |         |          |
| Sample A                   | 43               | 89.63   | 31.87    | 0         |         |          | 50       | 97.98   | 27.10    | 0     |         |          |
| Sample B                   | 29               | 105.14  | 24.32    | 0         |         |          | 11       | 92.18   | 24.40    | 0     |         |          |
| Sample C                   | 56               | 101.02  | 28.71    | 0         |         |          | 83       | 95.11   | 30.30    | 0     |         |          |
|                            |                  | F= 2.98 | P= 0.054 |           |         |          |          | F= 0.25 | P= 0.777 |       |         |          |
| <b>CHOLESTEROL (MG/DL)</b> |                  |         |          |           |         |          |          |         |          |       |         |          |
| Sample A                   | 66               | 164.45  | 30.33    | 42        | 161.76  | 30.89    | 52       | 164.54  | 30.63    | 32    | 152.59  | 25.00    |
| Sample B                   | 48               | 169.06  | 30.98    | 37        | 173.81  | 29.28    | 11       | 161.00  | 31.68    | 31    | 149.87  | 22.58    |
| Sample C                   | 79               | 171.78  | 31.00    | 102       | 170.50  | 35.63    | 88       | 159.73  | 28.55    | 151   | 156.15  | 28.18    |
|                            |                  | F= 1.03 | P= 0.360 |           | F= 1.47 | P= 0.232 |          | F= 0.44 | P= 0.647 |       | F= 0.81 | P= 0.445 |
| <b>VITAMIN A (MCG/DL)</b>  |                  |         |          |           |         |          |          |         |          |       |         |          |
| Sample A                   | 42               | 38.83   | 9.63     | 0         |         |          | 51       | 36.43   | 7.38     | 0     |         |          |
| Sample B                   | 29               | 39.76   | 10.76    | 0         |         |          | 11       | 32.36   | 7.26     | 0     |         |          |
| Sample C                   | 54               | 34.81   | 7.41     | 0         |         |          | 81       | 36.44   | 6.78     | 0     |         |          |
|                            |                  | F= 3.72 | P= 0.027 |           |         |          |          | F= 1.70 | P= 0.186 |       |         |          |
| <b>VITAMIN C (MG/DL)</b>   |                  |         |          |           |         |          |          |         |          |       |         |          |
| Sample A                   | 0                |         |          | 0         |         |          | 38       | 1.38    | 0.43     | 0     |         |          |
| Sample B                   | 0                |         |          | 0         |         |          | 11       | 1.46    | 0.40     | 0     |         |          |
| Sample C                   | 0                |         |          | 0         |         |          | 60       | 1.46    | 0.49     | 0     |         |          |
|                            |                  |         |          |           |         |          |          | F= 0.38 | P= 0.685 |       |         |          |

Table 7-3

BIOCHEMICAL INDICATORS FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS ACROSS SITE

|                     | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|---------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                     | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| HENATOCRIT (%)      | 434        | 35.0  | 36.0  | 38.0  | 36.3  | 2.4  | 340            | 35.0  | 36.5  | 38.0  | 36.6  | 2.6  | -1.50 | 0.134 |
| HEMOGLOBIN (GM/DL)  | 430        | 12.3  | 12.9  | 13.5  | 12.9  | 0.9  | 335            | 12.3  | 12.9  | 13.5  | 12.9  | 0.9  | -0.84 | 0.400 |
| FEP (MCG/DL)        | 429        | 14.0  | 19.0  | 24.0  | 19.8  | 8.7  | 331            | 13.0  | 19.0  | 25.0  | 20.1  | 9.6  | -0.42 | 0.672 |
| MONC (%)            | 425        | 34.3  | 35.4  | 36.4  | 35.4  | 1.7  | 333            | 34.2  | 35.4  | 36.3  | 35.4  | 1.7  | 0.08  | 0.935 |
| TIBC (MCG/DL)       | 383        | 297.0 | 325.0 | 353.0 | 327.2 | 41.1 | 300            | 298.0 | 322.0 | 350.0 | 325.8 | 41.2 | 0.45  | 0.653 |
| SERUM IRON (MCG/DL) | 395        | 51.0  | 67.0  | 87.0  | 69.9  | 25.7 | 310            | 54.0  | 69.0  | 91.0  | 72.4  | 26.1 | -1.26 | 0.209 |
| TS (%)              | 373        | 15.9  | 20.2  | 25.7  | 21.2  | 7.6  | 300            | 17.0  | 21.5  | 27.5  | 22.2  | 7.9  | -1.73 | 0.084 |
| FERRITIN (NG/DL)    | 374        | 15.0  | 22.0  | 30.0  | 24.4  | 12.9 | 291            | 15.0  | 21.0  | 31.0  | 24.8  | 21.0 | -0.31 | 0.754 |
| B-CAROTENE (MCG/DL) | 155        | 80.5  | 102.0 | 121.0 | 101.9 | 29.4 | 117            | 71.0  | 90.0  | 107.0 | 90.3  | 27.1 | 3.36  | 0.001 |
| CHOLESTEROL (MG/DL) | 416        | 143.0 | 159.0 | 183.0 | 163.6 | 29.8 | 323            | 142.0 | 163.0 | 181.5 | 162.9 | 31.8 | 0.30  | 0.761 |
| VITAMIN A (MCG/DL)  | 154        | 31.0  | 36.0  | 42.0  | 36.3  | 8.7  | 114            | 32.0  | 36.0  | 42.0  | 37.2  | 7.4  | -0.85 | 0.398 |
| VITAMIN C (MG/DL)   | 70         | 1.2   | 1.5   | 1.8   | 1.5   | 0.5  | 39             | 1.1   | 1.3   | 1.5   | 1.3   | 0.4  | 2.20  | 0.030 |

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Table 7-3 (continued)

BIOCHEMICAL INDICATORS FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                           | HEAD START |      |      |      |      |     | NON-HEAD START |      |      |      |      |      | T     | P     |
|---------------------------|------------|------|------|------|------|-----|----------------|------|------|------|------|------|-------|-------|
|                           | N          | Q1   | MED  | Q3   | MEAN | SD  | N              | Q1   | MED  | Q3   | MEAN | SD   |       |       |
| <b>HEMATOCRIT (%)</b>     |            |      |      |      |      |     |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 119        | 34.0 | 36.0 | 37.0 | 35.5 | 2.7 | 94             | 34.5 | 36.0 | 37.5 | 36.1 | 2.0  | -1.77 | 0.078 |
| St. Clair                 | 100        | 34.5 | 35.5 | 37.0 | 35.5 | 1.8 | 82             | 34.0 | 35.0 | 37.0 | 35.2 | 2.5  | 0.94  | 0.351 |
| Maricopa                  | 97         | 35.5 | 36.5 | 38.0 | 36.5 | 2.1 | 58             | 35.0 | 36.0 | 38.0 | 36.5 | 2.4  | 0.12  | 0.907 |
| Mingo                     | 118        | 36.5 | 37.5 | 39.0 | 37.6 | 2.0 | 106            | 36.5 | 38.0 | 40.0 | 38.2 | 2.4  | -1.77 | 0.078 |
| <b>HEMOGLOBIN (GM/DL)</b> |            |      |      |      |      |     |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 118        | 12.0 | 12.6 | 13.3 | 12.6 | 1.0 | 94             | 12.2 | 12.8 | 13.5 | 12.9 | 0.9  | -2.05 | 0.042 |
| St. Clair                 | 101        | 12.0 | 12.5 | 13.2 | 12.6 | 0.9 | 81             | 12.1 | 12.4 | 13.1 | 12.5 | 1.0  | 0.58  | 0.563 |
| Maricopa                  | 96         | 12.7 | 13.2 | 13.6 | 13.1 | 0.8 | 56             | 12.5 | 13.0 | 13.4 | 13.0 | 0.7  | 0.70  | 0.486 |
| Mingo                     | 115        | 12.7 | 13.2 | 13.8 | 13.2 | 0.8 | 104            | 12.7 | 13.3 | 13.9 | 13.2 | 0.9  | -0.53 | 0.594 |
| <b>FEP (MCG/DL)</b>       |            |      |      |      |      |     |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 117        | 14.0 | 17.0 | 24.0 | 18.9 | 8.4 | 94             | 13.0 | 20.0 | 23.0 | 19.3 | 8.6  | -0.29 | 0.776 |
| St. Clair                 | 101        | 16.0 | 19.0 | 26.0 | 21.1 | 9.1 | 78             | 15.0 | 20.0 | 27.0 | 22.9 | 11.1 | -1.15 | 0.251 |
| Maricopa                  | 97         | 18.0 | 23.0 | 28.0 | 23.5 | 7.8 | 58             | 18.0 | 22.0 | 29.0 | 23.5 | 7.0  | 0.03  | 0.974 |
| Mingo                     | 114        | 11.0 | 15.0 | 21.0 | 16.5 | 7.8 | 101            | 10.0 | 14.0 | 20.0 | 16.8 | 9.3  | -0.29 | 0.773 |
| <b>MCHC (%)</b>           |            |      |      |      |      |     |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 118        | 34.4 | 35.4 | 36.6 | 35.5 | 1.6 | 94             | 34.6 | 35.7 | 36.8 | 35.7 | 1.9  | -0.75 | 0.456 |
| St. Clair                 | 99         | 34.0 | 35.5 | 36.6 | 35.4 | 1.9 | 82             | 34.3 | 35.5 | 36.7 | 35.5 | 1.7  | -0.40 | 0.686 |
| Maricopa                  | 95         | 34.9 | 35.8 | 36.5 | 35.7 | 1.7 | 55             | 35.2 | 35.6 | 36.4 | 35.7 | 1.7  | 0.00  | 0.997 |
| Mingo                     | 113        | 33.9 | 34.9 | 35.9 | 35.0 | 1.5 | 102            | 34.0 | 34.7 | 35.7 | 34.8 | 1.4  | 0.84  | 0.400 |

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Table 7-3 (continued)

BIOCHEMICAL INDICATORS FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>TIBC (MCG/DL)</b>       |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 101        | 308.0 | 331.0 | 363.0 | 334.1 | 42.8 | 78             | 301.0 | 327.0 | 354.0 | 331.0 | 41.5 | 0.50  | 0.620 |
| St. Clair                  | 89         | 294.0 | 317.0 | 343.0 | 323.8 | 36.8 | 72             | 301.5 | 318.5 | 340.5 | 319.3 | 31.1 | 0.84  | 0.403 |
| Maricopa                   | 87         | 305.0 | 340.0 | 362.0 | 337.5 | 42.2 | 58             | 300.0 | 330.0 | 368.0 | 338.6 | 53.9 | -0.12 | 0.901 |
| Mingo                      | 106        | 288.0 | 310.0 | 339.0 | 315.0 | 39.0 | 92             | 294.0 | 318.5 | 345.0 | 318.3 | 36.6 | -0.62 | 0.533 |
| <b>SERUM IRON (MCG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 108        | 46.5  | 61.0  | 77.0  | 63.4  | 23.4 | 82             | 53.0  | 66.0  | 87.0  | 68.8  | 24.3 | -1.55 | 0.124 |
| St. Clair                  | 89         | 55.0  | 73.0  | 92.0  | 75.6  | 24.6 | 75             | 53.0  | 67.0  | 88.0  | 69.3  | 24.9 | 1.60  | 0.111 |
| Maricopa                   | 92         | 57.5  | 72.0  | 97.0  | 77.4  | 27.9 | 58             | 66.0  | 86.0  | 102.0 | 85.5  | 29.6 | -1.66 | 0.100 |
| Mingo                      | 106        | 48.0  | 63.5  | 76.0  | 65.2  | 24.5 | 95             | 53.0  | 69.0  | 87.0  | 69.9  | 24.0 | -1.35 | 0.179 |
| <b>TS (%)</b>              |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 99         | 13.6  | 19.0  | 23.9  | 18.9  | 7.0  | 78             | 16.0  | 21.1  | 25.2  | 20.7  | 6.9  | -1.70 | 0.092 |
| St. Clair                  | 84         | 18.5  | 23.5  | 27.5  | 23.0  | 6.6  | 73             | 17.1  | 21.4  | 26.8  | 22.1  | 8.0  | 0.77  | 0.441 |
| Maricopa                   | 89         | 17.0  | 21.6  | 26.7  | 22.6  | 8.2  | 57             | 19.6  | 26.0  | 30.4  | 25.3  | 8.7  | -1.89 | 0.061 |
| Mingo                      | 101        | 14.6  | 19.8  | 25.4  | 20.7  | 7.7  | 92             | 16.7  | 21.0  | 27.5  | 21.8  | 7.6  | -0.94 | 0.349 |
| <b>FERRITIN (NG/DL)</b>    |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 95         | 16.0  | 22.0  | 30.0  | 24.3  | 11.0 | 75             | 17.5  | 25.0  | 35.0  | 26.7  | 11.9 | -1.38 | 0.169 |
| St. Clair                  | 88         | 19.5  | 27.0  | 35.5  | 29.8  | 15.7 | 76             | 17.0  | 26.0  | 35.0  | 30.8  | 16.1 | -0.21 | 0.831 |
| Maricopa                   | 86         | 14.0  | 19.0  | 26.0  | 21.1  | 11.0 | 52             | 13.5  | 17.0  | 23.0  | 19.6  | 10.3 | 0.79  | 0.429 |
| Mingo                      | 105        | 15.0  | 19.0  | 27.0  | 22.7  | 12.1 | 89             | 14.0  | 19.0  | 28.0  | 21.3  | 10.4 | 0.86  | 0.392 |

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Table 7-3 (continued)

BIOCHEMICAL INDICATORS FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>B-CAROTENE (MCG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 68         | 80.5  | 103.5 | 129.5 | 105.2 | 31.4 | 60             | 76.0  | 88.0  | 106.0 | 90.1  | 24.7 | 3.04  | 0.003 |
| Maricopa                   | 87         | 79.5  | 98.0  | 116.5 | 99.3  | 27.6 | 57             | 71.0  | 90.0  | 107.0 | 90.6  | 29.7 | 1.78  | 0.078 |
| <b>CHOLESTEROL (MG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 109        | 144.0 | 162.0 | 187.0 | 166.9 | 31.9 | 84             | 156.5 | 172.0 | 188.0 | 170.8 | 29.3 | -0.87 | 0.385 |
| St. Clair                  | 100        | 144.5 | 165.0 | 184.0 | 168.9 | 32.5 | 81             | 149.0 | 163.0 | 185.0 | 169.5 | 34.8 | -0.11 | 0.909 |
| Maricopa                   | 93         | 139.0 | 159.0 | 182.0 | 162.8 | 29.0 | 58             | 141.0 | 153.5 | 169.0 | 159.3 | 30.2 | 0.71  | 0.481 |
| Mingo                      | 114        | 142.0 | 156.5 | 170.0 | 156.3 | 24.5 | 100            | 132.5 | 155.0 | 170.5 | 152.9 | 29.6 | 0.89  | 0.373 |
| <b>VITAMIN A (MCG/DL)</b>  |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 67         | 30.0  | 36.0  | 43.0  | 36.9  | 10.4 | 58             | 32.0  | 36.5  | 42.0  | 37.7  | 7.7  | -0.49 | 0.623 |
| Maricopa                   | 87         | 32.0  | 36.0  | 39.5  | 35.8  | 7.1  | 56             | 31.0  | 35.5  | 39.5  | 36.6  | 7.0  | -0.58 | 0.562 |
| <b>VITAMIN C (MG/DL)</b>   |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Maricopa                   | 70         | 1.2   | 1.5   | 1.8   | 1.5   | 0.5  | 39             | 1.1   | 1.3   | 1.5   | 1.3   | 0.4  | 2.20  | 0.030 |

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Table 7-4

BIOCHEMICAL INDICATORS FOR TWO TO FOUR YEAR OLDS  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS ACROSS SITE

|                     | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|---------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                     | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| HEMATOCRIT (%)      | 102        | 34.5  | 36.0  | 38.0  | 36.2  | 2.2  | 131            | 35.0  | 36.5  | 38.0  | 36.7  | 2.5  | -1.42 | 0.158 |
| HEMOGLOBIN (GM/DL)  | 101        | 12.2  | 12.8  | 13.4  | 12.8  | 0.9  | 129            | 12.2  | 12.9  | 13.6  | 12.9  | 1.0  | -1.07 | 0.288 |
| FEP (MCG/DL)        | 100        | 12.0  | 17.0  | 22.5  | 18.1  | 9.1  | 127            | 12.0  | 18.0  | 22.5  | 19.0  | 9.2  | -0.73 | 0.466 |
| MCHC (%)            | 99         | 34.2  | 35.0  | 36.2  | 35.2  | 1.7  | 128            | 34.0  | 35.1  | 36.1  | 35.2  | 1.7  | 0.08  | 0.937 |
| TIBC (MCG/DL)       | 85         | 294.0 | 320.0 | 349.0 | 323.8 | 39.5 | 106            | 299.0 | 320.0 | 349.0 | 323.8 | 38.6 | 0.00  | 0.996 |
| SERUM IRON (MCG/DL) | 86         | 53.0  | 68.0  | 85.0  | 69.4  | 23.6 | 114            | 50.0  | 67.5  | 87.0  | 68.3  | 24.9 | 0.33  | 0.743 |
| TS (%)              | 77         | 16.4  | 20.3  | 25.4  | 20.8  | 6.4  | 110            | 16.1  | 21.7  | 26.1  | 21.2  | 7.6  | -0.31 | 0.758 |
| FERRITIN (NG/DL)    | 82         | 16.0  | 22.0  | 29.0  | 24.6  | 12.1 | 105            | 14.0  | 23.0  | 34.0  | 24.9  | 14.2 | -0.15 | 0.881 |
| B-CAROTENE (MCG/DL) | 19         | 65.5  | 108.0 | 121.0 | 100.5 | 34.6 | 24             | 83.0  | 91.0  | 101.0 | 93.7  | 16.8 | 0.78  | 0.441 |
| CHOLESTEROL (MG/DL) | 93         | 147.0 | 164.0 | 186.0 | 168.0 | 29.7 | 121            | 147.0 | 167.0 | 183.0 | 165.6 | 30.3 | 0.57  | 0.572 |
| VITAMIN A (MCG/DL)  | 19         | 32.5  | 36.0  | 44.5  | 37.9  | 8.0  | 24             | 31.5  | 36.0  | 41.0  | 36.3  | 6.2  | 0.70  | 0.488 |

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Table 7-4 (continued)

BIOCHEMICAL INDICATORS FOR TWO TO FOUR YEAR OLDS  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                           | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|---------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                           | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>HEMATOCRIT (%)</b>     |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys          | 41         | 34.0  | 36.0  | 37.0  | 35.8  | 2.2  | 42             | 34.5  | 36.2  | 37.0  | 36.1  | 2.1  | -0.62 | 0.536 |
| St. Clair                 | 31         | 34.5  | 35.0  | 36.0  | 35.3  | 1.8  | 35             | 34.0  | 35.5  | 37.0  | 35.4  | 2.1  | -0.29 | 0.777 |
| Mingo                     | 30         | 36.5  | 37.5  | 39.5  | 37.8  | 2.0  | 54             | 36.5  | 38.0  | 40.0  | 37.9  | 2.6  | -0.31 | 0.755 |
| <b>HEMOGLOBIN (GM/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys          | 41         | 12.3  | 12.9  | 13.3  | 12.8  | 0.9  | 42             | 12.3  | 12.8  | 13.5  | 12.9  | 0.9  | -0.79 | 0.432 |
| St. Clair                 | 31         | 11.8  | 12.2  | 12.8  | 12.4  | 0.8  | 34             | 12.0  | 12.4  | 13.0  | 12.5  | 1.0  | -0.79 | 0.435 |
| Mingo                     | 29         | 12.9  | 13.2  | 13.7  | 13.2  | 0.8  | 53             | 12.6  | 13.2  | 13.7  | 13.1  | 1.0  | 0.42  | 0.674 |
| <b>FEP. (MCG/DL)</b>      |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys          | 40         | 12.5  | 17.0  | 23.0  | 17.8  | 8.1  | 43             | 12.0  | 19.0  | 22.5  | 18.9  | 8.4  | -0.60 | 0.550 |
| St. Clair                 | 31         | 13.5  | 17.0  | 25.5  | 20.1  | 11.1 | 33             | 16.0  | 19.0  | 26.0  | 21.6  | 10.1 | -0.56 | 0.580 |
| Mingo                     | 29         | 12.0  | 15.0  | 21.0  | 16.5  | 7.7  | 51             | 10.0  | 17.0  | 21.0  | 17.5  | 9.2  | -0.52 | 0.608 |
| <b>MCHC (%)</b>           |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys          | 41         | 34.7  | 35.5  | 36.5  | 35.6  | 1.4  | 42             | 34.9  | 35.7  | 36.8  | 35.8  | 1.7  | -0.44 | 0.661 |
| St. Clair                 | 31         | 33.8  | 34.8  | 36.3  | 35.0  | 2.1  | 35             | 34.0  | 35.1  | 36.0  | 35.1  | 1.6  | -0.21 | 0.832 |
| Mingo                     | 27         | 33.8  | 34.5  | 35.3  | 34.8  | 1.6  | 51             | 33.8  | 34.7  | 35.6  | 34.7  | 1.6  | 0.08  | 0.937 |
| <b>TIBC (MCG/DL)</b>      |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys          | 34         | 309.0 | 336.0 | 368.0 | 333.3 | 36.9 | 32             | 300.0 | 324.0 | 348.5 | 333.0 | 44.7 | 0.03  | 0.979 |
| St. Clair                 | 24         | 298.5 | 312.0 | 344.5 | 330.1 | 43.7 | 29             | 301.0 | 322.0 | 354.0 | 322.6 | 37.7 | 0.66  | 0.512 |
| Mingo                     | 27         | 282.5 | 300.0 | 325.0 | 306.2 | 33.9 | 45             | 295.0 | 318.0 | 340.0 | 318.0 | 33.7 | -1.44 | 0.156 |

Table 7-4 (continued)

BIOCHEMICAL INDICATORS FOR TWO TO FOUR YEAR OLDS  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>SERUM IRON (MCG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 35         | 81.0  | 63.0  | 77.5  | 65.6  | 22.4 | 36             | 44.5  | 64.5  | 85.5  | 66.3  | 27.5 | -0.12 | 0.902 |
| St. Clair                  | 25         | 72.0  | 83.0  | 94.0  | 82.7  | 20.9 | 31             | 54.5  | 66.0  | 87.0  | 69.0  | 23.7 | 2.28  | 0.026 |
| Mingo                      | 26         | 46.0  | 57.0  | 72.0  | 61.9  | 23.2 | 47             | 54.0  | 70.0  | 82.0  | 69.4  | 24.1 | -1.29 | 0.207 |
| <b>TS (%)</b>              |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 33         | 13.5  | 19.1  | 23.7  | 19.3  | 6.5  | 33             | 14.8  | 21.3  | 24.6  | 19.9  | 8.4  | -0.31 | 0.756 |
| St. Clair                  | 21         | 20.8  | 24.5  | 25.8  | 24.2  | 4.6  | 30             | 17.0  | 21.0  | 24.6  | 21.0  | 7.1  | 1.89  | 0.064 |
| Mingo                      | 23         | 15.5  | 19.8  | 24.7  | 20.0  | 6.9  | 47             | 16.7  | 22.5  | 27.7  | 22.2  | 7.4  | -1.17 | 0.249 |
| <b>FERRITIN (NG/DL)</b>    |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 31         | 17.5  | 22.0  | 26.5  | 23.7  | 11.4 | 31             | 20.0  | 26.0  | 37.5  | 29.2  | 12.7 | -1.81 | 0.076 |
| St. Clair                  | 24         | 16.5  | 27.0  | 39.5  | 27.4  | 12.7 | 30             | 16.0  | 25.0  | 36.0  | 28.0  | 17.6 | -0.13 | 0.895 |
| Mingo                      | 27         | 16.0  | 21.0  | 26.0  | 23.3  | 12.2 | 44             | 12.5  | 15.5  | 28.0  | 19.8  | 10.8 | 1.21  | 0.232 |
| <b>B-CAROTENE (MCG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 18         | 65.5  | 108.0 | 121.0 | 100.5 | 34.6 | 24             | 83.0  | 91.0  | 101.0 | 93.7  | 16.8 | 0.78  | 0.441 |
| <b>CHOLESTEROL (MG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 34         | 147.0 | 170.5 | 191.0 | 172.0 | 34.2 | 36             | 154.5 | 175.0 | 189.5 | 174.2 | 29.3 | -0.29 | 0.775 |
| St. Clair                  | 30         | 152.0 | 173.0 | 190.0 | 174.1 | 27.3 | 34             | 156.0 | 172.0 | 183.0 | 169.0 | 32.3 | 0.68  | 0.496 |
| Mingo                      | 29         | 145.0 | 157.0 | 168.0 | 156.9 | 23.8 | 51             | 138.5 | 165.0 | 172.5 | 157.4 | 27.9 | -0.07 | 0.941 |
| <b>VITAMIN A (MCG/DL)</b>  |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 19         | 32.5  | 36.0  | 44.5  | 37.9  | 8.0  | 24             | 31.5  | 36.0  | 41.0  | 36.3  | 6.2  | 0.70  | 0.488 |

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Table 7-5

BIOCHEMICAL INDICATORS FOR FOUR TO SIX YEAR OLDS  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS ACROSS SITE.

|                     | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|---------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                     | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| HEMATOCRIT (%)      | 332        | 35.0  | 36.0  | 38.0  | 36.3  | 2.4  | 209            | 35.0  | 36.5  | 38.0  | 36.5  | 2.6  | -0.84 | 0.402 |
| HEMOGLOBIN (GM/DL)  | 329        | 12.3  | 13.0  | 13.5  | 12.9  | 0.9  | 206            | 12.3  | 12.9  | 13.5  | 12.9  | 0.9  | -0.53 | 0.599 |
| FEP (MCG/DL)        | 329        | 14.0  | 19.0  | 25.0  | 20.4  | 8.5  | 204            | 14.0  | 20.0  | 27.0  | 20.8  | 9.7  | -0.55 | 0.586 |
| MCHC (%)            | 326        | 34.4  | 35.5  | 36.4  | 35.4  | 1.7  | 205            | 34.3  | 35.6  | 36.4  | 35.5  | 1.8  | -0.34 | 0.731 |
| TIBC (MCG/DL)       | 298        | 297.0 | 328.5 | 355.0 | 328.1 | 41.6 | 184            | 297.0 | 324.5 | 353.0 | 326.8 | 42.7 | 0.34  | 0.732 |
| SERUM IRON (MCG/DL) | 309        | 51.0  | 67.0  | 87.0  | 70.0  | 26.3 | 196            | 57.0  | 69.0  | 93.5  | 74.7  | 26.5 | -1.95 | 0.051 |
| TS (%)              | 296        | 15.7  | 20.1  | 26.2  | 21.3  | 7.8  | 190            | 17.4  | 21.4  | 28.3  | 22.9  | 8.0  | -2.13 | 0.034 |
| FERRITIN (NG/DL)    | 292        | 15.0  | 21.5  | 30.0  | 24.3  | 13.2 | 186            | 15.0  | 21.0  | 30.0  | 24.8  | 24.0 | -0.24 | 0.814 |
| B-CAROTENE (MCG/DL) | 136        | 81.0  | 102.0 | 121.0 | 102.1 | 28.7 | 93             | 68.0  | 88.0  | 107.0 | 89.5  | 29.2 | 3.24  | 0.001 |
| CHOLESTEROL (MG/DL) | 323        | 141.0 | 158.0 | 180.0 | 162.3 | 29.8 | 202            | 141.0 | 157.5 | 180.0 | 161.2 | 32.7 | 0.39  | 0.700 |
| VITAMIN A (MCG/DL)  | 135        | 30.5  | 35.0  | 41.0  | 35.1  | 8.8  | 90             | 33.0  | 36.0  | 42.0  | 37.4  | 7.7  | -1.15 | 0.252 |
| VITAMIN C (MG/DL)   | 70         | 1.2   | 1.5   | 1.8   | 1.5   | 0.5  | 39             | 1.1   | 1.3   | 1.5   | 1.3   | 0.4  | 2.20  | 0.030 |

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Table 7-5 (continued)

BIOCHEMICAL INDICATORS FOR FOUR TO SIX YEAR OLDS  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                           | HEAD START |      |      |      |      |     | NON-HEAD START |      |      |      |      |      | T     | P     |
|---------------------------|------------|------|------|------|------|-----|----------------|------|------|------|------|------|-------|-------|
|                           | N          | Q1   | MED  | Q3   | MEAN | SD  | N              | Q1   | MED  | Q3   | MEAN | SD   |       |       |
| <b>HEMATOCRIT (%)</b>     |            |      |      |      |      |     |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 78         | 34.0 | 36.0 | 37.0 | 35.3 | 3.0 | 52             | 34.5 | 35.5 | 37.8 | 36.0 | 2.1  | -1.62 | 0.107 |
| St. Clair                 | 69         | 34.5 | 36.0 | 37.0 | 35.6 | 1.8 | 47             | 34.0 | 35.0 | 37.0 | 35.0 | 2.8  | 1.25  | 0.215 |
| Maricopa                  | 97         | 35.5 | 36.5 | 38.0 | 36.5 | 2.1 | 58             | 35.0 | 36.0 | 38.0 | 36.5 | 2.4  | 0.12  | 0.907 |
| Mingo                     | 88         | 36.4 | 37.5 | 39.0 | 37.6 | 2.1 | 52             | 37.0 | 38.5 | 39.5 | 38.4 | 2.1  | -2.22 | 0.028 |
| <b>HEMOGLOBIN (GM/DL)</b> |            |      |      |      |      |     |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 77         | 11.9 | 12.5 | 13.3 | 12.5 | 1.1 | 52             | 12.1 | 12.8 | 13.5 | 12.8 | 0.9  | -1.80 | 0.075 |
| St. Clair                 | 70         | 12.1 | 12.5 | 13.3 | 12.7 | 1.0 | 47             | 12.1 | 12.5 | 13.3 | 12.5 | 1.0  | 1.04  | 0.303 |
| Maricopa                  | 96         | 12.7 | 13.2 | 13.6 | 13.1 | 0.8 | 56             | 12.5 | 13.0 | 13.4 | 13.0 | 0.7  | 0.70  | 0.486 |
| Mingo                     | 86         | 12.7 | 13.2 | 13.8 | 13.2 | 0.8 | 51             | 12.7 | 13.3 | 14.0 | 13.4 | 0.7  | -1.50 | 0.136 |
| <b>FEP (MCG/DL)</b>       |            |      |      |      |      |     |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 77         | 14.0 | 18.0 | 24.0 | 19.5 | 8.6 | 51             | 14.0 | 20.0 | 23.5 | 19.6 | 8.8  | -0.05 | 0.959 |
| St. Clair                 | 70         | 16.0 | 20.0 | 26.0 | 21.6 | 8.1 | 45             | 15.0 | 21.0 | 30.0 | 23.9 | 11.8 | -1.15 | 0.253 |
| Maricopa                  | 97         | 18.0 | 23.0 | 28.0 | 23.5 | 7.8 | 58             | 18.0 | 22.0 | 29.0 | 23.5 | 7.0  | 0.03  | 0.974 |
| Mingo                     | 85         | 11.0 | 15.0 | 21.0 | 16.5 | 8.0 | 50             | 9.0  | 13.0 | 20.0 | 16.2 | 9.5  | 0.21  | 0.834 |
| <b>MCHC (%)</b>           |            |      |      |      |      |     |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 77         | 34.4 | 35.3 | 36.6 | 35.4 | 1.7 | 52             | 34.1 | 35.8 | 36.8 | 35.6 | 2.1  | -0.52 | 0.605 |
| St. Clair                 | 68         | 34.1 | 35.6 | 36.6 | 35.6 | 1.8 | 47             | 34.4 | 35.8 | 37.1 | 35.8 | 1.8  | -0.66 | 0.513 |
| Maricopa                  | 95         | 34.9 | 35.8 | 36.5 | 35.7 | 1.7 | 55             | 35.2 | 35.6 | 36.4 | 35.7 | 1.7  | 0.00  | 0.997 |
| Mingo                     | 86         | 33.9 | 35.1 | 36.0 | 35.0 | 1.4 | 51             | 34.0 | 34.7 | 35.7 | 34.8 | 1.3  | 0.77  | 0.443 |

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Table 7-5 (continued)

BIOCHEMICAL INDICATORS FOR FOUR TO SIX YEAR OLDS  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>TIBC (MCG/DL)</b>       |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 67         | 307.0 | 330.0 | 361.0 | 334.5 | 45.7 | 46             | 303.0 | 328.5 | 357.0 | 329.5 | 39.5 | 0.62  | 0.537 |
| St. Clair                  | 65         | 291.0 | 326.0 | 341.0 | 321.4 | 34.0 | 43             | 302.0 | 313.0 | 333.5 | 317.0 | 26.0 | 0.76  | 0.449 |
| Maricopa                   | 87         | 305.0 | 340.0 | 362.0 | 337.5 | 42.2 | 58             | 300.0 | 330.0 | 368.0 | 338.6 | 53.9 | -0.12 | 0.901 |
| Mingo                      | 78         | 290.0 | 310.0 | 342.0 | 318.0 | 40.9 | 47             | 291.5 | 319.0 | 346.0 | 318.6 | 39.5 | -0.09 | 0.929 |
| <b>SERUM IRON (MCG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 73         | 44.0  | 59.0  | 76.0  | 62.3  | 23.9 | 46             | 57.0  | 66.0  | 87.0  | 70.7  | 21.5 | -1.99 | 0.049 |
| St. Clair                  | 64         | 54.0  | 69.0  | 91.5  | 72.8  | 25.4 | 44             | 46.0  | 71.0  | 90.0  | 69.5  | 26.0 | 0.64  | 0.523 |
| Maricopa                   | 92         | 57.5  | 72.0  | 97.0  | 77.4  | 27.9 | 58             | 66.0  | 86.0  | 102.0 | 85.5  | 29.6 | -1.66 | 0.100 |
| Mingo                      | 80         | 48.5  | 65.0  | 79.5  | 66.3  | 25.0 | 48             | 53.0  | 67.0  | 88.0  | 70.4  | 24.2 | -0.90 | 0.370 |
| <b>TS (%)</b>              |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 66         | 13.6  | 17.5  | 23.9  | 18.7  | 7.3  | 45             | 17.0  | 21.1  | 25.5  | 21.3  | 5.6  | -2.10 | 0.038 |
| St. Clair                  | 63         | 18.0  | 21.5  | 27.5  | 22.6  | 7.1  | 43             | 17.2  | 23.5  | 28.8  | 22.9  | 8.6  | -0.13 | 0.897 |
| Maricopa                   | 89         | 17.0  | 21.8  | 26.7  | 22.6  | 8.2  | 57             | 19.6  | 26.0  | 30.4  | 25.3  | 8.7  | -1.89 | 0.061 |
| Mingo                      | 78         | 14.3  | 19.8  | 26.0  | 20.9  | 8.0  | 45             | 17.2  | 19.9  | 26.9  | 21.4  | 7.9  | -0.30 | 0.767 |
| <b>FERRITIN (NG/DL)</b>    |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 64         | 15.5  | 23.0  | 32.0  | 24.6  | 10.8 | 44             | 15.5  | 24.5  | 31.0  | 25.0  | 11.2 | -0.19 | 0.848 |
| St. Clair                  | 64         | 20.0  | 27.0  | 35.0  | 30.7  | 16.7 | 45             | 19.0  | 26.0  | 32.0  | 32.6  | 44.5 | -0.28 | 0.783 |
| Maricopa                   | 86         | 14.0  | 19.0  | 26.0  | 21.1  | 11.0 | 52             | 13.5  | 17.0  | 23.0  | 19.6  | 10.3 | 0.79  | 0.429 |
| Mingo                      | 78         | 15.0  | 19.0  | 27.0  | 22.4  | 12.2 | 45             | 15.0  | 20.0  | 29.0  | 22.7  | 10.0 | -0.11 | 0.910 |

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Table 7-5 (continued)

BIOCHEMICAL INDICATORS FOR FOUR TO SIX YEAR OLDS  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>B-CAROTENE (MCG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 49         | 82.0  | 108.0 | 132.0 | 107.0 | 30.3 | 36             | 64.0  | 83.0  | 107.0 | 87.7  | 28.8 | 2.99  | 0.004 |
| Maricopa                   | 87         | 79.5  | 98.0  | 116.5 | 89.3  | 27.6 | 57             | 71.0  | 90.0  | 107.0 | 90.6  | 29.7 | 1.78  | 0.078 |
| <b>CHOLESTEROL (MG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 75         | 142.0 | 162.0 | 183.5 | 164.6 | 30.8 | 48             | 156.5 | 169.5 | 185.0 | 168.2 | 29.3 | -0.65 | 0.518 |
| St. Clair                  | 70         | 143.0 | 160.5 | 183.0 | 166.6 | 34.5 | 47             | 146.5 | 158.0 | 190.0 | 169.8 | 36.8 | -0.46 | 0.643 |
| Maricopa                   | 93         | 139.0 | 159.0 | 182.0 | 162.8 | 29.0 | 58             | 141.0 | 153.5 | 169.0 | 159.3 | 30.2 | 0.71  | 0.489 |
| Mingo                      | 85         | 142.0 | 156.0 | 170.0 | 156.0 | 24.8 | 49             | 130.0 | 147.0 | 163.0 | 148.3 | 30.9 | 1.50  | 0.138 |
| <b>VITAMIN A (MCG/DL)</b>  |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 48         | 29.0  | 33.5  | 43.0  | 36.6  | 11.3 | 34             | 34.0  | 38.0  | 44.0  | 38.7  | 8.6  | -0.99 | 0.326 |
| Maricopa                   | 87         | 32.0  | 36.0  | 39.5  | 35.8  | 7.1  | 56             | 31.0  | 35.5  | 39.5  | 36.6  | 7.0  | -0.58 | 0.562 |
| <b>VITAMIN C (MG/DL)</b>   |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Maricopa                   | 70         | 1.2   | 1.5   | 1.8   | 1.5   | 0.5  | 39             | 1.1   | 1.3   | 1.5   | 1.3   | 0.4  | 2.20  | 0.030 |

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Table 7-6

BIOCHEMICAL INDICATORS FOR MALES WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS ACROSS SITE

|                     | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|---------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                     | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| HEMATOCRIT (%)      | 223        | 35.0  | 36.5  | 38.0  | 36.4  | 2.3  | 170            | 35.0  | 36.5  | 38.0  | 36.5  | 2.6  | -0.34 | 0.730 |
| HEMOGLOBIN (GM/DL)  | 220        | 12.3  | 12.9  | 13.5  | 12.9  | 0.9  | 168            | 12.3  | 12.9  | 13.5  | 12.9  | 1.0  | -0.78 | 0.434 |
| FEP (MCG/DL)        | 218        | 14.0  | 19.0  | 24.0  | 20.0  | 8.1  | 166            | 14.0  | 19.0  | 24.0  | 20.0  | 9.1  | -0.02 | 0.982 |
| MCHC (%)            | 217        | 34.2  | 35.3  | 36.3  | 35.3  | 1.6  | 167            | 34.5  | 35.7  | 36.5  | 35.5  | 1.7  | -1.42 | 0.156 |
| TIBC (MCG/DL)       | 199        | 297.0 | 328.0 | 352.5 | 327.6 | 41.5 | 148            | 302.5 | 329.0 | 350.5 | 329.5 | 41.6 | -0.42 | 0.673 |
| SERUM IRON (MCG/DL) | 203        | 53.0  | 66.0  | 84.5  | 70.0  | 25.9 | 154            | 54.0  | 67.5  | 88.0  | 71.6  | 24.7 | -0.60 | 0.548 |
| TS (%)              | 183        | 15.7  | 20.1  | 25.7  | 21.3  | 7.7  | 152            | 16.8  | 21.3  | 26.9  | 22.0  | 7.5  | -0.82 | 0.414 |
| FERRITIN (NG/DL)    | 198        | 15.0  | 20.0  | 28.0  | 23.3  | 12.5 | 145            | 14.0  | 21.0  | 29.0  | 24.2  | 26.7 | -0.39 | 0.698 |
| B-CAROTENE (MCG/DL) | 79         | 75.0  | 102.0 | 124.0 | 100.9 | 32.3 | 59             | 74.0  | 93.0  | 109.0 | 93.2  | 26.0 | 1.56  | 0.121 |
| CHOLESTERDL (MG/DL) | 217        | 143.0 | 160.0 | 182.0 | 163.3 | 29.1 | 160            | 144.0 | 164.5 | 183.0 | 164.3 | 32.6 | -0.32 | 0.751 |
| VITAMIN A (MCG/DL)  | 79         | 31.0  | 36.0  | 42.0  | 36.9  | 9.1  | 58             | 32.0  | 36.0  | 42.0  | 37.2  | 7.8  | -0.24 | 0.811 |
| VITAMIN C (MG/DL)   | 40         | 1.3   | 1.5   | 1.8   | 1.5   | 0.5  | 15             | 1.0   | 1.3   | 1.5   | 1.2   | 0.4  | 2.30  | 0.029 |

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Table 7-6 (continued)

BIOCHEMICAL INDICATORS FOR MALES WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                           | HEAD START |      |      |      |      |     | NON-HEAD START |      |      |      |      |      | T     | P     |
|---------------------------|------------|------|------|------|------|-----|----------------|------|------|------|------|------|-------|-------|
|                           | N          | Q1   | MED  | Q3   | MEAN | SD  | N              | Q1   | MED  | Q3   | MEAN | SD   |       |       |
| <b>HEMATOCRIT (%)</b>     |            |      |      |      |      |     |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 53         | 34.0 | 35.0 | 37.0 | 35.5 | 2.4 | 54             | 34.5 | 36.0 | 37.0 | 35.8 | 1.9  | -0.85 | 0.398 |
| St. Clair                 | 53         | 34.5 | 35.0 | 36.5 | 35.3 | 1.8 | 43             | 34.0 | 35.5 | 37.0 | 35.2 | 3.0  | 0.19  | 0.852 |
| Maricopa                  | 52         | 35.5 | 36.8 | 38.0 | 36.8 | 2.0 | 22             | 35.0 | 36.5 | 37.0 | 36.5 | 2.0  | 0.54  | 0.589 |
| Mingo                     | 64         | 36.5 | 37.5 | 39.0 | 37.7 | 2.1 | 51             | 36.5 | 38.0 | 40.0 | 38.2 | 2.3  | -1.23 | 0.222 |
| <b>HEMOGLOBIN (GM/DL)</b> |            |      |      |      |      |     |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 52         | 12.0 | 12.6 | 13.2 | 12.6 | 0.9 | 54             | 12.2 | 12.8 | 13.3 | 12.8 | 0.9  | -1.25 | 0.215 |
| St. Clair                 | 54         | 11.8 | 12.4 | 13.1 | 12.6 | 1.0 | 42             | 12.1 | 12.6 | 13.3 | 12.7 | 1.1  | -0.55 | 0.587 |
| Maricopa                  | 52         | 12.9 | 13.2 | 13.6 | 13.2 | 0.7 | 21             | 12.7 | 13.0 | 13.5 | 13.1 | 0.8  | 0.52  | 0.606 |
| Mingo                     | 62         | 12.7 | 13.2 | 13.7 | 13.1 | 0.7 | 51             | 12.6 | 13.3 | 14.0 | 13.3 | 0.9  | -0.89 | 0.377 |
| <b>FEP (MCG/DL)</b>       |            |      |      |      |      |     |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 52         | 15.0 | 18.0 | 24.0 | 20.3 | 8.5 | 54             | 12.0 | 18.0 | 22.0 | 18.4 | 9.0  | 1.11  | 0.270 |
| St. Clair                 | 54         | 15.0 | 20.0 | 27.0 | 21.4 | 9.1 | 41             | 16.0 | 19.0 | 27.0 | 22.6 | 10.3 | -0.58 | 0.561 |
| Maricopa                  | 52         | 18.5 | 22.0 | 26.0 | 22.6 | 6.9 | 22             | 19.0 | 25.0 | 30.0 | 24.1 | 6.7  | -0.90 | 0.376 |
| Mingo                     | 60         | 11.0 | 15.0 | 21.0 | 16.1 | 6.2 | 49             | 12.0 | 15.0 | 21.0 | 17.6 | 8.3  | -1.10 | 0.275 |
| <b>MCHC (%)</b>           |            |      |      |      |      |     |                |      |      |      |      |      |       |       |
| Greene/Humphreys          | 52         | 34.6 | 35.2 | 36.5 | 35.4 | 1.5 | 54             | 34.7 | 36.0 | 36.9 | 35.7 | 1.8  | -0.90 | 0.368 |
| St. Clair                 | 52         | 34.0 | 35.4 | 36.3 | 35.3 | 2.0 | 43             | 34.7 | 36.0 | 36.7 | 35.8 | 1.6  | -1.33 | 0.187 |
| Maricopa                  | 51         | 34.8 | 35.9 | 36.7 | 35.7 | 1.5 | 21             | 35.1 | 35.9 | 36.8 | 35.9 | 1.4  | -0.54 | 0.590 |
| Mingo                     | 62         | 33.8 | 34.8 | 35.6 | 34.7 | 1.3 | 49             | 34.0 | 34.8 | 35.9 | 34.9 | 1.5  | -0.44 | 0.659 |

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Table 7-6 (continued)

BIOCHEMICAL INDICATORS FOR MALES WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>TIBC (MCG/DL)</b>       |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 47         | 306.0 | 333.0 | 361.0 | 329.1 | 41.3 | 47             | 302.5 | 332.0 | 356.0 | 334.8 | 42.6 | -0.66 | 0.511 |
| St. Clair                  | 46         | 301.0 | 330.0 | 345.0 | 326.7 | 37.6 | 35             | 300.5 | 310.0 | 334.0 | 315.6 | 31.9 | 1.43  | 0.156 |
| Maricopa                   | 46         | 313.0 | 342.5 | 369.0 | 339.4 | 42.9 | 22             | 307.0 | 343.5 | 381.0 | 348.4 | 57.0 | -0.66 | 0.516 |
| Mingo                      | 60         | 285.5 | 310.0 | 341.5 | 318.0 | 41.8 | 44             | 302.0 | 329.0 | 346.0 | 325.3 | 34.7 | -0.98 | 0.328 |
| <b>SERUM IRON (MCG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 50         | 48.0  | 60.0  | 72.0  | 62.7  | 24.7 | 47             | 57.5  | 67.0  | 87.0  | 72.2  | 22.4 | -1.99 | 0.050 |
| St. Clair                  | 45         | 55.0  | 71.0  | 90.0  | 74.3  | 25.0 | 39             | 44.0  | 60.0  | 85.0  | 65.7  | 25.4 | 1.56  | 0.123 |
| Maricopa                   | 48         | 59.5  | 72.0  | 100.0 | 78.7  | 29.1 | 22             | 63.0  | 84.0  | 99.0  | 82.1  | 29.0 | -0.46 | 0.647 |
| Mingo                      | 60         | 51.0  | 66.5  | 75.5  | 65.8  | 22.5 | 46             | 53.0  | 66.5  | 88.0  | 70.9  | 23.2 | -1.14 | 0.258 |
| <b>TS (%)</b>              |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 45         | 13.6  | 17.7  | 22.3  | 18.6  | 6.8  | 46             | 16.6  | 21.2  | 25.2  | 21.5  | 6.3  | -2.07 | 0.041 |
| St. Clair                  | 42         | 17.8  | 22.8  | 26.4  | 22.8  | 6.7  | 38             | 16.0  | 20.7  | 28.3  | 21.6  | 8.4  | 0.73  | 0.467 |
| Maricopa                   | 47         | 17.9  | 22.0  | 26.9  | 23.2  | 8.8  | 22             | 19.0  | 24.6  | 27.2  | 23.6  | 8.0  | -0.20 | 0.845 |
| Mingo                      | 58         | 15.1  | 19.8  | 24.9  | 20.7  | 7.5  | 46             | 16.6  | 20.5  | 28.04 | 22.0  | 7.6  | -0.85 | 0.399 |
| <b>FERRITIN (NG/DL)</b>    |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 46         | 16.0  | 22.5  | 30.0  | 24.3  | 10.7 | 45             | 16.0  | 23.0  | 32.0  | 25.1  | 11.6 | -0.34 | 0.732 |
| St. Clair                  | 46         | 18.0  | 26.5  | 35.0  | 28.8  | 16.1 | 38             | 16.0  | 24.5  | 35.0  | 33.3  | 48.6 | -0.54 | 0.593 |
| Maricopa                   | 47         | 13.5  | 19.0  | 27.0  | 21.8  | 12.0 | 19             | 10.5  | 15.0  | 19.0  | 16.7  | 8.6  | 1.96  | 0.056 |
| Mingo                      | 59         | 14.0  | 18.0  | 23.5  | 19.3  | 9.3  | 43             | 13.5  | 17.0  | 23.5  | 18.6  | 7.6  | 0.43  | 0.670 |

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Table 7-6 (continued)

BIOCHEMICAL INDICATORS FOR MALES WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE.

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>B-CAROTENE (MCG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 32         | 75.0  | 102.5 | 130.0 | 104.6 | 34.8 | 37             | 78.0  | 93.0  | 107.0 | 92.6  | 24.0 | 1.64  | 0.107 |
| Maricopa                   | 47         | 78.0  | 102.0 | 115.0 | 98.5  | 30.5 | 22             | 71.0  | 91.5  | 112.0 | 94.2  | 29.7 | 0.55  | 0.587 |
| <b>CHOLESTERDL (MG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 51         | 152.0 | 170.0 | 189.5 | 171.9 | 29.7 | 48             | 155.5 | 172.5 | 188.0 | 169.4 | 30.5 | 0.41  | 0.683 |
| St. Clair                  | 54         | 141.0 | 156.0 | 183.0 | 164.1 | 33.5 | 42             | 143.0 | 160.0 | 183.0 | 168.7 | 40.2 | -0.59 | 0.554 |
| Maricopa                   | 50         | 146.0 | 159.5 | 176.0 | 161.3 | 25.9 | 22             | 148.0 | 164.5 | 182.0 | 165.3 | 30.4 | -0.53 | 0.600 |
| Mingo                      | 62         | 141.0 | 158.0 | 173.0 | 157.2 | 25.6 | 48             | 133.5 | 150.0 | 172.5 | 155.1 | 26.6 | 0.42  | 0.678 |
| <b>VITAMIN A (MCG/DL)</b>  |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 32         | 29.0  | 36.0  | 43.0  | 37.3  | 11.8 | 36             | 32.0  | 35.5  | 42.0  | 37.6  | 8.4  | -0.11 | 0.915 |
| Maricopa                   | 47         | 32.5  | 36.0  | 40.0  | 36.6  | 6.8  | 22             | 31.0  | 36.0  | 40.0  | 36.6  | 6.7  | -0.02 | 0.983 |
| <b>VITAMIN C (MG/DL)</b>   |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Maricopa                   | 40         | 1.2   | 1.5   | 1.8   | 1.6   | 0.5  | 15             | 1.0   | 1.3   | 1.6   | 1.2   | 0.4  | 2.30  | 0.029 |

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Table 7-7

BIOCHEMICAL INDICATORS FOR FEMALES WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS ACROSS SITE

|                     | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|---------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                     | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| HEMATOCRIT (%)      | 212        | 35.0  | 36.0  | 38.0  | 36.2  | 2.5  | 170            | 35.0  | 36.8  | 38.0  | 36.7  | 2.6  | -1.76 | 0.079 |
| HEMOGLOBIN (GM/DL)  | 210        | 12.3  | 12.9  | 13.5  | 12.9  | 0.9  | 167            | 12.3  | 12.9  | 13.5  | 12.9  | 0.9  | -0.41 | 0.685 |
| FEP (MCG/DL)        | 211        | 13.0  | 18.0  | 25.0  | 19.7  | 9.3  | 165            | 13.0  | 19.0  | 25.0  | 20.3  | 10.0 | -0.55 | 0.582 |
| MCHC (%)            | 208        | 34.4  | 35.6  | 36.4  | 35.5  | 1.8  | 166            | 34.1  | 35.1  | 36.1  | 35.2  | 1.8  | 1.44  | 0.151 |
| TIBC (MCG/DL)       | 184        | 297.5 | 323.0 | 354.5 | 326.8 | 40.9 | 152            | 295.0 | 317.0 | 350.0 | 322.1 | 40.7 | 1.04  | 0.300 |
| SERUM IRON (MCG/DL) | 192        | 50.0  | 69.0  | 88.0  | 69.8  | 25.6 | 156            | 55.0  | 69.5  | 93.5  | 73.1  | 27.4 | -1.16 | 0.248 |
| TS (%)              | 180        | 15.9  | 20.4  | 25.7  | 21.1  | 7.5  | 148            | 17.0  | 21.9  | 28.2  | 22.5  | 8.3  | -1.62 | 0.107 |
| FERRITIN (NG/DL)    | 176        | 16.0  | 23.0  | 32.0  | 25.6  | 13.3 | 146            | 16.0  | 22.5  | 33.0  | 25.5  | 13.0 | 0.13  | 0.894 |
| B-CARDENE (MCG/DL)  | 76         | 81.5  | 103.5 | 119.0 | 102.9 | 26.3 | 58             | 69.0  | 87.0  | 103.0 | 87.4  | 28.2 | 3.25  | 0.002 |
| CHOLESTEROL (MG/DL) | 199        | 142.5 | 158.0 | 183.0 | 163.8 | 30.7 | 163            | 140.0 | 161.0 | 180.0 | 161.4 | 31.0 | 0.74  | 0.458 |
| VITAMIN A (MCG/DL)  | 75         | 30.0  | 35.0  | 41.0  | 35.8  | 8.2  | 56             | 31.5  | 36.0  | 42.5  | 37.1  | 7.0  | -1.01 | 0.316 |
| VITAMIN C (MG/DL)   | 30         | 1.0   | 1.5   | 1.8   | 1.4   | 0.5  | 24             | 1.1   | 1.3   | 1.5   | 1.4   | 0.3  | 0.64  | 0.525 |

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Table 7-7 (continued)

BIOCHEMICAL INDICATORS FOR FEMALES WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                           | HEAD START |      |      |      |      |     | NON-HEAD START |       |      |      |      |      | T     | P     |
|---------------------------|------------|------|------|------|------|-----|----------------|-------|------|------|------|------|-------|-------|
|                           | N          | Q1   | *MED | Q3   | MEAN | SD  | N              | Q1    | MED  | Q3   | MEAN | SD   |       |       |
| <b>HEMATOCRIT (%)</b>     |            |      |      |      |      |     |                |       |      |      |      |      |       |       |
| Greene/Humphreys          | 66         | 34.0 | 36.0 | 37.0 | 35.5 | 3.0 | 40             | 35.0  | 36.0 | 38.0 | 36.4 | 2.2  | -1.76 | 0.082 |
| St. Clair                 | 47         | 34.5 | 35.5 | 37.2 | 35.7 | 1.8 | 39             | 34.0  | 35.0 | 36.8 | 35.2 | 1.9  | 1.37  | 0.173 |
| Maricopa                  | 45         | 35.5 | 36.0 | 38.0 | 36.2 | 2.3 | 36             | 35.0  | 36.0 | 38.0 | 36.5 | 2.6  | -0.43 | 0.667 |
| Mingo                     | 54         | 36.0 | 37.5 | 39.5 | 37.6 | 2.0 | 55             | 37.0  | 38.0 | 39.5 | 38.1 | 2.5  | -1.30 | 0.195 |
| <b>HEMOGLOBIN (GM/DL)</b> |            |      |      |      |      |     |                |       |      |      |      |      |       |       |
| Greene/Humphreys          | 66         | 11.9 | 12.6 | 13.4 | 12.6 | 1.1 | 40             | 12.2  | 12.8 | 13.8 | 13.0 | 0.9  | -1.75 | 0.083 |
| St. Clair                 | 47         | 12.1 | 12.6 | 13.2 | 12.7 | 0.8 | 39             | 11.9  | 12.3 | 12.8 | 12.4 | 0.8  | 1.70  | 0.093 |
| Maricopa                  | 44         | 12.6 | 13.0 | 13.6 | 13.0 | 0.8 | 35             | 12.5  | 13.0 | 13.4 | 13.0 | 0.7  | 0.18  | 0.860 |
| Mingo                     | 53         | 12.6 | 13.2 | 13.9 | 13.2 | 0.8 | 53             | 12.7  | 13.3 | 13.7 | 13.2 | 0.9  | 0.14  | 0.893 |
| <b>FEP (MCG/DL)</b>       |            |      |      |      |      |     |                |       |      |      |      |      |       |       |
| Greene/Humphreys          | 65         | 12.0 | 17.0 | 22.0 | 17.8 | 8.2 | 40             | 13.5  | 21.0 | 24.0 | 20.4 | 8.0  | -1.58 | 0.117 |
| St. Clair                 | 47         | 16.0 | 19.0 | 25.0 | 20.8 | 9.2 | 37             | 15.0  | 20.0 | 27.0 | 23.2 | 12.0 | -1.03 | 0.306 |
| Maricopa                  | 45         | 18.0 | 24.0 | 31.0 | 24.6 | 8.7 | 36             | 17.0  | 22.0 | 28.5 | 23.1 | 7.3  | 0.85  | 0.401 |
| Mingo                     | 54         | 11.0 | 15.0 | 21.0 | 17.0 | 9.4 | 52             | 8.5   | 13.0 | 19.5 | 16.1 | 10.2 | 0.46  | 0.643 |
| <b>MCHC (%)</b>           |            |      |      |      |      |     |                |       |      |      |      |      |       |       |
| Greene/Humphreys          | 66         | 34.2 | 35.8 | 36.6 | 35.6 | 1.7 | 40             | 34.37 | 35.5 | 36.8 | 35.6 | 2.0  | -0.19 | 0.846 |
| St. Clair                 | 47         | 34.3 | 35.6 | 36.8 | 35.5 | 1.8 | 39             | 33.9  | 34.9 | 35.9 | 35.2 | 1.8  | 0.81  | 0.422 |
| Maricopa                  | 44         | 35.0 | 35.7 | 36.3 | 35.7 | 2.0 | 34             | 35.3  | 35.5 | 36.1 | 35.6 | 1.9  | 0.27  | 0.791 |
| Mingo                     | 51         | 34.2 | 35.2 | 36.1 | 35.2 | 1.6 | 53             | 34.0  | 34.4 | 35.6 | 34.7 | 1.4  | 1.69  | 0.095 |

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Table 7-7 (continued)

BIOCHEMICAL INDICATORS FOR FEMALES WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>HGB (MCG/DL)</b>        |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 54         | 312.0 | 330.0 | 368.0 | 338.5 | 44.0 | 31             | 298.0 | 321.0 | 346.0 | 325.2 | 39.7 | 1.43  | 0.157 |
| St. Clair                  | 43         | 292.5 | 311.0 | 339.0 | 320.6 | 36.2 | 37             | 302.0 | 328.0 | 346.0 | 322.7 | 30.4 | -0.29 | 0.776 |
| Maricopa                   | 41         | 300.0 | 339.0 | 362.0 | 335.4 | 41.8 | 36             | 298.5 | 313.0 | 361.0 | 332.5 | 51.9 | 0.26  | 0.794 |
| Mingo                      | 46         | 289.0 | 308.0 | 339.0 | 311.1 | 35.0 | 48             | 287.5 | 313.5 | 340.0 | 311.9 | 37.5 | -0.11 | 0.914 |
| <b>SERUM IRON (MCG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 58         | 45.0  | 63.0  | 79.0  | 64.0  | 22.4 | 35             | 49.0  | 62.0  | 84.5  | 64.2  | 26.2 | -0.04 | 0.965 |
| St. Clair                  | 44         | 57.0  | 81.5  | 93.0  | 76.9  | 24.3 | 36             | 56.0  | 71.0  | 90.5  | 73.3  | 24.2 | 0.66  | 0.513 |
| Maricopa                   | 44         | 52.5  | 72.0  | 94.5  | 76.0  | 26.7 | 36             | 66.5  | 90.5  | 107.0 | 87.5  | 30.1 | -1.78 | 0.079 |
| Mingo                      | 46         | 43.0  | 60.5  | 79.0  | 64.5  | 27.3 | 49             | 55.0  | 69.0  | 86.0  | 68.9  | 25.0 | -0.81 | 0.417 |
| <b>TS (%)</b>              |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 54         | 13.5  | 19.1  | 24.0  | 19.1  | 7.2  | 32             | 15.2  | 20.6  | 25.2  | 19.5  | 7.6  | -0.24 | 0.814 |
| St. Clair                  | 42         | 19.0  | 23.5  | 27.6  | 23.2  | 6.5  | 35             | 17.7  | 22.5  | 25.5  | 22.7  | 7.7  | 0.32  | 0.748 |
| Maricopa                   | 42         | 16.1  | 20.4  | 26.5  | 21.9  | 7.6  | 35             | 19.7  | 28.2  | 32.6  | 26.4  | 9.1  | -2.33 | 0.023 |
| Mingo                      | 42         | 14.5  | 19.6  | 27.4  | 20.8  | 8.2  | 46             | 17.9  | 21.2  | 26.9  | 21.6  | 7.8  | -0.48 | 0.634 |
| <b>FERRITIN (NG/DL)</b>    |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 49         | 16.0  | 22.0  | 30.0  | 24.3  | 11.3 | 30             | 20.0  | 28.0  | 38.0  | 29.2  | 12.1 | -1.80 | 0.076 |
| St. Clair                  | 42         | 22.0  | 27.0  | 37.0  | 30.8  | 15.5 | 37             | 17.0  | 27.0  | 35.0  | 28.1  | 15.3 | 0.77  | 0.443 |
| Maricopa                   | 39         | 14.5  | 18.0  | 25.0  | 20.3  | 9.8  | 33             | 15.0  | 19.0  | 23.0  | 21.4  | 10.9 | -0.44 | 0.663 |
| Mingo                      | 46         | 17.0  | 25.0  | 32.0  | 26.8  | 14.0 | 46             | 14.0  | 20.5  | 34.0  | 23.8  | 12.0 | 1.17  | 0.246 |

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Table 7-7 (continued)

BIOCHEMICAL INDICATORS FOR FEMALES WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>B-CAROTENE (MCG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 36         | 84.0  | 104.5 | 129.5 | 105.8 | 28.5 | 23             | 69.0  | 83.0  | 97.5  | 86.1  | 26.0 | 2.73  | 0.009 |
| Maricopa                   | 40         | 79.5  | 96.0  | 116.5 | 100.4 | 24.2 | 35             | 69.5  | 88.0  | 106.0 | 88.3  | 29.8 | 1.91  | 0.061 |
| <b>CHOLESTEROL (MG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 58         | 139.0 | 155.0 | 184.0 | 162.5 | 33.4 | 36             | 159.0 | 171.0 | 185.0 | 172.6 | 27.9 | -1.57 | 0.120 |
| St. Clair                  | 46         | 152.0 | 168.0 | 190.0 | 174.5 | 30.7 | 39             | 153.0 | 164.0 | 187.0 | 170.3 | 28.2 | 0.65  | 0.515 |
| Maricopa                   | 43         | 137.5 | 159.0 | 187.5 | 164.6 | 32.4 | 36             | 138.0 | 147.0 | 164.5 | 155.7 | 29.9 | 1.27  | 0.209 |
| Mingo                      | 52         | 142.0 | 148.5 | 165.0 | 155.2 | 23.3 | 52             | 131.5 | 156.5 | 167.0 | 151.0 | 32.2 | 0.77  | 0.442 |
| <b>VITAMIN A (MCG/DL)</b>  |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 35         | 30.0  | 36.0  | 44.5  | 36.6  | 9.1  | 22             | 32.0  | 39.0  | 44.0  | 38.0  | 6.6  | -0.67 | 0.505 |
| Maricopa                   | 40         | 30.5  | 35.0  | 39.0  | 35.0  | 7.5  | 34             | 31.0  | 35.0  | 38.0  | 36.5  | 7.4  | -0.87 | 0.387 |
| <b>VITAMIN C (MG/DL)</b>   |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Maricopa                   | 30         | 1.0   | 1.5   | 1.8   | 1.4   | 0.5  | 24             | 1.2   | 1.3   | 1.5   | 1.4   | 0.3  | 0.64  | 0.525 |

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Table 7-8

BIOCHEMICAL INDICATORS FOR HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN ETHNICITY ACROSS SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>HEMATOCRIT (%)</b>      |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| White                      | 151        | 36.0  | 37.5  | 39.0  | 37.3  | 2.2  | 134            | 36.5  | 38.0  | 39.5  | 37.9  | 2.3  | -2.01 | 0.046 |
| Black                      | 219        | 34.0  | 36.0  | 37.0  | 35.6  | 2.4  | 160            | 34.0  | 35.5  | 37.0  | 35.5  | 2.3  | 0.24  | 0.808 |
| Hispanic                   | 64         | 35.5  | 36.0  | 38.0  | 36.4  | 1.9  | 46             | 35.0  | 36.3  | 37.0  | 36.5  | 2.5  | -0.26 | 0.797 |
| <b>HEMOGLOBIN (GM/DL)</b>  |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| White                      | 148        | 12.6  | 13.2  | 13.7  | 13.1  | 0.8  | 132            | 12.7  | 13.3  | 13.9  | 13.3  | 0.8  | -1.16 | 0.248 |
| Black                      | 219        | 12.0  | 12.5  | 13.3  | 12.6  | 1.0  | 159            | 12.0  | 12.5  | 13.3  | 12.6  | 0.9  | -0.09 | 0.925 |
| Hispanic                   | 63         | 12.8  | 13.2  | 13.6  | 13.1  | 0.7  | 44             | 12.6  | 13.0  | 13.4  | 13.0  | 0.8  | 0.57  | 0.568 |
| <b>FEP (MCG/DL)</b>        |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| White                      | 147        | 12.0  | 17.0  | 21.5  | 17.1  | 7.0  | 128            | 11.0  | 17.0  | 21.0  | 17.7  | 9.0  | -0.58 | 0.565 |
| Black                      | 218        | 14.0  | 18.0  | 25.0  | 20.1  | 9.1  | 157            | 14.0  | 20.0  | 25.0  | 21.1  | 10.2 | -1.04 | 0.301 |
| Hispanic                   | 64         | 19.0  | 25.0  | 30.0  | 25.3  | 7.9  | 46             | 19.0  | 22.0  | 30.0  | 23.4  | 7.1  | 1.28  | 0.205 |
| <b>MCHC (%)</b>            |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| White                      | 146        | 33.9  | 35.2  | 36.1  | 35.1  | 1.5  | 130            | 34.0  | 34.9  | 36.0  | 35.1  | 1.6  | 0.13  | 0.895 |
| Black                      | 216        | 34.2  | 35.4  | 36.5  | 35.4  | 1.7  | 159            | 34.3  | 35.5  | 36.6  | 35.5  | 1.8  | -0.41 | 0.685 |
| Hispanic                   | 63         | 35.3  | 35.9  | 36.6  | 36.0  | 1.8  | 44             | 35.3  | 35.7  | 36.7  | 35.9  | 1.8  | 0.29  | 0.774 |
| <b>TIBC (MCG/DL)</b>       |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| White                      | 133        | 290.0 | 312.0 | 343.0 | 318.9 | 40.7 | 117            | 293.0 | 319.0 | 347.0 | 319.6 | 39.2 | -0.12 | 0.901 |
| Black                      | 192        | 299.0 | 328.5 | 349.5 | 327.5 | 40.2 | 137            | 301.0 | 322.0 | 347.0 | 324.9 | 36.8 | 0.61  | 0.545 |
| Hispanic                   | 58         | 320.0 | 347.0 | 377.0 | 344.9 | 40.1 | 46             | 307.0 | 331.5 | 380.0 | 343.9 | 53.1 | 0.11  | 0.914 |
| <b>SERUM IRON (MCG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| White                      | 137        | 51.0  | 64.0  | 81.0  | 67.8  | 24.7 | 124            | 53.5  | 69.0  | 88.0  | 71.1  | 24.0 | -1.10 | 0.271 |
| Black                      | 199        | 51.5  | 67.0  | 87.0  | 69.2  | 25.4 | 140            | 54.0  | 66.5  | 87.0  | 69.0  | 24.8 | 0.04  | 0.965 |
| Hispanic                   | 59         | 58.0  | 72.0  | 96.5  | 77.4  | 28.0 | 46             | 66.0  | 90.0  | 102.0 | 86.0  | 31.2 | -1.47 | 0.145 |

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Table 7-8 (continued)

BIOCHEMICAL INDICATORS FOR HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN ETHNICITY ACROSS SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>TS (%)</b>              |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| White                      | 130        | 15.5  | 19.4  | 25.2  | 20.8  | 7.7  | 117            | 17.2  | 21.3  | 26.9  | 21.9  | 7.1  | -1.20 | 0.231 |
| Black                      | 183        | 15.6  | 20.3  | 25.6  | 20.9  | 7.2  | 137            | 16.4  | 21.1  | 25.7  | 21.5  | 7.7  | -0.64 | 0.519 |
| Hispanic                   | 60         | 17.6  | 22.9  | 26.9  | 23.0  | 8.4  | 46             | 19.0  | 26.2  | 32.0  | 25.4  | 9.5  | -1.87 | 0.173 |
| <b>FERRITIN (NG/DL)</b>    |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| White                      | 131        | 15.0  | 19.0  | 27.0  | 21.8  | 11.3 | 112            | 14.0  | 19.0  | 28.0  | 21.7  | 10.5 | 0.11  | 0.911 |
| Black                      | 184        | 18.0  | 25.0  | 34.0  | 27.6  | 14.0 | 138            | 17.0  | 26.0  | 35.0  | 29.1  | 27.8 | -0.59 | 0.558 |
| Hispanic                   | 59         | 14.0  | 18.0  | 24.0  | 20.0  | 10.1 | 41             | 13.0  | 16.0  | 22.0  | 19.0  | 10.6 | 0.49  | 0.625 |
| <b>B-CAROTENE (MCG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| White                      | 38         | 78.0  | 101.5 | 119.0 | 97.8  | 27.3 | 22             | 63.0  | 84.5  | 106.0 | 88.0  | 31.8 | 1.20  | 0.236 |
| Black                      | 59         | 80.5  | 103.0 | 129.5 | 104.6 | 32.6 | 51             | 76.0  | 88.0  | 103.0 | 88.4  | 21.3 | 3.12  | 0.002 |
| Hispanic                   | 58         | 82.0  | 102.0 | 117.0 | 101.9 | 27.3 | 44             | 71.0  | 92.5  | 110.5 | 93.8  | 30.8 | 1.38  | 0.170 |
| <b>CHOLESTEROL (MG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| White                      | 144        | 142.0 | 157.5 | 172.0 | 157.8 | 24.5 | 128            | 136.0 | 155.0 | 175.5 | 155.1 | 29.7 | 0.83  | 0.406 |
| Black                      | 211        | 145.0 | 164.0 | 187.5 | 168.0 | 32.3 | 149            | 150.0 | 169.0 | 186.0 | 169.6 | 32.7 | -0.46 | 0.645 |
| Hispanic                   | 61         | 139.0 | 158.0 | 176.0 | 161.6 | 30.6 | 46             | 141.0 | 158.5 | 171.0 | 162.6 | 30.1 | -0.17 | 0.867 |
| <b>VITAMIN A (MCG/DL)</b>  |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| White                      | 37         | 33.0  | 36.0  | 39.0  | 36.1  | 5.7  | 21             | 34.0  | 36.0  | 43.0  | 38.4  | 6.2  | -1.36 | 0.181 |
| Black                      | 58         | 30.0  | 35.5  | 43.0  | 37.0  | 10.7 | 49             | 32.0  | 37.0  | 42.0  | 37.7  | 8.1  | -0.40 | 0.688 |
| Hispanic                   | 59         | 31.0  | 35.0  | 41.0  | 35.8  | 8.0  | 44             | 31.0  | 35.0  | 39.0  | 35.9  | 7.0  | -0.10 | 0.919 |
| <b>VITAMIN C (MG/DL)</b>   |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| White                      | 20         | 1.3   | 1.5   | 1.8   | 1.6   | 0.5  | 9              | 1.2   | 1.3   | 1.5   | 1.4   | 0.3  | 1.84  | 0.077 |
| Black                      | 5          | 1.2   | 1.5   | 1.6   | 1.4   | 0.7  | 1              | ---   | 1.1   | ---   | 1.1   | ---  | 1.10  | 0.335 |
| Hispanic                   | 45         | 1.1   | 1.5   | 1.8   | 1.4   | 0.5  | 29             | 1.0   | 1.3   | 1.6   | 1.3   | 0.4  | 1.37  | 0.177 |

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Table 7-8 (continued)

BIOCHEMICAL INDICATORS FOR HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN ETHNICITY BY SITE

|                           | HEAD START |      |      |      |      |      | NON-HEAD START |      |      |      |      |      | T     | P     |
|---------------------------|------------|------|------|------|------|------|----------------|------|------|------|------|------|-------|-------|
|                           | N          | Q1   | MED  | Q3   | MEAN | SD   | N              | Q1   | MED  | Q3   | MEAN | SD   |       |       |
| <b>HEMATOCRIT (%)</b>     |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Greene/Humphreys          |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| White                     | 17         | 35.0 | 36.0 | 37.0 | 36.2 | 2.2  | 18             | 35.0 | 36.8 | 38.5 | 36.9 | 2.1  | -1.01 | 0.322 |
| Black                     | 100        | 34.0 | 35.8 | 37.0 | 35.4 | 2.8  | 76             | 34.5 | 35.5 | 37.0 | 35.9 | 2.0  | -1.31 | 0.191 |
| St. Clair                 |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Black                     | 100        | 34.5 | 35.5 | 37.0 | 35.5 | 1.8  | 79             | 34.0 | 35.0 | 37.0 | 35.3 | 2.0  | 0.66  | 0.509 |
| Maricopa                  |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| White                     | 27         | 34.8 | 36.5 | 38.0 | 36.5 | 2.4  | 11             | 35.0 | 38.0 | 38.0 | 37.0 | 1.8  | -0.64 | 0.525 |
| Black                     | 6          | 38.0 | 38.3 | 40.0 | 38.0 | 2.7  | 2              | ---  | ---  | ---  | 33.5 | 0.7  | 3.76  | 0.009 |
| Hispanic                  | 64         | 35.5 | 36.0 | 38.0 | 36.4 | 1.9  | 45             | 35.0 | 36.0 | 37.0 | 36.5 | 2.5  | -0.23 | 0.819 |
| Mingo                     |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| White                     | 107        | 36.5 | 37.5 | 39.3 | 37.7 | 2.0  | 105            | 36.5 | 38.0 | 39.5 | 38.1 | 2.4  | -1.35 | 0.177 |
| Black                     | 11         | 35.8 | 37.0 | 37.8 | 36.7 | 2.0  | 1              | ---  | 40.5 | ---  | 40.5 | ---  | -6.28 | 0.000 |
| <b>HEMOGLOBIN (GM/DL)</b> |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Greene/Humphreys          |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| White                     | 17         | 12.3 | 12.6 | 13.3 | 12.8 | 0.8  | 18             | 12.9 | 13.8 | 14.2 | 13.5 | 0.8  | -2.63 | 0.013 |
| Black                     | 98         | 11.9 | 12.6 | 13.3 | 12.6 | 1.0  | 76             | 12.0 | 12.7 | 13.3 | 12.7 | 0.9  | -1.01 | 0.312 |
| St. Clair                 |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Black                     | 101        | 12.0 | 12.5 | 13.2 | 12.6 | 0.9  | 78             | 12.1 | 12.4 | 13.1 | 12.6 | 0.9  | 0.24  | 0.807 |
| Maricopa                  |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| White                     | 27         | 12.8 | 13.1 | 13.6 | 13.1 | 0.8  | 11             | 12.6 | 13.0 | 13.4 | 13.0 | 0.5  | 0.32  | 0.750 |
| Black                     | 6          | 12.6 | 12.8 | 13.5 | 12.8 | 0.9  | 2              | ---  | ---  | ---  | 11.9 | 0.3  | 2.01  | 0.091 |
| Hispanic                  | 63         | 12.8 | 13.2 | 13.6 | 13.1 | 0.7  | 43             | 12.6 | 13.0 | 13.4 | 13.1 | 0.8  | 0.50  | 0.620 |
| Mingo                     |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| White                     | 104        | 12.7 | 13.3 | 13.8 | 13.2 | 0.7  | 103            | 12.7 | 13.3 | 13.9 | 13.2 | 0.9  | -0.16 | 0.870 |
| Black                     | 11         | 12.4 | 13.1 | 13.2 | 12.9 | 1.0  | 1              | ---  | 14.1 | ---  | 14.1 | ---  | -4.06 | 0.002 |
| <b>FEP (MCG/DL)</b>       |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Greene/Humphreys          |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| White                     | 17         | 13.0 | 20.0 | 24.0 | 19.3 | 8.2  | 17             | 14.0 | 19.0 | 20.0 | 18.4 | 6.8  | 0.36  | 0.719 |
| Black                     | 98         | 14.0 | 17.0 | 24.0 | 18.7 | 8.4  | 77             | 13.0 | 20.0 | 24.0 | 19.5 | 9.0  | -0.56 | 0.576 |
| St. Clair                 |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Black                     | 101        | 16.0 | 19.0 | 26.0 | 21.1 | 9.1  | 75             | 15.0 | 20.0 | 27.0 | 22.7 | 11.1 | -1.03 | 0.307 |
| Maricopa                  |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| White                     | 27         | 17.5 | 19.0 | 22.5 | 20.1 | 4.6  | 11             | 18.0 | 22.0 | 28.5 | 23.8 | 6.9  | -1.64 | 0.123 |
| Black                     | 6          | 11.0 | 14.5 | 28.0 | 20.0 | 12.3 | 2              | ---  | ---  | ---  | 20.0 | 9.9  | 0.00  | 0.000 |
| Hispanic                  | 64         | 19.0 | 25.0 | 30.0 | 25.3 | 7.9  | 45             | 19.0 | 22.0 | 30.0 | 23.5 | 7.1  | 1.20  | 0.234 |
| Mingo                     |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| White                     | 103        | 11.0 | 15.0 | 20.0 | 16.0 | 7.1  | 100            | 10.0 | 14.5 | 20.5 | 16.9 | 9.3  | -0.79 | 0.431 |
| Black                     | 11         | 10.5 | 17.0 | 29.0 | 21.2 | 12.5 | 1              | ---  | 9.0  | ---  | 9.0  | ---  | 3.22  | 0.009 |

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Table 7-8 (continued)

BIOCHEMICAL INDICATORS FOR HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN ETHNICITY BY SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |       | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|-------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD    |       |       |
| <b>MCHC (%)</b>            |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Greene/Humphreys           |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| White                      | 17         | 34.5  | 35.3  | 36.6  | 35.4  | 1.5  | 18             | 35.6  | 36.5  | 37.0  | 36.7  | 1.7   | -2.40 | 0.022 |
| Black                      | 99         | 34.4  | 35.4  | 36.5  | 35.5  | 1.6  | 76             | 34.2  | 35.5  | 36.6  | 35.4  | 1.8   | 0.20  | 0.845 |
| St. Clair                  |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Black                      | 99         | 34.0  | 35.5  | 36.6  | 35.4  | 1.8  | 79             | 34.3  | 35.6  | 36.6  | 35.5  | 1.8   | -0.44 | 0.664 |
| Maricopa                   |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| White                      | 26         | 34.8  | 35.8  | 36.7  | 35.7  | 1.4  | 11             | 34.9  | 35.3  | 35.7  | 35.2  | 0.8   | 1.32  | 0.196 |
| Black                      | 6          | 33.2  | 33.5  | 34.0  | 33.6  | 0.6  | 1              | ----- | 34.4  | ----- | 34.4  | ----- | -3.37 | 0.020 |
| Hispanic                   | 63         | 35.3  | 35.9  | 36.6  | 36.0  | 1.8  | 43             | 35.3  | 35.8  | 36.7  | 35.9  | 1.8   | 0.17  | 0.867 |
| Mingo                      |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| White                      | 103        | 33.9  | 34.9  | 35.9  | 34.9  | 1.5  | 101            | 33.9  | 34.7  | 35.7  | 34.8  | 1.4   | 0.63  | 0.528 |
| Black                      | 10         | 34.5  | 34.9  | 35.9  | 35.3  | 1.1  | 1              | ----- | 34.8  | ----- | 34.8  | ----- | 1.52  | 0.162 |
| <b>TIBC (MCG/DL)</b>       |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Greene/Humphreys           |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| White                      | 14         | 311.0 | 335.0 | 361.0 | 337.3 | 29.8 | 15             | 301.5 | 337.0 | 354.5 | 326.3 | 39.5  | 0.85  | 0.406 |
| Black                      | 85         | 306.0 | 330.0 | 363.0 | 333.9 | 44.4 | 63             | 301.5 | 325.0 | 353.0 | 332.1 | 42.1  | 0.25  | 0.803 |
| St. Clair                  |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Black                      | 89         | 294.0 | 317.0 | 343.0 | 323.8 | 36.8 | 70             | 301.0 | 318.5 | 337.0 | 318.6 | 31.1  | 0.95  | 0.343 |
| Maricopa                   |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| White                      | 24         | 297.0 | 316.5 | 355.0 | 323.0 | 46.9 | 11             | 282.5 | 316.0 | 361.0 | 321.5 | 58.0  | 0.07  | 0.944 |
| Black                      | 5          | 305.0 | 317.0 | 340.0 | 321.6 | 19.0 | 2              | ----- | ----- | ----- | 323.5 | 33.2  | -0.08 | 0.952 |
| Hispanic                   | 58         | 320.0 | 347.0 | 377.0 | 344.9 | 40.1 | 45             | 307.0 | 330.0 | 380.0 | 343.4 | 53.6  | 0.16  | 0.874 |
| Mingo                      |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| White                      | 95         | 287.5 | 310.0 | 339.0 | 315.2 | 40.0 | 91             | 294.0 | 318.0 | 345.0 | 318.2 | 36.8  | -0.53 | 0.595 |
| Black                      | 11         | 292.5 | 297.0 | 331.5 | 312.9 | 30.2 | 1              | ----- | 329.0 | ----- | 329.0 | ----- | -1.77 | 0.107 |
| <b>SERUM IRON (MCG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Greene/Humphreys           |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| White                      | 14         | 54.0  | 60.0  | 81.0  | 65.7  | 22.9 | 18             | 53.0  | 72.0  | 91.0  | 72.3  | 20.9  | -0.84 | 0.411 |
| Black                      | 92         | 44.5  | 62.5  | 77.0  | 63.3  | 23.7 | 64             | 51.5  | 64.5  | 85.5  | 67.8  | 25.2  | -1.12 | 0.267 |
| St. Clair                  |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Black                      | 89         | 55.0  | 73.0  | 92.0  | 75.6  | 24.6 | 72             | 53.0  | 67.0  | 88.5  | 69.5  | 25.0  | 1.55  | 0.123 |
| Maricopa                   |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| White                      | 27         | 57.5  | 67.0  | 90.5  | 74.5  | 24.3 | 11             | 59.5  | 77.0  | 105.5 | 79.6  | 28.6  | -0.52 | 0.609 |
| Black                      | 6          | 70.0  | 90.5  | 121.0 | 91.0  | 41.0 | 2              | ----- | ----- | ----- | 79.5  | 9.2   | 0.64  | 0.546 |
| Hispanic                   | 59         | 58.0  | 72.0  | 96.5  | 77.4  | 28.0 | 45             | 67.0  | 92.0  | 102.0 | 87.2  | 30.5  | -1.68 | 0.097 |
| Mingo                      |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| White                      | 96         | 49.5  | 63.5  | 78.5  | 66.1  | 25.0 | 95             | 53.0  | 69.0  | 87.0  | 69.9  | 24.0  | -1.05 | 0.296 |
| Black                      | 10         | 42.0  | 58.0  | 68.0  | 56.6  | 18.1 | 0              |       |       |       |       |       |       |       |

Table 7-8 (continued)

BIOCHEMICAL INDICATORS FOR HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN ETHNICITY BY SITE

|                           | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |      |       | T     | P     |
|---------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|------|-------|-------|-------|
|                           | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN | SD    |       |       |
| <b>TS (%)</b>             |            |       |       |       |       |      |                |       |       |       |      |       |       |       |
| Greene/Humphreys          |            |       |       |       |       |      |                |       |       |       |      |       |       |       |
| White                     | 15         | 15.9  | 17.9  | 24.3  | 20.8  | 8.5  | 16             | 18.7  | 22.3  | 25.8  | 22.2 | 4.1   | -0.58 | 0.569 |
| Black                     | 82         | 13.4  | 19.1  | 23.8  | 18.6  | 6.8  | 62             | 14.8  | 20.8  | 25.1  | 20.3 | 7.4   | -1.37 | 0.173 |
| St. Clair                 |            |       |       |       |       |      |                |       |       |       |      |       |       |       |
| Black                     | 84         | 18.5  | 23.5  | 27.5  | 23.0  | 6.6  | 70             | 17.1  | 21.2  | 26.8  | 22.0 | 7.7   | 0.88  | 0.382 |
| Maricopa                  |            |       |       |       |       |      |                |       |       |       |      |       |       |       |
| White                     | 24         | 16.2  | 19.3  | 24.1  | 20.7  | 6.6  | 10             | 19.4  | 24.7  | 28.2  | 23.4 | 6.5   | -1.09 | 0.289 |
| Black                     | 5          | 23.0  | 23.4  | 35.3  | 26.7  | 12.5 | 2              | ----- | ----- | ----- | 24.9 | 5.4   | 0.27  | 0.795 |
| Hispanic                  | 60         | 17.6  | 22.9  | 26.9  | 23.0  | 8.4  | 45             | 19.6  | 26.4  | 32.0  | 25.8 | 9.3   | -1.59 | 0.116 |
| Mingo                     |            |       |       |       |       |      |                |       |       |       |      |       |       |       |
| White                     | 91         | 14.5  | 19.8  | 25.5  | 20.8  | 7.9  | 91             | 16.7  | 20.7  | 27.4  | 21.7 | 7.6   | -0.79 | 0.431 |
| Black                     | 10         | 15.4  | 20.6  | 23.2  | 20.3  | 6.6  | 1              | ----- | 29.2  | ----- | 29.2 | ----- | -4.28 | 0.002 |
| <b>FERRITIN (NG/ML)</b>   |            |       |       |       |       |      |                |       |       |       |      |       |       |       |
| Greene/Humphreys          |            |       |       |       |       |      |                |       |       |       |      |       |       |       |
| White                     | 15         | 15.0  | 21.0  | 30.5  | 22.5  | 9.4  | 14             | 16.0  | 21.0  | 29.0  | 23.7 | 11.8  | -0.30 | 0.769 |
| Black                     | 78         | 17.0  | 22.0  | 30.0  | 24.3  | 11.0 | 61             | 19.0  | 26.0  | 35.0  | 27.4 | 11.9  | -1.61 | 0.111 |
| St. Clair                 |            |       |       |       |       |      |                |       |       |       |      |       |       |       |
| Black                     | 88         | 19.5  | 27.0  | 35.5  | 29.8  | 15.7 | 72             | 17.0  | 25.5  | 35.0  | 26.9 | 14.0  | 1.21  | 0.230 |
| Maricopa                  |            |       |       |       |       |      |                |       |       |       |      |       |       |       |
| White                     | 22         | 13.0  | 20.0  | 26.0  | 21.4  | 10.7 | 10             | 17.0  | 18.5  | 34.0  | 22.8 | 9.5   | -0.37 | 0.716 |
| Black                     | 5          | 27.0  | 34.0  | 47.0  | 32.8  | 17.7 | 2              | ----- | ----- | ----- | 19.5 | 5.0   | 1.54  | 0.185 |
| Hispanic                  | 59         | 14.0  | 18.0  | 24.0  | 20.0  | 10.1 | 40             | 13.0  | 16.0  | 22.0  | 18.9 | 10.7  | 0.54  | 0.589 |
| Mingo                     |            |       |       |       |       |      |                |       |       |       |      |       |       |       |
| White                     | 94         | 15.0  | 19.0  | 26.0  | 21.8  | 11.8 | 88             | 14.0  | 19.0  | 28.0  | 21.2 | 10.5  | 0.36  | 0.719 |
| Black                     | 11         | 17.5  | 31.0  | 35.0  | 30.1  | 12.8 | 1              | ----- | 28.0  | ----- | 28.0 | ----- | 0.54  | 0.599 |
| <b>B-CARDENE (MCG/DL)</b> |            |       |       |       |       |      |                |       |       |       |      |       |       |       |
| Greene/Humphreys          |            |       |       |       |       |      |                |       |       |       |      |       |       |       |
| White                     | 14         | 101.0 | 111.5 | 132.0 | 111.4 | 27.6 | 11             | 64.0  | 96.0  | 120.0 | 98.6 | 36.7  | 0.96  | 0.349 |
| Black                     | 52         | 77.5  | 103.0 | 129.5 | 103.9 | 33.0 | 49             | 76.0  | 88.0  | 102.0 | 88.2 | 21.2  | 2.86  | 0.005 |
| Maricopa                  |            |       |       |       |       |      |                |       |       |       |      |       |       |       |
| White                     | 24         | 71.5  | 87.0  | 110.0 | 89.8  | 24.4 | 11             | 63.5  | 83.0  | 94.5  | 77.4 | 23.0  | 1.46  | 0.160 |
| Black                     | 5          | 105.0 | 107.0 | 137.0 | 115.6 | 37.2 | 2              | ----- | ----- | ----- | 93.5 | 30.4  | 0.81  | 0.502 |
| Hispanic                  | 58         | 82.0  | 102.0 | 117.0 | 101.9 | 27.3 | 44             | 71.0  | 92.5  | 110.5 | 93.8 | 30.8  | 1.38  | 0.170 |

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Table 7-8 (continued)

BIOCHEMICAL INDICATORS FOR HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN ETHNICITY BY SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |       | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|-------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD    |       |       |
| <b>CHOLESTEROL (NG/DL)</b> |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Greene/Humphreys           |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| White                      | 15         | 139.0 | 162.0 | 173.5 | 163.2 | 28.9 | 18             | 160.0 | 183.0 | 191.0 | 176.5 | 26.6  | -1.37 | 0.183 |
| Black                      | 92         | 146.5 | 167.0 | 187.5 | 167.5 | 32.6 | 66             | 156.0 | 172.0 | 184.0 | 169.2 | 30.0  | -0.35 | 0.730 |
| St. Clair                  |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Black                      | 100        | 144.5 | 165.0 | 184.0 | 168.9 | 32.5 | 78             | 149.0 | 163.5 | 186.0 | 170.0 | 35.2  | -0.23 | 0.822 |
| Maricopa                   |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| White                      | 26         | 146.0 | 159.5 | 178.0 | 159.6 | 20.6 | 11             | 137.0 | 144.0 | 151.0 | 143.6 | 22.5  | 2.02  | 0.059 |
| Black                      | 6          | 170.0 | 194.5 | 220.0 | 189.5 | 33.6 | 2              | ----- | ----- | ----- | 161.0 | 56.6  | 0.67  | 0.622 |
| Hispanic                   | 61         | 139.0 | 158.0 | 176.0 | 161.6 | 30.6 | 45             | 141.0 | 160.0 | 171.0 | 163.1 | 30.3  | -0.25 | 0.803 |
| Mingo                      |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| White                      | 103        | 142.0 | 157.0 | 170.0 | 156.6 | 24.8 | 99             | 132.5 | 155.0 | 169.5 | 152.4 | 29.3  | 1.09  | 0.279 |
| Black                      | 11         | 137.0 | 147.0 | 158.5 | 153.2 | 22.1 | 1              | ----- | 201.0 | ----- | 201.0 | ----- | -7.16 | 0.000 |
| <b>VITAMIN A (MCG/DL)</b>  |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Greene/Humphreys           |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| White                      | 14         | 29.0  | 36.0  | 41.0  | 35.5  | 7.1  | 40             | 33.0  | 36.5  | 43.0  | 38.0  | 5.4   | -0.98 | 0.337 |
| Black                      | 51         | 30.0  | 36.0  | 44.5  | 37.6  | 11.3 | 48             | 32.0  | 36.5  | 42.0  | 37.7  | 8.2   | -0.06 | 0.952 |
| Maricopa                   |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| White                      | 23         | 33.0  | 36.0  | 39.0  | 36.5  | 4.9  | 11             | 34.5  | 36.0  | 44.0  | 38.7  | 7.1   | -0.93 | 0.367 |
| Black                      | 5          | 30.0  | 35.0  | 36.0  | 33.6  | 4.5  | 1              | ----- | 40.0  | ----- | 40.0  | ----- | -3.18 | 0.034 |
| Hispanic                   | 59         | 31.0  | 35.0  | 41.0  | 35.8  | 8.0  | 44             | 31.0  | 35.0  | 39.0  | 35.9  | 7.0   | -0.10 | 0.919 |
| <b>VITAMIN C (MG/DL)</b>   |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Maricopa                   |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| White                      | 20         | 1.3   | 1.5   | 1.8   | 1.6   | 0.5  | 9              | 1.2   | 1.3   | 1.5   | 1.4   | 0.3   | 1.84  | 0.077 |
| Black                      | 5          | 1.2   | 1.5   | 1.6   | 1.4   | 0.7  | 1              | ----- | 1.1   | ----- | 1.1   | ----- | 1.10  | 0.335 |
| Hispanic                   | 45         | 1.1   | 1.5   | 1.8   | 1.4   | 0.5  | 29             | 1.0   | 1.3   | 1.6   | 1.3   | 0.4   | 1.37  | 0.177 |

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Table 7-9

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN AGE GROUPS ACROSS SITE

|                     | 2-4 YEAR OLDS |       |       |       |       |      | 4-6 YEAR OLDS |       |       |       |       |      | T     | P     |
|---------------------|---------------|-------|-------|-------|-------|------|---------------|-------|-------|-------|-------|------|-------|-------|
|                     | N             | Q1    | MED   | Q3    | MEAN  | SD   | N             | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| HEMATOCRIT (%)      | 233           | 35.0  | 36.5  | 38.0  | 36.5  | 2.4  | 541           | 35.0  | 36.5  | 38.0  | 36.4  | 2.5  | 0.40  | 0.686 |
| HEMOGLOBIN (GM/DL)  | 230           | 12.2  | 12.8  | 13.4  | 12.8  | 0.9  | 535           | 12.3  | 13.0  | 13.5  | 12.9  | 0.9  | -1.05 | 0.296 |
| FEP (MCG/DL)        | 227           | 12.0  | 18.0  | 22.5  | 18.6  | 9.1  | 533           | 14.0  | 19.0  | 25.0  | 20.5  | 9.0  | -2.64 | 0.009 |
| MCHC (%)            | 227           | 34.1  | 35.0  | 36.1  | 35.2  | 1.7  | 531           | 34.3  | 35.5  | 36.4  | 35.5  | 1.7  | -1.98 | 0.048 |
| TIBC (MCG/DL)       | 191           | 297.0 | 320.0 | 349.0 | 323.8 | 38.9 | 492           | 297.0 | 327.0 | 354.0 | 327.6 | 42.0 | -1.13 | 0.259 |
| SERUM IRON (MCG/DL) | 200           | 52.0  | 68.0  | 86.0  | 68.8  | 24.3 | 505           | 53.0  | 68.0  | 89.0  | 71.9  | 26.4 | -1.47 | 0.143 |
| TS (%)              | 187           | 16.4  | 20.8  | 25.5  | 21.0  | 7.1  | 486           | 16.2  | 20.8  | 27.0  | 21.9  | 7.9  | -1.39 | 0.167 |
| FERRITIN (NG/DL)    | 187           | 15.0  | 22.0  | 31.5  | 24.8  | 13.2 | 478           | 15.0  | 21.0  | 30.0  | 24.5  | 18.1 | 0.24  | 0.808 |
| B-CAROTENE (MCG/DL) | 43            | 80.5  | 93.0  | 113.5 | 96.7  | 26.1 | 229           | 75.0  | 96.0  | 115.0 | 97.0  | 29.5 | -0.06 | 0.949 |
| CHOLESTEROL (MG/DL) | 214           | 147.0 | 165.0 | 183.0 | 166.7 | 30.0 | 525           | 141.0 | 158.0 | 180.0 | 161.9 | 30.9 | 1.96  | 0.051 |
| VITAMIN A (MCG/DL)  | 43            | 32.0  | 36.0  | 42.0  | 37.0  | 7.0  | 225           | 31.0  | 36.0  | 42.0  | 36.6  | 8.4  | 0.34  | 0.735 |
| VITAMIN C (MG/DL)   | 0             |       |       |       |       |      | 109           | 1.1   | 1.5   | 1.7   | 1.4   | 0.5  |       |       |

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Table 7-9 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN AGE GROUPS WITHIN SITE

|                           | 2-4 YEAR OLDS |      |      |      |      |      | 4-6 YEAR OLDS |      |      |      |      |     | T     | P     |
|---------------------------|---------------|------|------|------|------|------|---------------|------|------|------|------|-----|-------|-------|
|                           | N             | Q1   | MED  | Q3   | MEAN | SD   | N             | Q1   | MED  | Q3   | MEAN | SD  |       |       |
| <b>HEMATOCRIT</b>         |               |      |      |      |      |      |               |      |      |      |      |     |       |       |
| Greene/Humphreys          | 83            | 34.0 | 36.0 | 37.0 | 36.0 | 2.1  | 130           | 34.5 | 35.5 | 37.0 | 35.6 | 2.6 | 1.20  | 0.230 |
| St. Clair                 | 66            | 34.0 | 35.2 | 37.0 | 35.4 | 2.0  | 116           | 34.0 | 35.5 | 37.0 | 35.4 | 2.3 | -0.03 | 0.977 |
| Maricopa                  | 0             |      |      |      |      |      | 155           | 35.0 | 36.5 | 38.0 | 36.5 | 2.2 |       |       |
| Mingo                     | 84            | 36.5 | 37.8 | 39.5 | 37.8 | 2.4  | 140           | 36.5 | 37.8 | 39.2 | 37.9 | 2.1 | -0.12 | 0.907 |
| <b>HEMOGLOBIN (GM/DL)</b> |               |      |      |      |      |      |               |      |      |      |      |     |       |       |
| Greene/Humphreys          | 83            | 12.3 | 12.8 | 13.4 | 12.8 | 0.9  | 129           | 12.0 | 12.7 | 13.4 | 12.6 | 1.0 | 1.54  | 0.129 |
| St. Clair                 | 65            | 12.0 | 12.3 | 12.8 | 12.4 | 0.9  | 117           | 12.1 | 12.5 | 13.3 | 12.6 | 1.0 | -1.37 | 0.173 |
| Maricopa                  | 0             |      |      |      |      |      | 152           | 12.6 | 13.1 | 13.6 | 13.1 | 0.8 |       |       |
| Mingo                     | 82            | 12.7 | 13.2 | 13.7 | 13.1 | 0.9  | 137           | 12.7 | 13.3 | 13.9 | 13.2 | 0.8 | -0.83 | 0.410 |
| <b>FEP (MCG/DL)</b>       |               |      |      |      |      |      |               |      |      |      |      |     |       |       |
| Greene/Humphreys          | 83            | 12.0 | 18.0 | 22.5 | 18.3 | 8.2  | 128           | 14.0 | 18.0 | 24.0 | 19.6 | 8.6 | -1.05 | 0.295 |
| St. Clair                 | 64            | 14.5 | 19.0 | 26.5 | 20.9 | 10.5 | 115           | 16.0 | 20.0 | 27.0 | 22.5 | 9.7 | -1.02 | 0.310 |
| Maricopa                  | 0             |      |      |      |      |      | 155           | 18.0 | 22.0 | 28.0 | 23.5 | 7.5 |       |       |
| Mingo                     | 80            | 10.0 | 15.0 | 21.0 | 17.2 | 8.6  | 135           | 10.0 | 14.0 | 20.0 | 16.4 | 8.5 | 0.64  | 0.521 |
| <b>MCHC (%)</b>           |               |      |      |      |      |      |               |      |      |      |      |     |       |       |
| Greene/Humphreys          | 83            | 34.7 | 35.6 | 36.6 | 35.7 | 1.6  | 129           | 34.3 | 35.5 | 36.8 | 35.5 | 1.8 | 0.72  | 0.475 |
| St. Clair                 | 66            | 33.8 | 35.0 | 36.1 | 35.1 | 1.8  | 115           | 34.3 | 35.6 | 36.7 | 35.6 | 1.8 | -1.99 | 0.048 |
| Maricopa                  | 0             |      |      |      |      |      | 150           | 34.9 | 35.7 | 36.5 | 35.7 | 1.7 |       |       |
| Mingo                     | 78            | 33.8 | 34.6 | 35.5 | 34.8 | 1.6  | 137           | 34.0 | 34.9 | 35.9 | 34.9 | 1.4 | -0.86 | 0.394 |

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Table 7-9 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN AGE GROUPS WITHIN SITE

|                            | 2-4 YEAR OLDS |       |       |       |       |      | 4-6 YEAR OLDS |       |       |       |       |      | T     | P     |
|----------------------------|---------------|-------|-------|-------|-------|------|---------------|-------|-------|-------|-------|------|-------|-------|
|                            | N             | Q1    | MED   | Q3    | MEAN  | SD   | N             | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>TIBC (MCG/DL)</b>       |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys           | 66            | 302.0 | 331.5 | 359.0 | 333.2 | 40.6 | 113           | 306.0 | 330.0 | 359.0 | 332.5 | 43.2 | 0.10  | 0.918 |
| St. Clair                  | 53            | 300.0 | 317.0 | 350.0 | 326.0 | 40.3 | 108           | 297.0 | 317.5 | 338.5 | 319.6 | 31.0 | 1.01  | 0.314 |
| Maricopa                   | 0             |       |       |       |       |      | 145           | 304.0 | 338.0 | 363.0 | 337.9 | 47.1 |       |       |
| Mingo                      | 72            | 289.5 | 314.5 | 338.5 | 313.6 | 34.0 | 126           | 289.0 | 315.0 | 345.0 | 318.2 | 39.9 | -0.87 | 0.384 |
| <b>SERUM IRON (MCG/DL)</b> |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys           | 71            | 47.5  | 64.0  | 83.0  | 65.9  | 25.0 | 119           | 50.5  | 63.0  | 80.0  | 65.6  | 23.3 | 0.10  | 0.921 |
| St. Clair                  | 55            | 58.5  | 74.0  | 91.5  | 75.1  | 23.4 | 108           | 53.0  | 69.5  | 91.0  | 71.5  | 25.6 | 0.92  | 0.359 |
| Maricopa                   | 0             |       |       |       |       |      | 150           | 60.0  | 75.0  | 102.0 | 80.5  | 28.7 |       |       |
| Mingo                      | 73            | 51.0  | 67.0  | 80.0  | 66.7  | 23.9 | 128           | 50.0  | 66.0  | 84.0  | 67.8  | 24.7 | -0.32 | 0.752 |
| <b>T5 (%)</b>              |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys           | 66            | 13.5  | 19.4  | 24.0  | 19.6  | 7.4  | 111           | 14.7  | 19.5  | 24.3  | 19.7  | 6.8  | -0.14 | 0.886 |
| St. Clair                  | 51            | 18.2  | 23.1  | 25.7  | 22.3  | 6.4  | 106           | 17.5  | 21.7  | 28.2  | 22.7  | 7.7  | -0.36 | 0.722 |
| Maricopa                   | 0             |       |       |       |       |      | 146           | 17.6  | 23.3  | 29.5  | 23.6  | 8.5  |       |       |
| Mingo                      | 70            | 16.4  | 20.9  | 27.1  | 21.5  | 7.2  | 123           | 14.5  | 19.8  | 26.5  | 21.1  | 7.9  | 0.32  | 0.750 |
| <b>FERRITIN (NG/DL)</b>    |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys           | 62            | 19.0  | 22.5  | 34.0  | 26.4  | 12.3 | 108           | 15.5  | 23.0  | 31.5  | 24.7  | 10.9 | 0.91  | 0.363 |
| St. Clair                  | 54            | 16.0  | 25.5  | 36.0  | 27.7  | 15.5 | 109           | 20.0  | 27.0  | 35.0  | 31.5  | 31.2 | -1.03 | 0.307 |
| Maricopa                   | 0             |       |       |       |       |      | 138           | 14.0  | 18.0  | 25.0  | 20.6  | 10.7 |       |       |
| Mingo                      | 71            | 13.5  | 19.0  | 27.5  | 21.2  | 11.4 | 123           | 15.0  | 19.0  | 28.0  | 22.5  | 11.4 | -0.80 | 0.422 |

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Table 7-9 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN AGE GROUPS WITHIN SITE

|                            | 2-4 YEAR OLDS |       |       |       |       |      | 4-6 YEAR OLDS |       |       |       |       |      | T     | P     |
|----------------------------|---------------|-------|-------|-------|-------|------|---------------|-------|-------|-------|-------|------|-------|-------|
|                            | N             | Q1    | MED   | Q3    | MEAN  | SD   | N             | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>B-CAROTENE (MCG/DL)</b> |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys           | 43            | 80.5  | 93.0  | 113.5 | 96.7  | 26.1 | 85            | 76.0  | 96.0  | 123.0 | 98.8  | 31.0 | -0.41 | 0.681 |
| Maricopa                   | 0             |       |       |       |       |      | 144           | 75.0  | 94.5  | 112.5 | 95.9  | 28.7 |       |       |
| <b>CHOLESTEROL (MG/DL)</b> |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys           | 70            | 148.0 | 173.5 | 191.0 | 173.1 | 31.6 | 123           | 147.5 | 167.0 | 184.0 | 166.0 | 30.1 | 1.53  | 0.129 |
| St. Clair                  | 64            | 154.5 | 173.0 | 185.5 | 171.4 | 29.9 | 117           | 143.0 | 159.0 | 183.0 | 167.9 | 35.3 | 0.71  | 0.480 |
| Maricopa                   | 0             |       |       |       |       |      | 151           | 139.5 | 155.0 | 178.5 | 161.5 | 29.4 |       |       |
| Mingo                      | 80            | 138.5 | 160.5 | 170.5 | 157.2 | 26.3 | 134           | 135.0 | 150.0 | 170.0 | 153.2 | 27.3 | 1.06  | 0.291 |
| <b>VITAMIN A (MCG/DL)</b>  |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys           | 43            | 32.0  | 36.0  | 42.0  | 37.0  | 7.0  | 82            | 30.0  | 35.5  | 43.0  | 37.5  | 10.2 | -0.28 | 0.778 |
| Maricopa                   | 0             |       |       |       |       |      | 143           | 31.5  | 36.0  | 39.5  | 36.1  | 7.1  |       |       |
| <b>VITAMIN C (MG/DL)</b>   |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Maricopa                   | 0             |       |       |       |       |      | 109           | 1.1   | 1.5   | 1.7   | 1.4   | 0.5  |       |       |

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Table 7-10

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN AGE GROUPS WITHIN ETHNICITY ACROSS SITE

|                            | 2-4 YEAR OLDS |       |       |       |       |       | 4-6 YEAR OLDS |       |       |       |       |      | T      | P     |
|----------------------------|---------------|-------|-------|-------|-------|-------|---------------|-------|-------|-------|-------|------|--------|-------|
|                            | N             | Q1    | MED   | Q3    | MEAN  | SD    | N             | Q1    | MED   | Q3    | MEAN  | SD   |        |       |
| <b>HEMATOCRIT (%)</b>      |               |       |       |       |       |       |               |       |       |       |       |      |        |       |
| White                      | 88            | 36.0  | 37.8  | 39.5  | 37.8  | 2.4   | 197           | 36.0  | 37.5  | 39.0  | 37.5  | 2.2  | 0.82   | 0.415 |
| Black                      | 144           | 34.0  | 35.5  | 37.0  | 35.7  | 2.1   | 235           | 34.0  | 35.5  | 37.0  | 35.5  | 2.5  | 1.01   | 0.315 |
| Hispanic                   | 1             | ----- | 37.0  | ----- | 37.0  | ----- | 109           | 35.0  | 36.0  | 38.0  | 36.4  | 2.2  | 2.69   | 0.008 |
| <b>HEMOGLOBIN (GM/DL)</b>  |               |       |       |       |       |       |               |       |       |       |       |      |        |       |
| White                      | 86            | 12.7  | 13.3  | 13.9  | 13.2  | 0.9   | 194           | 12.7  | 13.2  | 13.8  | 13.2  | 0.8  | -0.22  | 0.828 |
| Black                      | 143           | 12.0  | 12.5  | 13.2  | 12.6  | 0.9   | 235           | 12.0  | 12.5  | 13.3  | 12.6  | 1.0  | 0.41   | 0.680 |
| Hispanic                   | 1             | ----- | 12.6  | ----- | 12.6  | ----- | 106           | 12.7  | 13.2  | 13.6  | 13.1  | 0.7  | -6.82  | 0.000 |
| <b>FEP (MCG/DL)</b>        |               |       |       |       |       |       |               |       |       |       |       |      |        |       |
| White                      | 84            | 11.0  | 15.0  | 21.0  | 17.1  | 8.2   | 191           | 11.5  | 17.0  | 22.0  | 17.5  | 7.9  | -0.37  | 0.715 |
| Black                      | 142           | 13.0  | 18.0  | 24.0  | 19.5  | 9.6   | 233           | 15.0  | 19.0  | 26.0  | 21.1  | 9.5  | -1.57  | 0.117 |
| Hispanic                   | 1             | ----- | 19.0  | ----- | 19.0  | ----- | 109           | 19.0  | 24.0  | 30.0  | 24.5  | 7.6  | -7.63  | 0.000 |
| <b>MCHC (%)</b>            |               |       |       |       |       |       |               |       |       |       |       |      |        |       |
| White                      | 83            | 33.9  | 34.8  | 35.9  | 34.9  | 1.6   | 193           | 34.1  | 35.2  | 36.1  | 35.2  | 1.5  | -1.32  | 0.190 |
| Black                      | 143           | 34.4  | 35.3  | 36.4  | 35.4  | 1.7   | 232           | 34.1  | 35.5  | 36.6  | 35.5  | 1.8  | -0.56  | 0.573 |
| Hispanic                   | 1             | ----- | 34.1  | ----- | 34.1  | ----- | 106           | 35.3  | 35.9  | 36.7  | 35.9  | 1.8  | -10.87 | 0.000 |
| <b>TIBC (MCG/DL)</b>       |               |       |       |       |       |       |               |       |       |       |       |      |        |       |
| White                      | 74            | 290.0 | 314.0 | 340.0 | 315.5 | 34.5  | 176           | 290.5 | 319.0 | 349.0 | 320.8 | 42.0 | -1.03  | 0.305 |
| Black                      | 116           | 299.5 | 322.5 | 350.0 | 328.7 | 40.7  | 213           | 301.0 | 326.0 | 346.0 | 325.2 | 37.7 | 0.75   | 0.451 |
| Hispanic                   | 1             | ----- | 366.0 | ----- | 366.0 | ----- | 103           | 309.5 | 342.0 | 378.5 | 344.2 | 46.2 | 4.78   | 0.000 |
| <b>SERUM IRON (MCG/DL)</b> |               |       |       |       |       |       |               |       |       |       |       |      |        |       |
| White                      | 78            | 53.0  | 67.5  | 80.0  | 67.7  | 23.0  | 183           | 51.0  | 66.0  | 88.0  | 70.0  | 25.0 | -0.72  | 0.475 |
| Black                      | 121           | 50.0  | 68.0  | 87.0  | 69.8  | 25.1  | 218           | 52.0  | 66.0  | 87.0  | 68.7  | 25.1 | 0.36   | 0.718 |
| Hispanic                   | 1             | ----- | 34.0  | ----- | 34.0  | ----- | 104           | 63.0  | 82.0  | 101.5 | 81.6  | 29.4 | -16.51 | 0.000 |

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Table 7-10 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN AGE GROUPS WITHIN ETHNICITY ACROSS SITE

|                            | 2-4 YEAR OLDS |       |       |       |       |      | 4-6 YEAR OLDS |       |       |       |       |      | T      | P     |
|----------------------------|---------------|-------|-------|-------|-------|------|---------------|-------|-------|-------|-------|------|--------|-------|
|                            | N             | Q1    | MED   | Q3    | MEAN  | SD   | N             | Q1    | MED   | Q3    | MEAN  | SD   |        |       |
| <b>TS (%)</b>              |               |       |       |       |       |      |               |       |       |       |       |      |        |       |
| White                      | 73            | 15.7  | 21.3  | 26.4  | 21.5  | 7.0  | 174           | 15.9  | 19.7  | 26.1  | 21.2  | 7.6  | 0.33   | 0.745 |
| Black                      | 113           | 15.0  | 20.8  | 25.3  | 20.8  | 7.2  | 207           | 16.0  | 20.6  | 26.2  | 21.4  | 7.5  | -0.64  | 0.521 |
| Hispanic                   | 1             |       | 9.3   |       | 9.3   |      | 105           | 17.8  | 24.0  | 30.1  | 24.2  | 8.8  | -17.25 | 0.000 |
| <b>FERRITIN (NG/DL)</b>    |               |       |       |       |       |      |               |       |       |       |       |      |        |       |
| White                      | 72            | 13.5  | 18.0  | 26.5  | 20.7  | 10.9 | 171           | 15.0  | 19.0  | 27.0  | 22.2  | 10.9 | -0.95  | 0.342 |
| Black                      | 114           | 17.0  | 25.0  | 35.0  | 27.4  | 14.0 | 208           | 18.0  | 26.0  | 33.5  | 28.8  | 24.0 | -0.64  | 0.523 |
| Hispanic                   | 1             |       | 24.0  |       | 24.0  |      | 99            | 13.5  | 17.0  | 22.5  | 19.6  | 10.3 | 4.29   | 0.000 |
| <b>B-CAROTENE (MCG/DL)</b> |               |       |       |       |       |      |               |       |       |       |       |      |        |       |
| White                      | 4             | 102.5 | 106.0 | 116.0 | 109.3 | 10.2 | 56            | 66.5  | 88.5  | 113.5 | 93.1  | 29.8 | 2.49   | 0.038 |
| Black                      | 39            | 77.0  | 92.0  | 113.5 | 95.4  | 26.9 | 71            | 76.0  | 96.0  | 116.0 | 98.0  | 30.2 | -0.46  | 0.644 |
| Hispanic                   | 0             |       |       |       |       |      | 102           | 76.0  | 96.0  | 115.0 | 98.4  | 29.0 |        |       |
| <b>CHOLESTEROL (MG/DL)</b> |               |       |       |       |       |      |               |       |       |       |       |      |        |       |
| White                      | 83            | 140.5 | 163.0 | 174.5 | 159.2 | 28.3 | 189           | 139.0 | 155.0 | 172.0 | 155.4 | 26.5 | 1.04   | 0.298 |
| Black                      | 130           | 150.0 | 173.0 | 188.0 | 171.6 | 30.2 | 230           | 143.0 | 162.0 | 186.0 | 167.0 | 33.6 | 1.34   | 0.183 |
| Hispanic                   | 1             |       | 140.0 |       | 140.0 |      | 106           | 139.0 | 158.5 | 176.0 | 162.2 | 30.3 | -7.54  | 0.000 |
| <b>VITAMIN A (MCG/DL)</b>  |               |       |       |       |       |      |               |       |       |       |       |      |        |       |
| White                      | 4             | 36.0  | 38.5  | 43.5  | 39.8  | 4.8  | 54            | 33.0  | 36.0  | 42.0  | 36.7  | 6.0  | 1.19   | 0.300 |
| Black                      | 39            | 31.5  | 36.0  | 42.0  | 36.7  | 7.2  | 68            | 30.0  | 36.0  | 43.5  | 37.7  | 10.8 | -0.54  | 0.593 |
| Hispanic                   | 0             |       |       |       |       |      | 103           | 31.0  | 35.0  | 39.5  | 35.8  | 7.6  |        |       |
| <b>VITAMIN C (MG/DL)</b>   |               |       |       |       |       |      |               |       |       |       |       |      |        |       |
| White                      | 0             |       |       |       |       |      | 29            | 1.2   | 1.5   | 1.7   | 1.5   | 0.4  |        |       |
| Black                      | 0             |       |       |       |       |      | 6             | 1.1   | 1.3   | 1.6   | 1.4   | 0.6  |        |       |
| Hispanic                   | 0             |       |       |       |       |      | 74            | 1.0   | 1.5   | 1.7   | 1.4   | 0.4  |        |       |

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Table 7-10 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN AGE GROUPS WITHIN ETHNICITY BY SITE

|                           | 2-4 YEAR OLDS |      |      |      |      |      | 4-6 YEAR OLDS |      |      |      |      |      | T     | P     |
|---------------------------|---------------|------|------|------|------|------|---------------|------|------|------|------|------|-------|-------|
|                           | N             | Q1   | MED  | Q3   | MEAN | SD   | N             | Q1   | MED  | Q3   | MEAN | SD   |       |       |
| <b>HEMATOCRIT (%)</b>     |               |      |      |      |      |      |               |      |      |      |      |      |       |       |
| Greene/Humphreys          |               |      |      |      |      |      |               |      |      |      |      |      |       |       |
| White                     | 10            | 35.0 | 36.0 | 38.5 | 36.8 | 2.0  | 25            | 35.0 | 36.0 | 37.5 | 36.5 | 2.3  | 0.43  | 0.670 |
| Black                     | 73            | 34.0 | 36.0 | 37.0 | 35.9 | 2.1  | 105           | 34.0 | 35.0 | 37.0 | 35.4 | 2.7  | 1.36  | 0.175 |
| St Clair                  |               |      |      |      |      |      |               |      |      |      |      |      |       |       |
| Black                     | 65            | 34.0 | 35.0 | 36.5 | 35.4 | 1.9  | 116           | 34.0 | 35.5 | 37.0 | 35.4 | 2.3  | -0.11 | 0.916 |
| Maricopa                  |               |      |      |      |      |      |               |      |      |      |      |      |       |       |
| White                     | 0             |      |      |      |      |      | 38            | 35.0 | 36.5 | 38.0 | 36.7 | 2.2  |       |       |
| Black                     | 0             |      |      |      |      |      | 8             | 33.5 | 38.0 | 39.3 | 36.9 | 3.1  |       |       |
| Hispanic                  | 0             |      |      |      |      |      | 109           | 35.0 | 36.0 | 38.0 | 36.4 | 2.2  |       |       |
| Mingo                     |               |      |      |      |      |      |               |      |      |      |      |      |       |       |
| White                     | 78            | 38.5 | 38.0 | 39.5 | 37.9 | 2.4  | 134           | 36.5 | 38.0 | 39.5 | 37.9 | 2.1  | -0.21 | 0.835 |
| Black                     | 6             | 36.5 | 37.5 | 38.0 | 37.5 | 1.8  | 6             | 35.0 | 36.8 | 39.0 | 36.6 | 2.6  | 0.71  | 0.497 |
| <b>HEMOGLOBIN (GM/DL)</b> |               |      |      |      |      |      |               |      |      |      |      |      |       |       |
| Greene/Humphreys          |               |      |      |      |      |      |               |      |      |      |      |      |       |       |
| White                     | 10            | 12.5 | 13.3 | 13.9 | 13.3 | 0.9  | 25            | 12.5 | 13.1 | 14.0 | 13.2 | 0.9  | 0.32  | 0.749 |
| Black                     | 73            | 12.3 | 12.7 | 13.4 | 12.8 | 0.9  | 104           | 11.9 | 12.5 | 13.3 | 12.5 | 1.0  | 1.91  | 0.058 |
| St Clair                  |               |      |      |      |      |      |               |      |      |      |      |      |       |       |
| Black                     | 64            | 11.9 | 12.3 | 12.9 | 12.4 | 0.9  | 117           | 12.1 | 12.5 | 13.3 | 12.6 | 1.0  | -1.37 | 0.172 |
| Maricopa                  |               |      |      |      |      |      |               |      |      |      |      |      |       |       |
| White                     | 0             |      |      |      |      |      | 38            | 12.7 | 13.0 | 13.5 | 13.1 | 0.7  |       |       |
| Black                     | 0             |      |      |      |      |      | 8             | 11.9 | 12.6 | 13.3 | 12.5 | 0.9  |       |       |
| Hispanic                  | 0             |      |      |      |      |      | 106           | 12.7 | 13.2 | 13.6 | 13.1 | 0.7  |       |       |
| Mingo                     |               |      |      |      |      |      |               |      |      |      |      |      |       |       |
| White                     | 76            | 12.7 | 13.3 | 13.7 | 13.2 | 0.9  | 131           | 12.7 | 13.3 | 13.9 | 13.3 | 0.7  | -0.68 | 0.499 |
| Black                     | 6             | 12.6 | 13.1 | 13.1 | 12.8 | 1.0  | 6             | 12.2 | 13.2 | 13.6 | 13.1 | 1.1  | -0.38 | 0.713 |
| <b>FEP (MCG/DL)</b>       |               |      |      |      |      |      |               |      |      |      |      |      |       |       |
| Greene/Humphreys          |               |      |      |      |      |      |               |      |      |      |      |      |       |       |
| White                     | 10            | 12.0 | 17.0 | 21.0 | 17.7 | 6.4  | 24            | 15.0 | 20.0 | 22.0 | 19.3 | 7.9  | -0.62 | 0.545 |
| Black                     | 73            | 12.0 | 18.0 | 23.0 | 18.4 | 8.5  | 104           | 14.0 | 18.0 | 24.0 | 19.6 | 8.8  | -0.93 | 0.355 |
| St Clair                  |               |      |      |      |      |      |               |      |      |      |      |      |       |       |
| Black                     | 63            | 14.5 | 19.0 | 26.5 | 20.9 | 10.6 | 115           | 16.0 | 20.0 | 27.0 | 22.5 | 9.7  | -0.99 | 0.324 |
| Maricopa                  |               |      |      |      |      |      |               |      |      |      |      |      |       |       |
| White                     | 0             |      |      |      |      |      | 38            | 18.0 | 19.5 | 24.0 | 21.2 | 5.5  |       |       |
| Black                     | 0             |      |      |      |      |      | 8             | 11.0 | 15.5 | 27.5 | 20.0 | 11.0 |       |       |
| Hispanic                  | 0             |      |      |      |      |      | 109           | 19.0 | 24.0 | 30.0 | 24.5 | 7.6  |       |       |
| Mingo                     |               |      |      |      |      |      |               |      |      |      |      |      |       |       |
| White                     | 74            | 11.0 | 15.0 | 21.0 | 17.1 | 8.4  | 129           | 10.0 | 14.0 | 20.0 | 16.1 | 8.2  | 0.78  | 0.437 |
| Black                     | 6             | 9.0  | 12.5 | 30.0 | 18.3 | 12.2 | 6             | 11.0 | 19.0 | 28.0 | 22.0 | 13.6 | -0.49 | 0.633 |

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Table 7-10 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF EARLY CHILDHOOD NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN AGE GROUPS WITHIN ETHNICITY BY SITE

|                            | 2-4 YEAR OLDS |       |       |       |       |      | 4-6 YEAR OLDS |       |       |       |       |      | T     | P     |
|----------------------------|---------------|-------|-------|-------|-------|------|---------------|-------|-------|-------|-------|------|-------|-------|
|                            | N             | Q1    | MED   | Q3    | MEAN  | SD   | N             | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>MCHC (%)</b>            |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys           |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| White                      | 10            | 35.6  | 36.3  | 36.6  | 36.0  | 0.8  | 25            | 35.0  | 36.3  | 36.9  | 36.1  | 2.0  | -0.18 | 0.858 |
| Black                      | 73            | 34.7  | 35.5  | 36.5  | 35.6  | 1.6  | 104           | 34.1  | 35.5  | 36.6  | 35.4  | 1.8  | 1.02  | 0.311 |
| St Clair                   |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Black                      | 65            | 33.8  | 35.0  | 36.1  | 35.1  | 1.9  | 115           | 34.3  | 35.6  | 36.7  | 35.7  | 1.8  | -1.92 | 0.057 |
| Maricopa                   |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| White                      | 0             |       |       |       |       |      | 37            | 34.8  | 35.6  | 36.2  | 35.5  | 1.3  |       |       |
| Black                      | 0             |       |       |       |       |      | 7             | 33.2  | 33.6  | 34.2  | 33.7  | 0.7  |       |       |
| Hispanic                   | 0             |       |       |       |       |      | 106           | 35.3  | 35.9  | 36.7  | 35.9  | 1.8  |       |       |
| Mingo                      |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| White                      | 73            | 33.8  | 34.6  | 35.5  | 34.8  | 1.6  | 131           | 33.9  | 34.8  | 35.9  | 34.9  | 1.4  | -0.64 | 0.521 |
| Black                      | 5             | 34.5  | 34.8  | 34.9  | 34.7  | 0.2  | 6             | 34.9  | 35.6  | 36.8  | 35.7  | 1.2  | -1.96 | 0.107 |
| <b>TIBC (MCG/DL)</b>       |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys           |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| White                      | 8             | 310.0 | 325.0 | 356.0 | 330.9 | 28.5 | 21            | 311.0 | 337.0 | 355.0 | 331.9 | 37.8 | -0.08 | 0.938 |
| Black                      | 58            | 301.0 | 331.5 | 359.0 | 333.5 | 42.1 | 92            | 305.0 | 330.0 | 360.0 | 332.6 | 44.5 | 0.12  | 0.907 |
| St Clair                   |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Black                      | 52            | 299.5 | 316.5 | 350.0 | 325.3 | 40.3 | 108           | 297.0 | 317.5 | 338.5 | 319.6 | 31.0 | 0.88  | 0.379 |
| Maricopa                   |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| White                      | 0             |       |       |       |       |      | 35            | 292.5 | 316.0 | 359.0 | 322.5 | 49.8 |       |       |
| Black                      | 0             |       |       |       |       |      | 7             | 304.0 | 317.0 | 341.5 | 322.1 | 20.6 |       |       |
| Hispanic                   | 0             |       |       |       |       |      | 103           | 309.5 | 342.0 | 378.5 | 344.2 | 46.2 |       |       |
| Mingo                      |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| White                      | 66            | 289.0 | 314.0 | 339.0 | 313.7 | 34.9 | 120           | 289.0 | 316.5 | 344.5 | 318.3 | 40.2 | -0.83 | 0.410 |
| Black                      | 6             | 292.0 | 322.0 | 329.0 | 312.3 | 24.6 | 6             | 293.0 | 297.0 | 358.0 | 316.2 | 35.4 | -0.22 | 0.832 |
| <b>SERUM IRON (MCG/DL)</b> |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys           |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| White                      | 10            | 55.0  | 61.5  | 77.0  | 64.9  | 15.9 | 22            | 53.0  | 66.5  | 91.0  | 71.5  | 23.9 | -0.92 | 0.368 |
| Black                      | 61            | 45.0  | 64.0  | 84.0  | 66.1  | 26.3 | 97            | 49.0  | 63.0  | 76.0  | 64.2  | 23.0 | 0.46  | 0.649 |
| St Clair                   |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Black                      | 55            | 59.0  | 74.0  | 91.5  | 75.9  | 22.9 | 108           | 53.0  | 69.5  | 91.0  | 71.5  | 25.6 | 1.12  | 0.266 |
| Maricopa                   |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| White                      | 0             |       |       |       |       |      | 38            | 58.0  | 68.0  | 95.0  | 76.0  | 25.3 |       |       |
| Black                      | 0             |       |       |       |       |      | 8             | 70.5  | 79.5  | 115.5 | 88.1  | 35.2 |       |       |
| Hispanic                   | 0             |       |       |       |       |      | 104           | 63.0  | 82.0  | 101.5 | 81.6  | 29.4 |       |       |
| Mingo                      |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| White                      | 68            | 53.0  | 69.0  | 80.5  | 68.1  | 23.9 | 123           | 50.0  | 66.0  | 84.0  | 67.9  | 25.0 | 0.06  | 0.949 |
| Black                      | 5             | 42.0  | 46.0  | 48.0  | 47.2  | 13.2 | 5             | 88.0  | 68.0  | 75.0  | 66.0  | 18.5 | -1.85 | 0.107 |

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Table 7-10 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN AGE GROUPS WITHIN ETHNICITY BY SITE

|                            | 2-4 YEAR OLDS |       |       |       |       |      | 4-6 YEAR OLDS |      |       |       |       |      | T     | P     |
|----------------------------|---------------|-------|-------|-------|-------|------|---------------|------|-------|-------|-------|------|-------|-------|
|                            | N             | Q1    | MED   | Q3    | MEAN  | SD   | N             | Q1   | MED   | Q3    | MEAN  | SD   |       |       |
| <b>TS (%)</b>              |               |       |       |       |       |      |               |      |       |       |       |      |       |       |
| Greene/Humphreys           |               |       |       |       |       |      |               |      |       |       |       |      |       |       |
| White                      | 8             | 17.3  | 19.9  | 24.3  | 20.7  | 4.0  | 23            | 16.7 | 21.4  | 25.8  | 21.8  | 7.3  | -0.49 | 0.630 |
| Black                      | 58            | 13.4  | 19.3  | 24.0  | 19.4  | 7.8  | 88            | 14.4 | 19.3  | 24.1  | 19.2  | 6.5  | 0.17  | 0.869 |
| St Clair                   |               |       |       |       |       |      |               |      |       |       |       |      |       |       |
| Black                      | 50            | 18.3  | 23.1  | 25.7  | 22.6  | 6.1  | 106           | 17.5 | 21.7  | 28.2  | 22.7  | 7.7  | -0.13 | 0.893 |
| Maricopa                   |               |       |       |       |       |      |               |      |       |       |       |      |       |       |
| White                      | 0             |       |       |       |       |      | 34            | 16.2 | 19.6  | 27.5  | 21.5  | 6.6  |       |       |
| Black                      | 0             |       |       |       |       |      | 7             | 22.0 | 23.4  | 32.0  | 26.2  | 10.4 |       |       |
| Hispanic                   | 0             |       |       |       |       |      | 105           | 17.8 | 24.0  | 30.1  | 24.2  | 8.8  |       |       |
| Mingo                      |               |       |       |       |       |      |               |      |       |       |       |      |       |       |
| White                      | 65            | 16.6  | 21.3  | 27.1  | 21.6  | 7.3  | 117           | 14.4 | 19.4  | 26.1  | 21.0  | 8.0  | 0.53  | 0.598 |
| Black                      | 5             | 15.4  | 16.4  | 20.2  | 19.1  | 6.0  | 6             | 20.9 | 23.1  | 28.3  | 22.7  | 7.5  | -0.87 | 0.405 |
| <b>FERRITIN (NG/DL)</b>    |               |       |       |       |       |      |               |      |       |       |       |      |       |       |
| Greene/Humphreys           |               |       |       |       |       |      |               |      |       |       |       |      |       |       |
| White                      | 7             | 16.0  | 18.0  | 33.5  | 25.0  | 12.4 | 22            | 15.0 | 21.0  | 30.0  | 22.5  | 10.0 | 0.49  | 0.639 |
| Black                      | 55            | 19.5  | 23.0  | 33.0  | 26.6  | 12.4 | 86            | 16.0 | 24.0  | 32.0  | 25.3  | 11.1 | 0.65  | 0.518 |
| St Clair                   |               |       |       |       |       |      |               |      |       |       |       |      |       |       |
| Black                      | 53            | 16.0  | 26.0  | 36.0  | 27.8  | 15.6 | 109           | 20.0 | 27.0  | 35.0  | 31.5  | 31.2 | -1.00 | 0.319 |
| Maricopa                   |               |       |       |       |       |      |               |      |       |       |       |      |       |       |
| White                      | 0             |       |       |       |       |      | 32            | 15.5 | 19.5  | 29.0  | 21.8  | 10.2 |       |       |
| Black                      | 0             |       |       |       |       |      | 7             | 19.5 | 27.0  | 40.5  | 29.0  | 16.0 |       |       |
| Hispanic                   | 0             |       |       |       |       |      | 99            | 13.5 | 17.0  | 22.5  | 19.6  | 10.3 |       |       |
| Mingo                      |               |       |       |       |       |      |               |      |       |       |       |      |       |       |
| White                      | 65            | 13.0  | 18.0  | 25.0  | 20.2  | 10.7 | 117           | 15.0 | 19.0  | 27.0  | 22.2  | 11.4 | -1.15 | 0.251 |
| Black                      | 6             | 18.0  | 29.5  | 34.0  | 31.0  | 14.9 | 6             | 17.0 | 32.0  | 36.0  | 28.8  | 10.1 | 0.29  | 0.775 |
| <b>B-CARDTENE (MCG/DL)</b> |               |       |       |       |       |      |               |      |       |       |       |      |       |       |
| Greene/Humphreys           |               |       |       |       |       |      |               |      |       |       |       |      |       |       |
| White                      | 4             | 102.5 | 106.0 | 116.0 | 109.3 | 10.2 | 21            | 73.0 | 109.0 | 132.0 | 105.1 | 34.6 | -0.45 | 0.658 |
| Black                      | 39            | 77.0  | 92.0  | 113.5 | 95.4  | 26.9 | 64            | 76.0 | 96.0  | 115.5 | 96.8  | 29.8 | -0.24 | 0.810 |
| Maricopa                   |               |       |       |       |       |      |               |      |       |       |       |      |       |       |
| White                      | 0             |       |       |       |       |      | 35            | 66.5 | 85.0  | 105.0 | 85.9  | 24.3 |       |       |
| Black                      | 0             |       |       |       |       |      | 7             | 88.5 | 107.0 | 126.0 | 109.3 | 34.6 |       |       |
| Hispanic                   | 0             |       |       |       |       |      | 102           | 76.0 | 96.0  | 115.0 | 98.4  | 29.0 |       |       |

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Table 7-10 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN AGE GROUPS WITHIN ETHNICITY BY SITE

|                            | 2-4 YEAR OLDS |       |       |       |       |      | 4-6 YEAR OLDS |       |       |       |       |      | T     | P     |
|----------------------------|---------------|-------|-------|-------|-------|------|---------------|-------|-------|-------|-------|------|-------|-------|
|                            | N             | Q1    | MED   | Q3    | MEAN  | SD   | N             | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>CHOLESTEROL (MG/DL)</b> |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys           |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| White                      | 9             | 142.0 | 172.0 | 191.0 | 172.1 | 39.7 | 24            | 152.0 | 169.0 | 185.0 | 169.8 | 23.3 | 0.16  | 0.875 |
| Black                      | 61            | 150.0 | 174.0 | 191.0 | 173.3 | 30.6 | 99            | 145.5 | 167.0 | 184.0 | 165.1 | 31.6 | 1.62  | 0.107 |
| St Clair                   |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Black                      | 60            | 156.5 | 173.0 | 185.5 | 171.9 | 29.9 | 117           | 143.0 | 159.0 | 183.0 | 167.9 | 35.3 | 0.81  | 0.422 |
| Maricopa                   |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| White                      | 0             |       |       |       |       |      | 37            | 141.0 | 151.0 | 171.0 | 154.9 | 22.2 |       |       |
| Black                      | 0             |       |       |       |       |      | 8             | 152.0 | 194.5 | 210.5 | 182.4 | 37.9 |       |       |
| Hispanic                   | 0             |       |       |       |       |      | 106           | 139.0 | 158.5 | 176.0 | 162.2 | 30.3 |       |       |
| Mingo                      |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| White                      | 74            | 139.0 | 163.0 | 171.0 | 157.6 | 26.5 | 128           | 134.0 | 149.5 | 169.5 | 152.8 | 27.4 | 1.23  | 0.222 |
| Black                      | 6             | 133.0 | 147.0 | 158.0 | 152.3 | 26.2 | 6             | 141.0 | 158.5 | 191.0 | 162.0 | 25.7 | -0.65 | 0.533 |
| <b>VITAMIN A (MCG/DL)</b>  |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Greene/Humphreys           |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| White                      | 4             | 36.0  | 38.5  | 43.5  | 39.8  | 4.8  | 20            | 31.5  | 34.0  | 42.5  | 35.9  | 6.6  | 1.37  | 0.220 |
| Black                      | 39            | 31.5  | 36.0  | 42.0  | 36.7  | 7.2  | 62            | 30.0  | 36.0  | 45.0  | 38.0  | 11.2 | -0.67 | 0.504 |
| Maricopa                   |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| White                      | 0             |       |       |       |       |      | 34            | 33.0  | 36.0  | 40.0  | 37.2  | 5.7  |       |       |
| Black                      | 0             |       |       |       |       |      | 6             | 30.0  | 35.5  | 39.0  | 34.7  | 4.8  |       |       |
| Hispanic                   | 0             |       |       |       |       |      | 103           | 31.0  | 35.0  | 39.5  | 35.8  | 7.6  |       |       |
| <b>VITAMIN C (MG/DL)</b>   |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| Maricopa                   |               |       |       |       |       |      |               |       |       |       |       |      |       |       |
| White                      | 0             |       |       |       |       |      | 29            | 1.2   | 1.5   | 1.7   | 1.6   | 0.4  |       |       |
| Black                      | 0             |       |       |       |       |      | 6             | 1.1   | 1.3   | 1.6   | 1.4   | 0.6  |       |       |
| Hispanic                   | 0             |       |       |       |       |      | 74            | 1.0   | 1.5   | 1.7   | 1.4   | 0.4  |       |       |

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Table 7-11

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES ACROSS SITE

|                           | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|---------------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                           | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| HEMATOCRIT (%)            | 392   | 35.0  | 36.5  | 38.0  | 36.4  | 2.4  | 382     | 35.0  | 36.0  | 38.0  | 36.4  | 2.5  | -0.05 | 0.961 |
| HEMOGLOBIN (GM/DL)        | 388   | 12.3  | 12.9  | 13.5  | 12.9  | 0.9  | 377     | 12.3  | 12.9  | 13.5  | 12.9  | 0.9  | 0.37  | 0.715 |
| FEP <sub>1</sub> (MCG/DL) | 384   | 14.0  | 19.0  | 24.0  | 20.0  | 8.5  | 376     | 13.0  | 19.0  | 25.0  | 19.9  | 9.6  | 0.04  | 0.967 |
| MCHC (%)                  | 384   | 34.3  | 35.4  | 36.4  | 35.4  | 1.6  | 374     | 34.2  | 35.4  | 36.3  | 35.4  | 1.8  | 0.15  | 0.877 |
| TIBC (MCG/DL)             | 347   | 298.5 | 328.0 | 351.5 | 328.4 | 41.5 | 336     | 297.0 | 320.0 | 353.0 | 324.7 | 40.8 | 1.18  | 0.238 |
| SERUM IRON (MCG/DL)       | 357   | 53.0  | 67.0  | 88.0  | 70.7  | 25.3 | 348     | 52.0  | 69.0  | 91.0  | 71.3  | 26.5 | -0.33 | 0.739 |
| TS (%)                    | 345   | 16.6  | 20.4  | 26.4  | 21.6  | 7.6  | 328     | 16.1  | 21.1  | 27.2  | 21.8  | 7.9  | -0.28 | 0.781 |
| FERRITIN (NG/DL)          | 343   | 15.0  | 20.0  | 29.0  | 23.7  | 19.8 | 322     | 16.0  | 23.0  | 32.0  | 25.6  | 13.1 | -1.46 | 0.145 |
| B-CAROTENE (MCG/DL)       | 138   | 75.0  | 95.0  | 117.0 | 97.6  | 29.9 | 134     | 75.0  | 95.5  | 115.0 | 96.2  | 28.1 | 0.40  | 0.693 |
| CHOLESTEROL (MG/DL)       | 377   | 143.0 | 162.0 | 182.0 | 163.8 | 30.6 | 362     | 141.0 | 159.0 | 181.0 | 162.7 | 30.9 | 0.45  | 0.653 |
| VITAMIN A (MCG/DL)        | 137   | 32.0  | 36.0  | 42.0  | 37.0  | 8.5  | 131     | 31.0  | 36.0  | 41.5  | 36.3  | 7.8  | 0.67  | 0.501 |
| VITAMIN C (MG/DL)         | 55    | 1.1   | 1.5   | 1.7   | 1.5   | 0.5  | 54      | 1.1   | 1.4   | 1.7   | 1.4   | 0.4  | 0.66  | 0.510 |

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Table 7-11 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES WITHIN SITE

|                           | MALES |      |      |      |      |     | FEMALES |      |      |      |      |      | T     | P     |
|---------------------------|-------|------|------|------|------|-----|---------|------|------|------|------|------|-------|-------|
|                           | N     | Q1   | MED  | Q3   | MEAN | SD  | N       | Q1   | MED  | Q3   | MEAN | SD   |       |       |
| <b>HEMATOCRIT</b>         |       |      |      |      |      |     |         |      |      |      |      |      |       |       |
| Greene/Humphreys          | 107   | 34.5 | 35.5 | 37.0 | 35.6 | 2.1 | 106     | 34.0 | 36.0 | 37.5 | 35.8 | 2.7  | -0.56 | 0.576 |
| St. Clair                 | 96    | 34.0 | 35.5 | 37.0 | 35.3 | 2.4 | 86      | 34.0 | 35.2 | 37.0 | 35.5 | 1.8  | -0.66 | 0.513 |
| Maricopa                  | 74    | 35.0 | 36.5 | 38.0 | 36.7 | 2.0 | 81      | 35.0 | 36.0 | 38.0 | 36.3 | 2.4  | 1.07  | 0.288 |
| Mingo                     | 115   | 36.5 | 38.0 | 39.5 | 37.9 | 2.2 | 109     | 36.5 | 37.5 | 39.5 | 37.8 | 2.3  | 0.29  | 0.774 |
| <b>HEMOGLOBIN (GM/DL)</b> |       |      |      |      |      |     |         |      |      |      |      |      |       |       |
| Greene/Humphreys          | 106   | 12.1 | 12.7 | 13.3 | 12.7 | 0.9 | 106     | 12.0 | 12.8 | 13.5 | 12.7 | 1.0  | -0.40 | 0.687 |
| St. Clair                 | 96    | 12.0 | 12.5 | 13.2 | 12.6 | 1.0 | 86      | 12.0 | 12.3 | 13.0 | 12.5 | 0.8  | 0.52  | 0.603 |
| Maricopa                  | 73    | 12.8 | 13.2 | 13.6 | 13.1 | 0.7 | 79      | 12.6 | 13.0 | 13.4 | 13.0 | 0.8  | 1.36  | 0.176 |
| Mingo                     | 113   | 12.7 | 13.2 | 13.8 | 13.2 | 0.8 | 106     | 12.7 | 13.2 | 13.9 | 13.2 | 0.9  | -0.17 | 0.861 |
| <b>FEP (MCG/DL)</b>       |       |      |      |      |      |     |         |      |      |      |      |      |       |       |
| Greene/Humphreys          | 106   | 14.0 | 18.0 | 23.0 | 19.4 | 8.8 | 105     | 13.0 | 18.0 | 24.0 | 18.8 | 8.2  | 0.45  | 0.657 |
| St. Clair                 | 95    | 16.0 | 20.0 | 27.0 | 21.9 | 9.6 | 84      | 15.0 | 19.0 | 26.5 | 21.9 | 10.5 | 0.04  | 0.964 |
| Maricopa                  | 74    | 19.0 | 22.0 | 28.0 | 23.0 | 6.8 | 81      | 18.0 | 23.0 | 30.0 | 23.9 | 8.1  | -0.70 | 0.487 |
| Mingo                     | 109   | 11.0 | 15.0 | 21.0 | 16.8 | 7.2 | 106     | 9.0  | 13.5 | 20.0 | 16.5 | 9.8  | 0.05  | 0.825 |
| <b>MCHC (%)</b>           |       |      |      |      |      |     |         |      |      |      |      |      |       |       |
| Greene/Humphreys          | 106   | 34.6 | 35.6 | 36.7 | 35.6 | 1.7 | 106     | 34.2 | 35.5 | 36.6 | 35.6 | 1.8  | -0.01 | 0.990 |
| St. Clair                 | 95    | 34.3 | 35.6 | 36.6 | 35.6 | 1.8 | 86      | 34.0 | 35.3 | 36.6 | 35.3 | 1.8  | 0.83  | 0.409 |
| Maricopa                  | 72    | 34.9 | 35.9 | 36.8 | 35.8 | 1.4 | 78      | 35.0 | 35.6 | 36.3 | 35.7 | 1.9  | 0.45  | 0.653 |
| Mingo                     | 111   | 33.9 | 34.8 | 35.8 | 34.8 | 1.4 | 104     | 34.0 | 34.8 | 35.9 | 35.0 | 1.5  | -0.79 | 0.433 |

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Table 7-11 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES WITHIN SITE

|                            | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|----------------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                            | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>TIBC (MCG/DL)</b>       |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 94    | 303.0 | 333.0 | 359.0 | 332.0 | 41.8 | 85      | 307.0 | 330.0 | 357.0 | 333.6 | 42.7 | -0.26 | 0.793 |
| St. Clair                  | 81    | 301.0 | 317.0 | 344.0 | 321.9 | 35.5 | 80      | 298.5 | 317.5 | 340.5 | 321.6 | 33.4 | 0.06  | 0.954 |
| Maricopa                   | 68    | 310.0 | 342.5 | 376.0 | 342.3 | 47.7 | 77      | 300.0 | 329.0 | 362.0 | 334.0 | 46.5 | 1.06  | 0.293 |
| Mingo                      | 104   | 293.0 | 319.0 | 345.0 | 321.1 | 39.0 | 94      | 288.0 | 310.0 | 339.0 | 311.5 | 36.1 | 1.80  | 0.074 |
| <b>SERUM IRON (MCG/DL)</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 97    | 50.0  | 64.0  | 83.0  | 67.3  | 24.0 | 93      | 49.0  | 63.0  | 82.0  | 64.0  | 23.7 | 0.94  | 0.348 |
| St. Clair                  | 84    | 53.0  | 66.5  | 89.0  | 70.3  | 25.4 | 80      | 56.0  | 75.0  | 92.5  | 75.3  | 24.2 | -1.29 | 0.198 |
| Maricopa                   | 70    | 60.0  | 74.0  | 100.0 | 79.8  | 28.9 | 80      | 59.0  | 78.5  | 102.0 | 81.2  | 28.7 | -0.30 | 0.762 |
| Mingo                      | 106   | 53.0  | 66.5  | 80.0  | 68.0  | 22.8 | 95      | 46.5  | 67.0  | 83.0  | 66.8  | 26.1 | 0.37  | 0.715 |
| <b>TS (%)</b>              |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 91    | 15.0  | 19.5  | 24.3  | 20.1  | 6.7  | 86      | 13.7  | 19.1  | 24.3  | 19.3  | 7.3  | 0.77  | 0.441 |
| St. Clair                  | 80    | 17.2  | 21.7  | 27.4  | 22.2  | 7.6  | 77      | 18.3  | 23.2  | 27.4  | 23.0  | 7.0  | -0.66 | 0.508 |
| Maricopa                   | 69    | 18.1  | 23.0  | 27.1  | 23.3  | 8.5  | 77      | 16.2  | 23.4  | 30.4  | 23.9  | 8.5  | -0.43 | 0.669 |
| Mingo                      | 105   | 15.7  | 19.9  | 26.4  | 21.3  | 7.5  | 88      | 15.4  | 20.8  | 27.2  | 21.2  | 7.9  | 0.06  | 0.948 |
| <b>FERRITIN (NG/DL)</b>    |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 91    | 16.0  | 23.0  | 31.5  | 24.7  | 11.1 | 79      | 18.0  | 24.0  | 32.0  | 26.2  | 11.8 | -0.85 | 0.395 |
| St. Clair                  | 84    | 17.5  | 25.0  | 35.0  | 30.9  | 14.6 | 78      | 19.0  | 27.0  | 35.0  | 29.6  | 15.4 | 0.31  | 0.755 |
| Maricopa                   | 66    | 13.0  | 16.0  | 26.0  | 20.4  | 11.3 | 72      | 15.0  | 18.5  | 24.0  | 20.8  | 10.3 | -0.23 | 0.816 |
| Mingo                      | 102   | 14.0  | 17.5  | 24.0  | 19.0  | 8.6  | 92      | 15.0  | 22.5  | 33.5  | 25.4  | 13.1 | -3.94 | 0.000 |

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Table 7-11 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES WITHIN SITE

|                            | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|----------------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                            | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>B-CAROTENE (MCG/DL)</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 69    | 76.0  | 96.0  | 117.0 | 98.1  | 29.9 | 59      | 78.0  | 96.0  | 117.0 | 98.1  | 29.0 | 0.00  | 0.998 |
| Maricopa                   | 69    | 72.0  | 96.0  | 113.0 | 97.1  | 30.1 | 75      | 76.0  | 92.0  | 112.0 | 94.8  | 27.4 | 0.49  | 0.624 |
| <b>CHOLESTEROL (MG/DL)</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 99    | 154.5 | 170.0 | 188.0 | 170.7 | 30.0 | 94      | 143.0 | 165.0 | 184.0 | 166.4 | 31.6 | 0.98  | 0.329 |
| St. Clair                  | 96    | 141.0 | 157.5 | 183.0 | 166.1 | 36.5 | 85      | 153.0 | 168.0 | 189.0 | 172.6 | 29.5 | -1.33 | 0.187 |
| Maricopa                   | 72    | 147.0 | 160.0 | 179.0 | 162.5 | 27.2 | 79      | 138.0 | 151.0 | 178.5 | 160.5 | 31.4 | 0.43  | 0.670 |
| Mingo                      | 110   | 139.0 | 158.0 | 173.0 | 156.2 | 26.0 | 104     | 137.5 | 151.0 | 167.0 | 153.1 | 28.0 | 0.85  | 0.394 |
| <b>VITAMIN A (MCG/DL)</b>  |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 68    | 30.0  | 36.0  | 43.0  | 37.5  | 10.1 | 57      | 31.0  | 36.0  | 44.0  | 37.1  | 8.2  | 0.19  | 0.847 |
| Maricopa                   | 69    | 32.0  | 36.0  | 40.0  | 36.6  | 6.7  | 74      | 31.0  | 35.0  | 39.0  | 35.7  | 7.4  | 0.72  | 0.473 |
| <b>VITAMIN C (MG/DL)</b>   |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Maricopa                   | 55    | 1.2   | 1.5   | 1.7   | 1.5   | 0.5  | 54      | 1.1   | 1.4   | 1.7   | 1.4   | 0.4  | 0.66  | 0.510 |

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Table 7-12

BIOCHEMICAL INDICATORS FOR TWO TO FOUR YEAR OLDS  
WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES ACROSS SITE

|                     | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|---------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                     | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| HEMATOCRIT (%)      | 114   | 34.5  | 36.3  | 38.0  | 36.5  | 2.5  | 119     | 35.0  | 36.5  | 38.0  | 36.5  | 2.3  | -0.16 | 0.870 |
| HEMOGLOBIN (GM/DL)  | 112   | 12.3  | 12.9  | 13.4  | 12.9  | 0.9  | 118     | 12.1  | 12.8  | 13.5  | 12.8  | 0.9  | 0.72  | 0.471 |
| FEP (MCG/DL)        | 111   | 13.0  | 18.0  | 21.5  | 18.4  | 7.9  | 116     | 10.5  | 17.0  | 24.0  | 18.9  | 10.2 | -0.44 | 0.663 |
| MCHC (%)            | 111   | 34.3  | 35.3  | 36.6  | 35.4  | 1.8  | 116     | 34.0  | 34.9  | 35.9  | 35.0  | 1.6  | 1.39  | 0.166 |
| TIBC (MCG/DL)       | 96    | 295.0 | 322.5 | 350.0 | 326.0 | 39.1 | 95      | 298.0 | 317.0 | 344.5 | 321.5 | 38.7 | 0.80  | 0.427 |
| SERUM IRON (MCG/DL) | 99    | 55.0  | 68.0  | 83.5  | 70.9  | 24.3 | 101     | 49.0  | 67.0  | 87.0  | 66.8  | 24.4 | 1.20  | 0.231 |
| TS (%)              | 94    | 16.6  | 20.4  | 26.4  | 21.4  | 7.2  | 93      | 16.0  | 21.3  | 25.2  | 20.7  | 7.1  | 0.71  | 0.480 |
| FERRITIN (NG/DL)    | 94    | 14.0  | 20.0  | 28.0  | 21.9  | 11.0 | 93      | 17.0  | 25.0  | 35.0  | 27.8  | 14.7 | -3.10 | 0.002 |
| B-CAROTENE (MCG/DL) | 24    | 80.5  | 96.0  | 117.5 | 98.2  | 26.6 | 19      | 79.5  | 92.0  | 107.0 | 94.8  | 26.0 | 0.42  | 0.674 |
| CHOLESTEROL (MG/DL) | 104   | 152.5 | 170.5 | 183.0 | 170.6 | 29.5 | 110     | 142.0 | 163.5 | 183.0 | 163.0 | 30.1 | 1.87  | 0.063 |
| VITAMIN A (MCG/DL)  | 24    | 32.0  | 36.0  | 41.0  | 36.5  | 6.3  | 19      | 31.5  | 36.0  | 43.5  | 37.7  | 7.9  | -0.58 | 0.569 |

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Table 7-12 (continued)

BIOCHEMICAL INDICATORS FOR TWO TO FOUR YEAR OLDS  
WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES WITHIN SITE

|                           | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|---------------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                           | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>HEMATOCRIT (%)</b>     |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          | 43    | 34.0  | 35.0  | 37.0  | 35.6  | 2.0  | 40      | 35.0  | 36.5  | 38.0  | 36.4  | 2.2  | -1.57 | 0.121 |
| St. Clair                 | 31    | 34.0  | 35.5  | 36.8  | 35.4  | 2.2  | 35      | 34.2  | 35.0  | 36.8  | 35.4  | 1.7  | -0.03 | 0.976 |
| Mingo                     | 40    | 36.5  | 37.8  | 40.2  | 38.2  | 2.3  | 44      | 35.8  | 37.8  | 39.5  | 37.5  | 2.4  | 1.25  | 0.214 |
| <b>HEMOGLOBIN (GM/DL)</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          | 43    | 12.2  | 12.6  | 13.3  | 12.8  | 0.9  | 40      | 12.3  | 13.0  | 13.4  | 12.9  | 0.9  | -0.63 | 0.530 |
| St. Clair                 | 30    | 11.9  | 12.5  | 13.1  | 12.6  | 1.0  | 35      | 12.0  | 12.2  | 12.6  | 12.3  | 0.8  | 1.16  | 0.250 |
| Mingo                     | 39    | 12.9  | 13.2  | 13.7  | 13.2  | 0.9  | 43      | 12.6  | 13.2  | 13.6  | 13.1  | 1.0  | 0.75  | 0.453 |
| <b>FEP (MCG/DL)</b>       |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          | 43    | 13.0  | 18.0  | 21.0  | 17.8  | 7.0  | 40      | 11.5  | 19.5  | 25.0  | 19.0  | 9.4  | -0.65 | 0.520 |
| St. Clair                 | 30    | 15.0  | 19.0  | 27.0  | 20.4  | 9.0  | 34      | 14.0  | 18.5  | 26.0  | 21.2  | 11.9 | -0.31 | 0.760 |
| Mingo                     | 38    | 12.0  | 17.5  | 21.0  | 17.4  | 7.8  | 42      | 9.0   | 15.0  | 22.0  | 16.9  | 9.4  | 0.24  | 0.810 |
| <b>MCHC (%)</b>           |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          | 43    | 34.9  | 35.7  | 37.0  | 35.9  | 1.6  | 40      | 34.7  | 35.5  | 36.3  | 35.5  | 1.4  | 1.11  | 0.271 |
| St. Clair                 | 31    | 34.3  | 35.6  | 36.6  | 35.4  | 1.9  | 35      | 33.7  | 34.8  | 35.8  | 34.8  | 1.8  | 1.10  | 0.278 |
| Mingo                     | 37    | 33.9  | 34.8  | 35.4  | 34.8  | 1.7  | 41      | 33.8  | 34.7  | 35.5  | 34.8  | 1.6  | -0.01 | 0.991 |
| <b>TIBC (MCG/DL)</b>      |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          | 36    | 305.0 | 338.5 | 360.0 | 337.8 | 40.6 | 30      | 299.0 | 324.5 | 346.0 | 327.7 | 40.5 | 1.01  | 0.318 |
| St. Clair                 | 24    | 296.0 | 313.0 | 347.0 | 322.4 | 42.4 | 29      | 301.0 | 328.0 | 354.0 | 329.0 | 39.0 | -0.59 | 0.558 |
| Mingo                     | 36    | 289.0 | 325.5 | 342.0 | 316.7 | 33.1 | 36      | 289.5 | 306.5 | 323.0 | 310.4 | 35.2 | 0.79  | 0.434 |

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Table 7-12 (continued)

BIOCHEMICAL INDICATORS FOR TWO TO FOUR YEAR OLDS  
WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES WITHIN SITE

|                            | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|----------------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                            | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>SERUM IRON (MCG/DL)</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 38    | 57.0  | 67.0  | 84.0  | 71.4  | 24.8 | 33      | 42.0  | 55.0  | 79.0  | 59.7  | 24.1 | 2.02  | 0.047 |
| St. Clair                  | 25    | 54.0  | 65.0  | 87.0  | 68.2  | 25.5 | 31      | 66.5  | 83.0  | 93.5  | 80.7  | 20.2 | -2.01 | 0.050 |
| Mingo                      | 36    | 55.5  | 70.0  | 82.0  | 72.2  | 23.4 | 37      | 46.0  | 64.0  | 75.0  | 61.4  | 23.4 | 1.98  | 0.051 |
| <b>TS (%)</b>              |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 35    | 15.7  | 20.4  | 24.0  | 20.5  | 7.0  | 31      | 13.1  | 17.6  | 24.3  | 18.5  | 7.9  | 1.10  | 0.277 |
| St. Clair                  | 23    | 16.5  | 20.1  | 26.3  | 20.9  | 7.6  | 28      | 20.7  | 23.5  | 26.3  | 23.5  | 5.0  | -1.42 | 0.164 |
| Mingo                      | 36    | 17.5  | 21.1  | 27.7  | 22.6  | 7.3  | 34      | 15.4  | 20.9  | 25.2  | 20.3  | 7.1  | 1.33  | 0.188 |
| <b>FERRITIN (NG/DL)</b>    |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 33    | 15.0  | 22.0  | 32.0  | 23.9  | 11.0 | 29      | 20.0  | 25.0  | 36.0  | 29.4  | 13.2 | -1.76 | 0.083 |
| St. Clair                  | 25    | 16.0  | 20.0  | 35.0  | 24.5  | 14.0 | 29      | 17.0  | 30.0  | 41.0  | 30.5  | 16.4 | -1.46 | 0.150 |
| Mingo                      | 36    | 13.0  | 16.0  | 24.0  | 18.2  | 7.3  | 35      | 14.0  | 19.0  | 31.5  | 24.1  | 14.0 | -2.22 | 0.031 |
| <b>B-CAROTENE (MCG/DL)</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 24    | 80.5  | 96.0  | 117.5 | 98.2  | 26.6 | 19      | 79.5  | 92.0  | 107.0 | 94.8  | 26.0 | 0.42  | 0.674 |
| <b>CHOLESTEROL (MG/DL)</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 37    | 165.0 | 176.0 | 197.0 | 179.9 | 32.4 | 33      | 144.0 | 157.0 | 184.0 | 165.6 | 29.2 | 1.95  | 0.056 |
| St. Clair                  | 30    | 149.0 | 164.0 | 179.0 | 164.6 | 29.9 | 34      | 164.0 | 174.0 | 193.0 | 177.4 | 29.1 | -1.73 | 0.089 |
| Mingo                      | 37    | 152.0 | 165.0 | 177.0 | 166.1 | 24.2 | 43      | 137.0 | 149.0 | 165.0 | 149.6 | 26.0 | 2.94  | 0.004 |
| <b>VITAMIN A (MCG/DL)</b>  |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 24    | 32.0  | 36.0  | 41.0  | 36.5  | 6.3  | 19      | 31.5  | 36.0  | 43.5  | 37.7  | 7.9  | -0.58 | 0.569 |

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Table 7-13

BIOCHEMICAL INDICATORS FOR FOUR TO SIX YEAR OLDS  
WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES ACROSS SITE

|                     | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|---------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                     | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| HEMATOCRIT (%)      | 278   | 35.0  | 36.5  | 38.0  | 36.4  | 2.4  | 263     | 35.0  | 36.0  | 38.0  | 36.4  | 2.6  | 0.05  | 0.956 |
| HEMOGLOBIN (GM/DL)  | 276   | 12.3  | 13.0  | 13.5  | 12.9  | 0.9  | 259     | 12.3  | 12.9  | 13.5  | 12.9  | 0.9  | -0.08 | 0.936 |
| FEP (MCG/DL)        | 273   | 15.0  | 19.0  | 25.0  | 20.6  | 8.7  | 260     | 14.0  | 19.0  | 26.0  | 20.4  | 9.2  | 0.27  | 0.787 |
| MCHC (%)            | 273   | 34.3  | 35.5  | 36.4  | 35.4  | 1.6  | 258     | 34.4  | 35.6  | 36.4  | 35.5  | 1.8  | -0.77 | 0.440 |
| TIBC (MCG/DL)       | 251   | 299.5 | 329.0 | 354.0 | 329.3 | 42.4 | 241     | 297.0 | 324.0 | 354.0 | 325.9 | 41.6 | 0.89  | 0.372 |
| SERUM IRON (MCG/DL) | 258   | 53.0  | 66.0  | 88.0  | 70.6  | 25.8 | 247     | 54.0  | 70.0  | 93.0  | 73.2  | 27.1 | -1.10 | 0.271 |
| TS (%)              | 251   | 16.4  | 20.3  | 26.4  | 21.7  | 7.7  | 235     | 16.2  | 20.9  | 28.2  | 22.2  | 8.2  | -0.73 | 0.465 |
| FERRITIN (NG/DL)    | 249   | 15.0  | 21.0  | 29.0  | 24.3  | 22.2 | 229     | 16.0  | 22.0  | 31.0  | 24.7  | 12.4 | -0.20 | 0.845 |
| B-CAROTENE (MCG/DL) | 114   | 73.0  | 96.0  | 115.0 | 97.5  | 30.7 | 115     | 76.0  | 96.0  | 115.0 | 96.5  | 28.5 | 0.26  | 0.793 |
| CHOLESTEROL (MG/DL) | 273   | 141.0 | 158.0 | 181.0 | 161.2 | 30.6 | 252     | 141.0 | 158.0 | 179.5 | 162.6 | 31.2 | -0.55 | 0.585 |
| VITAMIN A (MCG/DL)  | 113   | 31.0  | 36.0  | 42.0  | 37.1  | 8.9  | 112     | 31.0  | 35.0  | 40.5  | 36.1  | 7.7  | 0.92  | 0.359 |
| VITAMIN C (MG/DL)   | 55    | 1.1   | 1.5   | 1.7   | 1.5   | 0.5  | 54      | 1.1   | 1.4   | 1.7   | 1.4   | 0.4  | 0.66  | 0.510 |

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Table 7-13 (continued)

BIOCHEMICAL INDICATORS FOR FOUR TO SIX YEAR OLDS  
WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES WITHIN SITE

|                           | MALES |      |      |      |      |     | FEMALES |      |      |      |      |      | T     | P     |
|---------------------------|-------|------|------|------|------|-----|---------|------|------|------|------|------|-------|-------|
|                           | N     | Q1   | MED  | Q3   | MEAN | SD  | N       | Q1   | MED  | Q3   | MEAN | SD   |       |       |
| <b>HEMATOCRIT (%)</b>     |       |      |      |      |      |     |         |      |      |      |      |      |       |       |
| Greene/Humphreys          | 64    | 34.5 | 35.8 | 37.0 | 35.6 | 2.2 | 66      | 34.0 | 35.5 | 37.0 | 35.5 | 3.0  | 0.29  | 0.775 |
| St. Clair                 | 65    | 34.0 | 35.5 | 37.0 | 35.2 | 2.5 | 51      | 34.2 | 35.5 | 37.0 | 35.6 | 1.9  | -0.78 | 0.438 |
| Maricopa                  | 74    | 35.0 | 36.5 | 38.0 | 36.7 | 2.0 | 81      | 35.0 | 36.0 | 38.0 | 36.3 | 2.4  | 1.07  | 0.288 |
| Mingo                     | 75    | 36.5 | 38.0 | 39.0 | 37.8 | 2.1 | 65      | 36.5 | 37.5 | 39.5 | 38.0 | 2.2  | -0.70 | 0.488 |
| <b>HEMOGLOBIN (GM/DL)</b> |       |      |      |      |      |     |         |      |      |      |      |      |       |       |
| Greene/Humphreys          | 63    | 12.0 | 12.8 | 13.2 | 12.6 | 0.9 | 66      | 11.9 | 12.7 | 13.5 | 12.6 | 1.1  | -0.10 | 0.917 |
| St. Clair                 | 66    | 12.1 | 12.5 | 13.3 | 12.6 | 1.1 | 51      | 12.2 | 12.6 | 13.2 | 12.7 | 0.8  | -0.32 | 0.747 |
| Maricopa                  | 73    | 12.8 | 13.2 | 13.6 | 13.1 | 0.7 | 79      | 12.6 | 13.0 | 13.4 | 13.0 | 0.8  | 1.36  | 0.176 |
| Mingo                     | 74    | 12.7 | 13.2 | 13.8 | 13.2 | 0.7 | 63      | 12.7 | 13.3 | 14.0 | 13.3 | 0.8  | -1.04 | 0.300 |
| <b>FEP (MCG/DL)</b>       |       |      |      |      |      |     |         |      |      |      |      |      |       |       |
| Greene/Humphreys          | 63    | 14.5 | 18.0 | 24.0 | 20.4 | 9.7 | 65      | 14.0 | 18.0 | 23.0 | 18.8 | 7.5  | 1.09  | 0.276 |
| St. Clair                 | 65    | 16.0 | 20.0 | 27.0 | 22.6 | 9.8 | 50      | 16.0 | 20.5 | 27.0 | 22.3 | 9.6  | 0.18  | 0.857 |
| Maricopa                  | 74    | 19.0 | 22.0 | 28.0 | 23.0 | 6.8 | 81      | 18.0 | 23.0 | 30.0 | 23.9 | 8.1  | -0.70 | 0.487 |
| Mingo                     | 71    | 11.0 | 15.0 | 20.5 | 16.5 | 6.9 | 64      | 9.0  | 13.0 | 20.0 | 16.3 | 10.1 | 0.13  | 0.895 |
| <b>MCHC (%)</b>           |       |      |      |      |      |     |         |      |      |      |      |      |       |       |
| Greene/Humphreys          | 63    | 34.5 | 35.5 | 36.5 | 35.4 | 1.7 | 66      | 34.1 | 35.6 | 37.1 | 35.6 | 2.0  | -0.78 | 0.437 |
| St. Clair                 | 64    | 34.3 | 35.6 | 36.5 | 35.6 | 1.8 | 51      | 34.3 | 35.6 | 37.0 | 35.6 | 1.7  | -0.02 | 0.981 |
| Maricopa                  | 72    | 34.9 | 35.9 | 36.8 | 35.8 | 1.4 | 78      | 35.0 | 35.6 | 36.3 | 35.7 | 1.9  | 0.45  | 0.653 |
| Mingo                     | 74    | 33.9 | 34.8 | 35.8 | 34.8 | 1.3 | 63      | 34.1 | 34.9 | 36.0 | 35.1 | 1.5  | -1.10 | 0.272 |

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Table 7-13 (continued)

BIOCHEMICAL INDICATORS FOR FOUR TO SIX YEAR OLDS  
WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES WITHIN SITE

|                            | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|----------------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                            | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>TIBC (MCG/DL)</b>       |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 58    | 303.0 | 331.5 | 359.0 | 328.4 | 42.5 | 55      | 310.0 | 330.0 | 358.0 | 336.9 | 43.9 | -1.05 | 0.298 |
| St. Clair                  | 57    | 302.0 | 322.0 | 344.0 | 321.7 | 32.6 | 51      | 293.0 | 317.0 | 336.0 | 317.4 | 29.3 | 0.73  | 0.467 |
| Maricopa                   | 68    | 310.0 | 342.5 | 376.0 | 342.3 | 47.7 | 77      | 300.0 | 329.0 | 362.0 | 334.0 | 46.5 | 1.06  | 0.293 |
| Mingo                      | 68    | 293.5 | 318.5 | 347.0 | 323.4 | 41.8 | 58      | 288.0 | 313.5 | 341.0 | 312.2 | 36.9 | 1.60  | 0.113 |
| <b>SERUM IRON (MCG/DL)</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 59    | 48.0  | 61.0  | 79.0  | 64.7  | 23.3 | 60      | 53.0  | 65.0  | 82.0  | 66.5  | 23.4 | -0.42 | 0.677 |
| St. Clair                  | 59    | 53.0  | 67.0  | 89.5  | 71.2  | 25.5 | 49      | 54.0  | 71.0  | 92.0  | 71.8  | 26.0 | -0.13 | 0.897 |
| Maricopa                   | 70    | 60.0  | 74.0  | 100.0 | 79.8  | 28.9 | 80      | 59.0  | 78.5  | 102.0 | 81.2  | 28.7 | -0.30 | 0.762 |
| Mingo                      | 70    | 50.0  | 65.0  | 76.0  | 65.9  | 22.4 | 58      | 48.0  | 68.5  | 93.0  | 70.2  | 27.2 | -0.97 | 0.334 |
| <b>TS (%)</b>              |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 56    | 14.9  | 19.3  | 24.7  | 19.8  | 6.6  | 55      | 14.7  | 19.7  | 24.2  | 19.7  | 7.0  | 0.08  | 0.933 |
| St. Clair                  | 57    | 17.5  | 22.0  | 28.0  | 22.8  | 7.6  | 49      | 17.8  | 21.1  | 28.2  | 22.7  | 8.0  | 0.04  | 0.972 |
| Maricopa                   | 69    | 18.1  | 23.0  | 27.1  | 23.3  | 8.5  | 77      | 16.2  | 23.4  | 30.4  | 23.9  | 8.5  | -0.43 | 0.668 |
| Mingo                      | 69    | 14.3  | 19.2  | 25.5  | 20.6  | 7.6  | 54      | 15.5  | 20.8  | 28.3  | 21.8  | 8.4  | -0.81 | 0.422 |
| <b>FERRITIN (NG/DL)</b>    |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 58    | 17.0  | 23.0  | 31.0  | 25.1  | 11.2 | 50      | 15.0  | 23.0  | 32.0  | 24.3  | 10.6 | 0.38  | 0.703 |
| St. Clair                  | 59    | 19.5  | 27.0  | 34.0  | 33.6  | 40.1 | 50      | 20.0  | 27.0  | 35.0  | 29.0  | 14.9 | 0.81  | 0.421 |
| Maricopa                   | 66    | 13.0  | 16.0  | 26.0  | 20.4  | 11.3 | 72      | 15.0  | 18.5  | 24.0  | 20.8  | 10.3 | -0.23 | 0.816 |
| Mingo                      | 66    | 14.0  | 18.0  | 23.0  | 19.4  | 9.3  | 57      | 16.0  | 24.0  | 35.0  | 26.1  | 12.6 | -3.30 | 0.001 |

Table 7-13 (continued)

BIOCHEMICAL INDICATORS FOR FOUR TO SIX YEAR OLDS  
WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES WITHIN SITE

|                            | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|----------------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                            | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>B-CARDTENE (MCG/DL)</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 45    | 76.0  | 96.0  | 117.0 | 98.1  | 31.8 | 40      | 78.0  | 98.5  | 125.5 | 99.7  | 30.5 | -0.24 | 0.812 |
| Maricopa                   | 69    | 72.0  | 96.0  | 113.0 | 97.1  | 30.1 | 75      | 76.0  | 92.0  | 112.0 | 94.8  | 27.4 | 0.49  | 0.624 |
| <b>CHOLESTEROL (MG/DL)</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 62    | 150.0 | 167.5 | 184.0 | 165.2 | 27.2 | 61      | 140.0 | 167.0 | 184.0 | 166.8 | 33.1 | -0.29 | 0.773 |
| St. Clair                  | 66    | 140.0 | 152.5 | 186.0 | 166.8 | 39.3 | 51      | 150.0 | 161.0 | 176.5 | 169.4 | 29.6 | -0.41 | 0.680 |
| Maricopa                   | 72    | 147.0 | 160.0 | 179.0 | 162.5 | 27.2 | 79      | 138.0 | 151.0 | 178.5 | 160.5 | 31.4 | 0.43  | 0.670 |
| Mingo                      | 73    | 133.0 | 149.0 | 167.0 | 151.3 | 25.5 | 61      | 141.0 | 156.0 | 175.0 | 155.6 | 28.4 | -0.89 | 0.373 |
| <b>VITAMIN A (MCG/DL)</b>  |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 44    | 29.5  | 35.0  | 43.0  | 38.0  | 11.7 | 38      | 31.0  | 36.0  | 44.0  | 36.8  | 8.4  | 0.52  | 0.604 |
| Maricopa                   | 69    | 32.0  | 36.0  | 40.0  | 36.6  | 6.7  | 74      | 31.0  | 35.0  | 39.0  | 35.7  | 7.4  | 0.72  | 0.473 |
| <b>VITAMIN C (MG/DL)</b>   |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Maricopa                   | 55    | 1.2   | 1.5   | 1.7   | 1.5   | 0.5  | 54      | 1.1   | 1.4   | 1.7   | 1.4   | 0.4  | 0.66  | 0.510 |

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Table 7-14

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES WITHIN ETHNICITY ACROSS SITE

|                            | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|----------------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                            | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>HEMATOCRIT (%)</b>      |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 143   | 36.1  | 37.5  | 39.0  | 37.6  | 2.2  | 142     | 36.0  | 37.5  | 39.0  | 37.6  | 2.4  | 0.25  | 0.800 |
| Black                      | 196   | 34.0  | 35.5  | 37.0  | 35.5  | 2.4  | 183     | 34.0  | 35.5  | 37.0  | 35.6  | 2.3  | -0.41 | 0.685 |
| Hispanic                   | 53    | 35.5  | 36.5  | 38.0  | 36.6  | 1.7  | 57      | 35.0  | 36.0  | 38.0  | 36.3  | 2.5  | 0.71  | 0.482 |
| <b>HEMOGLOBIN (GM/DL)</b>  |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 141   | 12.7  | 13.2  | 13.7  | 13.2  | 0.8  | 139     | 12.7  | 13.3  | 13.9  | 13.2  | 0.8  | -0.35 | 0.724 |
| Black                      | 195   | 12.0  | 12.5  | 13.3  | 12.6  | 1.0  | 183     | 12.0  | 12.5  | 13.3  | 12.6  | 0.9  | 0.43  | 0.670 |
| Hispanic                   | 52    | 12.8  | 13.2  | 13.6  | 13.2  | 0.6  | 55      | 12.6  | 13.1  | 13.5  | 13.0  | 0.8  | 1.26  | 0.212 |
| <b>FEP (MCG/DL)</b>        |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 137   | 12.0  | 17.0  | 21.0  | 17.5  | 7.2  | 138     | 11.0  | 17.0  | 22.0  | 17.3  | 8.7  | 0.24  | 0.808 |
| Black                      | 194   | 14.0  | 18.5  | 25.0  | 20.6  | 8.4  | 181     | 14.0  | 19.0  | 25.0  | 20.4  | 9.8  | 0.13  | 0.900 |
| Hispanic                   | 53    | 20.0  | 24.0  | 28.0  | 24.2  | 6.3  | 57      | 18.0  | 24.0  | 32.0  | 24.8  | 8.6  | -0.47 | 0.640 |
| <b>MCHC (%)</b>            |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 138   | 33.9  | 34.9  | 36.0  | 35.0  | 1.8  | 138     | 34.1  | 35.2  | 36.1  | 35.2  | 1.6  | -1.06 | 0.280 |
| Black                      | 194   | 34.3  | 35.5  | 36.6  | 35.5  | 1.8  | 181     | 34.1  | 35.3  | 36.5  | 35.4  | 1.7  | 0.51  | 0.611 |
| Hispanic                   | 52    | 35.3  | 36.1  | 37.0  | 36.1  | 1.2  | 55      | 35.3  | 35.7  | 36.3  | 35.8  | 2.2  | 0.99  | 0.327 |
| <b>TIBC (MCG/DL)</b>       |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 129   | 295.0 | 322.0 | 349.0 | 323.6 | 40.5 | 121     | 288.0 | 313.0 | 342.0 | 314.6 | 39.0 | 1.79  | 0.075 |
| Black                      | 169   | 302.0 | 325.0 | 349.0 | 325.9 | 39.0 | 160     | 299.0 | 325.5 | 348.0 | 327.1 | 38.7 | -0.29 | 0.774 |
| Hispanic                   | 49    | 323.0 | 348.0 | 381.0 | 349.7 | 46.6 | 55      | 307.5 | 335.0 | 362.5 | 339.8 | 45.5 | 1.10  | 0.275 |
| <b>SERUM IRON (MCG/DL)</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 135   | 53.0  | 67.0  | 82.0  | 69.1  | 23.2 | 126     | 51.0  | 66.0  | 82.0  | 69.5  | 25.7 | -0.13 | 0.896 |
| Black                      | 173   | 52.0  | 65.0  | 87.0  | 69.4  | 25.6 | 166     | 51.0  | 69.0  | 87.0  | 68.8  | 24.6 | 0.25  | 0.807 |
| Hispanic                   | 49    | 63.0  | 75.0  | 99.0  | 79.2  | 28.7 | 56      | 64.5  | 84.0  | 102.5 | 82.8  | 30.5 | -0.63 | 0.529 |

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Table 7-14 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES WITHIN ETHNICITY ACROSS SITE

|                            | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|----------------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                            | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>TS (%)</b>              |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 131   | 15.7  | 19.8  | 25.8  | 21.1  | 7.4  | 116     | 16.2  | 20.6  | 26.9  | 21.5  | 7.5  | -0.39 | 0.689 |
| Black                      | 164   | 16.1  | 20.7  | 26.3  | 21.4  | 7.4  | 156     | 15.8  | 20.8  | 25.4  | 20.9  | 7.4  | 0.61  | 0.543 |
| Hispanic                   | 50    | 17.6  | 23.5  | 26.7  | 23.3  | 8.5  | 56      | 16.9  | 24.3  | 32.1  | 24.6  | 9.3  | -0.74 | 0.460 |
| <b>FERRITIN (NG/DL)</b>    |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 127   | 13.5  | 17.0  | 23.5  | 19.1  | 8.7  | 116     | 15.0  | 21.0  | 32.0  | 24.7  | 12.3 | -4.06 | 0.000 |
| Black                      | 168   | 17.0  | 25.0  | 34.0  | 28.4  | 25.9 | 154     | 19.0  | 26.0  | 35.0  | 28.1  | 13.9 | 0.11  | 0.909 |
| Hispanic                   | 48    | 13.0  | 15.5  | 23.5  | 19.3  | 10.3 | 52      | 14.0  | 18.0  | 22.5  | 19.9  | 10.2 | -0.30 | 0.767 |
| <b>B-CAROTENE (MCG/DL)</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 27    | 64.0  | 96.0  | 114.5 | 94.6  | 31.6 | 33      | 78.0  | 89.0  | 106.0 | 93.8  | 27.5 | 0.10  | 0.917 |
| Black                      | 61    | 76.0  | 96.0  | 117.0 | 96.6  | 30.3 | 49      | 81.0  | 96.0  | 115.0 | 97.7  | 27.6 | -0.20 | 0.844 |
| Hispanic                   | 50    | 85.0  | 102.0 | 115.0 | 100.5 | 28.9 | 52      | 75.5  | 94.5  | 114.5 | 96.4  | 29.3 | 0.71  | 0.479 |
| <b>CHOLESTEROL (MG/DL)</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 136   | 140.0 | 158.0 | 172.5 | 156.8 | 28.4 | 136     | 138.5 | 155.5 | 175.0 | 156.2 | 28.7 | 0.19  | 0.853 |
| Black                      | 189   | 146.0 | 169.0 | 188.0 | 168.7 | 33.8 | 171     | 147.0 | 165.0 | 186.0 | 168.7 | 30.9 | -0.02 | 0.986 |
| Hispanic                   | 52    | 149.5 | 162.5 | 179.0 | 163.9 | 27.6 | 55      | 136.5 | 149.0 | 172.0 | 160.2 | 32.8 | 0.65  | 0.519 |
| <b>VITAMIN A (MCG/DL)</b>  |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 26    | 33.0  | 35.0  | 38.0  | 35.3  | 5.5  | 32      | 33.5  | 37.5  | 43.0  | 38.3  | 6.1  | -1.96 | 0.055 |
| Black                      | 61    | 30.0  | 36.0  | 42.0  | 37.8  | 10.2 | 46      | 30.0  | 36.0  | 44.0  | 36.7  | 8.7  | 0.61  | 0.542 |
| Hispanic                   | 50    | 32.0  | 37.0  | 42.0  | 36.9  | 7.5  | 53      | 31.0  | 35.0  | 38.0  | 34.8  | 7.6  | 1.38  | 0.171 |
| <b>VITAMIN C (MG/DL)</b>   |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 13    | 1.4   | 1.5   | 1.7   | 1.6   | 0.5  | 16      | 1.2   | 1.3   | 1.8   | 1.5   | 0.4  | 0.83  | 0.416 |
| Black                      | 5     | 1.2   | 1.5   | 1.6   | 1.5   | 0.5  | 1       | ---   | 0.5   | ---   | 0.5   | ---  | 4.92  | 0.008 |
| Hispanic                   | 37    | 1.0   | 1.5   | 1.6   | 1.4   | 0.5  | 37      | 1.1   | 1.4   | 1.7   | 1.4   | 0.4  | 0.03  | 0.979 |

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Table 7-14 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES WITHIN ETHNICITY BY SITE

|                           | MALES |      |      |      |      |      | FEMALES |      |      |      |      |      | T     | P     |
|---------------------------|-------|------|------|------|------|------|---------|------|------|------|------|------|-------|-------|
|                           | N     | Q1   | MED  | Q3   | MEAN | SD   | N       | Q1   | MED  | Q3   | MEAN | SD   |       |       |
| <b>HEMATOCRIT (%)</b>     |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| Greene/Humphreys          |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| White                     | 15    | 35.0 | 36.0 | 36.8 | 35.9 | 1.2  | 20      | 35.0 | 36.8 | 38.8 | 37.0 | 2.6  | -1.73 | 0.093 |
| Black                     | 92    | 34.0 | 35.3 | 37.0 | 35.6 | 2.3  | 86      | 34.0 | 36.0 | 37.0 | 35.5 | 2.7  | 0.14  | 0.889 |
| St Clair                  |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| Black                     | 95    | 34.0 | 35.5 | 37.0 | 35.3 | 2.4  | 86      | 34.0 | 35.3 | 37.0 | 35.5 | 1.8  | -0.71 | 0.479 |
| Maricopa                  |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| White                     | 17    | 35.5 | 36.5 | 39.0 | 37.1 | 2.5  | 21      | 35.0 | 36.5 | 38.0 | 36.3 | 1.9  | 1.02  | 0.315 |
| Black                     | 5     | 34.0 | 38.0 | 38.5 | 36.8 | 3.2  | 3       | ---  | ---  | ---  | 37.0 | 3.6  | -0.08 | 0.941 |
| Hispanic                  | 52    | 35.3 | 36.5 | 38.0 | 36.6 | 1.7  | 57      | 35.0 | 36.0 | 38.0 | 36.3 | 2.5  | 0.68  | 0.497 |
| Mingo                     |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| White                     | 111   | 36.5 | 38.0 | 39.5 | 37.9 | 2.1  | 101     | 36.5 | 38.0 | 39.5 | 37.9 | 2.3  | 0.10  | 0.924 |
| Black                     | 4     | 35.0 | 38.3 | 39.8 | 37.4 | 3.5  | 8       | 35.8 | 36.8 | 37.8 | 36.9 | 1.5  | 0.28  | 0.797 |
| <b>HEMOGLOBIN (GM/DL)</b> |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| Greene/Humphreys          |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| White                     | 15    | 12.4 | 12.9 | 13.3 | 12.9 | 0.7  | 20      | 12.5 | 13.9 | 14.2 | 13.4 | 1.0  | -1.66 | 0.106 |
| Black                     | 91    | 12.0 | 12.6 | 13.3 | 12.6 | 0.9  | 86      | 11.9 | 12.7 | 13.4 | 12.6 | 1.0  | 0.41  | 0.684 |
| St Clair                  |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| Black                     | 95    | 12.0 | 12.5 | 13.3 | 12.6 | 1.1  | 86      | 12.0 | 12.3 | 13.0 | 12.5 | 0.8  | 0.52  | 0.605 |
| Maricopa                  |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| White                     | 17    | 13.0 | 13.2 | 13.7 | 13.2 | 0.8  | 21      | 12.6 | 13.0 | 13.4 | 12.9 | 0.6  | 1.36  | 0.185 |
| Black                     | 5     | 11.7 | 12.6 | 12.6 | 12.3 | 0.9  | 3       | ---  | ---  | ---  | 12.9 | 0.8  | -1.05 | 0.343 |
| Hispanic                  | 51    | 12.8 | 13.2 | 13.6 | 13.2 | 0.6  | 55      | 12.6 | 13.1 | 13.5 | 13.0 | 0.8  | 1.33  | 0.187 |
| Mingo                     |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| White                     | 109   | 12.7 | 13.2 | 13.8 | 13.2 | 0.8  | 98      | 12.7 | 13.3 | 13.9 | 13.2 | 0.8  | -0.30 | 0.764 |
| Black                     | 4     | 12.3 | 13.2 | 13.7 | 13.0 | 1.1  | 8       | 12.4 | 13.1 | 13.3 | 12.9 | 1.1  | 0.08  | 0.942 |
| <b>FEP (MCG/DL)</b>       |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| Greene/Humphreys          |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| White                     | 15    | 14.5 | 20.0 | 23.0 | 19.9 | 8.7  | 19      | 11.5 | 19.0 | 21.0 | 17.9 | 6.4  | 0.74  | 0.467 |
| Black                     | 91    | 14.0 | 18.0 | 23.0 | 19.3 | 8.8  | 86      | 13.0 | 18.0 | 24.0 | 19.0 | 8.6  | 0.18  | 0.861 |
| St Clair                  |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| Black                     | 94    | 16.0 | 20.0 | 27.0 | 22.0 | 9.6  | 84      | 15.0 | 19.0 | 26.5 | 21.9 | 10.5 | 0.07  | 0.948 |
| Maricopa                  |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| White                     | 17    | 16.0 | 19.0 | 21.0 | 19.2 | 4.8  | 21      | 19.0 | 22.0 | 27.0 | 22.8 | 5.8  | -2.07 | 0.046 |
| Black                     | 5     | 11.0 | 27.0 | 28.0 | 23.6 | 12.8 | 3       | ---  | ---  | ---  | 14.0 | 3.6  | 1.58  | 0.175 |
| Hispanic                  | 52    | 20.0 | 24.0 | 28.0 | 24.3 | 6.3  | 57      | 18.0 | 24.0 | 32.0 | 24.8 | 8.6  | -0.40 | 0.691 |
| Mingo                     |       |      |      |      |      |      |         |      |      |      |      |      |       |       |
| White                     | 105   | 12.0 | 15.0 | 21.0 | 16.9 | 7.3  | 98      | 9.0  | 13.0 | 20.0 | 16.0 | 9.2  | 0.78  | 0.435 |
| Black                     | 4     | 9.0  | 13.0 | 19.0 | 14.0 | 6.0  | 8       | 10.5 | 21.5 | 33.5 | 23.3 | 14.0 | -1.60 | 0.141 |

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Table 7-14 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES WITHIN ETHNICITY BY SITE

|                            | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|----------------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                            | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>MCHC (%)</b>            |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 15    | 35.1  | 36.4  | 36.8  | 36.0  | 1.2  | 20      | 35.1  | 36.0  | 36.7  | 36.2  | 2.0  | -0.38 | 0.706 |
| Black                      | 91    | 34.6  | 35.5  | 36.6  | 35.5  | 1.7  | 86      | 34.2  | 35.4  | 36.5  | 35.4  | 1.8  | 0.27  | 0.787 |
| St Clair                   |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Black                      | 94    | 34.3  | 35.6  | 36.6  | 35.6  | 1.8  | 86      | 34.0  | 35.3  | 36.6  | 35.3  | 1.8  | 0.88  | 0.379 |
| Maricopa                   |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 16    | 34.5  | 35.6  | 36.4  | 35.5  | 1.5  | 21      | 34.9  | 35.6  | 36.2  | 35.6  | 1.0  | -0.29 | 0.777 |
| Black                      | 5     | 33.2  | 33.3  | 33.6  | 33.5  | 0.6  | 2       | ---   | ---   | ---   | 34.2  | 0.3  | -2.13 | 0.100 |
| Hispanic                   | 51    | 35.4  | 36.1  | 37.0  | 36.1  | 1.2  | 55      | 35.3  | 35.7  | 36.3  | 35.8  | 2.2  | 1.11  | 0.272 |
| Mingo                      |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 107   | 33.9  | 34.8  | 35.8  | 34.8  | 1.4  | 97      | 33.9  | 34.7  | 35.8  | 34.9  | 1.5  | -0.54 | 0.586 |
| Black                      | 4     | 34.5  | 34.9  | 35.2  | 34.8  | 0.5  | 7       | 34.7  | 34.9  | 36.3  | 35.6  | 1.2  | -1.44 | 0.183 |
| <b>TIBC (MCG/DL)</b>       |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 14    | 311.0 | 343.0 | 357.0 | 338.4 | 32.2 | 15      | 309.5 | 329.0 | 346.0 | 325.3 | 37.4 | 1.02  | 0.318 |
| Black                      | 80    | 302.0 | 330.0 | 360.0 | 330.8 | 43.3 | 70      | 306.0 | 330.0 | 359.0 | 335.4 | 43.8 | -0.64 | 0.521 |
| St Clair                   |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Black                      | 80    | 299.5 | 317.0 | 344.0 | 321.3 | 35.4 | 80      | 298.5 | 317.5 | 340.5 | 321.6 | 33.4 | -0.04 | 0.965 |
| Maricopa                   |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 15    | 300.5 | 319.0 | 348.5 | 323.8 | 52.6 | 20      | 286.5 | 309.5 | 361.0 | 321.5 | 48.9 | 0.13  | 0.898 |
| Black                      | 5     | 317.0 | 340.0 | 343.0 | 330.4 | 18.4 | 2       | ---   | ---   | ---   | 301.5 | 2.1  | 3.46  | 0.026 |
| Hispanic                   | 48    | 320.0 | 347.5 | 381.5 | 349.3 | 47.1 | 55      | 307.5 | 335.0 | 362.5 | 339.8 | 45.5 | 1.05  | 0.297 |
| Mingo                      |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 100   | 293.0 | 319.0 | 346.0 | 321.5 | 39.5 | 86      | 288.0 | 310.0 | 339.0 | 311.1 | 36.5 | 1.86  | 0.065 |
| Black                      | 4     | 290.0 | 311.0 | 332.5 | 311.3 | 24.8 | 8       | 294.5 | 307.0 | 342.5 | 315.8 | 32.6 | -0.27 | 0.797 |
| <b>SERUM IRON (MCG/DL)</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 14    | 58.0  | 69.0  | 81.0  | 68.6  | 18.9 | 18      | 53.0  | 62.0  | 93.0  | 70.1  | 24.1 | -0.19 | 0.847 |
| Black                      | 83    | 49.0  | 64.0  | 83.0  | 67.1  | 24.8 | 75      | 43.5  | 63.0  | 79.0  | 62.6  | 23.6 | 1.16  | 0.246 |
| St Clair                   |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Black                      | 83    | 54.0  | 67.0  | 89.0  | 70.7  | 25.2 | 80      | 56.0  | 75.0  | 92.5  | 75.3  | 24.2 | -1.18 | 0.240 |
| Maricopa                   |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 17    | 59.0  | 69.0  | 91.0  | 76.4  | 27.0 | 21      | 58.0  | 66.0  | 95.0  | 75.7  | 24.5 | 0.09  | 0.930 |
| Black                      | 5     | 70.0  | 73.0  | 121.0 | 87.6  | 44.5 | 3       | ---   | ---   | ---   | 89.0  | 19.7 | -0.06 | 0.953 |
| Hispanic                   | 48    | 63.0  | 78.0  | 99.5  | 80.1  | 28.3 | 56      | 64.5  | 84.0  | 102.5 | 82.9  | 30.5 | -0.47 | 0.638 |
| Mingo                      |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| White                      | 104   | 53.0  | 66.0  | 80.5  | 68.0  | 23.0 | 87      | 48.0  | 67.0  | 88.5  | 68.0  | 26.3 | 0.02  | 0.984 |
| Black                      | 2     | ---   | ---   | ---   | 68.0  | 0.0  | 8       | 38.5  | 47.0  | 71.5  | 53.8  | 19.4 | 2.08  | 0.076 |



Table 7-14 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES WITHIN ETHNICITY BY SITE

|                           | MALES |      |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|---------------------------|-------|------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                           | N     | Q1   | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>TS (%)</b>             |       |      |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          |       |      |       |       |       |      |         |       |       |       |       |      |       |       |
| White                     | 15    | 16.4 | 20.4  | 25.0  | 21.3  | 6.9  | 16      | 16.9  | 20.9  | 25.4  | 21.7  | 6.5  | -0.14 | 0.889 |
| Black                     | 76    | 14.6 | 19.5  | 24.2  | 19.8  | 6.7  | 70      | 13.4  | 19.0  | 24.0  | 18.7  | 7.4  | 0.95  | 0.343 |
| St Clair                  |       |      |       |       |       |      |         |       |       |       |       |      |       |       |
| Black                     | 79    | 17.5 | 22.0  | 27.4  | 22.4  | 7.5  | 77      | 18.3  | 23.2  | 27.4  | 23.0  | 7.0  | -0.52 | 0.601 |
| Maricopa                  |       |      |       |       |       |      |         |       |       |       |       |      |       |       |
| White                     | 15    | 17.7 | 19.5  | 26.9  | 21.3  | 7.5  | 19      | 16.2  | 19.7  | 26.6  | 21.6  | 6.0  | -0.12 | 0.903 |
| Black                     | 5     | 21.0 | 23.0  | 35.3  | 26.2  | 12.7 | 2       | ----- | ----- | ----- | 26.0  | 3.7  | 0.03  | 0.979 |
| Hispanic                  | 49    | 18.1 | 23.8  | 26.7  | 23.6  | 8.3  | 56      | 16.9  | 24.3  | 32.1  | 24.6  | 9.3  | -0.58 | 0.564 |
| Mingo                     |       |      |       |       |       |      |         |       |       |       |       |      |       |       |
| White                     | 101   | 15.6 | 19.8  | 26.1  | 21.1  | 7.5  | 81      | 16.0  | 21.1  | 27.4  | 21.4  | 8.1  | -0.31 | 0.755 |
| Black                     | 4     | 21.7 | 26.2  | 30.9  | 26.0  | 5.2  | 7       | 14.9  | 16.4  | 21.9  | 18.3  | 6.2  | 2.21  | 0.063 |
| <b>FERRITIN (NG/DL)</b>   |       |      |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          |       |      |       |       |       |      |         |       |       |       |       |      |       |       |
| White                     | 15    | 15.0 | 21.0  | 25.0  | 20.5  | 7.8  | 14      | 15.0  | 25.5  | 39.0  | 25.9  | 12.4 | -1.41 | 0.173 |
| Black                     | 76    | 16.5 | 23.5  | 33.5  | 25.5  | 11.5 | 65      | 19.0  | 23.0  | 32.0  | 26.2  | 11.8 | -0.37 | 0.712 |
| St Clair                  |       |      |       |       |       |      |         |       |       |       |       |      |       |       |
| Black                     | 83    | 17.5 | 25.0  | 35.0  | 30.9  | 34.8 | 79      | 19.0  | 27.0  | 35.0  | 29.6  | 15.4 | 0.33  | 0.742 |
| Maricopa                  |       |      |       |       |       |      |         |       |       |       |       |      |       |       |
| White                     | 14    | 11.0 | 17.0  | 24.0  | 19.1  | 10.1 | 18      | 17.0  | 20.0  | 34.0  | 24.0  | 10.0 | -1.37 | 0.181 |
| Black                     | 5     | 27.0 | 34.0  | 47.0  | 34.8  | 14.1 | 2       | ----- | ----- | ----- | 14.5  | 12.0 | 1.92  | 0.195 |
| Hispanic                  | 47    | 13.0 | 15.0  | 22.5  | 19.2  | 10.4 | 52      | 14.0  | 18.0  | 22.5  | 19.9  | 10.2 | -0.34 | 0.733 |
| Mingo                     |       |      |       |       |       |      |         |       |       |       |       |      |       |       |
| White                     | 98    | 13.0 | 17.0  | 23.0  | 18.8  | 8.6  | 84      | 15.0  | 21.0  | 32.0  | 24.6  | 12.9 | -3.48 | 0.001 |
| Black                     | 4     | 17.5 | 23.0  | 29.0  | 23.3  | 6.7  | 8       | 24.0  | 34.0  | 38.0  | 33.3  | 13.3 | -1.73 | 0.114 |
| <b>B-CARDENE (MCG/DL)</b> |       |      |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys          |       |      |       |       |       |      |         |       |       |       |       |      |       |       |
| White                     | 13    | 96.0 | 109.0 | 132.0 | 109.3 | 31.3 | 12      | 72.5  | 102.5 | 129.0 | 102.0 | 33.4 | 0.56  | 0.579 |
| Black                     | 56    | 76.0 | 94.5  | 113.5 | 95.5  | 28.3 | 47      | 78.5  | 96.0  | 115.5 | 97.1  | 28.0 | -0.28 | 0.779 |
| Maricopa                  |       |      |       |       |       |      |         |       |       |       |       |      |       |       |
| White                     | 14    | 58.0 | 76.5  | 108.0 | 81.0  | 26.1 | 21      | 78.0  | 88.0  | 104.0 | 89.1  | 23.1 | -0.95 | 0.353 |
| Black                     | 5     | 72.0 | 105.0 | 137.0 | 108.6 | 42.2 | 2       | ----- | ----- | ----- | 111.0 | 5.6  | -0.12 | 0.907 |
| Hispanic                  | 50    | 85.0 | 102.0 | 115.0 | 100.5 | 28.9 | 52      | 75.5  | 94.5  | 114.5 | 96.4  | 29.3 | 0.71  | 0.479 |

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Table 7-14 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES WITHIN ETHNICITY BY SITE

|                            | MALES |       |       |       |       |      | FEMALES |       |       |       |       |       | T     | P     |
|----------------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|-------|-------|-------|
|                            | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD    |       |       |
| <b>CHOLESTEROL (NG/DL)</b> |       |       |       |       |       |      |         |       |       |       |       |       |       |       |
| Greene/Humphreys           |       |       |       |       |       |      |         |       |       |       |       |       |       |       |
| White                      | 14    | 150.0 | 166.0 | 184.0 | 169.2 | 24.5 | 19      | 144.5 | 169.0 | 188.5 | 171.4 | 31.0  | -0.22 | 0.825 |
| Black                      | 85    | 155.0 | 172.0 | 189.0 | 171.0 | 30.9 | 75      | 143.5 | 163.0 | 184.0 | 165.1 | 31.8  | 1.18  | 0.241 |
| St Clair                   |       |       |       |       |       |      |         |       |       |       |       |       |       |       |
| Black                      | 95    | 141.5 | 158.0 | 183.0 | 166.4 | 36.6 | 85      | 153.0 | 168.0 | 189.0 | 172.6 | 29.5  | -1.26 | 0.208 |
| Maricopa                   |       |       |       |       |       |      |         |       |       |       |       |       |       |       |
| White                      | 16    | 141.0 | 155.0 | 165.5 | 155.1 | 20.8 | 21      | 141.0 | 151.0 | 171.0 | 154.7 | 23.7  | 0.06  | 0.950 |
| Black                      | 5     | 134.0 | 170.0 | 191.0 | 167.2 | 40.6 | 3       | ----- | ----- | ----- | 207.7 | 14.2  | -2.03 | 0.098 |
| Hispanic                   | 51    | 152.0 | 164.0 | 179.0 | 164.4 | 27.6 | 55      | 136.5 | 149.0 | 172.0 | 160.2 | 32.8  | 0.72  | 0.471 |
| Mingo                      |       |       |       |       |       |      |         |       |       |       |       |       |       |       |
| White                      | 106   | 135.0 | 157.5 | 172.0 | 155.5 | 25.9 | 96      | 138.0 | 155.0 | 167.0 | 153.6 | 28.6  | 0.49  | 0.624 |
| Black                      | 4     | 158.0 | 174.5 | 196.0 | 177.0 | 22.3 | 8       | 131.5 | 144.0 | 153.0 | 147.3 | 21.2  | -2.21 | 0.069 |
| <b>VITAMIN A (MCG/DL)</b>  |       |       |       |       |       |      |         |       |       |       |       |       |       |       |
| Greene/Humphreys           |       |       |       |       |       |      |         |       |       |       |       |       |       |       |
| White                      | 12    | 29.0  | 33.5  | 40.5  | 34.4  | 7.1  | 12      | 34.0  | 38.5  | 43.0  | 38.7  | 5.2   | -1.68 | 0.108 |
| Black                      | 56    | 30.5  | 36.0  | 43.0  | 38.1  | 10.6 | 45      | 30.0  | 36.0  | 44.0  | 36.7  | 8.8   | 0.71  | 0.478 |
| Maricopa                   |       |       |       |       |       |      |         |       |       |       |       |       |       |       |
| White                      | 14    | 33.0  | 36.0  | 38.0  | 36.1  | 3.8  | 20      | 33.0  | 37.0  | 43.0  | 38.0  | 6.6   | -1.10 | 0.281 |
| Black                      | 5     | 30.0  | 36.0  | 39.0  | 34.6  | 5.4  | 1       | ----- | 35.0  | ----- | 35.0  | ----- | -0.17 | 0.876 |
| Hispanic                   | 50    | 32.0  | 37.0  | 42.0  | 36.9  | 7.5  | 53      | 31.0  | 35.0  | 38.0  | 34.8  | 7.6   | 1.38  | 0.171 |
| <b>VITAMIN C (MG/DL)</b>   |       |       |       |       |       |      |         |       |       |       |       |       |       |       |
| Maricopa                   |       |       |       |       |       |      |         |       |       |       |       |       |       |       |
| White                      | 13    | 1.4   | 1.5   | 1.7   | 1.6   | 0.5  | 16      | 1.2   | 1.3   | 1.8   | 1.5   | 0.4   | 0.83  | 0.416 |
| Black                      | 5     | 1.2   | 1.5   | 1.6   | 1.5   | 0.5  | 1       | ----- | 0.5   | ----- | 0.5   | ----- | 4.82  | 0.008 |
| Hispanic                   | 37    | 1.0   | 1.5   | 1.6   | 1.4   | 0.5  | 37      | 1.1   | 1.4   | 1.7   | 1.4   | 0.4   | 0.03  | 0.979 |

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Table 7-15

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN WHITE AND BLACK CHILDREN ACROSS SITE

|                     | WHITE |       |       |       |       |      | BLACK |       |       |       |       |      | T     | P     |
|---------------------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|------|-------|-------|
|                     | N     | Q1    | MED   | Q3    | MEAN  | SD   | N     | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| HEMATOCRIT (%)      | 285   | 36.0  | 37.5  | 39.0  | 37.6  | 2.3  | 378   | 34.0  | 35.5  | 37.0  | 35.6  | 2.3  | 11.25 | 0.000 |
| HEMOGLOBIN (GM/DL)  | 280   | 12.7  | 13.2  | 13.8  | 13.2  | 0.8  | 378   | 12.0  | 12.5  | 13.3  | 12.6  | 1.0  | 8.54  | 0.000 |
| FEP (MCG/DL)        | 275   | 11.0  | 17.0  | 21.0  | 17.4  | 8.0  | 375   | 14.0  | 19.0  | 25.0  | 20.5  | 9.6  | -4.50 | 0.000 |
| MCHC (%)            | 276   | 34.0  | 35.0  | 36.0  | 35.1  | 1.5  | 378   | 34.2  | 35.4  | 36.5  | 35.4  | 1.8  | -2.57 | 0.010 |
| TIBC (MCG/DL)       | 250   | 290.0 | 317.0 | 347.0 | 319.2 | 39.9 | 328   | 300.0 | 325.0 | 349.0 | 326.5 | 38.8 | -2.19 | 0.029 |
| SERUM IRON (MCG/DL) | 261   | 53.0  | 67.0  | 86.0  | 69.3  | 24.4 | 339   | 52.0  | 67.0  | 87.0  | 69.1  | 25.1 | 0.11  | 0.911 |
| TS (%)              | 247   | 16.1  | 20.2  | 26.1  | 21.3  | 7.4  | 320   | 16.0  | 20.8  | 25.7  | 21.2  | 7.4  | 0.24  | 0.812 |
| FERRITIN (NG/DL)    | 243   | 14.0  | 19.0  | 27.0  | 21.7  | 10.9 | 322   | 18.0  | 25.5  | 35.0  | 28.3  | 21.0 | -4.80 | 0.000 |
| B-CAROTENE (MCG/DL) | 60    | 70.0  | 92.0  | 113.5 | 94.2  | 29.2 | 110   | 76.0  | 96.0  | 117.0 | 97.1  | 29.0 | -0.62 | 0.535 |
| CHOLESTEROL (MG/DL) | 272   | 139.0 | 157.0 | 173.5 | 156.5 | 27.0 | 360   | 147.0 | 166.5 | 187.5 | 168.7 | 32.4 | -5.14 | 0.000 |
| VITAMIN A (MCG/DL)  | 58    | 33.0  | 36.0  | 42.0  | 36.9  | 5.9  | 107   | 30.0  | 36.0  | 43.0  | 37.3  | 9.6  | -0.32 | 0.749 |
| VITAMIN C (MG/DL)   | 29    | 1.2   | 1.5   | 1.7   | 1.6   | 0.4  | 6     | 1.1   | 1.3   | 1.6   | 1.4   | 0.6  | 0.78  | 0.463 |

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Table 7-15 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN WHITE AND BLACK CHILDREN WITHIN GREENE/HUMPHREYS COUNTY

|                     | WHITE |       |       |       |       |      | BLACK |       |       |       |       |      | T     | P     |
|---------------------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|------|-------|-------|
|                     | N     | Q1    | MED   | Q3    | MEAN  | SD   | N     | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| HEMATOCRIT (%)      | 35    | 35.0  | 36.0  | 38.0  | 36.6  | 2.2  | 178   | 34.0  | 35.5  | 37.0  | 35.6  | 2.5  | 2.39  | 0.020 |
| HEMOGLOBIN (GM/DL)  | 35    | 12.5  | 13.2  | 14.0  | 13.2  | 0.9  | 177   | 12.0  | 12.6  | 13.3  | 12.6  | 1.0  | 3.39  | 0.001 |
| FEP (MCG/DL)        | 34    | 13.0  | 20.0  | 22.0  | 18.8  | 7.5  | 177   | 13.0  | 18.0  | 24.0  | 19.1  | 8.7  | -0.22 | 0.826 |
| MCHC (%)            | 35    | 35.1  | 36.3  | 36.7  | 36.1  | 1.7  | 177   | 34.4  | 35.5  | 36.6  | 35.5  | 1.7  | 1.88  | 0.066 |
| TIBC (MCG/DL)       | 29    | 311.0 | 337.0 | 355.0 | 331.6 | 35.0 | 150   | 303.0 | 330.0 | 359.0 | 333.0 | 43.5 | -0.18 | 0.857 |
| SERUM IRON (MCG/DL) | 32    | 53.5  | 64.0  | 84.5  | 69.4  | 21.7 | 158   | 48.0  | 63.0  | 82.0  | 65.0  | 24.3 | 1.03  | 0.306 |
| TS (%)              | 31    | 16.9  | 20.5  | 25.2  | 21.5  | 6.5  | 146   | 14.0  | 19.3  | 24.1  | 19.3  | 7.0  | 1.68  | 0.101 |
| FERRITIN (NG/DL)    | 29    | 15.0  | 21.0  | 30.0  | 23.1  | 10.5 | 141   | 18.0  | 23.0  | 32.0  | 25.8  | 11.6 | -1.25 | 0.218 |
| B-CAROTENE (MCG/DL) | 25    | 80.0  | 108.0 | 130.0 | 105.8 | 31.9 | 103   | 76.0  | 96.0  | 115.5 | 96.3  | 28.6 | 1.37  | 0.180 |
| CHOLESTEROL (MG/DL) | 33    | 147.0 | 169.0 | 186.0 | 170.4 | 28.0 | 160   | 148.0 | 169.0 | 187.5 | 168.2 | 31.4 | 0.41  | 0.685 |
| VITAMIN A (MCG/DL)  | 24    | 32.5  | 36.0  | 42.5  | 36.5  | 6.4  | 101   | 30.0  | 36.0  | 43.0  | 37.5  | 9.8  | -0.58 | 0.562 |

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Table 7-15 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START  
AND NON-HEAD START BLACK CHILDREN WITHIN ST. CLAIR COUNTY

|                      | BLACK |       |       |       |       |      |
|----------------------|-------|-------|-------|-------|-------|------|
|                      | N     | Q1    | MED   | Q3    | MEAN  | SD   |
| HEMATOCRIT (%)       | 181   | 34.0  | 35.5  | 37.0  | 35.4  | 2.2  |
| HEMOGLOBIN (GM/DL)   | 181   | 12.0  | 12.5  | 13.1  | 12.6  | 1.0  |
| FEP (MCG/DL)         | 178   | 15.0  | 19.5  | 27.0  | 21.9  | 10.0 |
| MCHC (%)             | 180   | 34.1  | 35.5  | 36.6  | 35.5  | 1.8  |
| TIBC (MCG/DL)        | 160   | 298.5 | 317.0 | 342.5 | 321.5 | 34.3 |
| SERUM IRON (MCG/DL)  | 163   | 55.0  | 72.0  | 91.0  | 73.0  | 24.7 |
| TS (%)               | 156   | 17.8  | 22.9  | 27.5  | 22.7  | 7.2  |
| FERRITIN (NG/DL)     | 162   | 18.0  | 27.0  | 35.0  | 30.3  | 27.1 |
| CHOLESTERDL (MG/DL)* | 180   | 146.0 | 164.0 | 185.0 | 169.3 | 33.5 |

1206

Table 7-15 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN WHITE AND BLACK CHILDREN WITHIN MARICOPA COUNTY

|                     | WHITE |       |       |       |       |      | BLACK |       |       |       |       |      | T     | P     |
|---------------------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|------|-------|-------|
|                     | N     | Q1    | MED   | Q3    | MEAN  | SD   | N     | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| HEMATOCRIT (%)      | 38    | 35.0  | 36.5  | 38.0  | 36.7  | 2.2  | 8     | 33.5  | 38.0  | 39.3  | 36.9  | 3.1  | -0.18 | 0.863 |
| HEMOGLOBIN (GM/DL)  | 38    | 12.7  | 13.0  | 13.5  | 13.1  | 0.7  | 8     | 11.9  | 12.6  | 13.3  | 12.5  | 0.9  | 1.61  | 0.143 |
| FEP (MCG/DL)        | 38    | 18.0  | 19.5  | 24.0  | 21.2  | 5.5  | 8     | 11.0  | 15.5  | 27.5  | 20.0  | 11.0 | 0.30  | 0.775 |
| MCHC (%)            | 37    | 34.8  | 35.6  | 36.2  | 35.5  | 1.3  | 7     | 33.2  | 33.6  | 34.2  | 33.7  | 0.7  | 5.78  | 0.000 |
| TIBC (MCG/DL)       | 35    | 292.5 | 316.0 | 359.0 | 322.5 | 49.8 | 7     | 304.0 | 317.0 | 341.5 | 322.1 | 20.6 | 0.03  | 0.974 |
| SERUM IRON (MCG/DL) | 38    | 58.0  | 68.0  | 95.0  | 76.0  | 25.3 | 8     | 70.5  | 79.5  | 115.5 | 88.1  | 35.2 | -0.92 | 0.379 |
| TS (%)              | 34    | 16.2  | 19.6  | 27.5  | 21.5  | 6.6  | 7     | 22.0  | 23.4  | 32.0  | 26.2  | 10.4 | -1.13 | 0.294 |
| FERRITIN (NG/DL)    | 32    | 15.5  | 19.5  | 29.0  | 21.8  | 10.2 | 7     | 19.5  | 27.0  | 40.5  | 29.0  | 16.0 | -1.14 | 0.293 |
| B-CAROTENE (MCG/DL) | 35    | 66.5  | 85.0  | 105.0 | 85.9  | 24.3 | 7     | 88.5  | 107.0 | 126.0 | 109.3 | 34.6 | -1.71 | 0.131 |
| CHOLESTEROL (MG/DL) | 37    | 141.0 | 151.0 | 171.0 | 154.9 | 22.2 | 8     | 152.0 | 194.5 | 210.5 | 182.4 | 37.9 | -1.98 | 0.083 |
| VITAMIN A (MCG/DL)  | 34    | 33.0  | 36.0  | 40.0  | 37.2  | 5.7  | 6     | 30.0  | 35.5  | 39.0  | 34.7  | 4.8  | 1.17  | 0.274 |
| VITAMIN C (MG/DL)   | 29    | 1.2   | 1.5   | 1.7   | 1.6   | 0.4  | 6     | 1.1   | 1.3   | 1.6   | 1.4   | 0.6  | 0.78  | 0.463 |

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Table 7-15 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN WHITE AND BLACK CHILDREN WITHIN MINGO COUNTY

|                     | WHITE |       |       |       |       |      | BLACK |       |       |       |       |      | T     | P     |
|---------------------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|------|-------|-------|
|                     | N     | Q1    | MED   | Q3    | MEAN  | SD   | N     | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| HEMATOCRIT (%)      | 212   | 36.5  | 38.0  | 39.5  | 37.9  | 2.2  | 12    | 35.8  | 37.3  | 38.5  | 37.0  | 2.2  | 1.35  | 0.201 |
| HEMOGLOBIN (GM/DL)  | 207   | 12.7  | 13.3  | 13.8  | 13.2  | 0.8  | 12    | 12.4  | 13.1  | 13.4  | 13.0  | 1.0  | 0.84  | 0.416 |
| FEP (MCG/DL)        | 203   | 10.0  | 15.0  | 20.0  | 16.5  | 8.3  | 12    | 9.5   | 16.0  | 29.0  | 20.2  | 12.5 | -1.02 | 0.328 |
| MCHC (%)            | 204   | 33.9  | 34.8  | 35.8  | 34.8  | 1.5  | 11    | 34.7  | 34.9  | 35.6  | 35.3  | 1.0  | -1.34 | 0.205 |
| TIBC (MCG/DL)       | 186   | 289.0 | 315.0 | 342.0 | 316.7 | 38.4 | 12    | 292.5 | 307.0 | 332.5 | 314.3 | 29.1 | 0.27  | 0.788 |
| SERUM IRON (MCG/DL) | 191   | 51.0  | 67.0  | 82.5  | 68.0  | 24.5 | 10    | 42.0  | 58.0  | 68.0  | 56.6  | 18.1 | 1.90  | 0.084 |
| TS (%)              | 182   | 15.6  | 20.2  | 26.9  | 21.2  | 7.7  | 11    | 15.9  | 20.9  | 25.7  | 21.1  | 6.8  | 0.07  | 0.945 |
| FERRITIN (NG/DL)    | 182   | 14.0  | 19.0  | 27.0  | 21.5  | 11.1 | 12    | 17.5  | 30.5  | 35.0  | 29.9  | 12.2 | -2.33 | 0.038 |
| CHOLESTEROL (MG/DL) | 202   | 138.0 | 156.0 | 170.0 | 154.6 | 27.1 | 12    | 137.0 | 152.5 | 175.0 | 157.2 | 25.2 | -0.35 | 0.735 |

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Table 7-16

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN WHITE AND HISPANIC CHILDREN ACROSS SITE

|                     | WHITE |       |       |       |       |      | HISPANIC |       |       |       |       |      | T     | P     |
|---------------------|-------|-------|-------|-------|-------|------|----------|-------|-------|-------|-------|------|-------|-------|
|                     | N     | Q1    | MED   | Q3    | MEAN  | SD   | N        | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| HEMATOCRIT (%)      | 285   | 36.0  | 37.5  | 39.0  | 37.6  | 2.3  | 110      | 35.0  | 36.0  | 38.0  | 36.4  | 2.2  | 4.64  | 0.000 |
| HEMOGLOBIN (GM/DL)  | 280   | 12.7  | 13.2  | 13.8  | 13.2  | 0.8  | 107      | 12.7  | 13.2  | 13.6  | 13.1  | 0.7  | 1.20  | 0.231 |
| FEP (MCG/DL)        | 275   | 11.0  | 17.0  | 21.0  | 17.4  | 8.0  | 110      | 19.0  | 24.0  | 30.0  | 24.5  | 7.6  | -8.17 | 0.000 |
| MCHC (%)            | 276   | 34.0  | 35.0  | 36.0  | 35.1  | 1.5  | 107      | 35.3  | 35.8  | 36.6  | 35.9  | 1.8  | -4.21 | 0.000 |
| TIBC (MCG/DL)       | 250   | 290.0 | 317.0 | 347.0 | 319.2 | 39.9 | 104      | 309.5 | 343.0 | 378.5 | 344.4 | 46.1 | -4.87 | 0.000 |
| SERUM IRON (MCG/DL) | 261   | 53.0  | 67.0  | 86.0  | 69.3  | 24.4 | 105      | 63.0  | 82.0  | 101.0 | 81.2  | 29.6 | -3.62 | 0.000 |
| TS (%)              | 247   | 16.1  | 20.2  | 26.1  | 21.3  | 7.4  | 106      | 17.6  | 24.0  | 30.1  | 24.0  | 8.9  | -2.75 | 0.007 |
| FERRITIN (NG/DL)    | 243   | 14.0  | 19.0  | 27.0  | 21.7  | 10.9 | 100      | 13.5  | 17.5  | 23.0  | 19.6  | 10.2 | 1.71  | 0.088 |
| B-CAROTENE (MCG/DL) | 60    | 70.0  | 92.0  | 113.5 | 94.2  | 29.2 | 102      | 76.0  | 96.0  | 115.0 | 98.4  | 29.0 | -0.89 | 0.376 |
| CHOLESTEROL (MG/DL) | 272   | 139.0 | 157.0 | 173.5 | 156.5 | 27.0 | 107      | 139.5 | 158.0 | 176.0 | 162.0 | 30.3 | -1.63 | 0.105 |
| VITAMIN A (MCG/DL)  | 58    | 33.0  | 36.0  | 42.0  | 36.9  | 5.9  | 103      | 31.0  | 35.0  | 39.5  | 35.8  | 7.6  | 1.02  | 0.309 |
| VITAMIN C (MG/DL)   | 29    | 1.2   | 1.5   | 1.7   | 1.6   | 0.4  | 74       | 1.0   | 1.5   | 1.7   | 1.4   | 0.4  | 1.82  | 0.075 |

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Table 7-16 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN WHITE AND HISPANIC CHILDREN WITHIN MARICOPA COUNTY

|                     | WHITE |       |       |       |       |      | HISPANIC |       |       |       |       |      | T     | P     |
|---------------------|-------|-------|-------|-------|-------|------|----------|-------|-------|-------|-------|------|-------|-------|
|                     | N     | Q1    | MED   | Q3    | MEAN  | SD   | N        | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| HEMATOCRIT (%)      | 38    | 35.0  | 36.5  | 38.0  | 36.7  | 2.2  | 109      | 35.0  | 36.0  | 38.0  | 36.4  | 2.2  | 0.56  | 0.580 |
| HEMOGLOBIN (GM/DL)  | 38    | 12.7  | 13.0  | 13.5  | 13.1  | 0.7  | 106      | 12.7  | 13.2  | 13.6  | 13.1  | 0.7  | -0.22 | 0.827 |
| FEP (MCG/DL)        | 38    | 18.0  | 19.5  | 24.0  | 21.2  | 5.5  | 109      | 18.0  | 24.0  | 30.0  | 24.5  | 7.6  | -2.91 | 0.005 |
| MCHC (%)            | 37    | 34.8  | 35.6  | 36.2  | 35.5  | 1.3  | 106      | 35.3  | 35.9  | 36.7  | 35.9  | 1.8  | -1.45 | 0.150 |
| TIBC (MCG/DL)       | 35    | 292.5 | 316.0 | 359.0 | 322.5 | 49.8 | 103      | 309.5 | 342.0 | 378.5 | 344.2 | 46.2 | -2.27 | 0.027 |
| SERUM IRON (MCG/DL) | 38    | 58.0  | 68.0  | 95.0  | 76.0  | 25.3 | 104      | 63.0  | 82.0  | 101.5 | 81.6  | 29.4 | -1.12 | 0.267 |
| TS (%)              | 34    | 16.2  | 19.6  | 27.5  | 21.5  | 6.6  | 105      | 17.8  | 24.0  | 30.1  | 24.2  | 8.8  | -1.86 | 0.066 |
| FERRITIN (NG/DL)    | 32    | 15.5  | 19.5  | 29.0  | 21.8  | 10.2 | 99       | 13.5  | 17.0  | 22.5  | 19.6  | 10.3 | 1.10  | 0.278 |
| B-CAROTENE (MCG/DL) | 35    | 66.5  | 85.0  | 105.0 | 85.9  | 24.3 | 102      | 76.0  | 96.0  | 115.0 | 98.4  | 29.0 | -2.49 | 0.015 |
| CHOLESTEROL (MG/DL) | 37    | 141.0 | 151.0 | 171.0 | 154.9 | 22.2 | 106      | 139.0 | 158.5 | 176.0 | 162.2 | 30.3 | -1.57 | 0.121 |
| VITAMIN A (MCG/DL)  | 34    | 33.0  | 36.0  | 40.0  | 37.2  | 5.7  | 103      | 31.0  | 35.0  | 39.5  | 35.8  | 7.6  | 1.13  | 0.260 |
| VITAMIN C (MG/DL)   | 29    | 1.2   | 1.5   | 1.7   | 1.6   | 0.4  | 74       | 1.0   | 1.5   | 1.7   | 1.4   | 0.4  | 1.82  | 0.075 |

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Table 7-17

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN BLACK AND HISPANIC CHILDREN ACROSS SITE

|                     | BLACK |       |       |       |       |      | HISPANIC |       |       |       |       |      | T     | P     |
|---------------------|-------|-------|-------|-------|-------|------|----------|-------|-------|-------|-------|------|-------|-------|
|                     | N     | Q1    | MED   | Q3    | MEAN  | SD   | N        | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| HEMATOCRIT (%)      | 379   | 34.0  | 35.5  | 37.0  | 35.6  | 2.3  | 110      | 35.0  | 36.0  | 38.0  | 36.4  | 2.2  | -3.74 | 0.000 |
| HEMOGLOBIN (GM/DL)  | 378   | 12.0  | 12.5  | 13.3  | 12.6  | 1.0  | 107      | 12.7  | 13.2  | 13.6  | 13.1  | 0.7  | -5.56 | 0.000 |
| FEP (MCG/DL)        | 375   | 14.0  | 19.0  | 25.0  | 20.5  | 9.6  | 110      | 19.0  | 24.0  | 30.0  | 24.5  | 7.6  | -4.56 | 0.000 |
| MCHC (%)            | 375   | 34.2  | 35.4  | 36.5  | 35.4  | 1.8  | 107      | 35.3  | 35.8  | 36.6  | 35.9  | 1.8  | -2.53 | 0.012 |
| TIBC (MCG/DL)       | 329   | 300.0 | 325.0 | 349.0 | 326.5 | 38.8 | 104      | 309.5 | 343.0 | 378.5 | 344.4 | 46.1 | -3.60 | 0.000 |
| SERUM IRON (MCG/DL) | 339   | 52.0  | 67.0  | 87.0  | 69.1  | 25.1 | 105      | 63.0  | 82.0  | 101.0 | 81.2  | 29.6 | -3.77 | 0.000 |
| TS (%)              | 320   | 16.0  | 20.8  | 25.7  | 21.2  | 7.4  | 106      | 17.6  | 24.0  | 30.1  | 24.0  | 8.9  | -2.98 | 0.003 |
| FERRITIN (NG/DL)    | 322   | 18.0  | 25.5  | 35.0  | 28.3  | 21.0 | 100      | 13.5  | 17.5  | 23.0  | 19.6  | 10.2 | 5.57  | 0.000 |
| B-CAROTENE (MCG/DL) | 110   | 76.0  | 96.0  | 117.0 | 97.1  | 29.0 | 102      | 76.0  | 96.0  | 115.0 | 98.4  | 29.0 | -0.33 | 0.744 |
| CHOLESTEROL (MG/DL) | 360   | 147.0 | 166.5 | 187.5 | 168.7 | 32.4 | 107      | 139.5 | 158.0 | 176.0 | 162.0 | 30.3 | 1.98  | 0.049 |
| VITAMIN A (MCG/DL)  | 107   | 30.0  | 36.0  | 43.0  | 37.3  | 9.6  | 103      | 31.0  | 35.0  | 39.5  | 35.8  | 7.6  | 1.25  | 0.212 |
| VITAMIN C (MG/DL)   | 6     | 1.1   | 1.3   | 1.6   | 1.4   | 0.6  | 74       | 1.0   | 1.5   | 1.7   | 1.4   | 0.4  | -0.10 | 0.928 |

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Table 7-17 (continued)

BIOCHEMICAL INDICATORS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN BLACK AND HISPANIC CHILDREN WITHIN MARICOPA COUNTY

|                     | BLACK |       |       |       |       |      | HISPANIC |       |       |       |       |      | T     | P     |
|---------------------|-------|-------|-------|-------|-------|------|----------|-------|-------|-------|-------|------|-------|-------|
|                     | N     | Q1    | MED   | Q3    | MEAN  | SD   | N        | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| HEMATOCRIT (%)      | 8     | 33.5  | 38.0  | 39.3  | 36.9  | 3.1  | 109      | 35.0  | 36.0  | 38.0  | 36.4  | 2.2  | 0.39  | 0.705 |
| HEMOGLOBIN (GM/DL)  | 8     | 11.9  | 12.6  | 13.3  | 12.5  | 0.9  | 106      | 12.7  | 13.2  | 13.6  | 13.1  | 0.7  | -1.76 | 0.117 |
| FEP (MCG/DL)        | 8     | 11.0  | 15.5  | 27.5  | 20.0  | 11.0 | 109      | 19.0  | 24.0  | 30.0  | 24.5  | 7.6  | -1.15 | 0.289 |
| MCHC (%)            | 7     | 33.2  | 33.6  | 34.2  | 33.7  | 0.7  | 106      | 35.3  | 35.9  | 36.7  | 35.9  | 1.8  | -7.49 | 0.000 |
| TIBC (MCG/DL)       | 7     | 304.0 | 317.0 | 341.5 | 322.1 | 20.6 | 103      | 309.5 | 342.0 | 378.5 | 344.2 | 46.2 | -2.45 | 0.032 |
| SERUM IRON (MCG/DL) | 8     | 70.5  | 79.5  | 115.5 | 88.1  | 35.2 | 104      | 63.0  | 82.0  | 101.5 | 81.6  | 29.4 | 0.51  | 0.624 |
| TS (%)              | 7     | 22.0  | 23.4  | 32.0  | 26.2  | 10.4 | 105      | 17.8  | 24.0  | 30.1  | 24.2  | 8.8  | 0.50  | 0.634 |
| FERRITIN (NG/DL)    | 7     | 19.5  | 27.0  | 40.5  | 28.0  | 16.0 | 99       | 13.5  | 17.0  | 22.5  | 19.6  | 10.3 | 1.54  | 0.174 |
| B-CAROTENE (MCG/DL) | 7     | 88.5  | 107.0 | 126.0 | 109.3 | 34.6 | 102      | 76.0  | 96.0  | 115.0 | 98.4  | 29.0 | 0.81  | 0.442 |
| CHOLESTEROL (MG/DL) | 8     | 152.0 | 194.5 | 210.5 | 182.4 | 37.9 | 106      | 139.0 | 158.5 | 176.0 | 162.2 | 30.3 | 1.47  | 0.180 |
| VITAMIN A (MCG/DL)  | 6     | 30.0  | 35.5  | 39.0  | 34.7  | 4.8  | 103      | 31.0  | 35.0  | 39.5  | 35.8  | 7.6  | -0.56 | 0.592 |
| VITAMIN C (MG/DL)   | 6     | 1.1   | 1.3   | 1.6   | 1.4   | 0.6  | 74       | 1.0   | 1.5   | 1.7   | 1.4   | 0.4  | -0.10 | 0.928 |

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Table 7-18

Percentage of Children with Abnormal Levels on Biochemical Indicators at Posttest  
(Samples A, B, C) by Head Start Status

| Biochemical Indicator        | Posttested Children (Samples A, B, C) in: |                    |                               |                                 |                    |                    |                     |                    |                     |                     |
|------------------------------|---|--------------------|-------------------------------|---------------------------------|--------------------|--------------------|---------------------|--------------------|---------------------|---------------------|
|                              | Greene & Humphreys Counties               |                    | St. Clair County              |                                 | Maricopa County    |                    | Mingo County        |                    | All Sites           |                     |
|                              | HS<br>n=117                               | NHS<br>n=96        | HS<br>n=102                   | NHS<br>n=80                     | HS<br>n=97         | NHS<br>n=58        | HS<br>n=118         | NHS<br>n=106       | HS<br>n=434         | NHS<br>n=340        |
| Hematocrit<br>< 34.0%        | n<br>21/117<br>17.9                       | n<br>12/96<br>12.8 | n<br>14/101<br>13.9           | n<br>17/80<br>21.3              | n<br>6/97<br>6.2   | n<br>3/58<br>5.2   | n<br>4/118<br>3.4   | n<br>3/106<br>2.8  | n<br>45/433<br>10.4 | n<br>35/338<br>10.4 |
| Hemoglobin<br>< 11.0 gm/dl.  | n<br>4/117<br>3.4                         | n<br>0/96<br>0     | n<br>1/101<br>1.0             | n<br>2/80<br>2.5                | n<br>1/96<br>1.0   | n<br>0/58<br>0     | n<br>0/115<br>0     | n<br>4/105<br>3.8  | n<br>6/429<br>1.4   | n<br>6/335<br>1.8   |
| FBP<br>> 49 mcg/dl.          | n<br>3/117<br>2.6                         | n<br>1/96<br>1.1   | n<br>0/101 <sup>b</sup><br>0  | n<br>6/79 <sup>b</sup><br>7.6   | n<br>1/97<br>1.0   | n<br>0/58<br>0     | n<br>1/115<br>0.9   | n<br>1/102<br>1.0  | n<br>5/430<br>1.2   | n<br>8/334<br>2.4   |
| Serum Iron<br>< 40.0 mcg/dl. | n<br>16/109<br>14.7                       | n<br>8/84<br>9.5   | n<br>3/89 <sup>b</sup><br>3.4 | n<br>10/73 <sup>b</sup><br>13.7 | n<br>7/95<br>7.4   | n<br>4/58<br>6.9   | n<br>1/115<br>14.8  | n<br>1/102<br>9.3  | n<br>42/401<br>10.5 | n<br>31/312<br>9.9  |
| TIBC<br>> 400 mcg/dl.        | n<br>8/100<br>8.0                         | n<br>7/80<br>8.8   | n<br>4/89<br>4.5              | n<br>1/73<br>1.4                | n<br>11/93<br>11.8 | n<br>10/58<br>17.2 | n<br>5/107<br>4.7   | n<br>3/95<br>3.2   | n<br>28/389<br>7.2  | n<br>21/306<br>6.9  |
| TS<br>< 16.0%                | n<br>34/100<br>34.0                       | n<br>20/80<br>25.0 | n<br>12/85<br>14.1            | n<br>15/71<br>21.1              | n<br>17/93<br>18.3 | n<br>10/58<br>17.2 | n<br>31/102<br>30.4 | n<br>20/95<br>21.1 | n<br>94/380<br>24.7 | n<br>65/304<br>21.4 |
| Ferritin<br>< 10.0 ng/ml.    | n<br>4/95<br>4.2                          | n<br>2/78<br>2.6   | n<br>4/89<br>4.5              | n<br>3/73<br>4.1                | n<br>4/86<br>4.7   | n<br>4/53<br>7.5   | n<br>5/107<br>4.7   | n<br>3/91<br>3.3   | n<br>17/377<br>4.5  | n<br>14/295<br>4.7  |
| Cholesterol<br>> 200 mg/dl.  | n<br>16/109<br>14.7                       | n<br>10/84<br>11.9 | n<br>19/100<br>19.0           | n<br>12/79<br>15.2              | n<br>10/95<br>15.0 | n<br>6/58<br>10.3  | n<br>6/114<br>5.3   | n<br>7/100<br>7.0  | n<br>51/418<br>12.2 | n<br>35/321<br>10.9 |
| Vitamin A<br>< 20.0 mcg/dl.  | n<br>0/66<br>0                            | n<br>1/60<br>1.7   | a                             | a                               | n<br>1/91<br>1.1   | n<br>0/57<br>0     | a                   | a                  | n<br>1/157<br>0.6   | n<br>1/117<br>0.9   |
| B-Carotene<br>< 70.0 mcg/dl. | n<br>10/66<br>15.2                        | n<br>14/60<br>23.3 | a                             | a                               | n<br>12/91<br>13.2 | n<br>14/57<br>24.6 | a                   | a                  | n<br>22/157<br>14.0 | n<br>28/117<br>23.9 |

<sup>a</sup>Not available because assays were not performed.

Table 7-19

Percentage of Children Considered Anemic by Four Sequential Definitions of Anemia at Posttest by Site

| Definition of Anemia  | Posttested Children (Samples A, B, C) in: |                           |                          |                       |
|---|---|---------------------------|--------------------------|-----------------------|
|   | Greene & Humphreys Counties<br>n=213      | St. Clair County<br>n=183 | Maricopa County<br>n=155 | Mingo County<br>n=224 |
| Hemoglobin < 11.0<br>n<br>%   | 4/213<br>1.9                              | 3/183<br>1.6              | 1/155<br>0.6             | 4/224<br>1.8          |
| Hemoglobin < 11.0<br>< 11.0 + FEP > 49.0<br>n<br>%                              | 0<br>0.0                                  | 0<br>0.0                  | 0<br>0.0                 | 0<br>0.0              |
| Hemoglobin<br>< 11.0 + FEP > 49.0<br>+ Ferritin < 12.0<br>n<br>%                | 0<br>0.0                                  | 0<br>0.0                  | 0<br>0.0                 | 0<br>0.0              |
| Hemoglobin<br>< 11.0 + FEP > 49.0<br>+ Ferritin < 12.0<br>+ TS < 16.0<br>n<br>% | 0<br>0.0                                  | 0<br>0.0                  | 0<br>0.0                 | 0<br>0.0              |
| Hemoglobin < 10.5<br>n<br>%   | 3/213<br>1.4                              | 1/183<br>0.5              | 1/155<br>0.6             | 2/224<br>0.9          |
| Hemoglobin < 11.0<br>< 10.5 + FEP > 49.0<br>n<br>%                              | 0<br>0.0                                  | 0<br>0.0                  | 0<br>0.0                 | 0<br>0.0              |
| Hemoglobin<br>< 10.5 + FEP > 49.0<br>+ Ferritin < 12.0<br>n<br>%                | 0<br>0.0                                  | 0<br>0.0                  | 0<br>0.0                 | 0<br>0.0              |
| Hemoglobin<br>< 10.5 + FEP > 49.0<br>+ Ferritin < 12.0<br>+ TS < 16.0<br>n<br>% | 0<br>0.0                                  | 0<br>0.0                  | 0<br>0.0                 | 0<br>0.0              |

Table 7-20

Percentage of Children with Abnormal Levels of Biochemical Indicators at Posttest (Samples A, B, C) by Site and Race

| Biochemical Indicator                  | Posttested Children (Samples A, B, C) in: |                |                  |                 |              |                   |                |               |                        |                |                   |
|--|---|----------------|------------------|-----------------|--------------|-------------------|----------------|---------------|------------------------|----------------|-------------------|
|  | Greene & Humphreys Counties               |                | St. Clair County | Maricopa County |              |                   | Mingo County   |               | All <sup>b</sup> Sites |                |                   |
|  | White<br>n=36                             | Black<br>n=177 | Black<br>n=182   | White<br>n=38   | Black<br>n=8 | Hispanic<br>n=109 | White<br>n=212 | Black<br>n=12 | White<br>n=285         | Black<br>n=376 | Hispanic<br>n=110 |
| Hematocrit<br>< 34.0%<br>n<br>%        | 3/ 35<br>8.6                              | 30/176<br>17.0 | 31/180<br>17.2   | 2/ 38<br>5.3    | 2/ 8<br>25.0 | 5/109<br>4.6      | 6/212<br>2.8   | 1/ 12<br>8.3  | 11/285<br>3.9          | 64/376<br>17.0 | 5/110<br>4.5      |
| Hemoglobin<br>< 11.0 gm/dl.<br>n<br>%  | 0/ 35<br>0                                | 4/176<br>2.3   | 3/180<br>1.7     | 0/ 38<br>0      | 0/ 8<br>0    | 1/106<br>0.9      | 4/208<br>1.9   | 0/ 12<br>0    | 4/281<br>1.4           | 7/376<br>1.9   | 1/107<br>0.9      |
| FEP<br>> 49.0 mcg/dl.<br>n<br>%        | 1/ 35<br>2.9                              | 3/177<br>1.7   | 6/179<br>3.4     | 0/ 38<br>0      | 0/ 8<br>0    | 1/109<br>0.9      | 2/205<br>1.0   | 0/ 12<br>0    | 3/278<br>1.1           | 9/376<br>2.4   | 1/110<br>0.9      |
| TIBC<br>> 400 mcg/dl.<br>n<br>%        | 2/ 31<br>6.5                              | 13/149<br>8.7  | 5/161<br>3.1     | 4/ 37<br>10.8   | 0/ 7<br>0    | 17/107<br>15.9    | 8/190<br>4.2   | 0/ 12<br>0    | 14/258<br>5.4          | 18/329<br>5.5  | 17/108<br>15.7    |
| Serum Iron<br>< 40.0 mcg/dl.<br>n<br>% | 3/ 33<br>9.1                              | 21/160<br>13.1 | 12/161<br>7.5    | 2/ 38<br>5.3    | 1/ 8<br>12.5 | 8/107<br>7.5      | 23/193<br>11.9 | 2/ 12<br>16.7 | 28/264<br>10.6         | 36/341<br>10.5 | 9/108<br>8.3      |
| TS<br>< 16.0%<br>n<br>%                | 6/ 31<br>19.4                             | 48/149<br>32.2 | 26/155<br>16.8   | 6/ 37<br>16.2   | 1/ 7<br>14.3 | 20/107<br>18.7    | 48/186<br>25.8 | 3/ 11<br>27.3 | 60/254<br>23.6         | 78/322<br>24.2 | 21/108<br>19.4    |
| MCHC<br>%<br>n<br>%                    | 0/ 35<br>0.0                              | 0/176<br>0.0   | 1/180<br>0.6     | 0/ 38<br>0.0    | 0/ 8<br>0.0  | 2/106<br>1.9      | 2/208<br>1.0   | 0/ 12<br>0.0  | 2/281<br>0.1           | 1/376<br>4.0   | 2/107<br>1.9      |
| Ferritin<br>< 10.0 ng/ml.<br>n<br>%    | 1/ 30<br>3.3                              | 5/143<br>3.5   | 7/161<br>4.3     | 1/ 32<br>3.1    | 1/ 7<br>14.3 | 6/100<br>6.0      | 10/186<br>5.4  | 0/ 12<br>0    | 12/248<br>4.8          | 13/323<br>4.0  | 6/101<br>5.9      |
| Cholesterol<br>> 200 mg/dl.<br>n<br>%  | 6/ 34<br>17.6                             | 20/159<br>12.6 | 31/178<br>17.4   | 0/ 38<br>0      | 3/ 8<br>37.5 | 13/107<br>12.1    | 12/202<br>5.9  | 1/ 12<br>8.3  | 18/274<br>6.7          | 55/357<br>15.4 | 13/108<br>12.0    |
| Vitamin A<br>< 20.0 mcg/dl.<br>n<br>%  | 0/ 25<br>0                                | 1/101<br>1.0   | a                | 0/ 37<br>0      | 0/ 7<br>0    | 1/104<br>1.0      | a              | a             | 0/ 62<br>0.0           | 1/108<br>0.9   | 1/104<br>1.0      |
| B-Carotene<br>< 70.0 mcg/dl.<br>n<br>% | 5/ 25<br>20.0                             | 19/101<br>18.8 | a                | 10/ 37<br>27.0  | 1/ 7<br>14.3 | 15/104<br>14.4    | a              | a             | 15/ 62<br>24.2         | 20/108<br>18.5 | 15/104<br>14.4    |
| Vitamin C<br>mg/dl.<br>n<br>%          |   |                |                  | 0/ 29<br>0.0    | 0/ 6<br>0.0  | 0/ 74<br>0.0      |                |               | 0/ 29<br>0.0           | 0/ 6<br>0.0    | 0/ 74<br>0.0      |

<sup>a</sup> Not available because assays not performed.

<sup>b</sup> St. Clair County also had one Hispanic child shown only in summary of Hispanics in right-hand column.

7A-68

221

1222



Table 7-21

Means and Standard Deviations of Biochemical Indicators  
By Age Group and Site for Pretested Children (Samples A & D)

| Biochemical Indicator | Pretested Children (Samples A & D) in: |                         |                                      |                                    |                         |                         |                                      |                         |
|-----------------------|--|-------------------------|--------------------------------------|------------------------------------|-------------------------|-------------------------|--------------------------------------|-------------------------|
|                       | Greene & Humphreys Counties            |                         | St. Clair County                     |                                    | Maricopa County         |                         | Mingo County                         |                         |
|                       | 2-4 yr.<br>n=82                        | 4-6 yr.<br>n=10.        | 2-4 yr.<br>n=68                      | 4-6 yr.<br>n=41.                   | 2-4 yr.<br>n=38         | 4-6 yr.<br>n=59         | 2-4 yr.<br>n=62                      | 4-6 yr.<br>n=11         |
| Hematocrit %          | 36.3 <sub>±</sub> 2.8                  | 35.4 <sub>±</sub> 2.5   | 36.4 <sub>±</sub> 2.0                | 35.8 <sub>±</sub> 3.3              | 36.2 <sub>±</sub> 2.0   | 36.7 <sub>±</sub> 1.8   | 37.2 <sub>±</sub> 1.9                | 37.3 <sub>±</sub> 2.6   |
| Hemoglobin gm/dl.     | 12.3 <sub>±</sub> 1.0                  | 11.7 <sub>±</sub> 0.7   | 11.7 <sub>±</sub> 0.7                | 11.6 <sub>±</sub> 1.1              | 12.7 <sub>±</sub> 0.7   | 12.8 <sub>±</sub> 0.6   | 12.5 <sub>±</sub> 0.8                | 12.5 <sub>±</sub> 1.3   |
| FEP mcg/dl.           | 25.1 <sub>±</sub> 15.8                 | 27.7 <sub>±</sub> 17.0  | 32.8 <sub>±</sub> 18.9               | 28.9 <sub>±</sub> 17.5             | 21.2 <sub>±</sub> 6.2   | 21.5 <sub>±</sub> 7.9   | 25.5 <sub>±</sub> 12.9               | 24.3 <sub>±</sub> 11.0  |
| TIBC mcg/dl.          | 333.6 <sub>±</sub> 37.1                | 346.6 <sub>±</sub> 40.2 | 356.4 <sub>±</sub> 37.8 <sup>a</sup> | 347.6 <sub>±</sub> 44.9            | 332.9 <sub>±</sub> 34.1 | 335.9 <sub>±</sub> 32.2 | 343.7 <sub>±</sub> 44.4 <sup>a</sup> | 344.8 <sub>±</sub> 34.5 |
| Serum Iron mcg/dl.    | 78.6 <sub>±</sub> 23.4                 | 87.2 <sub>±</sub> 23.2  | 75.7 <sub>±</sub> 24.8               | 67.0 <sub>±</sub> 26.1             | 73.9 <sub>±</sub> 25.2  | 84.2 <sub>±</sub> 25.6  | 86.3 <sub>±</sub> 31.6               | 83.8 <sub>±</sub> 41.0  |
| TS %                  | 23.9 <sub>±</sub> 7.5                  | 25.8 <sub>±</sub> 8.5   | 21.7 <sub>±</sub> 7.3 <sup>a</sup>   | 19.4 <sub>±</sub> 7.8 <sup>a</sup> | 22.1 <sub>±</sub> 7.5   | 25.2 <sub>±</sub> 7.6   | 25.8 <sub>±</sub> 11.5               | 23.5 <sub>±</sub> 11.9  |
| Ferritin ng/ml.       | 37.2 <sub>±</sub> 12.6                 | 32.5 <sub>±</sub> 12.3  | 38.5 <sub>±</sub> 13.2               | 44.3 <sub>±</sub> 23.8             | 28.1 <sub>±</sub> 18.4  | 25.9 <sub>±</sub> 9.6   | 30.8 <sub>±</sub> 12.6               | 36.0 <sub>±</sub> 16.3  |
| Cholesterol mg/dl.    | 180.7 <sub>±</sub> 28.9                | 176.9 <sub>±</sub> 34.4 | 179.9 <sub>±</sub> 28.0              | 175.8 <sub>±</sub> 22.3            | 168.2 <sub>±</sub> 34.4 | 169.6 <sub>±</sub> 30.6 | 163.8 <sub>±</sub> 28.0              | 163.5 <sub>±</sub> 17.9 |
| Vitamin A mcg/dl.     | 35.6 <sub>±</sub> 11.2                 | 34.0 <sub>±</sub> 6.2   | 36.0 <sub>±</sub> 9.3 <sup>a</sup>   | 35.8 <sub>±</sub> 8.8              | 35.6 <sub>±</sub> 5.6   | 38.0 <sub>±</sub> 9.6   | 40.8 <sub>±</sub> 11.1 <sup>a</sup>  | 39.3 <sub>±</sub> 12.2  |
| B-carotene mcg/dl.    | 80.9 <sub>±</sub> 27.6                 | 97.0 <sub>±</sub> 47.7  | 83.8 <sub>±</sub> 27.8 <sup>a</sup>  | 89.7 <sub>±</sub> 27.3             | 83.6 <sub>±</sub> 28.0  | 77.6 <sub>±</sub> 28.2  | 75.5 <sub>±</sub> 25.2 <sup>a</sup>  | 68.0 <sub>±</sub> 25.8  |

<sup>a</sup> 20% or more missing data

<sup>b</sup> Results reported for all children, including those less than 2.5 years.

Table 7-22

Means and Standard Deviations of Biochemical Indicators  
By Age Group and Ethnicity for Pretested Children (Samples A & D)

| Biochemical Indicator | Pretested Children (Samples A & D) by: |                  |                  |                  |                  |                  |
|-----------------------|--|------------------|------------------|------------------|------------------|------------------|
|                       | White                                  |                  | Black            |                  | Hispanic         |                  |
|                       | 2-4 yr.<br>n=75                        | 4-6 yr.<br>n=23  | 2-4 yr.<br>n=144 | 4-6 yr.<br>n=53  | 2-4 yr.<br>n=31  | 4-6 yr.<br>n=40  |
| Hematocrit<br>%       | 36.8 $\pm$ 2.1                         | 37.3 $\pm$ 2.3   | 36.4 $\pm$ 2.5   | 35.7 $\pm$ 3.1   | 36.5 $\pm$ 1.8   | 36.5 $\pm$ 1.5   |
| Hemoglobin<br>gm/dl.  | 12.4 $\pm$ 0.8                         | 12.7 $\pm$ 1.0   | 12.0 $\pm$ 0.9   | 11.6 $\pm$ 1.0   | 12.8 $\pm$ 0.7   | 12.7 $\pm$ 0.6   |
| FEP<br>mcg/dl.        | 24.1 $\pm$ 12.3                        | 20.3 $\pm$ 8.8   | 29.0 $\pm$ 17.9  | 28.2 $\pm$ 17.0  | 22.4 $\pm$ 5.7   | 23.1 $\pm$ 8.5   |
| TIBC<br>mcg/dl.       | 341.5 $\pm$ 43.2                       | 329.7 $\pm$ 29.7 | 343.5 $\pm$ 38.5 | 348.0 $\pm$ 42.7 | 332.5 $\pm$ 35.0 | 339.4 $\pm$ 35.5 |
| Serum Iron<br>mcg/dl. | 83.4 $\pm$ 30.6                        | 81.1 $\pm$ 32.5  | 77.3 $\pm$ 24.0  | 71.8 $\pm$ 26.3  | 76.4 $\pm$ 26.1  | 85.9 $\pm$ 27.4  |
| TS<br>%               | 25.0 $\pm$ 10.9                        | 24.3 $\pm$ 9.7   | 22.9 $\pm$ 7.4   | 20.8 $\pm$ 8.2   | 22.9 $\pm$ 7.8   | 25.5 $\pm$ 8.0   |
| Ferritin<br>ng/ml.    | 30.3 $\pm$ 12.0                        | 31.6 $\pm$ 14.0  | 38.0 $\pm$ 12.9  | 42.1 $\pm$ 23.6  | 29.0 $\pm$ 20.1  | 25.0 $\pm$ 8.2   |
| Cholesterol<br>mg/dl. | 164.4 $\pm$ 26.7                       | 166.1 $\pm$ 25.2 | 180.5 $\pm$ 28.7 | 178.0 $\pm$ 29.9 | 170.4 $\pm$ 37.3 | 167.5 $\pm$ 24.4 |
| Vitamin A<br>mcg/dl.  | 39.6 $\pm$ 10.6                        | 39.4 $\pm$ 12.1  | 35.8 $\pm$ 10.6  | 35.5 $\pm$ 8.2   | 35.5 $\pm$ 5.2   | 37.2 $\pm$ 9.3   |
| B-carotene<br>mcg/dl. | 66.9 $\pm$ 25.4                        | 65.3 $\pm$ 26.2  | 82.6 $\pm$ 27.6  | 91.6 $\pm$ 32.0  | 85.6 $\pm$ 28.3  | 79.6 $\pm$ 25.5  |



Table 7-23

Unadjusted Means and Standard Deviations of Biochemical Indicators by Site and Head Start Status at Posttest (Samples A, B, C)

| Biochemical Indicator | Posttest Children (Samples A, B, C) In: |                          |                  |                 |                 |                          |                  |                  |                     |                      |
|-----------------------|---|--------------------------|------------------|-----------------|-----------------|--------------------------|------------------|------------------|---------------------|----------------------|
|                       | Greene & Humphreys Counties             |                          | St. Clair County |                 | Maricopa County |                          | Milago County    |                  | All Sites           |                      |
|                       | HS<br>n=117                             | NHS <sup>b</sup><br>n=94 | HS<br>n=102      | NHS<br>n=81     | HS<br>n=97      | NHS <sup>b</sup><br>n=58 | HS<br>n=118      | NHS<br>n=106     | HS<br>n=434         | NHS<br>n=341         |
| Hematocrit %          | 35.5+ 2.7<br>117                        | 36.0+ 2.0<br>94          | 35.5+ 1.8<br>100 | 35.4+ 2.0<br>80 | 36.5+ 2.1<br>97 | 36.5+ 2.4<br>58          | 37.6+ 2.0<br>118 | 38.2+ 2.4<br>106 | 36.3 + 2.4<br>432   | 36.6+ 2.4<br>338     |
| Hemoglobin gm/dl.     | 12.6+ 1.0<br>116                        | 12.9+ 0.9<br>94          | 12.6+ 0.9<br>101 | 12.6+ 0.8<br>79 | 13.1+ 0.8<br>96 | 13.0+ 0.7<br>56          | 13.2+ 0.8<br>115 | 13.2+ 0.9<br>104 | 12.9 + 0.9<br>428   | 12.9 + 0.9<br>333    |
| FEP mcg/dl.           | 18.8+ 8.4<br>115                        | 19.3+ 8.6<br>94          | 21.1+ 9.1<br>101 | 22.7+11.0<br>76 | 23.5+ 7.8<br>97 | 23.5+ 7.0<br>58          | 16.5+ 7.9<br>114 | 16.8+ 9.3<br>101 | 19.8 + 8.6<br>427   | 20.1 + 9.5<br>329    |
| Serum Iron mcg/dl.    | 63.7+23.5<br>105                        | 68.8+24.3<br>82          | 75.6+24.6<br>89  | 69.0+25.2<br>73 | 77.4+27.9<br>92 | 85.5+29.6<br>58          | 65.2+24.5<br>106 | 69.9+24.0<br>95  | 327 + 41<br>381     | 326 + 41<br>299      |
| TIBC mcg/dl.          | 334+42<br>99                            | 331+41<br>78             | 324+37<br>89     | 319+31<br>71    | 338+42<br>87    | 338+54<br>58             | 315+39<br>106    | 318+37<br>92     | 70.0 + 29.7<br>393  | 72.3 + 26.1<br>308   |
| TS %                  | 19.0+ 7.1<br>97                         | 20.7+ 6.9<br>78          | 23.0+ 6.6<br>84  | 21.8+ 7.8<br>71 | 22.6+ 8.2<br>89 | 25.3+ 8.7<br>57          | 20.7+ 7.7<br>101 | 21.8+ 7.6<br>92  | 21.2 + 7.6<br>371   | 22.2 + 7.8<br>298    |
| MCHC %                | 35.5+ 1.6<br>116                        | 35.7+ 1.9<br>94          | 35.4+ 1.9<br>99  | 35.5+ 1.7<br>80 | 35.7+ 1.7<br>95 | 35.7+ 1.7<br>55          | 34.9+ 1.4<br>113 | 34.8+ 1.4<br>102 | 35.4 + 1.7<br>423   | 35.4 + 1.7<br>331    |
| Ferritin ng/ml.       | 24.0+10.7<br>93                         | 26.7+11.9<br>75          | 29.8+15.7<br>88  | 26.9+13.9<br>73 | 21.1+11.0<br>85 | 19.6+10.3<br>52          | 22.6+12.1<br>105 | 21.3+10.4<br>89  | 24.3 + 12.9<br>372  | 23.8 + 12.1<br>289   |
| Cholesterol mg/dl.    | 167+32<br>107                           | 171+29<br>84             | 169+32<br>100    | 170+35<br>79    | 163+29<br>93    | 159+30<br>58             | 156+24<br>114    | 153+30<br>100    | 164 + 30<br>414     | 163 + 32<br>321      |
| Vitamin A mcg/dl.     | 37.1+10.5<br>65                         | 37.7+ 7.7<br>58          | a                | a               | 35.8+ 7.1<br>87 | 36.6+ 7.0<br>56          | a                | a                | 36.4 + 8.7<br>152   | 37.2 + 7.4<br>114    |
| B-Carotene mcg/dl.    | 105.5+31.8<br>66                        | 90.1+24.7**<br>60        | a                | a               | 99.3+27.6<br>87 | 90.6+29.7<br>57          | a                | a                | 102.0 + 29.6<br>153 | 90.3 + 27.1**<br>117 |
| Vitamin C mg/dl.      | a                                       | a                        | a                | a               | 1.5+ 0.5<br>70  | 1.3+ 0.4*<br>39          | a                | a                | 1.5 + 0.5<br>70     | 1.3 + 0.4*<br>39     |

<sup>a</sup> Not available because assays were not performed.

<sup>b</sup> Significance indicated as:

\*p < .05  
\*\*p < .01

7A-71

Table 7-24

Unadjusted Means and Standard Deviations of  
Biochemical Indicators by Site and Race at Posttest (Samples A, B, C)

| Biochemical Indicator | Posttested Children (Samples A, B, C) in: |                  |                  |                 |                 |                   |                  |                 |                        |                  |                   |
|-----------------------|---|------------------|------------------|-----------------|-----------------|-------------------|------------------|-----------------|------------------------|------------------|-------------------|
|                       | Greene & Humphreys Counties               |                  | St. Clair County | Maricopa County |                 |                   | Mingo County     |                 | All <sup>b</sup> Sites |                  |                   |
|                       | White<br>n=36                             | Black<br>n=177   | Black<br>n=182   | White<br>n=38   | Black<br>n=8    | Hispanic<br>n=109 | White<br>n=212   | Black<br>n=12   | White<br>n=286         | Black<br>n=379   | Hispanic<br>n=110 |
| Hematocrit<br>%       | 16.6+2.2<br>35                            | 35.6+2.5<br>176  | 35.4+1.9<br>179  | 36.7+2.2<br>38  | 36.9+3.1<br>8   | 36.4+2.2<br>109   | 37.9+2.2<br>212  | 37.0+2.2<br>12  | 37.6+2.3<br>285        | 35.6+2.3<br>375  | 36.4+2.2<br>110   |
| Hemoglobin<br>gm/dl.  | 13.2+0.9<br>35                            | 12.6+1.0<br>175  | 12.6+0.9<br>179  | 13.1+0.7<br>38  | 12.5+0.9<br>8   | 13.1+0.7<br>106   | 13.0+0.8<br>207  | 13.0+1.0<br>12  | 13.2+0.8<br>280        | 12.6+0.9<br>374  | 13.1+0.7<br>107   |
| VEP<br>mcg/dl.        | 18.1+7.5<br>34                            | 19.1+8.7<br>175  | 21.8+10.0<br>176 | 21.2+5.6<br>38  | 20.0+11.0<br>8  | 24.6+7.6<br>109   | 16.4+8.3<br>203  | 20.2+12.5<br>12 | 17.4+8.6<br>275        | 20.4+9.5<br>371  | 24.5+7.6<br>110   |
| TIBC<br>mcg/dl.       | 332+35<br>39                              | 333+43<br>175    | 321+34<br>159    | 322+50<br>35    | 322+21<br>7     | 344+46<br>109     | 317+38<br>186    | 314+29<br>12    | 319+40<br>250          | 326+39<br>326    | 344+46<br>104     |
| Serum Iron<br>mcg/dl. | 69.4+21.7<br>32                           | 65.2+24.3<br>156 | 72.8+24.9<br>181 | 76.0+25.3<br>38 | 88.1+35.2<br>8  | 81.6+29.4<br>109  | 68.0+24.5<br>191 | 56.6+18.1<br>10 | 69.3+24.4<br>261       | 61.9+25.1<br>335 | 81.2+29.6<br>105  |
| TS<br>%               | 21.5+6.5<br>31                            | 19.4+7.1<br>144  | 22.6+7.1<br>154  | 21.5+6.6<br>34  | 26.2+10.4<br>7  | 24.2+8.8<br>105   | 21.2+7.7<br>182  | 21.1+6.8<br>11  | 21.3+7.4<br>247        | 121.2+7.3<br>316 | 24.0+8.9<br>106   |
| MCHC<br>%             | 36.1+1.7<br>35                            | 35.5+1.7<br>175  | 35.4+1.8<br>178  | 35.5+1.3<br>37  | 33.7+0.6<br>7   | 35.9+4.8<br>106   | 34.8+1.5<br>204  | 35.3+1.0<br>11  | 35.1+1.5<br>276        | 35.4+1.8<br>371  | 35.9+1.8<br>107   |
| Ferritin<br>ng/ml.    | 23.1+10.5<br>29                           | 25.6+11.5<br>139 | 28.5+15.0<br>160 | 21.8+10.2<br>32 | 29.0+16.0<br>7  | 19.6+10.3<br>99   | 21.5+11.1<br>202 | 29.9+12.2<br>12 | 21.7+10.9<br>263       | 27.3+13.5<br>318 | 19.6+10.2<br>100  |
| Cholesterol<br>gm/dl. | 170+28<br>33                              | 168+31<br>158    | 169+34<br>178    | 155+22<br>37    | 182+38<br>8     | 182+30<br>106     | 154+27<br>202    | 157+25<br>12    | 156+27<br>272          | 169+32<br>356    | 182+30<br>107     |
| Vitamin A<br>mcg/dl.  | 36.5+6.4<br>24                            | 37.6+9.8<br>99   | "                | 37.2+5.7<br>34  | 34.7+4.8<br>6   | 35.8+7.6<br>103   | "                | "               | 36.9+6.0<br>38         | 37.4+9.6<br>105  | 35.8+7.6<br>103   |
| B-Carotene<br>mcg/dl. | 105.8+31.9<br>25                          | 96.2+28.9<br>101 | "                | 85.9+24.3<br>35 | 109.3+34.6<br>7 | 98.4+29.0<br>102  | "                | "               | 94.2+29.2<br>60        | 97.1+29.0<br>108 | 98.4+29.0<br>102  |
| Vitamin C<br>mg/dl.   | "   | "                | "                | 1.6+0.4<br>29   | 1.4+0.6<br>6    | 1.4+0.4<br>74     | "                | "               | 1.6+0.4<br>29          | 1.4+0.6<br>6     | 1.4+0.4<br>74     |

<sup>a</sup>Not available because assays not performed.

<sup>b</sup>Overall difference among ethnic groups are statistically significant ( $p < .001$ ) for all biochemical indicators except Vitamins A & C and B-carotene.

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Table 7-25

Unadjusted Means and Standard Deviations of Biochemical Indicators  
by Site, Race and Head Start Status at Posttest  
(Samples A, B, C)

| Biochemical Indicator | Posttested Children (Samples A, B, C) In: |                 |                  |                 |                  |                 |
|-----------------------|---|-----------------|------------------|-----------------|------------------|-----------------|
|                       | Greene & Humphreys Counties               |                 |                  |                 | St. Clair County |                 |
|                       | White                                     |                 | Black            |                 | Black            |                 |
|                       | HS<br>n=17                                | NHS<br>n=19     | HS<br>n=100      | NHS<br>n=77     | HS<br>n=102      | NHS<br>n=80     |
| Hematocrit<br>%       | 36.2+ 2.2<br>17                           | 36.9+ 2.1<br>18 | 35.4+ 2.8<br>100 | 35.9+ 2.0<br>76 | 35.5+ 1.8<br>100 | 35.3+ 2.0<br>79 |
| Hemoglobin<br>gm/dl.  | 12.8+ 0.8<br>17                           | 13.5+ 0.8<br>18 | 12.6+ 1.0<br>99  | 12.7+ 0.8<br>76 | 12.6+ 0.9<br>101 | 12.6+ 0.8<br>78 |
| FEP<br>mcg/dl.        | 19.3+ 8.2<br>17                           | 18.4+ 6.8<br>17 | 18.7+ 8.4<br>98  | 19.5+ 9.0<br>77 | 21.7+ 9.1<br>101 | 22.7+11.1<br>75 |
| TIBC<br>mcg/dl.       | 337 +30<br>14                             | 326 +40<br>15   | 334 +44<br>85    | 332 +42<br>63   | 324 +37<br>89    | 319 +31<br>70   |
| Serum Iron<br>mcg/dl. | 65.7+22.9<br>14                           | 72.3+20.9<br>18 | 63.3+23.7<br>92  | 67.8+25.2<br>64 | 75.6+24.6<br>89  | 69.5+25.0<br>72 |
| TS<br>%               | 20.8+ 8.5<br>15                           | 22.2+ 4.1<br>16 | 18.6+ 6.8<br>82  | 20.3+ 7.4<br>62 | 23.0+ 6.6<br>84  | 22.0+ 7.7<br>70 |
| MCHC<br>%             | 35.4+ 1.5<br>17                           | 36.7+ 1.7<br>18 | 35.5+ 1.6<br>99  | 35.4+ 1.8<br>76 | 35.4+ 1.9<br>99  | 35.5+ 1.7<br>79 |
| Ferritin<br>ng/ml.    | 22.5+ 9.4<br>15                           | 23.7+11.8<br>14 | 24.2+11.0<br>78  | 27.4+11.9<br>61 | 29.8+15.7<br>88  | 26.9+14.0<br>72 |
| Cholesterol<br>mg/dl. | 163 + 29<br>15                            | 176 +27<br>18   | 167 +33<br>92    | 169 +30<br>66   | 169 +32<br>100   | 170 +35<br>78   |
| Vitamin A<br>mcg/dl.  | 35.5+ 7.1<br>14                           | 38.0+ 5.4<br>10 | 37.6+11.3<br>51  | 37.7+ 8.2<br>48 | a                | a               |
| B-Carotene<br>mg/dl.  | 111.1+27.6<br>14                          | 98.6+36.7<br>11 | 103.9+33.0<br>52 | 88.2+21.2<br>49 | a                | a               |

a Not available because assays not performed.

Table 7-25 (continued)

Unadjusted Means and Standard Deviations of Biochemical Indicators by Site, Race and Head Start Status at Posttest (Samples A, B, C)

| Biochemical Indicators | Posttested Children (Samples A, B, C) In: |                 |                 |                 |                |                  |                 |                   |                  |                 |                      |
|------------------------|---|-----------------|-----------------|-----------------|----------------|------------------|-----------------|-------------------|------------------|-----------------|----------------------|
|                        | Maricopa County                           |                 |                 |                 |                |                  | Mingo County    |                   |                  |                 |                      |
|                        | White                                     |                 | Black           |                 | Hispanic       |                  | White           |                   | Black            |                 |                      |
|                        | HS<br>n=27                                | NHS<br>n=11     | HS<br>n=6       | NHS<br>n=2      | HS<br>n=64     | NHS<br>n=45      | HS<br>n=107     | NHS<br>n=105      | HS<br>n=11       | NHS<br>n=1      |                      |
| Hematocrit (%)         | n   | 36.5+ 2.4<br>27 | 37.0+ 1.8<br>11 | 38.0+ 2.7<br>6  | 33.5+ 0.7<br>2 | 36.4+ 1.9<br>64  | 36.5+ 2.5<br>45 | 37.7+ 2.0<br>107  | 38.1+ 2.4<br>105 | 36.7+ 2.0<br>11 | 40.5<br>1            |
| Hemoglobin (gm/dl.)    | n   | 13.1+ 0.8<br>27 | 13.0+ 0.5<br>11 | 12.8+ 0.9<br>6  | 11.9+ 0.3<br>2 | 13.1+ 0.7<br>63  | 13.0+ 0.8<br>43 | 13.2+ 0.7<br>104  | 13.2+ 0.9<br>103 | 12.9+ 1.0<br>11 | 14.1<br>1            |
| FEP (mcg/dl.)          | n   | 20.1+ 4.6<br>27 | 23.8+ 6.9<br>11 | 20.0+12.3<br>6  | 20.0+ 9.9<br>2 | 25.3+ 7.9<br>64  | 23.5+ 7.1<br>45 | 16.0+ 7.1<br>103  | 16.9+ 9.3<br>100 | 21.2+12.5<br>11 | 9.0<br>1             |
| TIBC (mcg/dl.)         | n   | 323+47<br>24    | 321+58<br>11    | 322+19<br>5     | 323+33<br>2    | 345+40<br>58     | 343+54<br>45    | 315+40<br>95      | 318+37<br>91     | 313+30<br>11    | 329<br>1             |
| Iron (mcg/dl.)         |   | 74.5+24.3<br>27 | 79.6+28.6<br>11 | 91.0+41.0<br>6  | 79.5+ 9.2<br>2 | 77.4+28.0<br>59  | 87.2+30.5<br>45 | 66.1+25.0<br>96   | 69.9+24.0<br>95  | 56.6+18.1<br>10 | NA <sup>a</sup><br>0 |
| TS (%)                 |   | 20.7+ 6.6<br>24 | 23.4+ 6.5<br>10 | 26.7+12.4<br>5  | 24.9+ 5.4<br>2 | 23.0+ 8.4<br>60  | 25.8+ 9.3<br>45 | 20.8+ 7.9<br>91   | 21.7+ 7.6<br>91  | 20.3+ 6.6<br>10 | 29.2<br>1            |
| MCHC (%)               |   | 35.7+ 1.4<br>26 | 35.2+ 0.8<br>11 | 33.6+ 0.6<br>6  | 34.4+ 7<br>1   | 36.0+ 1.8<br>63  | 35.9+ 1.8<br>43 | 34.9+ 1.5<br>103  | 34.8+ 1.4<br>101 | 35.3+ 1.1<br>10 | 34.8<br>1            |
| Ferritin (ng/ml.)      |   | 21.4+10.7<br>22 | 22.8+ 9.5<br>10 | 32.8+17.7<br>5  | 19.5+ 5.0<br>2 | 20.0+10.1<br>59  | 18.9+10.7<br>40 | 21.8+11.8<br>94   | 21.2+10.5<br>88  | 30.1+12.8<br>11 | 28.0<br>1            |
| Cholesterol (mg/dl.)   |   | 160+21<br>26    | 144+22<br>11    | 190+34<br>6     | 161+56<br>2    | 162+30<br>61     | 163+30<br>45    | 157+25<br>103     | 152+29<br>99     | 153+22<br>11    | 201<br>1             |
| Vitamin A (mg/dl.)     |   | 36.5+ 4.9<br>23 | 38.7+ 7.1<br>11 | 33.6+ 4.5<br>5  | 40.0<br>1      | 35.8+ 8.0<br>59  | 35.9+ 7.0<br>44 | a                 | a                | a               | a                    |
| B-Carotene (mcg/dl.)   |   | 89.8+24.4<br>24 | 77.4+23.0<br>11 | 115.6+37.2<br>5 | 93.5+30.4<br>2 | 101.9+27.3<br>58 | 93.8+30.8<br>44 | a                 | a                | a               | a                    |
| Vitamin C (mcg/dl.)    |   | 1.6+ 0.5<br>20  | 1.4+ 0.3<br>9   | 1.4+ 0.6<br>5   | 1.1<br>1       | 1.4+ 0.5<br>45   | 1.3+ 0.4<br>29  | 1229 <sup>a</sup> |                  | a               | a                    |

<sup>a</sup> Not available because assays not performed.

Table 7-25 (continued)

Unadjusted Means and Standard Deviations of Biochemical Indicators by Head Start Status and Race, Across Sites at Posttest (Samples A, B, C)

| Biochemical Indicator | Posttested Children (Samples A, B, C) by: |                  |                  |                   |                  |                  |                 |
|-----------------------|---|------------------|------------------|-------------------|------------------|------------------|-----------------|
|                       | All Sites                                 |                  |                  |                   |                  |                  |                 |
|                       | White                                     |                  | Black            |                   | Hispanic         |                  |                 |
|                       | HS<br>n=151                               | NHS<br>n=135     | HS<br>n=219      | NHS<br>n=160      | HS<br>n=64       | NHS<br>n=46      |                 |
| Hematocrit (Z)        | n   | 37.3+ 2.2<br>151 | 37.9+ 2.3<br>134 | 35.6+ 2.4<br>217  | 35.6+ 2.0<br>158 | 36.4+ 1.9<br>64  | 36.5+ 2.4<br>46 |
| Hemoglobin (gm/dl.)   | n   | 13.1+ 0.8<br>148 | 13.2+ 0.8<br>132 | 12.6+ 1.0<br>217  | 12.6+ 0.8<br>157 | 13.1+ 0.7<br>63  | 13.0+ 0.8<br>44 |
| FEP (mcg/dl.)         | n   | 17.1+ 7.0<br>147 | 17.7+ 9.0<br>128 | 10.0+ 9.1<br>216  | 21.0+10.1<br>155 | 25.3+ 7.9<br>64  | 23.4+ 7.1<br>46 |
| TIBC (mcg/dl.)        | n   | 319 +41<br>133   | 320 +39<br>117   | 328 +40<br>190    | 325 +37<br>136   | 345 +40<br>58    | 344 +59<br>46   |
| Serum Iron (mcg/dl.)  | n   | 67.8+24.7<br>137 | 71.1+24.0<br>124 | 69.4+25.4<br>197  | 68.8+24.9<br>138 | 77.4+28.0<br>59  | 86.0+31.2<br>46 |
| TS (Z)                | n   | 20.8+ 7.7<br>130 | 21.9+ 7.1<br>117 | 21.0+ 7.2<br>181  | 21.3+ 7.6<br>135 | 23.0+ 8.4<br>60  | 25.4+ 9.5<br>46 |
| MCHC (Z)              | n   | 35.1+ 1.5<br>146 | 35.1+ 1.6<br>130 | 35.4+ 1.7<br>214  | 35.5+ 1.8<br>157 | 36.0+ 1.8<br>63  | 35.9+ 1.8<br>44 |
| Ferritin (ng/ml.)     | n   | 21.8+11.3<br>131 | 21.6+10.5<br>112 | 27.5+14.0<br>182  | 27.0+13.0<br>136 | 20.0+10.1<br>59  | 19.0+10.6<br>41 |
| Cholesterol (mg/dl.)  | n   | 158 +24.<br>144  | 155 +30<br>128   | 168 +32<br>209    | 170 +33<br>147   | 162 +30<br>61    | 162 +30<br>46   |
| Vitamin A (Z)         | n   | 36.1+ 5.7<br>37  | 38.4+ 6.2<br>21  | 37.2+10.9<br>56   | 37.7+ 8.1<br>49  | 35.8+ 8.0<br>59  | 35.9+ 7.0<br>44 |
| B-Carotene (mcg/dl.)  | n   | 97.8+27.3<br>38  | 88.0+31.8<br>22  | 104.9 +33.2<br>57 | 88.4+21.3<br>51  | 101.9+27.4<br>58 | 93.8+30.8<br>44 |
| Vitamin C (mg/dl.)    | n   | 1.6+ 0.5<br>20   | 1.4+ 0.3<br>9    | 1.4+ 0.6<br>5     | 1.1+ 0.0<br>1    | 1.4+ 0.5<br>45   | 1.3+ 0.4<br>29  |

Table 7-26

Percentage of Head Start Children Receiving A Hematocrit or Hemoglobin Screen by Head Start with Abnormal Hematocrit or Hemoglobin at Posttest

| Hematological Screen            | Posttested Children (Samples A, B, C) in:            |               |                           |              |                          |              |                         |             |                            |                |
|---------------------------------|--|---------------|---------------------------|--------------|--------------------------|--------------|-------------------------|-------------|----------------------------|----------------|
|                                 | Greene & Humphreys Counties<br>n=127                 |               | St. Clair County<br>n=108 |              | Maricopa County<br>n=102 |              | Mingo County<br>n=112   |             | All Sites<br>n=449         |                |
| Hematocrit Screen               | Yes<br>47  | No<br>80      | Yes<br>57                 | No<br>51     | Yes<br>83                | No<br>19     | Yes<br>78               | No<br>34    | Yes<br>265                 | No<br>184      |
| Abnormal Hematocrit at Posttest | n<br>5/46<br>%<br>10.9<br>X <sup>2</sup><br>p = 0.12 | 17/78<br>21.8 | 8/56<br>14.3<br>p = 1.00  | 7/49<br>14.3 | 4/82<br>4.9<br>p = 0.35  | 2/19<br>10.5 | 2/78<br>2.6<br>p = 0.38 | 2/34<br>2.9 | 19/262<br>7.3<br>p = 0.005 | 28/180<br>15.6 |
| Hemoglobin Screen               | Yes<br>37  | No<br>90      | Yes<br>57                 | No<br>51     | Yes<br>18                | No<br>84     | Yes<br>78               | No<br>34    | Yes<br>190                 | No<br>259      |
| Abnormal Hemoglobin at Posttest | n<br>0/37<br>%<br>0.0<br>X <sup>2</sup><br>p = 0.19  | 4/88<br>4.5   | 1/56<br>1.8<br>p = 0.35   | 0/49<br>0.0  | 1/18<br>5.6<br>p = 0.03  | 0/82<br>0.0  | 0/76<br>0.0             | 0/33<br>0.0 | 2/187<br>1.1<br>p = 0.64   | 4/248<br>1.6   |

Table 7-27

Regression Analysis of Hematocrit and Hemoglobin, Across Sites  
Longitudinal Data

| Dependent Variable | Sample Size | Factors <sup>a</sup>    | Effects <sup>b</sup> |  |
|--------------------|-------------|-------------------------|----------------------|--|
|                    |             |                         | b                    | se <sub>b</sub>  |
|                    |             | Site                    |                      |  |
| <u>HEMATOCRIT</u>  | <u>185</u>  | Greene & Humphreys      | <u>0.40</u>          | <u>0.56</u>  |
|                    |             | St. Clair               | <u>-0.58</u>         | <u>0.60</u>  |
|                    |             | Maricopa                | <u>-0.16</u>         | <u>0.67</u>  |
|                    |             | Mingo                   | <u>0.34</u>          | <u>0.72</u>  |
|                    |             | Program                 |                      |  |
|                    |             | Head Start              | <u>-0.36</u>         | <u>0.32</u>  |
|                    |             | Constant                | <u>18.61</u>         |  |
|                    |             | Statistics <sup>c</sup> | F = <u>8.98</u>      | R <sup>2</sup> = <u>0.34</u> MS <sub>e</sub> = <u>4.26</u> |
|                    |             | Site                    |                      |  |
| <u>HEMOGLOBIN</u>  | <u>184</u>  | Greene & Humphreys      | <u>0.25</u>          | <u>0.20</u>  |
|                    |             | St. Clair               | <u>0.37</u>          | <u>0.22</u>  |
|                    |             | Maricopa                | <u>-0.44</u>         | <u>0.24</u>  |
|                    |             | Mingo                   | <u>-0.17</u>         | <u>0.26</u>  |
|                    |             | Program                 |                      |  |
|                    |             | Head Start              | <u>-0.51</u>         | <u>0.12</u>  |
|                    |             | Constant                | <u>6.87</u>          |  |
|                    |             | Statistics <sup>c</sup> | F = <u>8.85</u>      | R <sup>2</sup> = <u>0.34</u> MS <sub>e</sub> = <u>0.56</u> |

<sup>a</sup>Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup>Centered without weights.

<sup>c</sup>MS<sub>e</sub> is residual mean square.

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Table 7-28

Regression Analysis of Free Erythrocyte Protoporphyrin and Total Iron  
Binding Capacity, Across Sites  
Longitudinal Data

| Dependent Variable | Sample Size | Factors <sup>a</sup>  | Effects <sup>b</sup> |                 |
|--------------------|-------------|---|----------------------|-----------------|
|                    |             |   | b                    | se <sub>b</sub> |
|                    |             | Site  |                      |                 |
| <u>FEP</u>         | <u>182</u>  | Greene & Humphreys  | <u>-0.36</u>         | <u>1.98</u>     |
|                    |             | St. Clair   | <u>1.58</u>          | <u>2.12</u>     |
|                    |             | Maricopa  | <u>0.99</u>          | <u>2.37</u>     |
|                    |             | Mingo   | <u>-2.54</u>         | <u>2.52</u>     |
|                    |             | Program   |                      |                 |
|                    |             | Head Start  | <u>1.75</u>          | <u>1.13</u>     |
|                    |             | Constant  | <u>9.07</u>          |                 |
|                    |             | Statistics <sup>c</sup> F = <u>12.45</u> R <sup>2</sup> = <u>0.42</u> MS <sub>e</sub> = <u>52.34</u>  |                      |                 |
|                    |             | Site  |                      |                 |
| <u>TIBC</u>        | <u>148</u>  | Greene & Humphreys  | <u>13.38</u>         | <u>12.38</u>    |
|                    |             | St. Clair   | <u>-7.70</u>         | <u>13.40</u>    |
|                    |             | Maricopa  | <u>-7.02</u>         | <u>13.47</u>    |
|                    |             | Mingo   | <u>1.34</u>          | <u>16.05</u>    |
|                    |             | Program   |                      |                 |
|                    |             | Head Start  | <u>3.95</u>          | <u>6.80</u>     |
|                    |             | Constant  | <u>183.16</u>        |                 |
|                    |             | Statistics <sup>c</sup> F = <u>3.83</u> R <sup>2</sup> = <u>0.22</u> MS <sub>e</sub> = <u>1521.86</u> |                      |                 |

<sup>a</sup> Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.



Table 7-29

Regression Analysis of Serum Iron and Transferrin Saturation, Across Sites  
Longitudinal Data

| Dependent Variable | Sample Size | Factors <sup>a</sup>    | Effects <sup>b</sup> |  |
|--------------------|-------------|-------------------------|----------------------|--|
|                    |             |                         | b                    | se <sub>b</sub>  |
|                    |             | Site                    |                      |  |
| <u>IRON</u>        | <u>160</u>  | Greene & Humphreys      | <u>-2.01</u>         | <u>6.80</u>  |
|                    |             | St. Clair               | <u>-3.33</u>         | <u>7.54</u>  |
|                    |             | Maricopa                | <u>-0.82</u>         | <u>8.07</u>  |
|                    |             | Mingo                   | <u>6.16</u>          | <u>8.90</u>  |
|                    |             | Program                 |                      |  |
|                    |             | Head Start              | <u>-1.58</u>         | <u>4.10</u>  |
|                    |             | Constant                | <u>45.19</u>         |  |
|                    |             | Statistics <sup>c</sup> | F = <u>2.77</u>      | R <sup>2</sup> = <u>0.16</u> MS <sub>e</sub> = <u>610.63</u> |
|                    |             | Site                    |                      |  |
| <u>TS</u>          | <u>147</u>  | Greene & Humphreys      | <u>-0.74</u>         | <u>2.25</u>  |
|                    |             | St. Clair               | <u>-0.63</u>         | <u>2.54</u>  |
|                    |             | Maricopa                | <u>0.62</u>          | <u>2.65</u>  |
|                    |             | Mingo                   | <u>0.76</u>          | <u>2.93</u>  |
|                    |             | Program                 |                      |  |
|                    |             | Head Start              | <u>-1.41</u>         | <u>1.40</u>  |
|                    |             | Constant                | <u>14.61</u>         |  |
|                    |             | Statistics <sup>c</sup> | F = <u>1.77</u>      | R <sup>2</sup> = <u>0.12</u> MS <sub>e</sub> = <u>64.88</u>  |

<sup>a</sup>Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup>Centered without weights.

<sup>c</sup>MS<sub>e</sub> is residual mean square.

Table 7-30

Regression Analysis of Serum, Ferritin and Cholesterol, Across Sites  
Longitudinal Data

| Dependent Variable | Sample Size | Factors <sup>a</sup>    | Effects <sup>b</sup> |  |
|--------------------|-------------|-------------------------|----------------------|--|
|                    |             |                         | b                    | se <sub>b</sub>  |
|                    |             | Site                    |                      |  |
| <u>FERRITIN</u>    | <u>154</u>  | Greene & Humphreys      | <u>-6.77</u>         | <u>3.30</u>  |
|                    |             | St. Clair               | <u>-1.90</u>         | <u>3.58</u>  |
|                    |             | Maricopa                | <u>6.71</u>          | <u>3.98</u>  |
|                    |             | Mingo                   | <u>1.96</u>          | <u>4.38</u>  |
|                    |             | Program                 |                      |  |
|                    |             | Head Start              | <u>-2.37</u>         | <u>2.01</u>  |
|                    |             | Constant                | <u>11.92</u>         |  |
|                    |             | Statistics <sup>c</sup> | F = <u>3.57</u>      | R <sup>2</sup> = <u>0.20</u> MS <sub>e</sub> = <u>141.34</u> |
|                    |             | Site                    |                      |  |
| <u>CHOLESTEROL</u> | <u>168</u>  | Greene & Humphreys      | <u>13.85</u>         | <u>8.40</u>  |
|                    |             | St. Clair               | <u>12.27</u>         | <u>8.95</u>  |
|                    |             | Maricopa                | <u>-6.07</u>         | <u>10.21</u>   |
|                    |             | Mingo                   | <u>-20.04</u>        | <u>9.92</u>  |
|                    |             | Program                 |                      |  |
|                    |             | Head Start              | <u>0.40</u>          | <u>4.34</u>  |
|                    |             | Constant                | <u>66.51</u>         |  |
|                    |             | Statistics <sup>c</sup> | F = <u>6.10</u>      | R <sup>2</sup> = <u>0.28</u> MS <sub>e</sub> = <u>721.49</u> |

<sup>a</sup>Adjusted for gender, race, mother's education, and income percentile.<sup>b</sup>Centered without weights.<sup>c</sup>MS<sub>e</sub> is residual mean square.

Table 7-31

Regression Analysis of Hematocrit, by Site  
Longitudinal Data

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |             |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------|-------------|
|                    |             |                      | b                    | se <sub>b</sub> |                         |             |
| Greene & Humphreys |             |                      |                      |                 |                         |             |
| <u>HEMATOCRIT</u>  | <u>65</u>   | Head Start           | <u>-0.16</u>         | <u>0.53</u>     | F =                     | <u>5.41</u> |
|                    |             | Constant             | <u>13.56</u>         |                 | MS <sub>e</sub>         | <u>4.36</u> |
| St. Clair          |             |                      |                      |                 |                         |             |
| <u>HEMATOCRIT</u>  | <u>38</u>   | Head Start           | <u>0.29</u>          | <u>0.68</u>     | F =                     | <u>1.12</u> |
|                    |             | Constant             | <u>22.58</u>         |                 | MS <sub>e</sub>         | <u>4.02</u> |
| Maricopa           |             |                      |                      |                 |                         |             |
| <u>HEMATOCRIT</u>  | <u>50</u>   | Head Start           | <u>-0.86</u>         | <u>0.70</u>     | F =                     | <u>1.76</u> |
|                    |             | Constant             | <u>14.16</u>         |                 | MS <sub>e</sub>         | <u>4.62</u> |
| Mingo              |             |                      |                      |                 |                         |             |
| <u>HEMATOCRIT</u>  | <u>32</u>   | Head Start           | <u>-0.84</u>         | <u>0.85</u>     | F =                     | <u>0.45</u> |
|                    |             | Constant             | <u>31.94</u>         |                 | MS <sub>e</sub>         | <u>5.07</u> |

<sup>a</sup>Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup>Centered without weights.

<sup>c</sup>MS<sub>e</sub> is residual mean square.

Table 7-32

Regression Analysis of Hemoglobin, by Site  
Longitudinal Data

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup>       |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------------|
|                    |             |                      | b                    | se <sub>b</sub> |                               |
| Greene & Humphreys |             |                      |                      |                 |                               |
| <u>HEMOGLOBIN</u>  | <u>66</u>   | Head Start           | <u>-0.28E-01</u>     | <u>0.24</u>     | F = <u>2.79</u>               |
|                    |             | Constant             | <u>6.14</u>          |                 | MS <sub>e</sub> = <u>0.85</u> |
| St. Clair          |             |                      |                      |                 |                               |
| <u>HEMOGLOBIN</u>  | <u>37</u>   | Head Start           | <u>-0.21</u>         | <u>0.26</u>     | F = <u>1.71</u>               |
|                    |             | Constant             | <u>6.02</u>          |                 | MS <sub>e</sub> = <u>0.60</u> |
| Maricopa           |             |                      |                      |                 |                               |
| <u>HEMOGLOBIN</u>  | <u>50</u>   | Head Start           | <u>0.73E-01</u>      | <u>0.15</u>     | F = <u>6.21</u>               |
|                    |             | Constant             | <u>6.99</u>          |                 | MS <sub>e</sub> = <u>0.23</u> |
| Mingo              |             |                      |                      |                 |                               |
| <u>HEMOGLOBIN</u>  | <u>31</u>   | Head Start           | <u>-0.19E-01</u>     | <u>0.32</u>     | F = <u>1.36</u>               |
|                    |             | Constant             | <u>7.11</u>          |                 | MS <sub>e</sub> = <u>0.62</u> |

<sup>a</sup> Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

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Table 7-33

Regression Analysis of Free Erythrocyte Protoporphyrin, by Site  
Longitudinal Data

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup>        |
|--------------------|-------------|----------------------|----------------------|-----------------|--------------------------------|
|                    |             |                      | b                    | se <sub>b</sub> |                                |
| Greene & Humphreys |             |                      |                      |                 |                                |
| <u>FEP</u>         | <u>64</u>   | Head Start           | <u>1.88</u>          | <u>1.61</u>     | F = <u>6.44</u>                |
|                    |             | Constant             | <u>5.65</u>          |                 | MS <sub>e</sub> = <u>37.54</u> |
| St. Clair          |             |                      |                      |                 |                                |
| <u>FEP</u>         | <u>37</u>   | Head Start           | <u>3.88</u>          | <u>3.56</u>     | F = <u>5.37</u>                |
|                    |             | Constant             | <u>12.85</u>         |                 | MS <sub>e</sub> = <u>92.46</u> |
| Maricopa           |             |                      |                      |                 |                                |
| <u>FEP</u>         | <u>51</u>   | Head Start           | <u>2.11</u>          | <u>1.77</u>     | F = <u>7.07</u>                |
|                    |             | Constant             | <u>10.32</u>         |                 | MS <sub>e</sub> = <u>29.86</u> |
| Mingo              |             |                      |                      |                 |                                |
| <u>FEP</u>         | <u>30</u>   | Head Start           | <u>-1.62</u>         | <u>3.57</u>     | F = <u>1.93</u>                |
|                    |             | Constant             | <u>-2.44</u>         |                 | MS <sub>e</sub> = <u>80.74</u> |

<sup>a</sup>Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup>Centered without weights.

<sup>c</sup>MS<sub>e</sub> is residual mean square.

Table 7-34

Regression Analysis of Total Iron Binding Capacity, by Site  
Longitudinal Data

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup>        |
|--------------------|-------------|----------------------|----------------------|-----------------|--------------------------------|
|                    |             |                      | b                    | se <sub>b</sub> |                                |
| Greene & Humphreys |             |                      |                      |                 |                                |
| <u>TIBC</u>        | <u>51</u>   | Head Start           | <u>9.55</u>          | <u>11.12</u>    | F = <u>2.44</u>                |
|                    |             | Constant             | <u>163.08</u>        |                 | MS <sub>e</sub> <u>1303.14</u> |
| St. Clair          |             |                      |                      |                 |                                |
| <u>TIBC</u>        | <u>26</u>   | Head Start           | <u>-8.55</u>         | <u>11.52</u>    | F = <u>2.38</u>                |
|                    |             | Constant             | <u>112.29</u>        |                 | MS <sub>e</sub> <u>846.77</u>  |
| Maricopa           |             |                      |                      |                 |                                |
| <u>TIBC</u>        | <u>50</u>   | Head Start           | <u>0.98</u>          | <u>13.37</u>    | F = <u>1.56</u>                |
|                    |             | Constant             | <u>197.71</u>        |                 | MS <sub>e</sub> <u>2274.55</u> |
| Mingo              |             |                      |                      |                 |                                |
| <u>TIBC</u>        | <u>21</u>   | Head Start           | <u>-2.73</u>         | <u>17.87</u>    | F = <u>1.89</u>                |
|                    |             | Constant             | <u>191.64</u>        |                 | MS <sub>e</sub> <u>1054.57</u> |

<sup>a</sup>Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup>Centered without weights.

<sup>c</sup>MS<sub>e</sub> is residual mean square.

Table 7-35

Regression Analysis of Serum Iron  
Longitudinal Data

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup><br>b | se <sub>b</sub> | Statistics <sup>c</sup> |
|--------------------|-------------|----------------------|---------------------------|-----------------|-------------------------|
| IRON               | 58          | Greene & Humphreys   |                           |                 |                         |
|                    |             | Head Start           | -4.38                     | 5.46            | F = 1.04                |
|                    |             | Constant             | 57.51                     |                 | MS <sub>e</sub> 396.28  |
| IRON               | 28          | St. Clair            |                           |                 |                         |
|                    |             | Head Start           | 5.82                      | 10.11           | F = 0.94                |
|                    |             | Constant             | 9.80                      |                 | MS <sub>e</sub> 641.75  |
| IRON               | 50          | Maricopa             |                           |                 |                         |
|                    |             | Head Start           | -2.67                     | 9.66            | F = 1.42                |
|                    |             | Constant             | 19.10                     |                 | MS <sub>e</sub> 909.20  |
| IRON               | 34          | Mingo                |                           |                 |                         |
|                    |             | Head Start           | 6.46                      | 12.84           | F = 1.02                |
|                    |             | Constant             | 35.97                     |                 | MS <sub>e</sub> 654.89  |

<sup>a</sup> Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 7-36

Regression Analysis of Transferrin Saturation, by Site  
Longitudinal Data

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------|
|                    |             |                      | b                    | se <sub>b</sub> |                         |
| Greene & Humphreys |             |                      |                      |                 |                         |
| TS                 | 52          | Head Start           | -2.85                | 2.07            | F = 7.59                |
|                    |             | Constant             | 20.11                |                 | MS <sub>e</sub> = 47.60 |
| St. Clair          |             |                      |                      |                 |                         |
| TS                 | 23          | Head Start           | 0.79                 | 3.35            | F = 1.02                |
|                    |             | Constant             | 4.03                 |                 | MS <sub>e</sub> = 55.14 |
| Maricopa           |             |                      |                      |                 |                         |
| TS                 | 50          | Head Start           | -1.04                | 2.85            | F = 1.52                |
|                    |             | Constant             | 1.48                 |                 | MS <sub>e</sub> = 79.48 |
| Mingo              |             |                      |                      |                 |                         |
| TS                 | 22          | Head Start           | 0.15                 | 4.74            | F = 1.10                |
|                    |             | Constant             | 10.31                |                 | MS <sub>e</sub> = 78.37 |

<sup>a</sup>Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup>Centered without weights.

<sup>c</sup>MS<sub>e</sub> is residual mean square.

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Table 7-37

Regression Analysis of Serum Ferritin, by Site  
Longitudinal Data

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |               |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------|---------------|
|                    |             |                      | b                    | se <sub>b</sub> |                         |               |
| Greene & Humphreys |             |                      |                      |                 |                         |               |
| <u>FERRITIN</u>    | <u>51</u>   | Head Start           | <u>0.79</u>          | <u>2.23</u>     | F                       | = <u>5.13</u> |
|                    |             | Constant             | <u>-0.87</u>         |                 | MS <sub>e</sub>         | <u>58.10</u>  |
| St. Clair          |             |                      |                      |                 |                         |               |
| <u>FERRITIN</u>    | <u>31</u>   | Head Start           | <u>-2.42</u>         | <u>0.13</u>     | F                       | = <u>3.62</u> |
|                    |             | Constant             | <u>6.32</u>          |                 | MS <sub>e</sub>         | <u>103.92</u> |
| Maricopa           |             |                      |                      |                 |                         |               |
| <u>FERRITIN</u>    | <u>48</u>   | Head Start           | <u>-4.39</u>         | <u>4.67</u>     | F                       | = <u>1.29</u> |
|                    |             | Constant             | <u>36.40</u>         |                 | MS <sub>e</sub>         | <u>199.53</u> |
| Mingo              |             |                      |                      |                 |                         |               |
| <u>FERRITIN</u>    | <u>24</u>   | Head Start           | <u>0.24</u>          | <u>9.12</u>     | F                       | = <u>0.28</u> |
|                    |             | Constant             | <u>27.94</u>         |                 | MS <sub>e</sub>         | <u>311.86</u> |

<sup>a</sup> Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 7-38

Regression Analysis of Serum Cholesterol, by Site  
Longitudinal Data

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------|
|                    |             |                      | b                    | se <sub>b</sub> |                         |
| Greene & Humphreys |             |                      |                      |                 |                         |
| CHOLESTEROL        | 58          | Head Start           | 0.34                 | 7.60            | F = 3.60                |
|                    |             | Constant             | 52.71                |                 | MS <sub>e</sub> 778.07  |
| St. Clair          |             |                      |                      |                 |                         |
| CHOLESTEROL        | 35          | Head Start           | 5.08                 | 9.14            | F = 2.77                |
|                    |             | Constant             | 68.93                |                 | MS <sub>e</sub> 638.36  |
| Maricopa           |             |                      |                      |                 |                         |
| CHOLESTEROL        | 49          | Head Start           | -3.30                | 9.89            | F = 2.82                |
|                    |             | Constant             | 32.97                |                 | MS <sub>e</sub> 947.96  |
| Mingo              |             |                      |                      |                 |                         |
| CHOLESTEROL        | 26          | Head Start           | 3.52                 | 11.15           | F = 1.17                |
|                    |             | Constant             | 128.0                |                 | MS <sub>e</sub> 562.82  |

<sup>a</sup> Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 7-39

Regression Analysis of Serum Vitamin A, by Site .  
Longitudinal Data

| Dependent Variable, | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |         |
|---------------------|-------------|----------------------|----------------------|-----------------|-------------------------|---------|
|                     |             |                      | b                    | se <sub>b</sub> |                         |         |
| Greene & Humphreys  |             |                      |                      |                 |                         |         |
| VITAMIN A           | 35          | Head Start           | -1.60                | 3.13            | F =                     | 2.25    |
|                     |             | Constant             | 9.02                 |                 | MS <sub>e</sub>         | 75.96   |
| Maricopa            |             |                      |                      |                 |                         |         |
| VITAMIN A           | 45          | Head Start           | 9.83                 | 17.95           | F =                     | 0.19    |
|                     |             | Constant             | 46.83                |                 | MS <sub>e</sub>         | 2883.37 |

<sup>a</sup> Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 7-40

Regression Analysis of B-Carotene, by Site  
Longitudinal Data

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup><br>b | se <sub>b</sub> | Statistics <sup>c</sup>       |
|--------------------|-------------|----------------------|---------------------------|-----------------|-------------------------------|
| Greene & Humphreys |             |                      |                           |                 |                               |
| <u>CAROTENE</u>    | <u>37</u>   | Head Start           | <u>8.38</u>               | <u>9.12</u>     | F = <u>3.63</u>               |
|                    |             | Constant             | <u>13.73</u>              |                 | MS <sub>e</sub> <u>655.60</u> |
| Maritopa           |             |                      |                           |                 |                               |
| <u>CAROTENE</u>    | <u>48</u>   | Head Start           | <u>5.14</u>               |                 | F = <u>5.32</u>               |
|                    |             | Constant             | <u>42.81</u>              |                 | MS <sub>e</sub> <u>709.87</u> |

<sup>a</sup> Adjusted for gender, race, mother's education, income percentile, and pretest value.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 7-41

Regression Analysis of Hematocrit and Hemoglobin, Across Sites  
Samples A, B, C.

| Dependent Variable                                 | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                        |
|--|-------------|----------------------|----------------------|------------------------|
|  |             |                      | b                    | se <sup>b</sup>        |
|  |             | Site                 |                      |                        |
| HEMATOCRIT   | 729         | Greene & Humphreys   | -0.53**              | 0.19                   |
|  |             | St. Clair            | -0.67**              | 0.23                   |
|  |             | Maricopa             | -0.18                | 0.17                   |
|  |             | Mingo                | 1.14***              | 0.22                   |
|  |             | Program              |                      |                        |
|  |             | Head Start           | -0.18                | 0.17                   |
|  |             | Constant             | 36.32                |                        |
| Statistics <sup>c</sup> F = 17.12 R <sup>2</sup> = |             |                      | 0.18                 | MS <sub>e</sub> = 4.95 |
|  |             | Site                 |                      |                        |
| HEMOGLOBIN   | 722         | Greene & Humphreys   | -0.28E-01            | 0.07                   |
|  |             | St. Clair            | -0.84E-01            | 0.09                   |
|  |             | Maricopa             | -0.28E-01            | 0.11                   |
|  |             | Mingo                | 0.14                 | 0.08                   |
|  |             | Program              |                      |                        |
|  |             | Head Start           | -0.20E-01            | 0.07                   |
|  |             | Constant             | 12.89                |                        |
| Statistics <sup>c</sup> F = 9.49 R <sup>2</sup> =  |             |                      | 0.10                 | MS <sub>e</sub> = 0.74 |

<sup>a</sup> Adjusted for gender, race, mother's education, and income percentile.<sup>b</sup> Centered without weights.<sup>c</sup> MS<sub>e</sub>

Table 7-42

Regression Analysis of Free Erythrocyte Protoporphyrin and Total  
Iron Binding Capacity, Across Sites  
Samples A, B, C

| Dependent Variable   | Sample Size | Factors <sup>a</sup>   | Effects <sup>b</sup> |                 |  |  |
|--|-------------|--|----------------------|-----------------|--|--|
|  |             |  | b                    | se <sup>b</sup> |  |  |
| FEP  | 716         | Site   |                      |                 |  |  |
|  |             | Greene & Humphreys   | -1.04                | 0.75            |  |  |
|  |             | St. Clair  | 1.55                 | 0.89            |  |  |
|  |             | Maricopa   | 1.87                 | 1.10            |  |  |
|  |             | Mingo  | -2.38                | 0.86            |  |  |
|  |             | Program  |                      |                 |  |  |
|  |             | Head Start   | -0.55                | 0.66            |  |  |
|  |             | Constant   | 21.49                |                 |  |  |
|  |             | Statistics <sup>c</sup> F = 7.72 R <sup>2</sup> = 0.09 MS <sub>e</sub> = 75.65 |                      |                 |  |  |
|  |             | TIBC   | 644                  | Site            |  |  |
| Greene & Humphreys   | 9.94**      |  |                      | 3.69            |  |  |
| St. Clair  | -1.49       |  |                      | 4.34            |  |  |
| Maricopa   | -1.62       |  |                      | 5.34            |  |  |
| Mingo  | -6.83       |  |                      | 4.17            |  |  |
| Program  |             |  |                      |                 |  |  |
| Head Start   | 1.70        |  |                      | 3.23            |  |  |
| Constant   | 323.54      |  |                      |                 |  |  |
| Statistics <sup>c</sup> F = 4.56 R <sup>2</sup> = 0.06 MS <sub>e</sub> = 1615.70 |             |  |                      |                 |  |  |

<sup>a</sup> Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub>

Table 7-43

Regression Analysis of Serum Iron and Transferrin Saturation, Across Sites  
Samples A, B, C

| Dependent Variable      | Sample Size | Factors <sup>a</sup>    | Effects <sup>b</sup> |                 |                       |                          |
|-------------------------|-------------|-------------------------|----------------------|-----------------|-----------------------|--------------------------|
|                         |             |                         | b                    | se <sup>b</sup> |                       |                          |
| IRON                    | 662         | Site                    |                      |                 |                       |                          |
|                         |             | Greene & Humphreys      | -4.72*               | 2.28            |                       |                          |
|                         |             | St. Clair               | 1.22                 | 2.74            |                       |                          |
|                         |             | Maricopa                | 7.27*                | 3.27            |                       |                          |
|                         |             | Mingo                   | 3.76                 | 2.63            |                       |                          |
|                         |             | Program                 |                      |                 |                       |                          |
|                         |             | Head Start              | -2.59                | 2.03            |                       |                          |
|                         |             | Constant                | 64.98                |                 |                       |                          |
|                         |             | Statistics <sup>c</sup> |                      | F = 4.67        | R <sup>2</sup> = 0.05 | MS <sub>e</sub> = 654.33 |
|                         |             | TS                      | 632                  | Site            |                       |                          |
| Greene & Humphreys      | -1.71*      |                         |                      | 0.70            |                       |                          |
| St. Clair               | 0.83        |                         |                      | 0.83            |                       |                          |
| Maricopa                | 1.00        |                         |                      | 1.02            |                       |                          |
| Mingo                   | -0.12       |                         |                      | 0.79            |                       |                          |
| Program                 |             |                         |                      |                 |                       |                          |
| Head Start              | -1.00       |                         |                      | 0.61            |                       |                          |
| Constant                | 19.30       |                         |                      |                 |                       |                          |
| Statistics <sup>c</sup> |             |                         |                      | F = 3.57        | R <sup>2</sup> = 0.05 | MS <sub>e</sub> = 58.09  |

<sup>a</sup>Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup>Centered without weights.

<sup>c</sup>MS<sub>e</sub> is residual mean square.

Table 7-44

Regression Analysis of Mean Corpuscular Hemoglobin Concentration  
and Serum Ferritin, Across Sites  
Samples A, B, C

| Dependent Variable      | Sample Size                   | Factors <sup>a</sup>    | Effects <sup>b</sup>     |                       |                        |
|-------------------------|-------------------------------|-------------------------|--------------------------|-----------------------|------------------------|
|                         |                               |                         | b                        | se <sup>b</sup>       |                        |
| MCHC                    | 715                           | Site                    |                          |                       |                        |
|                         |                               | Greene & Humphreys      | 0.47**                   | 0.14                  |                        |
|                         |                               | St. Clair               | 0.33                     | 0.17                  |                        |
|                         |                               | Maricopa                | -0.17                    | 0.22                  |                        |
|                         |                               | Mingo                   | -0.63***                 | 0.17                  |                        |
|                         |                               | Program                 |                          |                       |                        |
|                         |                               | Head Start              | 0.40E-01                 | 0.13                  |                        |
|                         |                               | Constant                | 26.05                    |                       |                        |
|                         |                               | Statistics <sup>c</sup> | F = 4.20                 | R <sup>2</sup> = 0.05 | MS <sub>e</sub> = 2.78 |
|                         |                               | FERRITIN                | 625                      | Site                  |                        |
| Greene & Humphreys      | -1.22                         | 0.86                    |                          |                       |                        |
| St. Clair               | 2.17*                         | 1.02                    |                          |                       |                        |
| Maricopa                | not entered into the equation |                         |                          |                       |                        |
| Mingo                   | -0.94                         | 1.26                    |                          |                       |                        |
| Program                 |                               |                         |                          |                       |                        |
| Head Start              | 0.66                          | 0.98                    |                          |                       |                        |
| Constant                | 27.59                         |                         |                          |                       |                        |
| Statistics <sup>c</sup> | F = 7.71                      | R <sup>2</sup> = 0.10   | MS <sub>e</sub> = 144.92 |                       |                        |

<sup>a</sup>Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup>Centered without weights.

<sup>c</sup>MS<sub>e</sub>



Table 7-45

Regression Analysis Vitamin A and B-Carotene, Across Sites  
Samples A, B, C

| Dependent Variable      | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup>     |                       |
|-------------------------|-------------|----------------------|--------------------------|-----------------------|
|                         |             |                      | b                        | se <sub>b</sub>       |
|                         |             | Site                 |                          |                       |
| VITAMIN A               | 255         | Greene & Humphreys   | 0.47E-01                 | 0.94                  |
|                         |             | Maricopa             | -0.46E-01                | 0.95                  |
|                         |             | Program              |                          |                       |
|                         |             | Head Start           | -0.65                    | 1.03                  |
|                         |             | Constant             | 35.54                    |                       |
| Statistics <sup>c</sup> |             |                      | F = 0.70                 | R <sup>2</sup> = 0.02 |
|                         |             |                      | MS <sub>e</sub> = 65.70  |                       |
|                         |             | Site                 |                          |                       |
| CAROTENE                | 259         | Greene & Humphreys   | 6.61*                    | 3.16                  |
|                         |             | Maricopa             | -6.61*                   | 3.16                  |
|                         |             | Program              |                          |                       |
|                         |             | Head Start           | 12.60**                  | 3.54                  |
|                         |             | Constant             | 30.65                    |                       |
| Statistics <sup>c</sup> |             |                      | F = 2.75                 | R <sup>2</sup> = 0.02 |
|                         |             |                      | MS <sub>e</sub> = 786.93 |                       |

<sup>a</sup> Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 7-46

Regression Analysis of Hematocrit by Site  
Samples A, B, C

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup>        |                 | Statistics <sup>c</sup> |
|--------------------|-------------|----------------------|-----------------------------|-----------------|-------------------------|
|                    |             |                      | b                           | se <sub>b</sub> |                         |
| Greene & Humphreys |             |                      |                             |                 |                         |
| HEMATOCRIT         | 203         | Head Start           | -0.53                       | 0.35            | F = 1.35                |
|                    |             | Constant             | 35.42                       |                 | MS <sub>e</sub> = 6.10  |
| St. Clair          |             |                      |                             |                 |                         |
| HEMATOCRIT         | 163         | Head Start           | 0.23                        | 0.06            | F = 1.00                |
|                    |             | Constant             | 35.36                       |                 | MS <sub>e</sub> = 3.65  |
| Maricopa           |             |                      |                             |                 |                         |
| HEMATOCRIT         | 150         | Head Start           | not entered in the equation |                 | F = 0.68                |
|                    |             | Constant             | 36.89                       |                 | MS <sub>e</sub> = 5.01  |
| Mingo              |             |                      |                             |                 |                         |
| HEMATOCRIT         | 213         | Head Start           | -0.37                       | 0.32            | F = 1.16                |
|                    |             | Constant             | 37.23                       |                 | MS <sub>e</sub> = 4.92  |

<sup>a</sup> Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 7-47

Regression Analysis of Hemoglobin, by Site  
Samples A, B, C

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |             |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------|-------------|
|                    |             |                      | b                    | se <sub>b</sub> |                         |             |
| Greene & Humphreys |             |                      |                      |                 |                         |             |
| <u>HEMOGLOBIN</u>  | <u>202</u>  | Head Start           | <u>-0.22</u>         | <u>0.14</u>     | F =                     | <u>2.03</u> |
|                    |             | Constant             | <u>12.76</u>         |                 | MS <sub>e</sub>         | <u>0.92</u> |
| St. Clair          |             |                      |                      |                 |                         |             |
| <u>HEMOGLOBIN</u>  | <u>163</u>  | Head Start           | <u>0.18</u>          | <u>0.14</u>     | F =                     | <u>2.36</u> |
|                    |             | Constant             | <u>11.42</u>         |                 | MS <sub>e</sub>         | <u>0.76</u> |
| Maricopa           |             |                      |                      |                 |                         |             |
| <u>HEMOGLOBIN</u>  | <u>148</u>  | Head Start           | <u>0.73</u>          | <u>0.13</u>     | F =                     | <u>1.33</u> |
|                    |             | Constant             | <u>12.80</u>         |                 | MS <sub>e</sub>         | <u>0.56</u> |
| Mingo              |             |                      |                      |                 |                         |             |
| <u>HEMOGLOBIN</u>  | <u>209</u>  | Head Start           | <u>0.27E-01</u>      | <u>0.12</u>     | F =                     | <u>0.70</u> |
|                    |             | Constant             | <u>13.31</u>         |                 | MS <sub>e</sub>         | <u>0.69</u> |

<sup>a</sup>Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup>Centered without weights.

<sup>c</sup>MS<sub>e</sub> is residual mean square.

Table 7-48

Regression Analysis of Total Iron Binding Capacity, by Site,  
Samples A, B, C

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup>   |
|--------------------|-------------|----------------------|----------------------|-----------------|---------------------------|
|                    |             |                      | b                    | se <sub>b</sub> |                           |
| Greene & Humphreys |             |                      |                      |                 |                           |
| TIBC               | 169         | Head Start           | 2.57                 | 6.60            | F = 0.07                  |
|                    |             | Constant             | 330.46               |                 | MS <sub>e</sub> = 1804.45 |
| St. Clair          |             |                      |                      |                 |                           |
| TIBC               | 145         | Head Start           | 4.66                 | 5.64            | F = 0.96                  |
|                    |             | Constant             | 332.02               |                 | MS <sub>e</sub> = 1221.56 |
| Maricopa           |             |                      |                      |                 |                           |
| TIBC               | 140         | Head Start           | 2.34                 | 8.19            | F = 1.59                  |
|                    |             | Constant             | 317.49               |                 | MS <sub>e</sub> = 2166.83 |
| Mingo              |             |                      |                      |                 |                           |
| TIBC               | 190         | Head Start           | -4.10                | 5.85            | F = 0.83                  |
|                    |             | Constant             | -299.81              |                 | MS <sub>e</sub> = 1406.09 |

<sup>a</sup>Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup>Centered without weights.

<sup>c</sup>MS<sub>e</sub> is residual mean square.

Table 7-49

Regression Analysis of Serum Iron, by Site  
Samples A, B, C

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup><br>b | se <sub>b</sub> | Statistics <sup>c</sup>  |
|--------------------|-------------|----------------------|---------------------------|-----------------|--------------------------|
| Greene & Humphreys |             |                      |                           |                 |                          |
| IRON               | 180         | Head Start           | -4.98                     | 3.67            | F = 0.90                 |
|                    |             | Constant             | 60.46                     |                 | MS <sub>e</sub> = 582.81 |
| St. Clair          |             |                      |                           |                 |                          |
| IRON               | 146         | Head Start           | 6.17                      | 4.18            | F = 1.42                 |
|                    |             | Constant             | 40.00                     |                 | MS <sub>e</sub> = 618.51 |
| Maricopa           |             |                      |                           |                 |                          |
| IRON               | 145         | Head Start           | -7.27                     | 5.07            | F = 0.82                 |
|                    |             | Constant             | 80.49                     |                 | MS <sub>e</sub> = 846.43 |
| Ningo              |             |                      |                           |                 |                          |
| IRON               | 191         | Head Start           | -2.37                     | 3.83            | F = 1.24                 |
|                    |             | Constant             | 40.56                     |                 | MS <sub>e</sub> = 600.84 |

<sup>a</sup>Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup>Centered without weights.

<sup>c</sup>MS<sub>e</sub> is residual mean square.

Table 7-50

Regression Analysis of Transferrin Saturation, by Site  
Samples A, B, C

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |       |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------|-------|
|                    |             |                      | b                    | se <sub>b</sub> |                         |       |
| Greene & Humphreys |             |                      |                      |                 |                         |       |
| TS                 | 167         | Head Start           | -1.74                | 1.11            | F                       | 1.34  |
|                    |             | Constant             | 17.17                |                 | MS <sub>e</sub>         | 49.44 |
| St. Clair          |             |                      |                      |                 |                         |       |
| TS                 | 140         | Head Start           | 1.01                 | 1.22            | F                       | 1.67  |
|                    |             | Constant             | 8.65                 |                 | MS <sub>e</sub>         | 50.85 |
| Maricopa           |             |                      |                      |                 |                         |       |
| TS                 | 141         | Head Start           | -2.57                | 1.50            | F                       | 1.34  |
|                    |             | Constant             | 23.86                |                 | MS <sub>e</sub>         | 72.46 |
| Mingo              |             |                      |                      |                 |                         |       |
| TS                 | 184         | Head Start           | -0.52                | 1.22            | F                       | 0.73  |
|                    |             | Constant             | 15.81                |                 | MS <sub>e</sub>         | 59.88 |

<sup>a</sup> Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

7A-100-1255

Table 7-51

Regression Analysis of Mean Corpuscular Hemoglobin Concentration, by Site  
Samples, A, B, C

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------|
|                    |             |                      | b                    | se <sub>b</sub> |                         |
| Greene & Humphreys |             |                      |                      |                 |                         |
| MCHC               | 202         | Head Start           | -0.88                | 0.25            | F = 0.73                |
|                    |             | Constant             | 36.07                |                 | MS <sub>e</sub> = 3.08  |
| St. Clair          |             |                      |                      |                 |                         |
| MCHC               | 162         | Head Start           | -0.16                | 0.28            | F = 2.66                |
|                    |             | Constant             | 31.84                |                 | MS <sub>e</sub> = 3.04  |
| Maricopa           |             |                      |                      |                 |                         |
| MCHC               | 146         | Head Start           | 0.10                 | 0.29            | F = 2.78                |
|                    |             | Constant             | 34.70                |                 | MS <sub>e</sub> = 2.77  |
| Mingo              |             |                      |                      |                 |                         |
| MCHC               | 205         | Head Start           | 0.22                 | 0.22            | F = 0.83                |
|                    |             | Constant             | 35.89                |                 | MS <sub>e</sub> = 2.12  |

<sup>a</sup>Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup>Centered without weights.

<sup>c</sup>MS<sub>e</sub> is residual mean square.

Table 7-52

Regression Analysis of Serum Ferritin, By Site  
Samples A, B, C

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics                    |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------------|
|                    |             |                      | b                    | se <sub>b</sub> |                               |
|                    |             | Greene & Humphreys   |                      |                 |                               |
| <u>FERRITIN</u>    | <u>161</u>  | Head Start           | <u>-3.08</u>         | <u>1.80</u>     | F = <u>0.93</u>               |
|                    |             | Constant             | <u>25.75</u>         |                 | MS <sub>e</sub> <u>126.60</u> |
|                    |             | St. Clair            |                      |                 |                               |
| <u>FERRITIN</u>    | <u>146</u>  | Head Start           | <u>.2.23</u>         | <u>2.60</u>     | F = <u>0.42</u>               |
|                    |             | Constant             | <u>27.72</u>         |                 | MS <sub>e</sub> <u>238.20</u> |
|                    |             | Maricopa             |                      |                 |                               |
| <u>FERRITIN</u>    | <u>133</u>  | Head Start           | <u>1.59</u>          | <u>1.87</u>     | F = <u>1.66</u>               |
|                    |             | Constant             | <u>28.24</u>         |                 | MS <sub>e</sub> <u>104.20</u> |
|                    |             | Mingo                |                      |                 |                               |
| <u>FERRITIN</u>    | <u>185</u>  | Head Start           | <u>2.22</u>          | <u>1.67</u>     | F = <u>7.13</u>               |
|                    |             | Constant             | <u>44.53</u>         |                 | MS <sub>e</sub> <u>112.35</u> |

<sup>a</sup>Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup>Centered without weights.

<sup>c</sup>MS<sub>e</sub> is residual mean square.



Table 7-53

Regression Analysis of Serum Cholesterol, by Site  
Samples A, B, C

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |          |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------|----------|
|                    |             |                      | b                    | se <sub>b</sub> |                         |          |
| CHOLESTEROL        | 183         | Greene & Humphreys   |                      |                 |                         |          |
|                    |             | Head Start           | -4.11                | 4.65            | F =                     | 0.69     |
|                    |             | Constant             | 174.75               |                 | MS <sub>e</sub>         | 951.83   |
| CHOLESTEROL        | 162         | St. Clair            |                      |                 |                         |          |
|                    |             | Head Start           | 31.07                | 27.52           | F =                     | 0.54     |
|                    |             | Constant             | 292.20               |                 | MS <sub>e</sub>         | 26812.26 |
| CHOLESTEROL        | 146         | Maricopa             |                      |                 |                         |          |
|                    |             | Head Start           | 2.98                 | 5.09            | F =                     | 1.61     |
|                    |             | Constant             | 170.10               |                 | MS <sub>e</sub>         | 855.43   |
| CHOLESTEROL        | 205         | Mingo                |                      |                 |                         |          |
|                    |             | Head Start           | 3.00                 | 4.03            | F =                     | 0.26     |
|                    |             | Constant             | 150.26               |                 | MS <sub>e</sub>         | 721.56   |

<sup>a</sup> Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 7-54

Regression Analysis of Vitamin A, by Site  
Samples A, B, C

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------|
|                    |             |                      | b                    | se <sub>b</sub> |                         |
| Greene & Humphreys |             |                      |                      |                 |                         |
| VITAMIN A          | 117         | Head Start           | -0.74                | 1.68            | F = 2.43                |
|                    |             | Constant             | 31.89                |                 | MS <sub>e</sub> = 79.03 |
| Maricopa           |             |                      |                      |                 |                         |
| VITAMIN A          | 138         | Head Start           | -0.52                | 1.26            | F = 0.88                |
|                    |             | Constant             | 37.09                |                 | MS <sub>e</sub> = 49.75 |

<sup>a</sup>Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup>Centered without weights.

<sup>c</sup>MS<sub>e</sub> is residual mean square.

Table 7-55

Regression Analysis of B-Carotene, by Site  
Samples A, B, C

| Dependent Variable  | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |               |
|---------------------|-------------|----------------------|----------------------|-----------------|-------------------------|---------------|
|                     |             |                      | b                    | se <sub>b</sub> |                         |               |
| Greene & Humphreys: |             |                      |                      |                 |                         |               |
| <u>CAROTENE</u>     | <u>120</u>  | Head Start           | <u>14.41*</u>        | <u>5.15</u>     | F =                     | <u>2.74</u>   |
|                     |             | Constant             | <u>82.05</u>         |                 | MS <sub>e</sub>         | <u>766.62</u> |
| Maricopa            |             |                      |                      |                 |                         |               |
| <u>CAROTENE</u>     | <u>139</u>  | Head Start           | <u>11.34*</u>        | <u>4.92</u>     | F =                     | <u>2.74</u>   |
|                     |             | Constant             | <u>74.90</u>         |                 | MS <sub>e</sub>         | <u>771.83</u> |

<sup>a</sup> Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 7-56

Regression Analysis of Vitamin C, by Site  
Samples A, B, C

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup>       |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------------|
|                    |             |                      | b                    | se <sub>b</sub> |                               |
|                    |             | Maricopa             |                      |                 |                               |
| <u>VITAMIN C</u>   | <u>105</u>  | Head Start           | <u>0.18</u>          | <u>0.09</u>     | F = <u>1.80</u>               |
|                    |             | Constant             | <u>1.16</u>          |                 | MS <sub>e</sub> = <u>0.20</u> |

<sup>a</sup>Adjusted for gender, race, mother's education, and income percentile.

<sup>b</sup>Centered without weights.

<sup>c</sup>MS<sub>e</sub> is residual mean square.

CHAPTER EIGHT

APPENDIX TABLES

Table 8-1

Mean Percentile Ranks for Boys and Girls  
on the McCarthy Motor Scale for Various Samples of Children<sup>a</sup>

| Sample                         |               | Greene & Humphreys Counties |       | St. Clair County |       | Maricopa County |       | Mingo County |       | All Sites |        |
|--------------------------------|---------------|-----------------------------|-------|------------------|-------|-----------------|-------|--------------|-------|-----------|--------|
|                                |               | Boys                        | Girls | Boys             | Girls | Boys            | Girls | Boys         | Girls | Boys      | Girls  |
| Pretest:<br>(Samples A, D)     | $\frac{n}{x}$ | 45                          | 49    | 54               | 55    | 50              | 45    | 33           | 37    | 182       | 186    |
|                                | $\bar{x}$     | 33.4                        | 30.7  | 10.8             | 21.6  | 16.6            | 29.0  | 15.5         | 29.2  | 18.9      | 27.3** |
|                                | s.d.          | 28.9                        | 26.8  | 15.1             | 21.9  | 18.0            | 25.7  | 30.0         | 30.0  | 22.9      | 25.6   |
| Posttest:<br>(Samples A, B, C) | $\frac{n}{x}$ | 112                         | 116   | 104              | 90    | 81              | 86    | 118          | 110   | 415       | 402    |
|                                | $\bar{x}$     | 36.6                        | 38.7  | 47.4             | 51.7  | 25.6            | 30.1  | 27.4         | 35.7  | 34.6      | 38.9** |
|                                | s.d.          | 27.7                        | 27.7  | 32.3             | 27.0  | 24.0            | 26.1  | 24.0         | 27.3  | 28.5      | 30.0   |
| Pretest:<br>(Sample A)         | $\frac{n}{x}$ | 36                          | 37    | 24               | 15    | 27              | 29    | 18           | 18    | 104       | 99     |
|                                | $\bar{x}$     | 36.1                        | 30.7  | 13.3             | 20.9  | 16.1            | 28.6  | 18.0         | 31.8  | 23.5      | 29.5   |
|                                | s.d.          | 28.7                        | 26.2  | 14.4             | 21.9  | 16.5            | 24.2  | 19.7         | 22.2  | 24.8      | 26.7   |
| Posttest:<br>(Sample A)        | $\frac{n}{x}$ | 37                          | 37    | 27               | 15    | 27              | 29    | 17           | 18    | 109       | 99     |
|                                | $\bar{x}$     | 34.8                        | 35.6  | 55.9             | 46.5  | 31.3            | 31.0  | 22.9         | 35.6  | 36.4      | 35.2   |
|                                | s.d.          | 24.0                        | 23.1  | 34.6             | 26.9  | 27.3            | 27.0  | 28.5         | 34.4  | 29.7      | 24.9   |

<sup>a</sup>Significance shown as:

\*\*  $p < .01$

Table 8-3

## Average Number of Refusals for the Development Evaluation by Age Group

| Age Group | Pretested Children (Samples A, D) in: |                           |                         |                      |
|-----------|---------------------------------------|---------------------------|-------------------------|----------------------|
|           | Greene & Humphreys Counties<br>n=95   | St. Clair County<br>n=113 | Maricopa County<br>n=95 | Mingo County<br>n=73 |
| < 2.25    | n                                     |                           | 1                       | 3                    |
|           | Mean                                  |                           | 1.00                    | 16.67                |
|           | S.D.                                  |                           | 0.0                     | 27.15                |
| 2.25-2.74 | n                                     | 14                        | 16                      | 13                   |
|           | Mean                                  | 12.21                     | 13.31                   | 25.23                |
|           | S.D.                                  | 21.75                     | 17.06                   | 20.90                |
| 2.75-3.24 | n                                     | 28                        | 27                      | 21                   |
|           | Mean                                  | 8.50                      | 7.41                    | 14.62                |
|           | S.D.                                  | 17.57                     | 10.25                   | 19.34                |
| 3.25-3.74 | n                                     | 36                        | 18                      | 20                   |
|           | Mean                                  | 5.14                      | 5.61                    | 4.50                 |
|           | S.D.                                  | 14.64                     | 9.34                    | 10.87                |
| 3.75-4.24 | n                                     | 8                         | 19                      | 50                   |
|           | Mean                                  | 6.62                      | 9.53                    | .82                  |
|           | S.D.                                  | 18.33                     | 14.61                   | 2.97                 |
| 4.25-4.74 | n                                     | 5                         | 19                      | 25                   |
|           | Mean                                  | .20                       | 7.26                    | .60                  |
|           | S.D.                                  | .45                       | 16.09                   | 2.80                 |
| 4.75-5.24 | n                                     | 4                         | 11                      | 1                    |
|           | Mean                                  | 13.25                     | 2.09                    | 0.0                  |
|           | S.D.                                  | 25.84                     | 6.93                    | 0.0                  |
| 5.25-5.74 | n                                     |                           | 2                       | 1                    |
|           | Mean                                  |                           | 0.0                     | 0.0                  |
|           | S.D.                                  |                           | 0.0                     | 0.0                  |

Table 8-4:

Correlations Between McCarthy Motor Scale and Age for Various Samples of Children

| Sample                                |        | Greene & Humphreys Counties | St. Clair County | Maricopa County | Mingo County  | All Sites     |
|---------------------------------------|--------|-----------------------------|------------------|-----------------|---------------|---------------|
| Pretest:<br>(Samples A, D)            | n<br>r | 95<br>-.39**                | 109<br>-.21*     | 95<br>-.08      | 70<br>-.02    | 346<br>-.22** |
| Posttest:<br>(Samples A, B, C)        | n<br>r | 228<br>-.00                 | 194<br>-.21**    | 167<br>.05      | 228<br>-.23** | 817<br>-.17** |
| Pretest:<br>(Sample A)                | n<br>r | 66<br>-.35**                | 38<br>-.07       | 56<br>-.18      | 32<br>.08     | 192<br>-.19*  |
| Posttest:<br>(Sample A <sup>b</sup> ) | n<br>r | 74<br>-.18                  | 42<br>-.20       | 56<br>.13       | 36<br>-.01    | 208<br>-.12   |

<sup>a</sup>Significance indicated as:

\* for  $p < .01$

\*\* for  $p < .001$

<sup>b</sup>Sample A including children with many refusals at pretest.

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Table 8-5

Correlations Between Number of Refusals on McCarthy Motor Scale and Child's Age for Various Samples of Children<sup>a</sup>

| Sample                         |        | Greene & Humphreys Counties | St. Clair County | Maricopa County | Mingo County   | All Sites      |
|--------------------------------|--------|-----------------------------|------------------|-----------------|----------------|----------------|
| Pretest:<br>(Samples A, D)     | n<br>r | 95<br>-.12                  | 113<br>-.18      | 95<br>-.22*     | 73<br>.40***   | 376<br>-.28*** |
| Posttest:<br>(Samples A, B, C) | n<br>r | 228<br>-.23***              | 194<br>-.24***   | 167<br>-.04     | 228<br>-.24*** | 817<br>-.25*** |
| Pretest:<br>(Sample A)         | n<br>r | 74<br>-.19*                 | 42<br>-.16       | 56<br>-.22*     | 36<br>-.30*    | 208<br>-.28*** |
| Posttest:<br>(Sample A)        | n<br>r | 74<br>-.09                  | 42<br>-.19       | 56<br>-.05      | 36<br>-.34*    | 208<br>-.20**  |

<sup>a</sup>Significance indicated as:

- \* for  $p < .05$
- \*\* for  $p < .01$
- \*\*\* for  $p < .001$

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Table 8-6

PRETEST AND POSTTEST DEVELOPMENTAL ASSESSMENT FOR HEAD START AND NON-HEAD START CHILDREN IN SAMPLE A WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

| McCARTHY PERCENTILE | HEAD START |       |       |       |       |       | NON-HEAD START |       |       |       |       |       | T     | P     |
|---------------------|------------|-------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|-------|-------|-------|
|                     | N          | Q1    | MED   | Q3    | MEAN  | SD    | N              | Q1    | MED   | Q3    | MEAN  | SD    |       |       |
| Greene/Humphreys    |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Pretest             | 36         | 15.00 | 35.00 | 60.00 | 40.44 | 29.40 | 30             | 15.00 | 30.00 | 55.00 | 34.76 | 22.70 | 0.89  | 0.379 |
| Posttest            | 43         | 20.00 | 40.00 | 57.50 | 38.74 | 23.60 | 31             | 10.00 | 25.00 | 45.00 | 30.26 | 22.50 | 1.57  | 0.122 |
| St Clair            |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Pretest             | 24         | 3.00  | 10.00 | 20.00 | 13.67 | 13.60 | 14             | 3.00  | 20.00 | 35.00 | 23.79 | 22.30 | -1.54 | 0.141 |
| Posttest            | 25         | 25.00 | 45.00 | 80.00 | 49.04 | 31.00 | 17             | 35.00 | 70.00 | 85.00 | 57.65 | 33.90 | -0.84 | 0.409 |
| Maricopa            |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Pretest             | 40         | 3.00  | 17.50 | 40.00 | 22.20 | 20.00 | 16             | 3.00  | 5.00  | 42.50 | 23.38 | 25.70 | -0.16 | 0.871 |
| Posttest            | 40         | 7.50  | 22.50 | 45.00 | 30.20 | 25.80 | 16             | 10.00 | 25.00 | 50.00 | 33.50 | 30.20 | -0.38 | 0.704 |
| Ningo               |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Pretest             | 17         | 5.00  | 15.00 | 25.00 | 21.76 | 23.70 | 15             | 7.50  | 35.00 | 80.00 | 43.87 | 36.90 | -1.99 | 0.059 |
| Posttest            | 18         | 5.00  | 12.50 | 25.00 | 18.50 | 18.70 | 18             | 5.00  | 30.00 | 55.00 | 31.28 | 23.40 | -1.81 | 0.079 |

PRETEST AND POSTTEST DEVELOPMENTAL ASSESSMENT FOR HEAD START AND NON-HEAD START CHILDREN IN SAMPLE A WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS ACROSS SITE

| McCARTHY PERCENTILE | HEAD START |       |       |       |       |       | NON-HEAD START |       |       |       |       |       | T     | P     |
|---------------------|------------|-------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|-------|-------|-------|
|                     | N          | Q1    | MED   | Q3    | MEAN  | SD    | N              | Q1    | MED   | Q3    | MEAN  | SD    |       |       |
| Pretest             | 117        | 5.00  | 20.00 | 40.00 | 26.00 | 24.80 | 75             | 5.00  | 25.00 | 55.00 | 32.11 | 27.20 | -1.57 | 0.118 |
| Posttest            | 126        | 10.00 | 30.00 | 55.00 | 35.18 | 26.80 | 82             | 10.00 | 35.00 | 55.00 | 36.79 | 28.50 | -0.41 | 0.684 |

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Table 8-6 (continued)

PRETEST AND POSTTEST DEVELOPMENTAL ASSESSMENT FOR HEAD START AND NON-HEAD START CHILDREN IN SAMPLE A WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                            | HEAD START |       |       |       |       |       | NON-HEAD START |       |       |       |       |       | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|-------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD    | N              | Q1    | MED   | Q3    | MEAN  | SD    |       |       |
| <b>McCARTHY PERCENTILE</b> |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| <b>Greene/Humphreys</b>    |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Pretest                    | 43         | 7.50  | 25.00 | 57.50 | 34.02 | 30.50 | 31             | 15.00 | 25.00 | 55.00 | 33.68 | 23.10 | 0.06  | 0.956 |
| Posttest                   | 43         | 20.00 | 40.00 | 57.50 | 38.74 | 23.60 | 31             | 10.00 | 25.00 | 45.00 | 30.26 | 22.50 | 1.57  | 0.122 |
| <b>St Clair</b>            |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Pretest                    | 24         | 3.00  | 10.00 | 20.00 | 13.67 | 13.60 | 16             | 2.00  | 17.50 | 30.00 | 20.94 | 22.20 | -1.17 | 0.253 |
| Posttest                   | 25         | 25.00 | 45.00 | 80.00 | 49.04 | 31.00 | 17             | 35.00 | 70.00 | 85.00 | 57.65 | 33.90 | -0.84 | 0.409 |
| <b>Maricopa</b>            |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Pretest                    | 40         | 3.00  | 17.50 | 40.00 | 22.20 | 20.00 | 16             | 3.00  | 5.00  | 42.50 | 23.38 | 25.70 | -0.16 | 0.871 |
| Posttest                   | 40         | 7.50  | 22.50 | 45.00 | 30.20 | 25.80 | 16             | 10.00 | 25.00 | 50.00 | 33.50 | 30.20 | -0.38 | 0.704 |
| <b>Mingo</b>               |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Pretest                    | 18         | 5.00  | 15.00 | 25.00 | 20.61 | 23.50 | 17             | 1.00  | 35.00 | 75.00 | 38.82 | 37.30 | -1.72 | 0.098 |
| Posttest                   | 18         | 5.00  | 12.50 | 25.00 | 18.50 | 18.70 | 18             | 5.00  | 30.00 | 55.00 | 31.28 | 23.40 | -1.81 | 0.079 |
| <b>McCARTHY REFUSALS</b>   |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| <b>Greene/Humphreys</b>    |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Pretest                    | 43         | 0.00  | 0.00  | 2.50  | 9.08  | 19.20 | 31             | 0.00  | 0.00  | 0.00  | 3.61  | 11.10 | 1.55  | 0.127 |
| Posttest                   | 43         | 0.00  | 0.00  | 1.00  | 0.77  | 1.76  | 31             | 0.50  | 1.00  | 2.00  | 3.58  | 8.76  | -1.76 | 0.087 |
| <b>St Clair</b>            |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Pretest                    | 24         | 0.00  | 3.00  | 10.50 | 6.08  | 7.32  | 16             | 0.50  | 2.50  | 20.50 | 13.19 | 18.60 | -1.45 | 0.164 |
| Posttest                   | 25         | 1.00  | 1.00  | 4.00  | 2.48  | 2.73  | 17             | 1.00  | 2.00  | 4.00  | 2.59  | 2.09  | -0.15 | 0.885 |
| <b>Maricopa</b>            |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Pretest                    | 40         | 0.00  | 0.00  | 0.00  | 0.85  | 3.54  | 16             | 0.00  | 0.00  | 0.50  | 3.63  | 10.60 | -1.03 | 0.319 |
| Posttest                   | 40         | 0.00  | 0.00  | 0.00  | 0.40  | 1.35  | 16             | 0.00  | 0.00  | 0.00  | 0.31  | 0.87  | 0.29  | 0.776 |
| <b>Mingo</b>               |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Pretest                    | 18         | 0.00  | 3.00  | 9.00  | 8.33  | 14.20 | 17             | 0.00  | 2.00  | 8.00  | 9.82  | 17.40 | -0.28 | 0.784 |
| Posttest                   | 18         | 0.00  | 0.00  | 1.00  | 1.17  | 2.04  | 18             | 0.00  | 0.00  | 1.00  | 1.94  | 5.08  | -0.60 | 0.553 |

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Table 8-6 (continued)

PRETEST AND POSTTEST DEVELOPMENTAL ASSESSMENT FOR HEAD START AND NON-HEAD START CHILDREN IN SAMPLE A WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                               | HEAD START |      |      |      |      |      | NON-HEAD START |      |      |      |      |      | T     | P     |
|-------------------------------|------------|------|------|------|------|------|----------------|------|------|------|------|------|-------|-------|
|                               | N          | Q1   | MED  | Q3   | MEAN | SD   | N              | Q1   | MED  | Q3   | MEAN | SD   |       |       |
| <b>AGGRESSIVE CHILD INDEX</b> |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Greene/Humphreys              |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Pretest                       | 42         | 1.38 | 1.75 | 2.13 | 1.83 | 0.58 | 30             | 1.63 | 2.00 | 2.50 | 2.08 | 0.63 | -1.73 | 0.089 |
| Posttest                      | 40         | 1.63 | 2.00 | 2.50 | 2.03 | 0.62 | 28             | 1.63 | 1.75 | 2.25 | 1.99 | 0.53 | 0.31  | 0.755 |
| St Clair                      |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Pretest                       | 25         | 1.88 | 2.25 | 3.13 | 2.51 | 0.85 | 17             | 2.13 | 2.63 | 3.25 | 2.54 | 0.70 | -0.11 | 0.915 |
| Posttest                      | 24         | 1.63 | 2.06 | 2.50 | 2.02 | 0.55 | 16             | 1.44 | 2.00 | 2.50 | 2.03 | 0.72 | -0.05 | 0.960 |
| Maricopa                      |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Pretest                       | 40         | 1.94 | 2.38 | 2.88 | 2.48 | 0.74 | 16             | 2.13 | 2.50 | 2.88 | 2.57 | 0.64 | -0.44 | 0.659 |
| Posttest                      | 39         | 2.25 | 2.63 | 2.88 | 2.52 | 0.52 | 16             | 1.69 | 2.31 | 3.19 | 2.40 | 0.90 | 0.48  | 0.638 |
| Mingo                         |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Pretest                       | 17         | 2.50 | 2.88 | 3.00 | 2.76 | 0.40 | 17             | 2.25 | 2.38 | 2.75 | 2.59 | 0.61 | 0.96  | 0.347 |
| Posttest                      | 18         | 2.00 | 2.25 | 3.00 | 2.58 | 0.85 | 17             | 1.63 | 2.13 | 2.75 | 2.16 | 0.67 | 1.66  | 0.107 |
| <b>WITHDRAWN CHILD INDEX</b>  |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Greene/Humphreys              |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Pretest                       | 43         | 1.00 | 1.29 | 1.50 | 1.28 | 0.27 | 29             | 1.14 | 1.29 | 1.57 | 1.43 | 0.48 | -1.53 | 0.134 |
| Posttest                      | 35         | 1.00 | 1.29 | 1.64 | 1.39 | 0.38 | 28             | 1.00 | 1.29 | 1.29 | 1.32 | 0.37 | 0.79  | 0.433 |
| St Clair                      |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Pretest                       | 25         | 1.29 | 1.43 | 2.00 | 1.72 | 0.63 | 15             | 1.43 | 1.71 | 2.00 | 1.75 | 0.42 | -0.21 | 0.834 |
| Posttest                      | 23         | 1.00 | 1.29 | 1.78 | 1.47 | 0.51 | 17             | 1.29 | 1.57 | 2.14 | 1.68 | 0.54 | -1.28 | 0.209 |
| Maricopa                      |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Pretest                       | 39         | 1.43 | 1.86 | 2.29 | 1.89 | 0.58 | 16             | 1.43 | 1.86 | 2.00 | 1.82 | 0.62 | 0.35  | 0.726 |
| Posttest                      | 39         | 1.71 | 2.00 | 2.57 | 2.16 | 0.58 | 15             | 1.57 | 2.14 | 2.29 | 1.89 | 0.55 | 1.60  | 0.121 |
| Mingo                         |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Pretest                       | 18         | 1.29 | 1.29 | 1.57 | 1.44 | 0.39 | 18             | 1.14 | 1.36 | 1.71 | 1.52 | 0.48 | -0.60 | 0.555 |
| Posttest                      | 18         | 1.29 | 1.57 | 1.86 | 1.66 | 0.53 | 18             | 1.00 | 1.43 | 1.71 | 1.55 | 0.60 | 0.59  | 0.557 |

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Table 8-6 (continued)

PRETEST AND POSTTEST DEVELOPMENTAL ASSESSMENT FOR HEAD START AND NON-HEAD START CHILDREN IN SAMPLE A  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS ACROSS SITE

|                               | HEAD START |       |       |       |       |       | NON-HEAD START |       |       |       |       |       | T     | P     |
|-------------------------------|------------|-------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|-------|-------|-------|
|                               | N          | Q1    | MED   | Q3    | MEAN  | SD    | N              | Q1    | MED   | Q3    | MEAN  | SD    |       |       |
| <b>MCCARTHY PERCENTILE</b>    |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Pretest                       | 125        | 3.00  | 15.00 | 40.00 | 24.40 | 24.70 | 80             | 4.00  | 25.00 | 55.00 | 30.16 | 27.40 | -1.52 | 0.129 |
| Posttest                      | 126        | 10.00 | 30.00 | 55.00 | 35.18 | 26.80 | 82             | 10.00 | 35.00 | 55.00 | 36.79 | 28.50 | -0.41 | 0.684 |
| <b>MCCARTHY REFUSALS</b>      |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Pretest                       | 125        | 0.00  | 0.00  | 4.00  | 5.77  | 13.40 | 80             | 0.00  | 0.00  | 3.50  | 6.85  | 14.50 | -0.54 | 0.593 |
| Posttest                      | 126        | 0.00  | 0.00  | 1.00  | 1.05  | 2.04  | 82             | 0.00  | 1.00  | 2.00  | 2.38  | 6.02  | -1.93 | 0.057 |
| <b>AGGRESSIVE CHILD INDEX</b> |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Pretest                       | 124        | 1.75  | 2.25  | 2.81  | 2.31  | 0.76  | 80             | 1.88  | 2.38  | 2.75  | 2.39  | 0.67  | -0.78 | 0.436 |
| Posttest                      | 121        | 1.88  | 2.25  | 2.63  | 2.27  | 0.66  | 77             | 1.63  | 2.00  | 2.63  | 2.12  | 0.69  | 1.48  | 0.140 |
| <b>WITHDRAWN CHILD INDEX</b>  |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Pretest                       | 125        | 1.29  | 1.43  | 1.86  | 1.58  | 0.54  | 79             | 1.29  | 1.43  | 1.86  | 1.60  | 0.52  | -0.23 | 0.819 |
| Posttest                      | 115        | 1.29  | 1.57  | 2.00  | 1.71  | 0.60  | 78             | 1.14  | 1.43  | 1.86  | 1.56  | 0.54  | 1.81  | 0.072 |

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Table 8-7

Average McCarthy Developmental Percentile Scores  
by Age Group

| Age Group | Longitudinal (Sample A) Children In: |                  |                  |                  |                 |                  |                 |                  |
|-----------|--------------------------------------|------------------|------------------|------------------|-----------------|------------------|-----------------|------------------|
|           | Greene & Humphreys Counties          |                  | St. Clair County |                  | Maricopa County |                  | Mingo County    |                  |
|           | Pretest<br>n=66                      | Posttest<br>n=74 | Pretest<br>n=38  | Posttest<br>n=42 | Pretest<br>n=56 | Posttest<br>n=56 | Pretest<br>n=32 | Posttest<br>n=36 |
| 2.25-2.74 |                                      |                  |                  |                  |                 |                  |                 |                  |
| Mean      |                                      |                  |                  |                  |                 |                  |                 |                  |
| S.D.      |                                      |                  |                  |                  |                 |                  |                 |                  |
| 2.75-3.24 |                                      |                  |                  |                  |                 |                  |                 |                  |
| Mean      |                                      |                  |                  |                  |                 |                  |                 | 1                |
| S.D.      |                                      |                  |                  |                  |                 |                  |                 | 35.00            |
| 3.25-3.74 | 10                                   | 13               | 5                | 8                |                 |                  | 4               | 6                |
| Mean      | 56.50                                | 50.00            | 22.60            | 71.62            |                 |                  | 40.25           | 22.00            |
| S.D.      | 15.10                                | 22.82            | 12.30            | 24.60            |                 |                  | 42.11           | 21.90            |
| 3.75-4.24 | 21                                   | 23               | 13               | 13               |                 |                  | 12              | 12               |
| Mean      | 43.38                                | 32.17            | 12.85            | 39.85            |                 |                  | 30.33           | 30.08            |
| S.D.      | 24.53                                | 22.69            | 7.64             | 28.13            |                 |                  | 30.25           | 17.94            |
| 4.25-4.74 | 23                                   | 25               | 7                | 7                | 9               | 9                | 9               | 9                |
| Mean      | 38.70                                | 31.00            | 13.71            | 63.00            | 27.78           | 23.89            | 32.89           | 17.33            |
| S.D.      | 28.25                                | 21.79            | 17.59            | 37.20            | 24.98           | 18.84            | 26.90           | 23.89            |
| 4.75-5.24 | 6                                    | 7                | 8                | 9                | 30              | 30               | 3               | 4                |
| Mean      | 13.67                                | 42.57            | 27.12            | 51.44            | 23.00           | 30.53            | 7.00            | 22.00            |
| S.D.      | 13.65                                | 24.14            | 27.1             | 34.71            | 22.53           | 27.46            | 7.21            | 23.08            |
| 5.25-5.74 | 4                                    | 4                | 2                | 2                | 17              | 17               | 4               | 4                |
| Mean      | 10.75                                | 19.50            | 5.50             | 37.50            | 19.00           | 36.06            | 46.50           | 31.00            |
| S.D.      | 6.99                                 | 18.36            | 6.36             | 10.61            | 18.38           | 29.74            | 50.42           | 33.74            |
| 5.75-6.24 | 2                                    | 2                | 3                | 3                |                 |                  |                 |                  |
| Mean      | 4.00                                 | 31.50            | 19.00            | 45.33            |                 |                  |                 |                  |
| S.D.      | 1.41                                 | 40.31            | 31.18            | 44.50            |                 |                  |                 |                  |
| > 6.25    |                                      |                  |                  |                  |                 |                  |                 |                  |
| Mean      |                                      |                  |                  |                  |                 |                  |                 |                  |
| S.D.      |                                      |                  |                  |                  |                 |                  |                 |                  |

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Table 8-8

## Average Number of Refusals for the Developmental Evaluation by Age Group

| Age Group | Longitudinal (Sample A) Children In: |                  |                  |                  |                 |                  |                 |                  |
|-----------|--------------------------------------|------------------|------------------|------------------|-----------------|------------------|-----------------|------------------|
|           | Greene & Humphreys Counties          |                  | St. Clair County |                  | Maricopa County |                  | Mingo County    |                  |
|           | Pretest<br>n=74                      | Posttest<br>n=74 | Pretest<br>n=42  | Posttest<br>n=42 | Pretest<br>n=56 | Posttest<br>n=56 | Pretest<br>n=36 | Posttest<br>n=36 |
| < 2.25    |                                      |                  |                  |                  |                 |                  |                 |                  |
| Mean      |                                      |                  |                  |                  |                 |                  |                 |                  |
| S.D.      |                                      |                  |                  |                  |                 |                  |                 |                  |
| 2.25-2.74 |                                      |                  |                  |                  |                 |                  |                 |                  |
| Mean      |                                      |                  |                  |                  |                 |                  |                 |                  |
| S.D.      |                                      |                  |                  |                  |                 |                  |                 |                  |
| 2.75-3.24 |                                      |                  |                  |                  |                 |                  | 1               | 1                |
| Mean      |                                      |                  |                  |                  |                 |                  | 48.00           | 2.00             |
| S.D.      |                                      |                  |                  |                  |                 |                  | 0.00            | 0.00             |
| 3.25-3.74 | 13                                   | 13               | 8                | 8                |                 |                  | 6               | 6                |
| Mean      | 13.15                                | .62              | 16.00            | 3.37             |                 |                  | 20.00           | 4.17             |
| S.D.      | 22.35                                | .77              | 17.08            | 3.14             |                 |                  | 25.17           | 7.91             |
| 3.75-4.24 | 23                                   | 23               | 13               | 13               |                 |                  | 12              | 12               |
| Mean      | 6.65                                 | 4.47             | 8.69             | 3.15             |                 |                  | 7.67            | 2.17             |
| S.D.      | 15.88                                | 10.20            | 12.05            | 2.94             |                 |                  | 10.60           | 3.30             |
| 4.25-4.74 | 25                                   | 25               | 7                | 7                | 9               | 9                | 9               | 9                |
| Mean      | 5.00                                 | .84              | 3.14             | 1.71             | 6.22            | .00              | 1.67            | .11              |
| S.D.      | 14.51                                | .90              | 5.18             | 1.50             | 13.95           | .00              | 2.83            | .33              |
| 4.75-5.24 | 7                                    | 7                | 9                | 9                | 30              | 30               | 4               | 4                |
| Mean      | 7.57                                 | .43              | 10.11            | 1.78             | .70             | .60              | 22.00           | .50              |
| S.D.      | 19.59                                | .53              | 17.45            | 1.71             | 3.12            | 1.61             | 23.21           | 1.00             |
| 5.25-5.74 | 4                                    | 4                | 2                | 2                | 17              | 17               | 4               | 4                |
| Mean      | .25                                  | 2.25             | 6.00             | 3.00             | .88             | .18              | .50             | 0.0              |
| S.D.      | .50                                  | 3.20             | 4.24             | 1.41             | 3.39            | .53              | 1.00            | 0.0              |
| 5.75-6.24 | 2                                    | 2                | 3                | 3                |                 |                  |                 |                  |
| Mean      | 0.0                                  | 0.00             | 7.67             | 1.33             |                 |                  |                 |                  |
| S.D.      | 0.0                                  | 0.00             | 13.27            | 2.31             |                 |                  |                 |                  |
| 6.25-6.74 |                                      |                  |                  |                  |                 |                  |                 |                  |
| Mean      |                                      |                  |                  |                  |                 |                  |                 |                  |
| S.D.      |                                      |                  |                  |                  |                 |                  |                 |                  |

Table 8-9

Regression Analysis of Developmental Assessment Measures  
Longitudinal Children

| Dependent Variable                       | Sample Size | Factors <sup>a</sup>                | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |
|--|-------------|-------------------------------------|----------------------|-----------------|-------------------------|
|  |             |                                     | b                    | se <sub>b</sub> |                         |
| MCCARTHY<br>MOTOR<br>SCALE<br>PERCENTILE | 193         | Site                                |                      |                 |                         |
|  |             | Greene & Humphreys                  | -7.00                | 7.57            | F = 3.98                |
|  |             | St. Clair                           | 13.21                | 8.11            | R <sup>2</sup> = .20    |
|  |             | Maricopa                            | 3.11                 | 7.95            | MS <sub>e</sub> = 599.9 |
|  |             | Mingo                               | -9.33                | 8.10            |                         |
|  |             | Program                             |                      |                 |                         |
|  |             | Head Start                          | -3.30                | 2.36            |                         |
|  |             | Non-Head Start                      | 3.30                 | 2.36            |                         |
|  |             | Head Start in<br>Greene & Humphreys | 8.14*                | 3.81            |                         |
|  |             | Constant                            | 25.54                |                 |                         |
| MCCARTHY RE-<br>FUSALS INDEX             | 198         | Site                                |                      |                 |                         |
|  |             | Greene & Humphreys                  | -.50                 | 1.24            | F = 2.85                |
|  |             | St. Clair                           | .29                  | 1.32            | R <sup>2</sup> = .14    |
|  |             | Maricopa                            | -.31                 | 1.31            | MS <sub>e</sub> = 16.23 |
|  |             | Mingo                               | .51                  | 1.32            |                         |
|  |             | Program                             |                      |                 |                         |
|  |             | Head Start                          | -.001                | .38             |                         |
|  |             | Non-Head Start                      | .001                 | .38             |                         |
|  |             | Head Start in<br>Greene & Humphreys | -1.45**              | .63             |                         |
|  |             | Constant                            | 8.03                 |                 |                         |

<sup>a</sup>Adjusted for age, gender, race, per capita income, family employment status, mother's education, and child's pretest score.

<sup>b</sup>Centered without weights.

<sup>c</sup>Significance

\*p < .05

\*\*p < .01

\*\*\*p < .001



Table 8-9 (continued)

Regression Analysis of Developmental Assessment Measures  
Longitudinal Children

| Dependent Variable     | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |  |  |
|------------------------|-------------|----------------------|----------------------|-----------------|-------------------------|--|--|
|                        |             |                      | b                    | se <sub>b</sub> |                         |  |  |
| WITHDRAWN CHILD INDEX  | <u>181</u>  | Site                 |                      |                 |                         | F = <u>15.89***</u><br>R <sup>2</sup> = <u>.48</u><br>MS <sub>e</sub> = <u>.18</u> |  |
|                        |             | Greene & Humphreys   | <u>-.38**</u>        | <u>.14</u>      |                         |  |  |
|                        |             | St. Clair            | <u>-.38**</u>        | <u>.14</u>      |                         |  |  |
|                        |             | Maricopa             | <u>.58***</u>        | <u>.14</u>      |                         |  |  |
|                        |             | Mingo                | <u>.17</u>           | <u>.14</u>      |                         |  |  |
|                        |             | Program              |                      |                 |                         |  |  |
|                        |             | Head Start           | <u>.04</u>           | <u>.03</u>      |                         |  |  |
|                        |             | Non-Head Start       | <u>-.04</u>          | <u>.03</u>      |                         |  |  |
|                        |             | Constant             | <u>.62</u>           |                 |                         |  |  |
| AGGRESSIVE CHILD INDEX | <u>185</u>  | Site                 |                      |                 |                         | F = <u>6.18*</u><br>R <sup>2</sup> = <u>.26</u><br>MS <sub>e</sub> = <u>.33</u>    |  |
|                        |             | Greene & Humphreys   | <u>-.18</u>          | <u>.18</u>      |                         |  |  |
|                        |             | St. Clair            | <u>-.33</u>          | <u>.19</u>      |                         |  |  |
|                        |             | Maricopa             | <u>.37*</u>          | <u>.19</u>      |                         |  |  |
|                        |             | Mingo                | <u>.12</u>           | <u>.19</u>      |                         |  |  |
|                        |             | Program              |                      |                 |                         |  |  |
|                        |             | Head Start           | <u>.06</u>           | <u>.05</u>      |                         |  |  |
|                        |             | Non-Head Start       | <u>-.06</u>          | <u>.05</u>      |                         |  |  |
|                        |             | Constant             | <u>1.47</u>          |                 |                         |  |  |

<sup>a</sup>Adjusted for age, gender, race, per capita income, family employment status, mother's education, and child's pretest score.

<sup>b</sup>Centered without weights.

<sup>c</sup>Significance

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

Table 8-9 (continued)

Regression Analysis of Developmental Assessment Measures  
Longitudinal Children

| Dependent Variable                    | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup>                        |
|---------------------------------------|-------------|----------------------|----------------------|-----------------|--|
|                                       |             |                      | b                    | se <sub>b</sub> |  |
| Greene & Humphreys                    |             |                      |                      |                 |  |
| McCARTHY<br>MOTOR SCALE<br>PERCENTILE | <u>60</u>   | Head Start           | <u>6.13*</u>         | <u>2.71</u>     | F = <u>3.25</u><br>R <sup>2</sup> = <u>.30</u> |
|                                       |             | Constant             | <u>35.36</u>         |                 | MS <sub>e</sub> = <u>374.4</u>                 |
|                                       |             |                      |                      |                 |  |
| St. Clair                             |             |                      |                      |                 |  |
|                                       | <u>31</u>   | Head Start           | <u>.537</u>          | <u>5.90</u>     | F = <u>1.19</u><br>R <sup>2</sup> = <u>.23</u> |
|                                       |             | Constant             | <u>8.25</u>          |                 | MS <sub>e</sub> = <u>863.64</u>                |
|                                       |             |                      |                      |                 |  |
| Maricopa                              |             |                      |                      |                 |  |
|                                       | <u>52</u>   | Head Start           | <u>did not enter</u> |                 | F = <u>2.28</u><br>R <sup>2</sup> = <u>.23</u> |
|                                       |             | Constant             | <u>-108.79</u>       |                 | MS <sub>e</sub> = <u>635.5</u>                 |
|                                       |             |                      |                      |                 |  |
| Mingo                                 |             |                      |                      |                 |  |
|                                       | <u>26</u>   | Head Start           | <u>-8.52</u>         | <u>4.87</u>     | F = <u>2.49</u><br>R <sup>2</sup> = <u>.44</u> |
|                                       |             | Constant             | <u>-2.70</u>         |                 | MS <sub>e</sub> = <u>423.12</u>                |
|                                       |             |                      |                      |                 |  |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status, mother's education, and child's pretest score.

<sup>b</sup> Centered without weights.

<sup>c</sup> Significance

\*p < .05

\*\*p < .01

\*\*\*p < .001

Table 8-9 (continued)

Regression Analysis of Developmental Assessment Measures  
Longitudinal Children

| Dependent Variable      | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup>          |
|-------------------------|-------------|----------------------|----------------------|-----------------|----------------------------------|
|                         |             |                      | b                    | se <sub>b</sub> |                                  |
| McCARTHY REFUSALS INDEX | 61          | Greene & Humphreys   |                      |                 |                                  |
|                         |             | Head Start           | -1.37                | .63             | F = 1.37<br>R <sup>2</sup> = .15 |
|                         |             | Constant             | 4.39                 |                 | MS <sub>e</sub> = 20.02          |
|                         | 32          | St. Clair            |                      |                 |                                  |
|                         |             | Head Start           | .19                  | .52             | F = 1.26<br>R <sup>2</sup> = .23 |
|                         |             | Constant             | 13.10                |                 | MS <sub>e</sub> = 6.37           |
|                         | 52          | Maricopa             |                      |                 |                                  |
|                         |             | Head Start           | -.05                 | .11             | F = .91<br>R <sup>2</sup> = .13  |
|                         |             | Constant             | -1.81                |                 | MS <sub>e</sub> = .41            |
|                         | 26          | Mingo                |                      |                 |                                  |
|                         |             | Head Start           | .47                  | .31             | F = .93<br>R <sup>2</sup> = .23  |
|                         |             | Constant             | 3.27                 |                 | MS <sub>e</sub> = 2.04           |

<sup>a</sup>Adjusted for age, gender, race, per capita income, family employment status, mother's education, and child's pretest score.

<sup>b</sup>Centered without weights.

<sup>c</sup>Significance

\*p < .05

\*\*p < .01

\*\*\*p < .001

Table 8-9 (continued)

Regression Analysis of Developmental Assessment Measures  
Longitudinal Children

| Dependent Variable     | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |  |
|------------------------|-------------|----------------------|----------------------|-----------------|-------------------------|--|
|                        |             |                      | b                    | se <sub>b</sub> |                         |  |
| AGGRESSIVE CHILD INDEX | 53          | Greene & Humphreys   |                      |                 |                         |  |
|                        |             | Head Start           | .08                  | .08             | F = 1.74                |  |
|                        |             |                      |                      |                 | R <sup>2</sup> = .19    |  |
|                        |             | Constant             | 1.87                 |                 | MS <sub>e</sub> = .30   |  |
|                        |             | St. Clair            |                      |                 |                         |  |
|                        |             | Head Start           | .02                  | .10             | F = 1.35                |  |
|                        |             |                      | R <sup>2</sup> = .26 |                 |                         |  |
|                        |             | Constant             | 2.51                 |                 | MS <sub>e</sub> = .24   |  |
|                        | 52          | Maricopa             |                      |                 |                         |  |
|                        |             | Head Start           | .06                  | .09             | F = 4.15                |  |
|                        |             |                      |                      |                 | R <sup>2</sup> = .36    |  |
|                        |             | Constant             | .74                  |                 | MS <sub>e</sub> = .32   |  |
|                        |             | Mingo                |                      |                 |                         |  |
|                        |             | Head Start           | .23                  | .16             | F = 3.07                |  |
|                        |             |                      | R <sup>2</sup> = .48 |                 |                         |  |
|                        |             | Constant             | .93                  |                 | MS <sub>e</sub> = .32   |  |

<sup>a</sup>Adjusted for age, gender, race, per capita income, family employment status, mother's education, and child's pretest score.

<sup>b</sup>Centered without weights.

<sup>c</sup>Significance

\*p < .05

\*\*p < .01

\*\*\*p < .001

Table 8-9 (continued)

Regression Analysis of Developmental Assessment Measures  
Longitudinal Children

| Dependent Variable    | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup>      |
|-----------------------|-------------|----------------------|----------------------|-----------------|------------------------------|
|                       |             |                      | b                    | SE <sub>b</sub> |                              |
| Greene & Humphreys    |             |                      |                      |                 |                              |
| WITHDRAWN CHILD INDEX | <u>51</u>   | Head Start           | <u>.03</u>           | <u>.06</u>      | F = <u>.46</u>               |
|                       |             |                      |                      |                 | R <sup>2</sup> = <u>.06</u>  |
|                       |             | Constant             | <u>1.35</u>          |                 | MS <sub>e</sub> = <u>.14</u> |
| St. Clair             |             |                      |                      |                 |                              |
| WITHDRAWN CHILD INDEX | <u>30</u>   | Head Start           | <u>-.25*</u>         | <u>.10</u>      | F = <u>1.44</u>              |
|                       |             |                      |                      |                 | R <sup>2</sup> = <u>.23</u>  |
|                       |             | Constant             | <u>1.26</u>          |                 | MS <sub>e</sub> = <u>.27</u> |
| Maricopa              |             |                      |                      |                 |                              |
| WITHDRAWN CHILD INDEX | <u>51</u>   | Head Start           | <u>.15</u>           | <u>.09</u>      | F = <u>1.76</u>              |
|                       |             |                      |                      |                 | R <sup>2</sup> = <u>.19</u>  |
|                       |             | Constant             | <u>.44</u>           |                 | MS <sub>e</sub> = <u>.30</u> |
| Mingo                 |             |                      |                      |                 |                              |
| WITHDRAWN CHILD INDEX | <u>26</u>   | Head Start           | <u>.08</u>           | <u>.09</u>      | F = <u>1.79</u>              |
|                       |             |                      |                      |                 | R <sup>2</sup> = <u>.31</u>  |
|                       |             | Constant             | <u>.28</u>           |                 | MS <sub>e</sub> = <u>.16</u> |

<sup>a</sup>Adjusted for age, gender, race, per capita income, family employment status, and mother's education.

<sup>b</sup>Centered without weights.

Significance

\*p < .05

\*\*p < .01

\*\*\*p < .001

Table 8-10

Regression Analysis of Developmental Assessment Measures  
All Posttest Children

| Dependent Variable                       | Sample Size | Factors <sup>a</sup>                | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |
|--|-------------|-------------------------------------|----------------------|-----------------|-------------------------|
|  |             |                                     | b                    | se <sub>b</sub> |                         |
| McCARTHY<br>MOTOR<br>SCALE<br>PERCENTILE | 776         | Site                                |                      |                 |                         |
|  |             | Greene & Humphreys                  | -1.47                | 1.67            | F = 13.39***            |
|  |             | St. Clair                           | 13.21***             | 1.96            | R <sup>2</sup> = 0.15   |
|  |             | Maricopa                            | -5.90*               | 2.12            | MS <sub>e</sub> = 694.3 |
|  |             | Mingo                               | -5.84**              | 1.75            |                         |
|  |             | Program                             |                      |                 |                         |
|  |             | Head Start                          | -.66                 | 1.15            |                         |
|  |             | Non-Head Start                      | .66                  | 1.15            |                         |
|  |             | Head Start in<br>Greene & Humphreys | 10.34***             | 2.14            |                         |
|  |             | Constant                            | 55.89                |                 |                         |
| McCARTHY REFU-<br>SALS INDEX             | 776         | Site                                |                      |                 |                         |
|  |             | Greene & Humphreys                  | 0.94**               | 0.30            | F = 12.03               |
|  |             | St. Clair                           | 1.04**               | 0.36            | R <sup>2</sup> = 0.14   |
|  |             | Maricopa                            | -0.93*               | 0.38            | MS <sub>e</sub> = 22.74 |
|  |             | Mingo                               | -1.11**              | .31             |                         |
|  |             | Program                             |                      |                 |                         |
|  |             | Head Start                          | -.19                 | .21             |                         |
|  |             | Non-Head Start                      | .19                  | .21             |                         |
|  |             | Head Start in<br>Greene & Humphreys | 1.78***              | .39             |                         |
|  |             | Constant                            | 8.78                 |                 |                         |

<sup>a</sup>Adjusted for age, gender, race, per capita income percentile, family employment status and mother's education.

<sup>b</sup>Centered without weights.

<sup>c</sup>Significance

\*p < .05

\*\*p < .01

\*\*\*p < .001

Table 8-10 (continued)

Regression Analysis of Developmental Assessment Measures  
All Posttest Children

| Dependent Variable    | Sample Size     | Factors <sup>a</sup>   | Effects <sup>b</sup> |                 | Statistics <sup>c</sup>       |
|-----------------------|-----------------|------------------------|----------------------|-----------------|-------------------------------|
|                       |                 |                        | b                    | se <sub>b</sub> |                               |
| WITHDRAWN CHILD INDEX | 776             | Site                   |                      |                 |                               |
|                       |                 | Greene & Humphreys     | <u>-0.29</u>         | <u>.03</u>      | F = <u>16.87</u>              |
|                       |                 | St. Clair              | <u>-0.12*</u>        | <u>0.04</u>     | R <sup>2</sup> = <u>0.17</u>  |
|                       |                 | Maricopa               | <u>0.36***</u>       | <u>0.04</u>     | MS <sub>e</sub> = <u>0.28</u> |
|                       |                 | Mingo                  | <u>.07*</u>          | <u>0.04</u>     |                               |
|                       |                 | Program                |                      |                 |                               |
|                       |                 | Head Start             | <u>.009</u>          | <u>.02</u>      |                               |
|                       |                 | Non-Head Start         | <u>-.009</u>         | <u>.02</u>      |                               |
|                       |                 | Constant               | <u>1.47</u>          |                 |                               |
|                       |                 | AGGRESSIVE CHILD INDEX | 779                  | Site            |                               |
| Greene & Humphreys    | <u>-0.31***</u> |                        |                      | <u>0.04</u>     | F = <u>11.39</u>              |
| St. Clair             | <u>-0.86</u>    |                        |                      | <u>0.05</u>     | R <sup>2</sup> = <u>0.12</u>  |
| Maricopa              | <u>0.25***</u>  |                        |                      | <u>0.05</u>     | MS <sub>e</sub> = <u>0.45</u> |
| Mingo                 | <u>.17***</u>   |                        |                      | <u>.04</u>      |                               |
| Program               |                 |                        |                      |                 |                               |
| Head Start            | <u>.004</u>     |                        |                      | <u>.03</u>      |                               |
| Non-Head Start        | <u>-.004</u>    |                        |                      | <u>.03</u>      |                               |
| Constant              | <u>2.64</u>     |                        |                      |                 |                               |

<sup>a</sup>Adjusted for age, gender, race, per capita income percentile, family employment status and mother's education.

<sup>b</sup>Centered without weights.

<sup>c</sup>Significance

\*p < .05

\*\*p < .01

\*\*\*p < .001

Table 8-10 (continued)

Regression Analysis of Developmental Assessment Measures  
All Posttest Children

| Dependent Variable                       | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup>                          |
|--|-------------|----------------------|----------------------|-----------------|--|
|  |             |                      | b                    | se <sub>b</sub> |  |
| Greene & Humphreys                       |             |                      |                      |                 |  |
| McCARTHY<br>MOTOR<br>SCALE<br>PERCENTILE | <u>220</u>  | Head Start           | <u>9.97***</u>       | <u>1.84</u>     | F = <u>7.35*</u><br>R <sup>2</sup> = <u>0.17</u> |
|  |             | Constant             | <u>52.71</u>         |                 | MS <sub>e</sub> = <u>642.6</u>                   |
| St. Clair                                |             |                      |                      |                 |  |
|  | <u>177</u>  | Head Start           | <u>.97</u>           | <u>2.32</u>     | F = <u>1.83</u><br>R <sup>2</sup> = <u>0.06</u>  |
|  |             | Constant             | <u>117.86</u>        |                 | MS <sub>e</sub> = <u>891.85</u>                  |
| Maricopa                                 |             |                      |                      |                 |  |
|  | <u>162</u>  | Head Start           | <u>-2.43</u>         | <u>2.04</u>     | F = <u>2.39</u><br>R <sup>2</sup> = <u>0.08</u>  |
|  |             | Constant             | <u>3.61</u>          |                 | MS <sub>e</sub> = <u>604.27</u>                  |
| Mingo                                    |             |                      |                      |                 |  |
|  | <u>217</u>  | Head Start           | <u>0.21</u>          | <u>1.83</u>     | F = <u>4.47</u><br>R <sup>2</sup> = <u>0.11</u>  |
|  |             | Constant             | <u>40.02</u>         |                 | MS <sub>e</sub> = <u>619.55</u>                  |

<sup>a</sup>Adjusted for age, gender, race, per capita income percentile, family employment status and mother's education.

<sup>b</sup>Centered without weights.

<sup>c</sup>Significance

\*p < .05

\*\*p < .01

\*\*\*p < .001



Table 8-10 (continued)

Regression Analysis of Developmental Assessment Measures  
All Posttest Children

| Dependent Variable            | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup>        |                              |
|-------------------------------|-------------|----------------------|----------------------|-----------------|--------------------------------|------------------------------|
|                               |             |                      | b                    | se <sub>b</sub> |                                |                              |
| McCARTHY<br>REFUSALS<br>INDEX | <u>220</u>  | Greene & Humphreys   |                      |                 |                                |                              |
|                               |             | Head Start           | <u>-1.92***</u>      | <u>.53</u>      | F = <u>5.02</u>                | R <sup>2</sup> = <u>0.12</u> |
|                               |             | Constant             | <u>14.48</u>         |                 | MS <sub>e</sub> = <u>54.31</u> |                              |
|                               | <u>177</u>  | St. Clair            |                      |                 |                                |                              |
|                               |             | Head Start           | <u>-0.54</u>         | <u>0.35</u>     | F = <u>2.28</u>                | R <sup>2</sup> = <u>0.08</u> |
|                               |             | Constant             | <u>9.00</u>          |                 | MS <sub>e</sub> = <u>20.22</u> |                              |
|                               | <u>162</u>  | Maricopa             |                      |                 |                                |                              |
|                               |             | Head Start           | <u>-0.06</u>         | <u>0.10</u>     | F = <u>0.48</u>                | R <sup>2</sup> = <u>0.02</u> |
|                               |             | Constant             | <u>-0.84</u>         |                 | MS <sub>e</sub> = <u>1.40</u>  |                              |
|                               | <u>217</u>  | Mingo                |                      |                 |                                |                              |
|                               |             | Head Start           | <u>-0.16</u>         | <u>0.22</u>     | F = <u>4.00</u>                | R <sup>2</sup> = <u>0.09</u> |
|                               |             | Constant             | <u>7.70</u>          |                 | MS <sub>e</sub> = <u>8.90</u>  |                              |

<sup>a</sup>Adjusted for age, gender, race, per capita income percentile, family employment status and mother's education.

<sup>b</sup>Centered without weights.

<sup>c</sup>Significance

\*p < .05

\*\*p < .01

\*\*\*p < .001

Table 8-10 (continued)

Regression Analysis of Developmental Assessment Measures  
All Posttest Children

| Dependent Variable     | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup>      |                 | Statistics <sup>c</sup>                         |
|------------------------|-------------|----------------------|---------------------------|-----------------|---|
|                        |             |                      | b                         | se <sub>b</sub> |   |
| AGGRESSIVE CHILD INDEX | 204         | Greene & Humphreys   |                           |                 |   |
|                        |             | Head Start           | <u>-0.09*</u>             | 0.05            | F = <u>1.74</u><br>R <sup>2</sup> = <u>0.05</u> |
|                        |             | Constant             | <u>2.57</u>               |                 | MS <sub>e</sub> = <u>0.37</u>                   |
|                        | 170         | St. Clair            |                           |                 |   |
|                        |             | Head Start           | <u>-0.10</u>              | 0.05            | F = <u>2.11</u><br>R <sup>2</sup> = <u>0.07</u> |
|                        |             | Constant             | <u>2.92</u>               |                 | MS <sub>e</sub> = <u>0.46</u>                   |
|                        | 159         | Maricopa             |                           |                 |   |
|                        |             | Head Start           | <u>too small to enter</u> |                 | F = <u>1.72</u><br>R <sup>2</sup> = <u>0.05</u> |
|                        |             | Constant             | <u>3.95</u>               |                 | MS <sub>e</sub> = <u>0.50</u>                   |
|                        | 211         | Mingo                |                           |                 |   |
|                        |             | Head Start           | <u>.0001</u>              | 0.05            | F = <u>1.35</u><br>R <sup>2</sup> = <u>0.04</u> |
|                        |             | Constant             | <u>3.00</u>               |                 | MS <sub>e</sub> = <u>0.43</u>                   |

<sup>a</sup>Adjusted for age, gender, race, per capita income percentile, family employment status and mother's education.

<sup>b</sup>Centered without weights.

<sup>c</sup>Significance

- \*p < .05
- \*\*p < .01
- \*\*\*p < .001

Table 8-10 (continued)

Regression Analysis of Developmental Assessment Measures  
All Posttest Children

| Dependent Variable    | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup>       |
|-----------------------|-------------|----------------------|----------------------|-----------------|-------------------------------|
|                       |             |                      | b                    | se <sub>b</sub> |                               |
| Greene & Humphreys    |             |                      |                      |                 |                               |
| WITHDRAWN CHILD INDEX | <u>203</u>  | Head Start           | <u>-.003</u>         | <u>0.03</u>     | F = <u>0.59</u>               |
|                       |             |                      |                      |                 | R <sup>2</sup> = <u>0.02</u>  |
|                       |             | Constant             | <u>1.15</u>          |                 | MS <sub>e</sub> = <u>0.19</u> |
| St. Clair             |             |                      |                      |                 |                               |
|                       | <u>167</u>  | Head Start           | <u>-0.05</u>         | <u>0.04</u>     | F = <u>0.66</u>               |
|                       |             |                      |                      |                 | R <sup>2</sup> = <u>0.02</u>  |
|                       |             | Constant             | <u>1.90</u>          |                 | MS <sub>e</sub> = <u>0.29</u> |
| Maricopa              |             |                      |                      |                 |                               |
|                       | <u>158</u>  | Head Start           | <u>0.06</u>          | <u>0.05</u>     | F = <u>2.14</u>               |
|                       |             |                      |                      |                 | R <sup>2</sup> = <u>0.08</u>  |
|                       |             | Constant             | <u>1.65</u>          |                 | MS <sub>e</sub> = <u>0.31</u> |
| Mingo                 |             |                      |                      |                 |                               |
|                       | <u>214</u>  | Head Start           | <u>-.025</u>         | <u>0.04</u>     | F = <u>0.68</u>               |
|                       |             |                      |                      |                 | R <sup>2</sup> = <u>0.02</u>  |
|                       |             | Constant             | <u>1.40</u>          |                 | MS <sub>e</sub> = <u>0.32</u> |

<sup>a</sup>Adjusted for age, gender, race, per capita income percentile, family employment status and mother's education.

<sup>b</sup>Centered without weights.

<sup>c</sup>Significance

\*p < .05

\*\*p < .01

\*\*\*p < .001

Table 8-11

Percentage of Posttest Children Who Scored at Various Percentile Levels on the McCarthy Motor Scale<sup>a</sup>

| Percentile Score | Posttested Children (Samples A, B, C) In: |              |                  |             |                 |             |              |              |             |              |
|------------------|---|--------------|------------------|-------------|-----------------|-------------|--------------|--------------|-------------|--------------|
|                  | Greene & Humphreys Counties               |              | St. Clair County |             | Maricopa County |             | Mingo County |              | All Sites   |              |
|                  | HS<br>n=127                               | NHS<br>n=101 | HS<br>n=108      | NHS<br>n=86 | HS<br>n=106     | NHS<br>n=61 | HS<br>n=119  | NHS<br>n=109 | HS<br>n=460 | NHS<br>n=357 |
| < 10             | 10.2                                      | 28.7         | 7.4              | 12.8        | 34.0            | 23.0        | 22.7         | 22.0         | 18.3        | 21.8         |
| < 20             | 18.1                                      | 46.5         | 17.6             | 24.4        | 48.1            | 42.6        | 42.9         | 40.4         | 31.3        | 38.7         |
| < 30             | 31.5                                      | 60.4         | 28.7             | 30.2        | 61.3            | 50.8        | 54.6         | 49.5         | 43.7        | 48.2         |
| < 40             | 38.6                                      | 70.3         | 35.2             | 36.0        | 67.0            | 67.2        | 64.7         | 59.6         | 51.1        | 58.3         |
| < 50             | 55.1                                      | 75.2         | 47.2             | 44.2        | 77.4            | 70.5        | 76.5         | 70.6         | 63.9        | 65.5         |
| < 60             | 64.6                                      | 87.1         | 60.2             | 59.3        | 87.7            | 82.0        | 87.4         | 81.7         | 74.8        | 77.9         |
| < 70             | 72.4                                      | 92.1         | 68.5             | 64.0        | 94.3            | 88.5        | 88.2         | 86.2         | 80.7        | 82.9         |
| 70+              | 27.6                                      | 7.9          | 31.5             | 36.0        | 5.7             | 11.5        | 11.8         | 13.8         | 19.3        | 17.1         |

<sup>a</sup>Children who refused to cooperate with the examiner eliminated from results.

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Table 8-12

## Average McCarthy Developmental Percentile Scores by Age Group

| Age Group | Posttested Children (Samples A, B, C) In: |                           |                          |                       |
|-----------|---|---------------------------|--------------------------|-----------------------|
|           | Greene & Humphreys Counties<br>n=228      | St. Clair County<br>n=194 | Maricopa County<br>n=167 | Mingo County<br>n=228 |
| 2.25-2.74 | n   |                           |                          | 7                     |
|           | Mean                                      |                           |                          | 45.00                 |
|           | S.D.                                      |                           |                          | 31.62                 |
| 2.75-3.74 | n   | 6                         | 8                        | 16                    |
|           | Mean                                      | 35.67                     | 65.38                    | 50.94                 |
|           | S.D.                                      | 34.29                     | 30.16                    | 24.17                 |
| 3.25-3.74 | n   | 54                        | 40                       | 44                    |
|           | Mean                                      | 42.48                     | 61.75                    | 35.27                 |
|           | S.D.                                      | 29.33                     | 26.49                    | 29.03                 |
| 3.75-4.24 | n   | 57                        | 52                       | 48                    |
|           | Mean                                      | 32.05                     | 42.38                    | 33.15                 |
|           | S.D.                                      | 26.09                     | 30.16                    | 25.50                 |
| 4.25-4.74 | n   | 59                        | 47                       | 31                    |
|           | Mean                                      | 38.54                     | 52.17                    | 27.55                 |
|           | S.D.                                      | 24.62                     | 27.78                    | 22.09                 |
| 4.75-5.24 | n   | 23                        | 37                       | 90                    |
|           | Mean                                      | 35.26                     | 38.54                    | 25.13                 |
|           | S.D.                                      | 27.87                     | 30.43                    | 24.22                 |
| 5.25-5.74 | n   | 12                        | 5                        | 45                    |
|           | Mean                                      | 43.17                     | 62.00                    | 34.29                 |
|           | S.D.                                      | 28.96                     | 25.15                    | 28.18                 |
| 5.75-6.24 | n   | 13                        | 5                        | 1                     |
|           | Mean                                      | 41.08                     | 39.20                    | 1.00                  |
|           | S.D.                                      | 35.41                     | 35.51                    | 0.00                  |
| ≥ 6.25    | n   | 4                         |                          |                       |
|           | Mean                                      | 29.25                     |                          |                       |
|           | S.D.                                      | 33.19                     |                          |                       |

Table 8-13

Average Number of Refusals for the Development Evaluation by Age Group

| Age Group | Posttested Children (Samples A, B, C) In: |                           |                          |                       |
|-----------|---|---------------------------|--------------------------|-----------------------|
|           | Greene & Humphreys Counties<br>n=228      | St. Clair County<br>n=194 | Maricopa County<br>n=167 | Mingo County<br>n=228 |
| < 2.25    | n   |                           |                          |                       |
|           | Mean                                      |                           |                          |                       |
|           | S.D.                                      |                           |                          |                       |
| 2.25-2.74 | n   |                           |                          | 6                     |
|           | Mean                                      |                           |                          | 4.5                   |
|           | S.D.                                      |                           |                          | 6.0                   |
| 2.75-3.24 | n   | 6                         | 8                        | 16                    |
|           | Mean                                      | 8.8                       | 6.8                      | 2.0                   |
|           | S.D.                                      | 14.9                      | 5.8                      | 3.0                   |
| 3.25-3.74 | n   | 54                        | 40                       | 44                    |
|           | Mean                                      | 4.8                       | 3.4                      | 1.8                   |
|           | S.D.                                      | 9.7                       | 3.4                      | 3.6                   |
| 3.75-4.24 | n   | 57                        | 52                       | 48                    |
|           | Mean                                      | 4.2                       | 5.1                      | 3.1                   |
|           | S.D.                                      | 9.4                       | 7.6                      | 2.6                   |
| 4.25-4.74 | n   | 59                        | 47                       | 51                    |
|           | Mean                                      | .88                       | 2.2                      | 1.2                   |
|           | S.D.                                      | 1.5                       | 2.2                      | 3.4                   |
| 4.75-5.24 | n   | 23                        | 37                       | 90                    |
|           | Mean                                      | 2.8                       | 1.9                      | .59                   |
|           | S.D.                                      | 8.2                       | 2.0                      | 1.3                   |
| 5.25-5.74 | n   | 12                        | 5                        | 45                    |
|           | Mean                                      | .69                       | 1.7                      | .47                   |
|           | S.D.                                      | 1.9                       | 1.6                      | 1.0                   |
| 5.75-6.24 | n   | 13                        | 5                        | 1                     |
|           | Mean                                      | .69                       | 2.0                      | 0.0                   |
|           | S.D.                                      | .86                       | 2.4                      | 0.0                   |
| 6.25-6.75 | n   | 4                         |                          |                       |
|           | Mean                                      | .75                       |                          |                       |
|           | S.D.                                      | .96                       |                          |                       |

Table 8-14

DEVELOPMENTAL ASSESSMENT FOR COMBINED GROUPS,  
OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS AMONG SAMPLES WITHIN SITE

|                               | Greene/Humphreys |       |       | St. Clair |       |       | Maricopa |       |       | Mingo |       |       |
|-------------------------------|------------------|-------|-------|-----------|-------|-------|----------|-------|-------|-------|-------|-------|
|                               | N                | MEAN  | SD    | N         | MEAN  | SD    | N        | MEAN  | SD    | N     | MEAN  | SD    |
| <b>MCCARTHY PERCENTILE</b>    |                  |       |       |           |       |       |          |       |       |       |       |       |
| Sample A                      | 74               | 35.19 | 23.41 | 42        | 52.52 | 32.06 | 56       | 31.14 | 26.89 | 36    | 24.89 | 21.84 |
| Sample B                      | 56               | 37.59 | 30.43 | 41        | 41.39 | 29.64 | 11       | 31.64 | 25.45 | 31    | 30.77 | 24.86 |
| Sample C                      | 98               | 39.59 | 29.02 | 111       | 51.15 | 29.02 | 100      | 25.68 | 24.11 | 161   | 32.99 | 26.80 |
|                               |                  | F=    | P=    |           | F=    | P=    |          | F=    | P=    |       | F=    | P=    |
|                               |                  | 0.53  | 0.588 |           | 1.90  | 0.152 |          | 0.98  | 0.379 |       | 1.46  | 0.235 |
| <b>MCCARTHY REFUSALS</b>      |                  |       |       |           |       |       |          |       |       |       |       |       |
| Sample A                      | 74               | 1.95  | 5.94  | 42        | 2.52  | 2.46  | 56       | 0.38  | 1.23  | 36    | 1.56  | 3.84  |
| Sample B                      | 56               | 2.73  | 7.56  | 41        | 4.61  | 5.83  | 11       | 0.00  | 0.00  | 31    | 1.65  | 3.41  |
| Sample C                      | 98               | 4.04  | 9.07  | 111       | 3.22  | 4.98  | 100      | 0.57  | 1.17  | 161   | 1.12  | 2.74  |
|                               |                  | F=    | P=    |           | F=    | P=    |          | F=    | P=    |       | F=    | P=    |
|                               |                  | 1.58  | 0.209 |           | 2.11  | 0.124 |          | 1.47  | 0.233 |       | 0.58  | 0.558 |
| <b>AGGRESSIVE CHILD INDEX</b> |                  |       |       |           |       |       |          |       |       |       |       |       |
| Sample A                      | 68               | 2.01  | 0.58  | 40        | 2.03  | 0.61  | 55       | 2.48  | 0.65  | 35    | 2.38  | 0.78  |
| Sample B                      | 50               | 2.02  | 0.67  | 40        | 2.38  | 0.77  | 11       | 2.22  | 0.64  | 31    | 2.46  | 0.59  |
| Sample C                      | 93               | 1.95  | 0.62  | 106       | 2.23  | 0.67  | 97       | 2.56  | 0.74  | 156   | 2.54  | 0.68  |
|                               |                  | F=    | P=    |           | F=    | P=    |          | F=    | P=    |       | F=    | P=    |
|                               |                  | 0.33  | 0.719 |           | 2.69  | 0.070 |          | 1.24  | 0.293 |       | 0.83  | 0.436 |
| <b>WITHDRAWN CHILD INDEX</b>  |                  |       |       |           |       |       |          |       |       |       |       |       |
| Sample A                      | 63               | 1.36  | 0.37  | 40        | 1.56  | 0.53  | 54       | 2.08  | 0.58  | 36    | 1.60  | 0.56  |
| Sample B                      | 52               | 1.42  | 0.53  | 37        | 1.62  | 0.53  | 10       | 1.93  | 0.48  | 30    | 1.61  | 0.43  |
| Sample C                      | 94               | 1.40  | 0.43  | 106       | 1.54  | 0.53  | 98       | 2.01  | 0.60  | 159   | 1.75  | 0.58  |
|                               |                  | F=    | P=    |           | F=    | P=    |          | F=    | P=    |       | F=    | P=    |
|                               |                  | 0.30  | 0.744 |           | 0.36  | 0.698 |          | 0.43  | 0.649 |       | 1.44  | 0.240 |

Table 8-14 (continued)

AGGRESSIVE CHILD INDEX FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLE BY SITE

|                         | HEAD START |      |      |      |      |      | NON-HEAD START |      |      |      |      |      | T     | P     |
|-------------------------|------------|------|------|------|------|------|----------------|------|------|------|------|------|-------|-------|
|                         | N          | Q1   | MED  | Q3   | MEAN | SD   | N              | Q1   | MED  | Q3   | MEAN | SD   |       |       |
| <b>Greene/Humphreys</b> |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Sample A                | 40         | 1.63 | 2.00 | 2.50 | 2.03 | 0.62 | 28             | 1.63 | 1.75 | 2.25 | 1.99 | 0.53 | 0.32  | 0.752 |
| Sample B                | 30         | 1.50 | 2.00 | 2.50 | 2.15 | 0.74 | 20             | 1.44 | 1.69 | 2.25 | 1.82 | 0.52 | 1.84  | 0.073 |
| Sample C                | 47         | 1.63 | 1.88 | 2.31 | 2.00 | 0.57 | 46             | 1.38 | 1.75 | 2.25 | 1.89 | 0.67 | 0.85  | 0.399 |
| Sample D                | 9          | 1.75 | 1.88 | 2.00 | 1.88 | 0.50 | 12             | 1.50 | 1.81 | 2.75 | 2.07 | 0.78 | -0.70 | 0.490 |
| Sample E                | 12         | 1.38 | 2.06 | 2.25 | 1.98 | 0.78 | 16             | 1.69 | 1.88 | 2.38 | 2.06 | 0.46 | -0.33 | 0.746 |
| <b>St. Clair</b>        |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Sample A                | 24         | 1.63 | 2.06 | 2.50 | 2.02 | 0.55 | 16             | 1.44 | 2.00 | 2.50 | 2.03 | 0.72 | -0.05 | 0.961 |
| Sample B                | 12         | 1.75 | 1.75 | 2.13 | 1.90 | 0.44 | 28             | 2.06 | 2.50 | 3.31 | 2.58 | 0.79 | 1.48  | 0.001 |
| Sample C                | 69         | 1.75 | 2.25 | 2.63 | 2.19 | 0.64 | 37             | 1.75 | 2.25 | 2.63 | 2.28 | 0.73 | -0.63 | 0.529 |
| Sample D                | 36         | 1.94 | 2.38 | 3.13 | 2.50 | 0.77 | 34             | 2.00 | 2.38 | 2.75 | 2.38 | 0.74 | 0.67  | 0.502 |
| Sample E                | 62         | 1.88 | 2.25 | 2.88 | 2.41 | 0.79 | 60             | 1.75 | 2.25 | 2.75 | 2.28 | 0.65 | 1.03  | 0.306 |
| <b>Maricopa</b>         |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Sample A                | 39         | 2.25 | 2.63 | 2.88 | 2.51 | 0.52 | 16             | 1.69 | 2.31 | 3.19 | 2.40 | 0.90 | 0.48  | 0.639 |
| Sample B                | 10         | 2.00 | 2.19 | 2.88 | 2.26 | 0.66 | 1              | ---- | 1.75 | ---- | 1.75 | ---- | 2.47  | 0.036 |
| Sample C                | 55         | 1.88 | 2.50 | 3.13 | 2.57 | 0.81 | 42             | 2.00 | 2.56 | 2.88 | 2.55 | 0.65 | 0.12  | 0.902 |
| Sample D                | 21         | 2.13 | 2.63 | 3.13 | 2.67 | 0.85 | 17             | 1.88 | 2.50 | 2.88 | 2.40 | 0.65 | 1.08  | 0.287 |
| Sample E                | 8          | 1.81 | 2.63 | 2.75 | 2.31 | 0.67 | 14             | 1.88 | 2.06 | 2.63 | 2.22 | 0.63 | 0.31  | 0.764 |
| <b>Mingo</b>            |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Sample A                | 18         | 2.00 | 2.25 | 3.00 | 2.58 | 0.85 | 17             | 1.63 | 2.13 | 2.75 | 2.15 | 0.67 | 1.67  | 0.105 |
| Sample B                | 17         | 2.00 | 2.38 | 3.00 | 2.50 | 0.58 | 14             | 2.00 | 2.19 | 2.88 | 2.41 | 0.60 | 0.42  | 0.681 |
| Sample C                | 80         | 1.94 | 2.50 | 2.88 | 2.46 | 0.63 | 76             | 2.19 | 2.75 | 3.00 | 2.62 | 0.72 | -1.45 | 0.149 |
| Sample D                | 22         | 2.00 | 2.38 | 3.00 | 2.54 | 0.92 | 14             | 2.38 | 2.63 | 3.13 | 2.85 | 0.63 | -1.19 | 0.242 |
| Sample E                | 33         | 2.25 | 2.50 | 3.13 | 2.60 | 0.71 | 31             | 2.38 | 2.63 | 3.00 | 2.63 | 0.56 | -0.17 | 0.868 |

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Table 8-14 (continued)

SELECTED FAMILY BACKGROUND CHARACTERISTICS FOR COMBINED GROUPS  
OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS AMONG SAMPLES WITHIN SITE

|                               | Greene/Humphreys |       |      | St. Clair |       |      | Maricopa |       |      | Mingo |       |      |
|-------------------------------|------------------|-------|------|-----------|-------|------|----------|-------|------|-------|-------|------|
|                               | N                | MEAN  | SD   | N         | MEAN  | SD   | N        | MEAN  | SD   | N     | MEAN  | SD   |
| <b>AGGRESSIVE CHILD INDEX</b> |                  |       |      |           |       |      |          |       |      |       |       |      |
| Sample A                      | 68               | 2.01  | 0.58 | 40        | 2.02  | 0.61 | 55       | 2.48  | 0.65 | 35    | 2.38  | 0.78 |
| Sample B                      | 50               | 2.01  | 0.67 | 40        | 2.38  | 0.77 | 11       | 2.22  | 0.64 | 31    | 2.46  | 0.58 |
| Sample C                      | 93               | 1.94  | 0.62 | 106       | 2.23  | 0.67 | 97       | 2.56  | 0.74 | 156   | 2.53  | 0.68 |
| Sample D                      | 21               | 1.99  | 0.67 | 70        | 2.44  | 0.75 | 38       | 2.55  | 0.77 | 36    | 2.66  | 0.83 |
| Sample E                      | 28               | 2.03  | 0.61 | 122       | 2.35  | 0.72 | 22       | 2.26  | 0.63 | 64    | 2.61  | 0.63 |
|                               | F=               | P=    |      | F=        | P=    |      | F=       | P=    |      | F=    | P=    |      |
|                               | 0.20             | 0.940 |      | 2.75      | 0.028 |      | 1.30     | 0.270 |      | 1.05  | 0.383 |      |
| <b>WITHDRAWN CHILD INDEX</b>  |                  |       |      |           |       |      |          |       |      |       |       |      |
| Sample A                      | 63               | 1.36  | 0.37 | 40        | 1.56  | 0.53 | 54       | 2.08  | 0.58 | 36    | 1.60  | 0.56 |
| Sample B                      | 52               | 1.42  | 0.53 | 37        | 1.62  | 0.53 | 10       | 1.93  | 0.48 | 30    | 1.61  | 0.43 |
| Sample C                      | 94               | 1.40  | 0.43 | 106       | 1.54  | 0.53 | 98       | 2.01  | 0.59 | 159   | 1.75  | 0.58 |
| Sample D                      | 20               | 1.47  | 0.49 | 69        | 1.72  | 0.68 | 36       | 1.86  | 0.66 | 37    | 1.50  | 0.43 |
| Sample E                      | 29               | 1.48  | 0.54 | 121       | 1.76  | 0.70 | 22       | 2.12  | 0.77 | 65    | 1.42  | 0.43 |
|                               | F=               | P=    |      | F=        | P=    |      | F=       | P=    |      | F=    | P=    |      |
|                               | 0.50             | 0.738 |      | 2.32      | 0.056 |      | 0.97     | 0.427 |      | 5.22  | 0.000 |      |

Table 8-14 (continued)

DEVELOPMENTAL ASSESSMENT FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                               | HEAD START |       |       |       |       |       | NON-HEAD START |       |       |       |       |       | T     | P     |
|-------------------------------|------------|-------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|-------|-------|-------|
|                               | N          | Q1    | MED   | Q3    | MEAN  | SD    | N              | Q1    | MED   | Q3    | MEAN  | SD    |       |       |
| <b>McCARTHY PERCENTILE</b>    |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Greene/Humphreys              | 127        | 25.00 | 45.00 | 70.00 | 45.86 | 27.20 | 101            | 5.00  | 20.00 | 45.00 | 27.38 | 24.80 | 5.36  | 0.000 |
| St. Clair                     | 108        | 25.00 | 50.00 | 72.50 | 49.59 | 29.30 | 86             | 20.00 | 50.00 | 80.00 | 49.13 | 31.00 | 0.11  | 0.915 |
| Maricopa                      | 106        | 5.00  | 20.00 | 40.00 | 25.80 | 23.70 | 61             | 10.00 | 25.00 | 55.00 | 31.56 | 27.30 | -1.38 | 0.172 |
| Mingo                         | 119        | 10.00 | 25.00 | 45.00 | 29.77 | 25.10 | 109            | 10.00 | 30.00 | 55.00 | 33.19 | 26.70 | -0.99 | 0.321 |
| <b>McCARTHY REFUSALS</b>      |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Greene/Humphreys              | 127        | 0.00  | 0.00  | 1.00  | 1.20  | 3.97  | 101            | 0.00  | 1.00  | 3.00  | 5.36  | 10.50 | -3.79 | 0.000 |
| St. Clair                     | 108        | 0.00  | 1.00  | 4.00  | 2.65  | 4.09  | 86             | 1.00  | 3.00  | 5.00  | 4.26  | 5.44  | -2.28 | 0.024 |
| Maricopa                      | 106        | 0.00  | 0.00  | 0.00  | 0.45  | 1.19  | 61             | 0.00  | 0.00  | 0.00  | 0.49  | 1.12  | -0.21 | 0.833 |
| Mingo                         | 119        | 0.00  | 0.00  | 1.00  | 0.90  | 2.39  | 109            | 0.00  | 0.00  | 1.00  | 1.66  | 3.55  | -1.88 | 0.062 |
| <b>AGGRESSIVE CHILD INDEX</b> |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Greene/Humphreys              | 117        | 1.63  | 2.00  | 2.50  | 2.05  | 0.63  | 94             | 1.50  | 1.75  | 2.25  | 1.90  | 0.60  | 1.70  | 0.091 |
| St. Clair                     | 105        | 1.75  | 2.13  | 2.50  | 2.12  | 0.60  | 81             | 1.75  | 2.25  | 2.75  | 2.34  | 0.77  | -2.09 | 0.038 |
| Maricopa                      | 104        | 2.06  | 2.50  | 3.00  | 2.52  | 0.70  | 59             | 1.94  | 2.38  | 2.88  | 2.50  | 0.72  | 0.19  | 0.847 |
| Mingo                         | 115        | 2.00  | 2.50  | 2.88  | 2.49  | 0.66  | 107            | 2.00  | 2.63  | 2.88  | 2.52  | 0.71  | -0.35 | 0.730 |
| <b>WITHDRAWN CHILD INDEX</b>  |            |       |       |       |       |       |                |       |       |       |       |       |       |       |
| Greene/Humphreys              | 113        | 1.00  | 1.29  | 1.57  | 1.41  | 0.42  | 96             | 1.00  | 1.29  | 1.57  | 1.38  | 0.46  | 0.50  | 0.619 |
| St. Clair                     | 101        | 1.00  | 1.29  | 1.86  | 1.51  | 0.49  | 82             | 1.14  | 1.57  | 2.00  | 1.61  | 0.56  | -1.32 | 0.190 |
| Maricopa                      | 102        | 1.57  | 2.00  | 2.43  | 2.05  | 0.58  | 60             | 1.57  | 2.00  | 2.36  | 1.98  | 0.59  | 0.71  | 0.478 |
| Mingo                         | 118        | 1.29  | 1.57  | 2.00  | 1.71  | 0.55  | 107            | 1.29  | 1.57  | 2.00  | 1.70  | 0.57  | 0.03  | 0.974 |

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Table 8-14 (continued)

DEVELOPMENTAL ASSESSMENT FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS ACROSS SITE

|                        | HEAD START |       |       |       |       |       | NON-HEAD START |       |       |       |       |       | T     | P     |
|------------------------|------------|-------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|-------|-------|-------|
|                        | N          | Q1    | MED   | Q3    | MEAN  | SD    | N              | Q1    | MED   | Q3    | MEAN  | SD    |       |       |
| McCARTHY PERCENTILE    | 460        | 10.00 | 35.00 | 60.00 | 37.95 | 28.20 | 357            | 10.00 | 30.00 | 55.00 | 35.11 | 28.50 | 1.42  | 0.155 |
| McCARTHY REFUSALS      | 460        | 0.00  | 0.00  | 1.00  | 1.29  | 3.26  | 357            | 0.00  | 1.00  | 3.00  | 3.13  | 6.74  | -4.75 | 0.000 |
| AGGRESSIVE CHILD INDEX | 441        | 1.75  | 2.25  | 2.75  | 2.29  | 0.68  | 341            | 1.75  | 2.25  | 2.88  | 2.30  | 0.74  | -0.22 | 0.825 |
| WITHDRAWN CHILD INDEX  | 434        | 1.29  | 1.57  | 2.00  | 1.66  | 0.57  | 345            | 1.14  | 1.57  | 2.00  | 1.64  | 0.58  | 0.58  | 0.564 |

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Table 8-14 (continued)

WITHDRAWN CHILD INDEX FOR HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SAMPLE BY SITE

|                         | HEAD START |      |      |      |      |      | NON-HEAD START |      |      |      |      |      | T     | P     |
|-------------------------|------------|------|------|------|------|------|----------------|------|------|------|------|------|-------|-------|
|                         | N          | Q1   | MED  | Q3   | MEAN | SD   | N              | Q1   | MED  | Q3   | MEAN | SD   |       |       |
| <b>Greene/Humphreys</b> |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Sample A                | 35         | 1.00 | 1.29 | 1.64 | 1.39 | 0.38 | 28             | 1.00 | 1.29 | 1.29 | 1.32 | 0.37 | 0.80  | 0.429 |
| Sample B                | 31         | 1.00 | 1.29 | 1.64 | 1.41 | 0.43 | 21             | 1.00 | 1.29 | 1.43 | 1.44 | 0.66 | -0.16 | 0.878 |
| Sample C                | 47         | 1.00 | 1.29 | 1.57 | 1.41 | 0.45 | 47             | 1.00 | 1.29 | 1.57 | 1.38 | 0.41 | 0.34  | 0.735 |
| Sample D                | 8          | 1.00 | 1.21 | 1.71 | 1.34 | 0.38 | 12             | 1.21 | 1.36 | 1.71 | 1.56 | 0.56 | -1.05 | 0.307 |
| Sample E                | 12         | 1.00 | 1.36 | 1.43 | 1.31 | 0.30 | 17             | 1.00 | 1.29 | 2.29 | 1.61 | 0.63 | -1.67 | 0.108 |
| <b>St. Clair</b>        |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Sample A                | 23         | 1.00 | 1.29 | 1.78 | 1.47 | 0.51 | 17             | 1.29 | 1.57 | 2.14 | 1.68 | 0.54 | -1.28 | 0.209 |
| Sample B                | 12         | 1.14 | 1.50 | 1.71 | 1.52 | 0.48 | 25             | 1.14 | 1.71 | 2.14 | 1.67 | 0.56 | -0.82 | 0.421 |
| Sample C                | 66         | 1.14 | 1.29 | 1.86 | 1.52 | 0.50 | 40             | 1.00 | 1.29 | 1.86 | 1.55 | 0.58 | -0.27 | 0.788 |
| Sample D                | 35         | 1.29 | 1.57 | 2.14 | 1.73 | 0.72 | 34             | 1.14 | 1.50 | 2.14 | 1.70 | 0.63 | 0.20  | 0.840 |
| Sample E                | 61         | 1.29 | 1.71 | 2.43 | 1.83 | 0.71 | 60             | 1.21 | 1.57 | 1.93 | 1.69 | 0.70 | 1.07  | 0.287 |
| <b>Maricopa</b>         |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Sample A                | 39         | 1.71 | 2.00 | 2.57 | 2.16 | 0.58 | 15             | 1.57 | 2.14 | 2.29 | 1.89 | 0.55 | 1.60  | 0.121 |
| Sample B                | 9          | 1.57 | 1.86 | 2.29 | 1.89 | 0.49 | 1              | ---- | 2.29 | ---- | 2.29 | ---- | -2.41 | 0.042 |
| Sample C                | 54         | 1.57 | 2.00 | 2.43 | 2.00 | 0.58 | 44             | 1.57 | 1.86 | 2.43 | 2.01 | 0.61 | -0.06 | 0.952 |
| Sample D                | 21         | 1.29 | 1.71 | 2.29 | 1.85 | 0.73 | 15             | 1.29 | 2.00 | 2.21 | 1.87 | 0.58 | -0.07 | 0.941 |
| Sample E                | 9          | 1.29 | 2.14 | 2.43 | 2.08 | 0.80 | 13             | 1.57 | 1.86 | 2.43 | 2.15 | 0.77 | -0.22 | 0.830 |
| <b>Mingo</b>            |            |      |      |      |      |      |                |      |      |      |      |      |       |       |
| Sample A                | 18         | 1.29 | 1.57 | 1.86 | 1.66 | 0.53 | 18             | 1.00 | 1.43 | 1.71 | 1.55 | 0.60 | 0.59  | 0.560 |
| Sample B                | 17         | 1.43 | 1.57 | 2.14 | 1.71 | 0.42 | 13             | 1.29 | 1.29 | 2.00 | 1.48 | 0.42 | 1.43  | 0.164 |
| Sample C                | 83         | 1.29 | 1.57 | 2.00 | 1.72 | 0.59 | 76             | 1.29 | 1.71 | 2.14 | 1.78 | 0.58 | -0.67 | 0.503 |
| Sample D                | 22         | 1.00 | 1.43 | 2.00 | 1.55 | 0.46 | 15             | 1.07 | 1.29 | 1.71 | 1.43 | 0.39 | 0.84  | 0.409 |
| Sample E                | 33         | 1.00 | 1.29 | 1.57 | 1.41 | 0.49 | 32             | 1.14 | 1.43 | 1.64 | 1.42 | 0.35 | -0.12 | 0.904 |

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CHAPTER NINE

APPENDIX TABLES

Table 9-1

Correlations of Speech and Language Scores by Age at Posttest

| Speech and Language Comprehension Measures                       | Posttested Children (Samples A, B, and C) in: |                  |                  |              |           |                   |
|--|---|------------------|------------------|--------------|-----------|-------------------|
|  | Greene or Humphreys Counties                  | St. Clair County | Maricopa County  | Mingo County | All Sites | All Non-Bilingual |
| <u>Speech</u>  |   |                  |                  |              |           |                   |
| Denver Articulation Screening Exam (DASE)                        |   |                  |                  |              |           |                   |
| # correct  | .27***  | .11              | .12              | .31***       | .29***    | .25***            |
| # refusals   | -.16*   | -.02             | ( ) <sup>a</sup> | -.13*        | -.11***   | -.10**            |
| <u>Language Comprehension</u>                                    |   |                  |                  |              |           |                   |
| Assessment of Children's Language Comprehension (ACLC)           |   |                  |                  |              |           |                   |
| # correct  | .45***  | .42***           | .06              | .40***       | .44***    | .40***            |
| # refusals   | -.07  | -.13*            | ( ) <sup>a</sup> | -.06         | -.10**    | -.08*             |
| 2-Critical Elements  |   |                  |                  |              |           |                   |
| # correct  | .39***  | .36***           | .04              | .37***       | .43***    | .37***            |
| # refusals   | -.09  | -.10             | .07              | .07          | -.03      | -.04              |
| 3-Critical Elements  |   |                  |                  |              |           |                   |
| # correct  | .46***  | .47***           | .11              | .38***       | .48***    | .44***            |
| # refusals   | -.06  | -.12*            | .10              | .06          | -.02      | -.04              |
| 4-Critical Elements  |   |                  |                  |              |           |                   |
| # correct  | .43***  | .41***           | .24**            | .35***       | .45***    | .39***            |
| # refusals   | -.08  | -.13*            | .10              | .08          | -.02      | -.05              |
| Fluharty Preschool Speech and Language Test (Repetition Subtest) |   |                  |                  |              |           |                   |
| # correct  | .32***  | .29***           | .16*             | .39***       | .33***    | .34***            |
| # refusals   | -.14*   | -.07             | -.01             | -.12*        | -.14***   | -.12**            |

<sup>a</sup> Cannot be computed.

Table 9-2

Speech and Language Measures For Combined Groups of Head Start and Non-Head Start Children  
With Unadjusted Comparisons Between Males and Females Within Site at Pretest

|                            | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|----------------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                            | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>VOCABULARY</b>          |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 112   | 34.00 | 41.00 | 45.00 | 39.76 | 7.22 | 114     | 38.00 | 43.00 | 46.00 | 41.72 | 6.44 | -2.17 | 0.031 |
| St. Clair                  | 101   | 36.00 | 41.00 | 45.00 | 39.49 | 7.52 | 99      | 36.00 | 41.00 | 45.00 | 39.33 | 6.60 | 0.13  | 0.897 |
| Maricopa                   | 62    | 42.00 | 47.00 | 48.00 | 45.52 | 4.33 | 67      | 45.00 | 46.00 | 48.00 | 45.60 | 3.53 | -0.12 | 0.908 |
| Ninno                      | 114   | 42.00 | 45.00 | 47.00 | 43.96 | 4.76 | 104     | 41.00 | 45.00 | 47.00 | 43.25 | 5.75 | 0.09  | 0.321 |
| <b>2 CRITICAL ELEMENTS</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 111   | 6.00  | 8.00  | 9.00  | 7.13  | 2.24 | 114     | 7.00  | 8.00  | 9.00  | 7.79  | 1.86 | -2.44 | 0.016 |
| St. Clair                  | 102   | 6.00  | 8.00  | 9.00  | 7.25  | 2.20 | 99      | 6.00  | 8.00  | 9.00  | 7.51  | 2.22 | -0.83 | 0.400 |
| Maricopa                   | 60    | 9.00  | 9.00  | 10.00 | 9.07  | 1.09 | 64      | 9.00  | 9.00  | 10.00 | 9.20  | 0.99 | -0.72 | 0.476 |
| Ninno                      | 114   | 7.00  | 8.00  | 9.00  | 7.89  | 1.69 | 104     | 7.00  | 8.00  | 9.00  | 7.75  | 2.05 | 0.59  | 0.557 |
| <b>3 CRITICAL ELEMENTS</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 111   | 4.00  | 6.00  | 7.00  | 5.41  | 2.41 | 114     | 5.00  | 6.00  | 7.00  | 6.16  | 2.30 | -2.17 | 0.031 |
| St. Clair                  | 102   | 4.00  | 5.00  | 7.00  | 5.39  | 2.15 | 99      | 5.00  | 6.00  | 7.00  | 5.93  | 2.36 | -1.64 | 0.103 |
| Maricopa                   | 60    | 6.00  | 8.00  | 9.00  | 7.63  | 1.78 | 64      | 7.00  | 8.00  | 9.00  | 7.95  | 1.50 | -1.06 | 0.291 |
| Ninno                      | 114   | 4.00  | 6.00  | 7.00  | 6.17  | 2.27 | 104     | 5.00  | 7.00  | 8.00  | 6.19  | 2.27 | -0.08 | 0.938 |
| <b>4 CRITICAL ELEMENTS</b> |       |       |       |       |       |      |         |       |       |       |       |      |       |       |
| Greene/Humphreys           | 111   | 3.00  | 4.00  | 5.00  | 3.89  | 2.34 | 114     | 4.00  | 5.00  | 6.00  | 4.74  | 2.02 | -2.91 | 0.004 |
| St. Clair                  | 102   | 3.00  | 4.00  | 5.00  | 4.27  | 2.05 | 99      | 3.00  | 5.00  | 6.00  | 4.36  | 2.28 | -0.28 | 0.779 |
| Maricopa                   | 60    | 5.00  | 6.00  | 8.00  | 6.47  | 2.16 | 64      | 5.00  | 7.00  | 8.00  | 6.49  | 1.72 | -0.67 | 0.502 |
| Ninno                      | 114   | 3.00  | 5.00  | 7.00  | 4.87  | 2.33 | 104     | 3.00  | 5.00  | 6.00  | 4.84  | 2.20 | 0.10  | 0.919 |

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Table 9-2 (continued)

Speech and Language Measures For Combined Groups of Head Start and Non-Head Start Children  
With Unadjusted Comparisons Between Males and Females Within Site at Pretest

|                            | M MLES |       |       |       |       |      | F FEMALES |       |       |       |       |      | T     | P     |
|----------------------------|--------|-------|-------|-------|-------|------|-----------|-------|-------|-------|-------|------|-------|-------|
|                            | N      | Q1    | MED   | Q3    | MEAN  | SD   | N         | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>ARTICULATION</b>        |        |       |       |       |       |      |           |       |       |       |       |      |       |       |
| Greene/Humphreys           | 101    | 20.00 | 24.00 | 28.00 | 22.57 | 7.12 | 99        | 25.00 | 28.00 | 29.00 | 26.30 | 4.27 | -4.50 | 0.000 |
| St. Clair                  | 86     | 21.00 | 25.00 | 27.00 | 25.94 | 4.27 | 80        | 23.50 | 27.00 | 28.00 | 25.27 | 4.87 | -1.87 | 0.063 |
| Maricopa                   | 54     | 25.00 | 27.00 | 28.00 | 25.98 | 3.41 | 55        | 27.00 | 28.00 | 29.50 | 27.51 | 3.02 | -2.47 | 0.015 |
| Minno                      | 101    | 10.00 | 23.00 | 27.00 | 21.99 | 6.35 | 97        | 21.00 | 25.00 | 27.00 | 23.47 | 5.47 | -1.75 | 0.082 |
| <b>SENTENCE REPETITION</b> |        |       |       |       |       |      |           |       |       |       |       |      |       |       |
| Greene/Humphreys           | 101    | 6.00  | 8.00  | 10.00 | 7.11  | 3.20 | 100       | 7.50  | 9.00  | 10.00 | 8.18  | 2.56 | -2.62 | 0.000 |
| St. Clair                  | 87     | 5.00  | 7.00  | 9.00  | 6.64  | 2.77 | 81        | 7.00  | 9.00  | 10.00 | 7.70  | 2.63 | -2.75 | 0.007 |
| Maricopa                   | 53     | 7.00  | 8.00  | 9.00  | 7.70  | 2.31 | 58        | 7.00  | 9.00  | 10.00 | 8.37  | 1.80 | -1.58 | 0.117 |
| Minno                      | 107    | 6.00  | 7.00  | 9.00  | 6.87  | 3.15 | 98        | 7.00  | 9.00  | 10.00 | 7.83  | 2.56 | -3.12 | 0.002 |
| <b>NUMBER OF PROBLEMS</b>  |        |       |       |       |       |      |           |       |       |       |       |      |       |       |
| Greene/Humphreys           | 98     | 0.00  | 1.00  | 3.00  | 1.81  | 1.89 | 100       | 0.00  | 0.00  | 2.00  | 1.11  | 1.51 | 2.90  | 0.004 |
| St. Clair                  | 93     | 0.00  | 1.00  | 3.00  | 2.06  | 2.07 | 83        | 0.00  | 1.00  | 2.00  | 1.30  | 1.81 | 2.61  | 0.010 |
| Maricopa                   | 51     | 0.00  | 0.00  | 1.00  | 0.82  | 1.41 | 61        | 0.00  | 0.00  | 1.00  | 0.62  | 1.27 | 0.78  | 0.434 |
| Minno                      | 84     | 0.00  | 2.00  | 3.00  | 1.98  | 1.94 | 85        | 0.00  | 1.00  | 2.00  | 1.28  | 1.48 | 2.34  | 0.021 |

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Table 9-2 (continued)

Speech and Language Measures For Combined Groups of Head Start and Non-Head Start Children  
With Unadjusted Comparisons Between Males and Females Within Site at Pretest

|                     | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|---------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                     | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| VOCABULARY          | 389   | 32.00 | 43.00 | 47.00 | 41.84 | 6.72 | 377     | 40.00 | 44.00 | 47.00 | 42.28 | 7.08 | -0.89 | 0.375 |
| 2 CRITICAL ELEMENTS | 387   | 7.00  | 8.00  | 9.00  | 7.68  | 2.04 | 375     | 7.00  | 8.00  | 9.00  | 7.96  | 1.97 | -1.08 | 0.061 |
| 3 CRITICAL ELEMENTS | 387   | 5.00  | 6.00  | 7.00  | 5.97  | 2.39 | 373     | 5.00  | 7.00  | 8.00  | 6.41  | 2.31 | -2.57 | 0.010 |
| 4 CRITICAL ELEMENTS | 387   | 7.00  | 5.00  | 6.00  | 4.68  | 2.38 | 372     | 3.00  | 5.00  | 7.00  | 4.98  | 2.22 | -1.82 | 0.069 |
| ARTICULATION        | 342   | 20.00 | 25.00 | 28.00 | 23.28 | 5.91 | 327     | 24.00 | 27.00 | 29.00 | 25.45 | 4.82 | -5.20 | 0.000 |
| SENTENCE REPETITION | 348   | 7.00  | 8.00  | 9.00  | 6.92  | 2.98 | 320     | 7.00  | 9.00  | 10.00 | 8.22  | 2.47 | -5.21 | 0.000 |
| NUMBER OF PROBLEMS  | 326   | 0.00  | 1.00  | 3.00  | 1.75  | 1.93 | 337     | 0.00  | 0.00  | 2.00  | 1.11  | 1.56 | 4.69  | 0.000 |

Table 9-2 (continued)

SPEECH AND LANGUAGE MEASURES FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN  
WITH UNADJUSTED COMPARISONS BETWEEN MALES AND FEMALES ACROSS SITE (EXCLUDING PARTICOPA COUNTY)

|                     | MALES |       |       |       |       |      | FEMALES |       |       |       |       |      | T     | P     |
|---------------------|-------|-------|-------|-------|-------|------|---------|-------|-------|-------|-------|------|-------|-------|
|                     | N     | Q1    | MED   | Q3    | MEAN  | SD   | N       | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| VOCABULARY          | 327   | 32.00 | 43.00 | 46.00 | 41.14 | 6.87 | 310     | 32.00 | 43.00 | 46.00 | 41.57 | 7.45 | -0.75 | 0.456 |
| 2 CRITICAL ELEMENTS | 327   | 7.00  | 8.00  | 9.00  | 7.43  | 2.07 | 310     | 7.00  | 8.00  | 9.00  | 7.70  | 2.03 | -1.63 | 0.103 |
| 3 CRITICAL ELEMENTS | 327   | 5.00  | 6.00  | 7.00  | 5.67  | 2.31 | 302     | 5.00  | 6.00  | 8.00  | 6.28  | 2.30 | -2.25 | 0.025 |
| 4 CRITICAL ELEMENTS | 327   | 7.00  | 5.00  | 6.00  | 4.35  | 2.28 | 307     | 3.00  | 5.00  | 6.00  | 4.66  | 2.19 | -1.76 | 0.078 |
| ARTICULATION        | 288   | 20.00 | 24.00 | 27.00 | 22.78 | 6.15 | 272     | 23.00 | 26.00 | 29.00 | 25.03 | 5.01 | -4.77 | 0.000 |
| SENTENCE REPETITION | 295   | 7.00  | 8.00  | 9.00  | 6.78  | 3.06 | 275     | 7.00  | 9.00  | 10.00 | 7.95  | 2.58 | -4.95 | 0.000 |
| NUMBER OF PROBLEMS  | 275   | 0.00  | 1.00  | 3.00  | 1.92  | 1.96 | 276     | 0.00  | 1.00  | 2.00  | 1.22  | 1.59 | 4.61  | 0.000 |

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Table 9-3

Results for Varimax Rotated Factor Analysis of  
Speech and Language Comprehension Problems

|   | Factor 1 | Factor 2 |
|---|----------|----------|
| Denver Articulation<br>Screening Examination<br>(DASE)                        | .98      | .16      |
| Assessment of Children's<br>Language Comprehension                            | .16      | .75      |
| 2-Critical Elements   | .16      | .75      |
| 3-Critical Elements   | .19      | .79      |
| 4-Critical Elements   | .15      | .69      |
| Fluharty Screening<br>Test for Preschool<br>Children (Sentence<br>Repetition) | .41      | .38      |
| Speech Quality  | .68      | -.19     |

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Table 9-4

Minimum Scores Used in Determining Speech Deficiencies

| Measure             | Child Age      |           |           |           |           |           |           |           |           |
|---------------------|----------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                     | Under<br>2 1/2 | 2 1/2 - 3 | 3 - 3 1/2 | 3 1/2 - 4 | 4 - 4 1/2 | 4 1/2 - 5 | 5 - 5 1/2 | 5 1/2 - 6 | 6 - 6 1/2 |
| ACLC                |                |           |           |           |           |           |           |           |           |
| 1 Critical Element  | 28             | 28        | 32        | 34        | 39        | 40        | 42        | 44        | 44        |
| 2 Critical Elements | 3              | 4         | 5         | 6         | 7         | 7         | 8         | 8         | 8         |
| 3 Critical Elements | 2              | 2         | 3         | 4         | 5         | 6         | 6         | 6         | 7         |
| DASE                | 14             | 14        | 15        | 16        | 18        | 22        | 22        | 24        | 25        |
| Fluharty            | 3              | 3         | 4         | 4         | 6         | 6         | 7         | 7         | 8         |

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Table 9-5

Proportion of Head Start-Eligible Children Identified to be in Need of Diagnostic Services by Different Age Cutoffs

|                               |   | Pretested Children (Samples A and D) in:<br>Greene & Humphreys Counties |               |              |
|-------------------------------|---|---|---------------|--------------|
|                               |   | At Pretest  | Six-Month Lag | One-Year Lag |
| Any Deficiency                | X | 69.4  | 60.0          | 52.9         |
| <u>Speech</u>                 |   |   |               |              |
| DASE                          | X | 25.9  | 33.5          | 23.5         |
| PDQ                           | X | 35.7  | 19.2          | 12.3         |
| Any                           | X | 45.9  | 32.9          | 28.2         |
| <u>Language Comprehension</u> |   |   |               |              |
| ACLC                          | X | 48.2  | 38.8          | 30.6         |
| Fluharty                      | X | 31.8  | 28.2          | 28.2         |
| Any                           | X | 60.0  | 48.2          | 42.4         |

|                               |   | Pretested Children (Samples A and D) in:<br>St. Clair County |               |              |
|-------------------------------|---|--|---------------|--------------|
|                               |   | At Pretest   | Six-Month Lag | One-Year Lag |
| Any Deficiency                | X | 51.1   | 54.8          | 27.2         |
| <u>Speech</u>                 |   |  |               |              |
| DASE                          | X | 14.1   | 12.0          | 12.0         |
| PDQ                           | X | 26.7   | 17.8          | 14.4         |
| Any                           | X | 30.4   | 22.8          | 19.6         |
| <u>Language Comprehension</u> |   |  |               |              |
| ACLC                          | X | 31.0   | 16.1          | 8.0          |
| Fluharty                      | X | 13.0   | 12.0          | 7.6          |
| Any                           | X | 38.0   | 22.8          | 13.0         |

|                               |   | Pretested Children (Samples A and D) in:<br>Mingo County |               |              |
|-------------------------------|---|--|---------------|--------------|
|                               |   | At Pretest   | Six-Month Lag | One-Year Lag |
| Any Deficiency                | X | 73.6   | 69.8          | 67.9         |
| <u>Speech</u>                 |   |  |               |              |
| DASE                          | X | 23.1   | 19.2          | 19.2         |
| PDQ                           | X | 45.7   | 41.3          | 41.3         |
| Any                           | X | 49.1   | 45.3          | 45.3         |
| <u>Language Comprehension</u> |   |  |               |              |
| ACLC                          | X | 25.0   | 8.2           | 4.1          |
| Fluharty                      | X | 53.8   | 48.1          | 42.3         |
| Any                           | X | 54.7   | 49.1          | 43.4         |

Table 9-6

Comparison of Head Start Health Evaluation Findings and those Based on Head Start Screens Recorded in Health Records

| Head Start Records              | Posttested Children (Samples A, B, C) in: |             |                  |             |                 |                          |              |             |           |             |      |
|---------------------------------|---|-------------|------------------|-------------|-----------------|--------------------------|--------------|-------------|-----------|-------------|------|
|                                 | Greene & Humphreys Counties               |             | St. Clair County |             | Maricopa County |                          | Mingo County |             | All Sites |             |      |
|                                 | Findings                                  | No Findings | Findings         | No Findings | Findings        | No Findings              | Findings     | Findings    | Findings  | No Findings |      |
| Speech or Language Problems     | N   | 12          | 38               | 8           | 62              | 14                       | 3            | 1           | 2         | 35          | 105  |
| Agree                           | n   | 7           | 24               | 6           | 34              | 10                       | 1            | 1           | 1         | 23          | 60   |
|                                 | Z   | 58.3        | 63.2             | 75.0        | 54.8            | 71.4                     | 33.3         | 100.0       | 50.0      | 67.6        | 58.3 |
| Disagree                        | n   | 5           | 14               | 2           | 28              | 4                        | 28           | 0           | 1         | 11          | 43   |
|                                 | Z   | 41.7        | 36.8             | 25.0        | 45.2            | 28.6                     | 66.7         | 0.0         | 50.0      | 32.4        | 41.7 |
|                                 |   | p < 0.188   |                  | p < 0.112   |                 | FET <sup>a</sup> = 0.357 |              | FET = 0.667 |           | p < 0.009   |      |
| Speech Problems                 | N   | 12          | 38               | 8           | 62              | 14                       | 3            | 0           | 2         | 35          | 105  |
| Agree                           | n   | 6           | 28               | 5           | 45              | 6                        | 1            | 0.0         | 1         | 17          | 75   |
|                                 | Z   | 50.0        | 73.7             | 62.5        | 72.6            | 42.9                     | 33.3         |             | 50.0      | 48.6        | 71.4 |
| Disagree                        | n   | 6           | 10               | 3           | 17              | 8                        | 2            | 1           | 1         | 18          | 30   |
|                                 | Z   | 50.0        | 26.3             | 37.5        | 27.4            | 57.1                     | 66.7         | 100.0       | 50.0      | 51.4        | 28.6 |
|                                 |   | p < 0.140   |                  | p < 0.444   |                 | FET = 0.643              |              |             |           | p < 0.025   |      |
| Language Comprehension Problems | N   | 12          | 38               | 8           | 62              | 14                       | 3            | 1           | 2         | 35          | 105  |
| Agree                           | n   | 5           | 30               | 5           | 46              | 7                        | 1            | 1           | 1         | 18          | 78   |
|                                 | Z   | 41.7        | 78.9             | 62.5        | 74.2            | 50.0                     | 33.3         | 33.3        | 50.0      | 51.4        | 74.3 |
| Disagree                        | n   | 7           | 8                | 3           | 16              | 7                        | 2            | 0           | 1         | 17          | 27   |
|                                 | Z   | 58.3        | 21.1             | 37.5        | 25.8            | 50.0                     | 66.7         | 0.0         | 50.0      | 48.6        | 25.7 |
|                                 |   | p < 0.156   |                  | p < 0.033   |                 | FET = 0.500              |              | FET = 0.667 |           | p < 0.002   |      |

<sup>a</sup>FET is Fisher's Exact Test

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Table 9-7

Speech and Language Deviations from Grand Mean for  
Combinations of Head Start and Previous Head Start Experience  
in All Sites

| Variable                                | Grand Mean | Head Start Previous Experience | Non-Head Start Previous Experience | Head Start No Previous Experience | Non-Head Start No Previous Experience |
|---|------------|--------------------------------|------------------------------------|-----------------------------------|---------------------------------------|
| <b>Vocabulary: One Critical Element</b> |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 33.86      | -1.34                          | .87                                | .05                               | 1.09                                  |
| Posttest-longitudinal                   | 42.95      | -.37                           | -.45                               | .38                               | .24                                   |
| Posttest-cross-sectional                | 42.54      | -.08                           | .11                                | .43                               | -.42                                  |
| <b>Two Critical Elements</b>            |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 6.27       | -.12                           | -.18                               | .03                               | .30                                   |
| Posttest-longitudinal                   | 8.13       | -.05                           | -.01                               | -.16                              | .29                                   |
| Posttest-cross-sectional                | 7.97       | .04                            | -.08                               | .06                               | -.06                                  |
| <b>Three Critical Elements</b>          |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 4.03       | .03                            | -.48                               | -.17                              | .58                                   |
| Posttest-longitudinal                   | 6.53       | .18                            | -.64                               | .08                               | .05                                   |
| Posttest-cross-sectional                | 6.30       | .07                            | -.27                               | .19                               | -.12                                  |
| <b>Four Critical Elements</b>           |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 2.48       | .04                            | .28                                | -.30                              | .12                                   |
| Posttest-longitudinal                   | 5.09       | .20                            | .09                                | -.12                              | -.14                                  |
| Posttest-cross-sectional                | 4.94       | -.14                           | .42                                | .05                               | -.14                                  |
| <b>Repetition</b>                       |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 5.59       | -.46                           | -.45                               | .31                               | .57                                   |
| Posttest-longitudinal                   | 7.88       | -.20                           | -.68                               | .42                               | .09                                   |
| Posttest-cross-sectional                | 7.67       | -.05                           | -.17                               | .17                               | -.04                                  |
| <b>Number of Speech Problems</b>        |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 2.25       | .11                            | .44                                | -.03                              | -.46                                  |
| Posttest-longitudinal                   | 1.41       | .19                            | -.11                               | -.17                              | .05                                   |
| Posttest-cross-sectional                | 1.41       | .02                            | -.05                               | -.08                              | .10                                   |

Table 9-7 (continued)

Speech and Language Deviations from Grand Mean for  
 Combinations of Head Start and Previous Head Start Experience  
 in All Non-Bilingual Sites

| Variable                                | Grand Mean | Head Start Previous Experience | Non-Head Start Previous Experience | Head Start No Previous Experience | Non-Head Start No Previous Experience |
|---|------------|--------------------------------|------------------------------------|-----------------------------------|---------------------------------------|
| <b>Vocabulary: One Critical Element</b> |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 33.86      | -1.34                          | .87                                | .05                               | 1.09                                  |
| Posttest-longitudinal                   | 41.88      | -.60                           | -.03                               | .32                               | .39                                   |
| Posttest-cross-sectional                | 41.90      | .05                            | .11                                | .70                               | -.76                                  |
| <b>Two Critical Elements</b>            |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 6.27       | -.12                           | -.18                               | .03                               | .30                                   |
| Posttest-longitudinal                   | 7.82       | -.11                           | .02                                | -.16                              | .34                                   |
| Posttest-cross-sectional                | 7.72       | .10                            | -.07                               | .10                               | -.17                                  |
| <b>Three Critical Elements</b>          |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 4.03       | .03                            | -.48                               | .17                               | .58                                   |
| Posttest-longitudinal                   | 6.17       | 0.28                           | -.61                               | .67                               | -.02                                  |
| Posttest-cross-sectional                | 5.99       | .17                            | -.31                               | .27                               | -.26                                  |
| <b>Four Critical Elements</b>           |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 2.48       | .04                            | .28                                | -.30                              | .12                                   |
| Posttest-longitudinal                   | 4.69       | .31                            | .02                                | -.16                              | -.20                                  |
| Posttest-cross-sectional                | 4.672      | -.02                           | .38                                | .03                               | -.23                                  |
| <b>Articulation</b>                     |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 19.45      | -.75                           | -1.64                              | 1.40                              | -.09                                  |
| Posttest-longitudinal                   | 24.92      | -.31                           | .31                                | .29                               | -.21                                  |
| Posttest-cross-sectional                | 24.35      | -.09                           | -.07                               | .24                               | -.09                                  |
| <b>Repetition</b>                       |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 5.59       | -.46                           | -.45                               | .31                               | .57                                   |
| Posttest-longitudinal                   | 8.08       | -.34                           | -.49                               | .44                               | .15                                   |
| Posttest-cross-sectional                | 7.60       | -.07                           | -.18                               | .23                               | -.03                                  |
| <b>Number of Speech Problems</b>        |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 2.25       | .11                            | .44                                | -.03                              | -.46                                  |
| Posttest-longitudinal                   | 1.58       | .10                            | .06                                | -.29                              | .21                                   |
| Posttest-cross-sectional                | 1.55       | -.02                           | -.06                               | -.16                              | .24                                   |

Table 9-7 (continued)

Speech and Language Deviations from Grand Mean for  
Combinations of Head Start and Previous Head Start Experience  
in Greene & Humphreys Counties

| Variable                                | Grand Mean | Head Start Previous Experience | Non-Head Start Previous Experience | Head Start No Previous Experience | Non-Head Start No Previous Experience |
|---|------------|--------------------------------|------------------------------------|-----------------------------------|---------------------------------------|
| <b>Vocabulary: One Critical Element</b> |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 30.65      | .52                            | 1.62                               | -1.16                             | -1.01                                 |
| Posttest-longitudinal                   | 41.74      | .11                            | -.99                               | 1.78                              | -1.77                                 |
| Posttest-cross-sectional                | 41.32      | .36                            | -.44                               | .94                               | -1.19                                 |
| <b>Two Critical Elements</b>            |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 5.95       | .48                            | -.43                               | .04                               | -.47                                  |
| Posttest-longitudinal                   | 7.80       | -0.00                          | -0.05                              | .01                               | .06                                   |
| Posttest-cross-sectional                | 7.67       | .08                            | -.13                               | .12                               | -.14                                  |
| <b>Three Critical Elements</b>          |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 3.43       | .22                            | .14                                | -.52                              | .26                                   |
| Posttest-longitudinal                   | 6.05       | .40                            | -.27                               | .09                               | -.54                                  |
| Posttest-cross-sectional                | 5.89       | .47                            | -.44                               | .07                               | -.34                                  |
| <b>Four Critical Elements</b>           |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 1.97       | .36                            | .82                                | -.63                              | -.62                                  |
| Posttest-longitudinal                   | 4.74       | .56                            | -.39                               | -.12                              | -.37                                  |
| Posttest-cross-sectional                | 4.42       | .21                            | .15                                | -.06                              | -.40                                  |
| <b>Articulation</b>                     |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 18.67      | .67                            | -.92                               | 1.06                              | .61                                   |
| Posttest-longitudinal                   | 25.81      | .80                            | .53                                | .19                               | .60                                   |
| Posttest-cross-sectional                | 25.11      | -.60                           | 1.26                               | .40                               | -.73                                  |
| <b>Repetition</b>                       |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 5.75       | -.52                           | .05                                | .22                               | .55                                   |
| Posttest-longitudinal                   | 8.20       | .04                            | .04                                | .47                               | .86                                   |
| Posttest-cross-sectional                | 7.99       | .05                            | .33                                | .13                               | -.51                                  |
| <b>Number of Speech Problems</b>        |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 2.61       | -.13                           | .15                                | .20                               | -.28                                  |
| Posttest-longitudinal                   | 1.33       | .12                            | -.30                               | .00                               | .25                                   |
| Posttest-cross-sectional                | 1.43       | -.03                           | -.28                               | -.01                              | .35                                   |



Table 9-7 (continued)

Speech and Language Deviations from Grand Mean for  
Combinations of Head Start and Previous Head Start Experience  
in St. Claire County

| Variable                                | Grand Mean         | Head Start Previous Experience | Non-Head Start Previous Experience | Head Start No Previous Experience | Non-Head Start No Previous Experience |
|---|--------------------|--------------------------------|------------------------------------|-----------------------------------|---------------------------------------|
| <b>Vocabulary: One Critical Element</b> |                    |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 35.43 <sup>a</sup> |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 40.03 <sup>a</sup> |                                |                                    |                                   |                                       |
| Posttest-cross-sectional                | 40.11              | -.37                           | 2.60                               | .90                               | -1.38                                 |
| <b>Two Critical Elements</b>            |                    |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 6.19 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 7.52 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-cross-sectional                | 7.54               | .21                            | .17                                | 0.00                              | -.24                                  |
| <b>Three Critical Elements</b>          |                    |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 4.75 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 5.77 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-cross-sectional                | 5.78               | .02                            | .18                                | .39                               | -.47                                  |
| <b>Four Critical Elements</b>           |                    |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 2.89 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 4.89 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-cross-sectional                | 4.45               | -.07                           | 1.17                               | .17                               | -.47                                  |
| <b>Articulation</b>                     |                    |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 21.76 <sup>a</sup> |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 24.74 <sup>a</sup> |                                |                                    |                                   |                                       |
| Posttest-cross-sectional                | 24.91              | .10                            | .86                                | -.45                              | .06                                   |
| <b>Repetition</b>                       |                    |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 6.72 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 8.07 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-cross-sectional                | 7.37               | -.48                           | -.06                               | .20                               | .23                                   |
| <b>Number of Speech Problems</b>        |                    |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 1.81 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 1.90 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-cross-sectional                | 1.70               | .20                            | -.39                               | -.28                              | .22                                   |

Table 9-7 (continued)

Speech and Language Deviations from Grand Mean for  
Combinations of Head Start and Previous Head Start Experience  
in Maricopa County

| Variable                                | Grand Mean | Head Start Previous Experience | Non-Head Start Previous Experience | Head Start No Previous Experience | Non-Head Start No Previous Experience |
|---|------------|--------------------------------|------------------------------------|-----------------------------------|---------------------------------------|
| <b>Vocabulary: One Critical Element</b> |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | a          |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 46.42      | -.12                           | -4.18                              | 1.38                              | -.46                                  |
| Posttest-cross-sectional                | 45.57      | -.35                           | .14                                | .01                               | .22                                   |
| <b>Two Critical Elements</b>            |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | a          |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 9.11       | .20                            | -.29                               | -.20                              | .14                                   |
| Posttest-cross-sectional                | 9.14       | -.12                           | .07                                | -.04                              | .14                                   |
| <b>Three Critical Elements</b>          |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | a          |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 7.69       | -.36                           | -1.19                              | .31                               | .39                                   |
| Posttest-cross-sectional                | 7.81       | -.30                           | .14                                | -.05                              | 0.27                                  |
| <b>Four Critical Elements</b>           |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | a          |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 6.36       | -.39                           | .22                                | .29                               | -.01                                  |
| Posttest-cross-sectional                | 6.48       | -.58                           | .72                                | .17                               | -.05                                  |
| <b>Articulation</b>                     |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | a          |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 27.00      | -.33                           | -.35                               | .56                               | -.26                                  |
| Posttest-cross-sectional                | 26.71      | -0.07                          | 1.49                               | -.01                              | -.43                                  |
| <b>Repetition</b>                       |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | a          |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 7.56       | -.16                           | -2.04                              | .51                               | .23                                   |
| Posttest-cross-sectional                | 8.02       | -.02                           | .05                                | .09                               | -.17                                  |
| <b>Number of Speech Problems</b>        |            |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | a          |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | .88        | .39                            | -.13                               | -.06                              | -.37                                  |
| Posttest-cross-sectional                | 9.74       | .13                            | -.31                               | .09                               | -.14                                  |

Table 9-7 (continued)

Speech and Language Deviations from Grand Mean for  
Combinations of Head Start and Previous Head Start Experience  
in Mingo County

| Variable                                | Grand Mean         | Head Start Previous Experience | Non-Head Start Previous Experience | Head Start No Previous Experience | Non-Head Start No Previous Experience |
|---|--------------------|--------------------------------|------------------------------------|-----------------------------------|---------------------------------------|
| <b>Vocabulary: One Critical Element</b> |                    |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 39.96 <sup>a</sup> |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 44.63 <sup>a</sup> |                                |                                    |                                   |                                       |
| Posttest-cross-sectional                | 43.97              | -.78                           | -.48                               | .38                               | .71                                   |
| <b>Two Critical Elements</b>            |                    |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 7.12 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 8.25 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-cross-sectional                | 7.93               | -.08                           | -.12                               | .26                               | -.05                                  |
| <b>Three Critical Elements</b>          |                    |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 5.19 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 7.00 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-cross-sectional                | 6.26               | -.19                           | -.49                               | .32                               | .20                                   |
| <b>Four Critical Elements</b>           |                    |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 3.31 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 5.08 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-cross-sectional                | 4.97               | -.35                           | .37                                | .06                               | .13                                   |
| <b>Articulation</b>                     |                    |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 1.57 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 2.04 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-cross-sectional                | 23.09              | .64                            | -2.09                              | .85                               | -.27                                  |
| <b>Repetition</b>                       |                    |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 3.74 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 7.79 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-cross-sectional                | 7.40               | .07                            | -.81                               | .31                               | .11                                   |
| <b>Number of Speech Problems</b>        |                    |                                |                                    |                                   |                                       |
| Pretest-longitudinal                    | 1.91 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-longitudinal                   | 1.82 <sup>a</sup>  |                                |                                    |                                   |                                       |
| Posttest-cross-sectional                | 1.57               | -.16                           | .75                                | -.27                              | .05                                   |

Table 9-8

UNADJUSTED COMPARISONS BETWEEN THOSE WHO DID AND THOSE WHO DID NOT RECEIVE SPEECH SCREENS  
FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| SCREENED  | Greene/Humphreys |      | St. Clair      |      | Maricopa        |      | Mingo          |      |
|---|------------------|------|----------------|------|-----------------|------|----------------|------|
|   | YES              | NO   | YES            | NO   | YES             | NO   | YES            | NO   |
| PER CAPITA INCOME N<br>LESS THAN \$1295                   | 49               | 69   | 57             | 44   | 17              | 80   | 2              | 48   |
| n   | 40               | 48   | 50             | 34   | 12              | 46   | 0              | 30   |
| %   | 81.6             | 69.6 | 87.7           | 77.3 | 70.6            | 57.5 | 0.0            | 62.5 |
|   | CHI SQ = 2.201   |      | CHI SQ = 1.936 |      | CHI SQ = 0.999  |      | CHI SQ = 3.125 |      |
|   | DF = 1           |      | DF = 1         |      | DF = 1          |      | DF = 1         |      |
|   | P = 0.138        |      | P = 0.164      |      | P = 0.317       |      | P = 0.077      |      |
| MOTHER HAS LESS N<br>THAN 12 YEARS OF<br>EDUCATION        | 50               | 74   | 61             | 47   | 17              | 84   | 3              | 49   |
| n   | 26               | 33   | 22             | 20   | 9               | 45   | 2              | 26   |
| %   | 52.0             | 44.6 | 36.1           | 42.6 | 52.9            | 53.6 | 66.7           | 53.1 |
|   | CHI SQ = 0.656   |      | CHI SQ = 0.470 |      | CHI SQ = 0.002  |      | CHI SQ = 0.211 |      |
|   | DF = 1           |      | DF = 1         |      | DF = 1          |      | DF = 1         |      |
|   | P = 0.418        |      | P = 0.493      |      | P = 0.962       |      | P = 0.646      |      |
| MOTHER'S AGE AT N<br>BIRTH OF CHILD<br>LESS THAN 18 YEARS | 48               | 74   | 60             | 45   | 17              | 83   | 3              | 49   |
| n   | 7                | 13   | 13             | 10   | 2               | 14   | 0              | 7    |
| %   | 14.6             | 17.6 | 21.7           | 22.2 | 11.8            | 16.9 | 0.0            | 14.3 |
|   | CHI SQ = 0.189   |      | CHI SQ = 0.005 |      | CHI SQ = 0.273  |      | CHI SQ = 0.495 |      |
|   | DF = 1           |      | DF = 1         |      | DF = 1          |      | DF = 1         |      |
|   | P = 0.664        |      | P = 0.946      |      | P = 0.601       |      | P = 0.482      |      |
| MOTHER THINKS N<br>CHILD HAS SPEECH<br>PROBLEM            | 50               | 74   | 61             | 47   | 15              | 81   | 3              | 48   |
| n   | 15               | 10   | 11             | 6    | 6               | 4    | 2              | 7    |
| %   | 30.0             | 13.5 | 18.0           | 12.8 | 40.0            | 4.9  | 66.7           | 14.6 |
|   | CHI SQ = 5.039   |      | CHI SQ = 0.555 |      | CHI SQ = 16.673 |      | CHI SQ = 5.270 |      |
|   | DF = 1           |      | DF = 1         |      | DF = 1          |      | DF = 1         |      |
|   | P = 0.025        |      | P = 0.456      |      | P = 0.000       |      | P = 0.022      |      |

Table 9-8 (CONTINUED)

UNADJUSTED COMPARISONS BETWEEN THOSE WHO DID AND THOSE WHO DID NOT RECEIVE SPEECH SCREENS FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| SCREENED                               |   | Greene/Humphreys |      | St. Clair      |      | Maricopa       |       | Mingo          |      |
|--|---|------------------|------|----------------|------|----------------|-------|----------------|------|
|  |   | YES              | NO   | YES            | NO   | YES            | NO    | YES            | NO   |
| NO MEDICAL INSURANCE                   | N | 45               | 65   | 60             | 46   | 16             | 83    | 3              | 47   |
|  | n | 21               | 17   | 8              | 11   | 13             | 59    | 0              | 25   |
|  | % | 46.7             | 26.2 | 13.3           | 23.9 | 81.3           | 71.1  | 0.0            | 53.2 |
|  |   | CHI SQ = 4.948   |      | CHI SQ = 1.981 |      | CHI SQ = 0.699 |       | CHI SQ = 3.191 |      |
|  |   | DF = 1           |      | DF = 1         |      | DF = 1         |       | DF = 1         |      |
|  |   | P = 0.026        |      | P = 0.159      |      | P = 0.403      |       | P = 0.074      |      |
| NO MEDICAID INSURANCE                  | N | 50               | 73   | 61             | 46   | 17             | 84    | 3              | 48   |
|  | n | 32               | 42   | 15             | 19   | 17             | 84    | 2              | 40   |
|  | % | 64.0             | 57.5 | 24.6           | 41.3 | 100.0          | 100.0 | 66.7           | 83.3 |
|  |   | CHI SQ = 0.518   |      | CHI SQ = 3.379 |      |                |       | CHI SQ = 0.540 |      |
|  |   | DF = 1           |      | DF = 1         |      |                |       | DF = 1         |      |
|  |   | P = 0.472        |      | P = 0.066      |      |                |       | P = 0.463      |      |
| DIFFICULT ACCESS TO MEDICAL CARE       | N | 50               | 74   | 61             | 47   | 16             | 84    | 3              | 48   |
|  | n | 9                | 15   | 3              | 1    | 2              | 18    | 0              | 15   |
|  | % | 18.0             | 20.3 | 4.9            | 2.1  | 12.5           | 21.4  | 0.0            | 31.3 |
|  |   | CHI SQ = 0.099   |      | CHI SQ = 0.580 |      | CHI SQ = 0.670 |       | CHI SQ = 1.328 |      |
|  |   | DF = 1           |      | DF = 1         |      | DF = 1         |       | DF = 1         |      |
|  |   | P = 0.754        |      | P = 0.446      |      | P = 0.413      |       | P = 0.249      |      |
| NO PARTICIPATION IN GOVERNMENT PROGRAM | N | 48               | 71   | 58             | 44   | 17             | 82    | 3              | 44   |
|  | n | 4                | 5    | 1              | 0    | 4              | 10    | 1              | 11   |
|  | % | 8.3              | 7.0  | 1.7            | 0.0  | 23.5           | 12.2  | 33.3           | 25.0 |
|  |   | CHI SQ = 0.068   |      | CHI SQ = 0.766 |      | CHI SQ = 1.490 |       | CHI SQ = 0.103 |      |
|  |   | DF = 1           |      | DF = 1         |      | DF = 1         |       | DF = 1         |      |
|  |   | P = 0.794        |      | P = 0.381      |      | P = 0.222      |       | P = 0.749      |      |

Table 9-9

UNADJUSTED COMPARISONS BETWEEN THOSE WHO HAD AND THOSE WHO DID NOT HAVE SPEECH FINDINGS  
FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| FINDINGS  | Greene/Humphreys                       |      | St. Clair                             |      | Maricopa                                   |       | Mingo                                      |       |
|---|--|------|---------------------------------------|------|--|-------|--|-------|
|   | YES                                    | NO   | YES                                   | NO   | YES  | NO    | YES  | NO    |
| PER CAPITA INCOME N<br>LESS THAN \$1295                   | 12                                     | 26   | 8                                     | 47   | 14   | 3     | 0  | 2     |
| n   | 11                                     | 20   | 8                                     | 41   | 9  | 3     | 0  | 0     |
| %   | 91.7                                   | 76.9 | 100.0                                 | 87.2 | 64.3                                       | 100.0 | 0.0  | 0.0   |
|   | CHI SQ = 1.188<br>DF = 1<br>P = 0.276  |      | CHI SQ = 1.146<br>DF = 1<br>P = 0.284 |      | FISHER'S EXACT TEST<br>DF = 1<br>P = 0.323 |       |  |       |
| MOTHER HAS LESS N<br>THAN 12 YEARS OF<br>EDUCATION        | 12                                     | 27   | 8                                     | 51   | 14   | 3     | 1  | 2     |
| n   | 6                                      | 13   | 3                                     | 19   | 6  | 3     | 0  | 2     |
| %   | 50.0                                   | 48.1 | 37.5                                  | 37.3 | 42.9                                       | 100.0 | 0.0  | 100.0 |
|   | CHI SQ = 0.011<br>DF = 1<br>P = 0.915  |      | CHI SQ = 0.000<br>DF = 1<br>P = 0.989 |      | FISHER'S EXACT TEST<br>DF = 1<br>P = 0.123 |       | FISHER'S EXACT TEST<br>DF = 1<br>P = 0.333 |       |
| MOTHER'S AGE AT N<br>BIRTH OF CHILD<br>LESS THAN 18 YEARS | 12                                     | 26   | 8                                     | 50   | 14   | 3     | 1  | 2     |
| n   | 4                                      | 2    | 3                                     | 10   | 0  | 2     | 0  | 0     |
| %   | 33.3                                   | 7.7  | 37.5                                  | 20.0 | 0.0  | 66.7  | 0.0  | 0.0   |
|   | CHI SQ = 4.060<br>DF = 1<br>P = 0.044  |      | CHI SQ = 1.215<br>DF = 1<br>P = 0.270 |      | FISHER'S EXACT TEST<br>DF = 1<br>P = 0.022 |       |  |       |
| MOTHER THINKS N<br>CHILD HAS SPEECH<br>PROBLEM            | 12                                     | 27   | 8                                     | 51   | 12   | 3     | 1  | 2     |
| n   | 8                                      | 4    | 2                                     | 8    | 6  | 0     | 1  | 1     |
| %   | 66.7                                   | 14.8 | 25.0                                  | 15.7 | 50.0                                       | 0.0   | 100.0                                      | 50.0  |
|   | CHI SQ = 10.486<br>DF = 1<br>P = 0.001 |      | CHI SQ = 0.426<br>DF = 1<br>P = 0.514 |      | FISHER'S EXACT TEST<br>DF = 1<br>P = 0.185 |       | FISHER'S EXACT TEST<br>DF = 1<br>P = 0.667 |       |

Table 9-9 (CONTINUED)

UNADJUSTED COMPARISONS BETWEEN THOSE WHO HAD AND THOSE WHO DID NOT HAVE SPEECH FINDINGS.  
FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| FINDINGS                               |   | Greene/Humphreys                      |      | St. Clair                             |      | Maricopa                                   |       | Mingo                                      |       |
|--|---|---------------------------------------|------|---------------------------------------|------|--|-------|--|-------|
|  |   | YES                                   | NO   | YES                                   | NO   | YES  | NO    | YES  | NO    |
| NO MEDICAL INSURANCE                   | N | 11                                    | 26   | 8                                     | 50   | 13   | 3     | 1  | 2     |
|  | n | 5                                     | 12   | 1                                     | 7    | 10   | 3     | 0  | 0     |
|  | % | 45.5                                  | 46.2 | 12.5                                  | 14.0 | 76.9                                       | 100.0 | 0.0  | 0.0   |
|  |   | CHI SQ = 0.002<br>DF = 1<br>P = 0.969 |      | CHI SQ = 0.013<br>DF = 1<br>P = 0.909 |      | FISHER'S EXACT TEST<br>DF = 1<br>P = 0.511 |       |  |       |
| NO MEDICAID INSURANCE                  | N | 12                                    | 27   | 8                                     | 51   | 14   | 3     | 1  | 2     |
|  | n | 9                                     | 16   | 1                                     | 13   | 14   | 3     | 0  | 2     |
|  | % | 75.0                                  | 59.3 | 12.5                                  | 25.5 | 100.0                                      | 100.0 | 0.0  | 100.0 |
|  |   | CHI SQ = 0.895<br>DF = 1<br>P = 0.344 |      | CHI SQ = 0.645<br>DF = 1<br>P = 0.422 |      | FISHER'S EXACT TEST<br>DF = 1<br>P = 0.333 |       |  |       |
| DIFFICULT ACCESS TO MEDICAL CARE       | N | 12                                    | 27   | 8                                     | 51   | 14   | 2     | 1  | 2     |
|  | n | 1                                     | 4    | 0                                     | 3    | 2  | 0     | 0  | 0     |
|  | % | 8.3                                   | 14.8 | 0.0                                   | 5.9  | 14.3                                       | 0.0   | 0.0  | 0.0   |
|  |   | CHI SQ = 0.312<br>DF = 1<br>P = 0.576 |      | CHI SQ = 0.496<br>DF = 1<br>P = 0.481 |      | FISHER'S EXACT TEST<br>DF = 1<br>P = 0.758 |       |  |       |
| NO PARTICIPATION IN GOVERNMENT PROGRAM | N | 11                                    | 27   | 8                                     | 48   | 14   | 3     | 1  | 2     |
|  | n | 0                                     | 2    | 0                                     | 1    | 4  | 0     | 0  | 1     |
|  | % | 0.0                                   | 7.4  | 0.0                                   | 2.1  | 28.6                                       | 0.0   | 0.0  | 50.0  |
|  |   | CHI SQ = 0.860<br>DF = 1<br>P = 0.354 |      | CHI SQ = 0.170<br>DF = 1<br>P = 0.680 |      | FISHER'S EXACT TEST<br>DF = 1<br>P = 0.420 |       | FISHER'S EXACT TEST<br>DF = 1<br>P = 0.667 |       |

Table 9-10

UNADJUSTED COMPARISONS BETWEEN THOSE WHO WERE AND THOSE WHO WERE NOT REFERRED FOR TREATMENT  
FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| REFERRAL  | Greene/Humphreys |      | St. Clair      |      | Maricopa            |       | Mingo               |      |
|---|------------------|------|----------------|------|---------------------|-------|---------------------|------|
|   | YES              | NO   | YES            | NO   | YES                 | NO    | YES                 | NO   |
| PER CAPITA INCOME N<br>LESS THAN \$1295                   | 10               | 38   | 3              | 54   | 13                  | 4     | 0                   | 3    |
| n   | 9                | 29   | 3              | 47   | 8                   | 4     | 0                   | 1    |
| %   | 90.0             | 76.3 | 100.0          | 87.0 | 61.5                | 100.0 | 0.0                 | 33.3 |
|   | CHI SQ = 0.899   |      | CHI SQ = 0.443 |      | FISHER'S EXACT TEST |       |                     |      |
|   | DF = 1           |      | DF = 1         |      | DF = 1              |       |                     |      |
|   | P = 0.343        |      | P = 0.505      |      | P = 0.208           |       |                     |      |
| MOTHER HAS LESS N<br>THAN 12 YEARS OF<br>EDUCATION        | 10               | 39   | 3              | 58   | 13                  | 4     | 1                   | 3    |
| n   | 5                | 21   | 1              | 21   | 5                   | 4     | 0                   | 2    |
| %   | 50.0             | 53.8 | 33.3           | 36.2 | 38.5                | 100.0 | 0.0                 | 66.7 |
|   | CHI SQ = 0.047   |      | CHI SQ = 0.010 |      | FISHER'S EXACT TEST |       | FISHER'S EXACT TEST |      |
|   | DF = 1           |      | DF = 1         |      | DF = 1              |       | DF = 1              |      |
|   | P = 0.828        |      | P = 0.919      |      | P = 0.053           |       | P = 0.500           |      |
| MOTHER'S AGE AT N<br>BIRTH OF CHILD<br>LESS THAN 18 YEARS | 10               | 37   | 3              | 57   | 13                  | 4     | 1                   | 3    |
| n   | 1                | 7    | 0              | 13   | 0                   | 2     | 0                   | 1    |
| %   | 10.0             | 18.9 | 0.0            | 22.8 | 0.0                 | 50.0  | 0.0                 | 33.3 |
|   | CHI SQ = 0.443   |      | CHI SQ = 0.873 |      | FISHER'S EXACT TEST |       | FISHER'S EXACT TEST |      |
|   | DF = 1           |      | DF = 1         |      | DF = 1              |       | DF = 1              |      |
|   | P = 0.505        |      | P = 0.350      |      | P = 0.044           |       | P = 0.750           |      |
| MOTHER THINKS N<br>CHILD HAS SPEECH<br>PROBLEM            | 10               | 39   | 3              | 58   | 11                  | 4     | 1                   | 3    |
| n   | 5                | 9    | 1              | 10   | 6                   | 0     | 1                   | 1    |
| %   | 50.0             | 23.1 | 33.3           | 17.2 | 54.5                | 0.0   | 100.0               | 33.3 |
|   | CHI SQ = 2.827   |      | CHI SQ = 0.500 |      | FISHER'S EXACT TEST |       | FISHER'S EXACT TEST |      |
|   | DF = 1           |      | DF = 1         |      | DF = 1              |       | DF = 1              |      |
|   | P = 0.093        |      | P = 0.480      |      | P = 0.092           |       | P = 0.500           |      |



Table 9-10 (CONTINUED)

UNADJUSTED COMPARISONS BETWEEN THOSE WHO WERE AND THOSE WHO WERE NOT REFERRED FOR TREATMENT FOR SPECIAL GROUPS OF HEAD START CHILDREN WITHIN SITE

| REFERRAL                               |   | Greene/Humphreys                      |      | St. Clair                             |      | Maricopa                                   |       | Mingo                                      |       |
|--|---|---------------------------------------|------|---------------------------------------|------|--|-------|--|-------|
|  |   | YES                                   | NO   | YES                                   | NO   | YES  | NO    | YES  | NO    |
| NO MEDICAL INSURANCE                   | N | 7                                     | 37   | 3                                     | 57   | 12   | 4     | 1  | 2     |
|  | n | 4                                     | 16   | 0                                     | 8    | 9  | 4     | 0  | 0     |
|  | % | 57.1                                  | 43.2 | 0.0                                   | 14.0 | 75.0                                       | 100.0 | 0.0  | 0.0   |
|  |   | CHI SQ = 0.459<br>DF = 1<br>P = 0.498 |      | CHI SQ = 0.486<br>DF = 1<br>P = 0.486 |      | FISHER'S EXACT TEST<br>DF = 1<br>P = 0.393 |       |  |       |
| NO MEDICAID INSURANCE                  | N | 10                                    | 38   | 3                                     | 58   | 13   | 4     | 1  | 2     |
|  | n | 8                                     | 22   | 0                                     | 15   | 13   | 4     | 0  | 2     |
|  | % | 80.0                                  | 57.9 | 0.0                                   | 25.9 | 100.0                                      | 100.0 | 0.0  | 100.0 |
|  |   | CHI SQ = 1.650<br>DF = 1<br>P = 0.199 |      | CHI SQ = 1.029<br>DF = 1<br>P = 0.310 |      |  |       | FISHER'S EXACT TEST<br>DF = 1<br>P = 0.303 |       |
| DIFFICULT ACCESS TO MEDICAL CARE       | N | 10                                    | 39   | 3                                     | 58   | 13   | 3     | 1  | 3     |
|  | n | 0                                     | 10   | 0                                     | 3    | 2  | 0     | 0  | 0     |
|  | % | 0.0                                   | 25.6 | 0.0                                   | 5.2  | 15.4                                       | 0.0   | 0.0  | 0.0   |
|  |   | CHI SQ = 3.222<br>DF = 1<br>P = 0.073 |      | CHI SQ = 0.163<br>DF = 1<br>P = 0.686 |      | FISHER'S EXACT TEST<br>DF = 1<br>P = 0.650 |       |  |       |
| NO PARTICIPATION IN GOVERNMENT PROGRAM | N | 10                                    | 37   | 3                                     | 55   | 13   | 4     | 1  | 3     |
|  | n | 0                                     | 4    | 0                                     | 1    | 4  | 0     | 0  | 1     |
|  | % | 0.0                                   | 10.8 | 0.0                                   | 1.8  | 30.8                                       | 0.0   | 0.0  | 33.3  |
|  |   | CHI SQ = 1.182<br>DF = 1<br>P = 0.277 |      | CHI SQ = 0.055<br>DF = 1<br>P = 0.814 |      | FISHER'S EXACT TEST<br>DF = 1<br>P = 0.300 |       | FISHER'S EXACT TEST<br>DF = 1<br>P = 0.750 |       |

Table 9-11

Regression Analysis of Speech and Language Evaluation Measures  
Longitudinal Children

| Dependent Variable  | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup>           |                         |
|---------------------|-------------|----------------------|--------------------------------|-------------------------|
|                     |             |                      | b                              | se <sub>b</sub>         |
| VOCABULARY          | 80          | Site                 |                                |                         |
|                     |             | Greene & Humphreys   | d                              |                         |
|                     |             | St. Clair            | -3.89*                         | 1.46                    |
|                     |             | Maricopa             | d                              |                         |
|                     |             | Mingo                |                                |                         |
|                     |             | Program              |                                |                         |
|                     |             | Head Start           | -.95                           | 1.36                    |
|                     |             | Non-Head Start       |                                |                         |
|                     |             | Constant             |                                |                         |
|                     |             | Statistics           | F = 3.78**R <sup>2</sup> = .33 | MS <sub>e</sub> = 33.36 |
| 2 CRITICAL ELEMENTS | 80          | Site                 |                                |                         |
|                     |             | Greene & Humphreys   | d                              |                         |
|                     |             | St. Clair            | -.38                           | .43                     |
|                     |             | Maricopa             | .44                            | 1.37                    |
|                     |             | Mingo                |                                |                         |
|                     |             | Program              |                                |                         |
|                     |             | Head Start           | -.42                           | .38                     |
|                     |             | Non-Head Start       |                                |                         |
|                     |             | Constant             | 4.23                           |                         |
|                     |             | Statistics           | F = 1.65 R <sup>2</sup> = .19  | MS <sub>e</sub> = 2.58  |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

<sup>d</sup> Not in equation

Table 9-11 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
Longitudinal Children

| Dependent Variable         | Sample Size | Factors <sup>a</sup>                          | Effects <sup>b</sup>          |                 |
|----------------------------|-------------|---|-------------------------------|-----------------|
|                            |             |   | b                             | se <sub>b</sub> |
| <u>3 CRITICAL ELEMENTS</u> | 80          | Site  |                               |                 |
|                            |             | Greene & Humphreys                            | <u>d</u>                      |                 |
|                            |             | St. Clair                                     | <u>.39</u>                    | <u>.46</u>      |
|                            |             | Maricopa                                      | <u>-1.77</u>                  | <u>1.44</u>     |
|                            |             | Mingo   |                               |                 |
|                            |             | Program                                       |                               |                 |
|                            |             | Head Start                                    | <u>.24</u>                    | <u>.40</u>      |
|                            |             | Constant                                      | <u>3.19</u>                   |                 |
| Statistics                 |             | F = <u>3.83**</u> R <sup>2</sup> = <u>.36</u> | MS <sub>e</sub> = <u>2.88</u> |                 |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

<sup>d</sup> Not in equation

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Table 9-11 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
Longitudinal Children

| Dependent Variable         | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                      |                        |
|----------------------------|-------------|----------------------|----------------------|----------------------|------------------------|
|                            |             |                      | b                    | se <sub>b</sub>      |                        |
| <u>4 CRITICAL ELEMENTS</u> | 80          | Site                 |                      |                      |                        |
|                            |             | Greene & Humphreys   | d                    |                      |                        |
|                            |             | St. Clair            | d                    |                      |                        |
|                            |             | Maricopa             | -.29                 | 1.55                 |                        |
|                            |             | Mingo                |                      |                      |                        |
|                            |             | Program              |                      |                      |                        |
|                            |             | Head Start           |                      |                      |                        |
|                            |             | Non-Head Start       |                      |                      |                        |
|                            |             | Constant             |                      | 1/80                 |                        |
| Statistics                 |             |                      | F = 1.16             | R <sup>2</sup> = .10 | MS <sub>e</sub> = 3.83 |
| <u>REPETITION</u>          | 80          | Site                 |                      |                      |                        |
|                            |             | Greene & Humphreys   | -.48                 | .54                  |                        |
|                            |             | St. Clair            | -.65                 | .60                  |                        |
|                            |             | Maricopa             | d                    |                      |                        |
|                            |             | Mingo                |                      |                      |                        |
|                            |             | Program              |                      |                      |                        |
|                            |             | Head Start           | .20                  | .46                  |                        |
|                            |             | Non-Head Start       | -.20                 | .46                  |                        |
|                            |             | Constant             |                      | 5.48                 |                        |
| Statistics                 |             |                      | F = 2.14             | R <sup>2</sup> = .24 | MS <sub>e</sub> = 3.73 |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

<sup>d</sup> Not in equation

Table 9-11 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
Longitudinal Children

| Dependent Variable         | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                             |
|----------------------------|-------------|----------------------|----------------------|-----------------------------|
|                            |             |                      | b                    | se <sup>c</sup>             |
| <u>ARTICULATION</u>        | 80          | Site                 |                      |                             |
|                            |             | Greene & Humphreys   | <u>1.49</u>          | <u>.82</u>                  |
|                            |             | St. Clair            | <u>-.77</u>          | <u>.92</u>                  |
|                            |             | Maricopa             | <u>d</u>             |                             |
|                            |             | Mingo                |                      |                             |
|                            |             | Program              |                      |                             |
|                            |             | Head Start           | <u>-.15</u>          | <u>.69</u>                  |
|                            |             | Non-Head Start       |                      |                             |
|                            |             | Constant             | <u>14.55</u>         |                             |
|                            |             | Statistics           | F = <u>12.12</u>     | R <sup>2</sup> = <u>.61</u> |
| <u>NO. SPEECH PROBLEMS</u> | 80          | Site                 |                      |                             |
|                            |             | Greene & Humphreys   | <u>-.65</u>          | <u>.36</u>                  |
|                            |             | St. Clair            | <u>d</u>             |                             |
|                            |             | Maricopa             | <u>.46</u>           | <u>1.23</u>                 |
|                            |             | Mingo                |                      |                             |
|                            |             | Program              |                      |                             |
|                            |             | Head Start           | <u>-.24</u>          | <u>.31</u>                  |
|                            |             | Non-Head Start       | <u>.24</u>           | <u>.31</u>                  |
|                            |             | Constant             | <u>2.77</u>          |                             |
|                            |             | Statistics           | F = <u>5.32</u>      | R <sup>2</sup> = <u>.44</u> |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

<sup>d</sup> Not in equation

Table 9-11 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
Longitudinal Children

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |              |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------|--------------|
|                    |             |                      | b                    | SE <sub>b</sub> |                         |              |
| Greene & Humphreys |             |                      |                      |                 |                         |              |
| <u>VOCABULARY</u>  | <u>42</u>   | Head Start           | <u>2.70</u>          | <u>1.42</u>     | F =                     | <u>3.24</u>  |
|                    |             |                      |                      |                 | R <sup>2</sup> =        | <u>.44</u>   |
|                    |             | Constant             | <u>14.86</u>         |                 | MS <sub>e</sub> =       | <u>16.84</u> |
| St. Clair          |             |                      |                      |                 |                         |              |
| <u>VOCABULARY</u>  | <u>23</u>   | Head Start           | <u>-5.44</u>         | <u>4.13</u>     | F =                     | <u>2.00</u>  |
|                    |             |                      |                      |                 | R <sup>2</sup> =        | <u>.48</u>   |
|                    |             | Constant             | <u>-5.88</u>         |                 | MS <sub>e</sub> =       | <u>72.82</u> |
| Maricopa           |             |                      |                      |                 |                         |              |
| <u>VOCABULARY</u>  | <u>0</u>    | Head Start           | _____                | _____           | F =                     | _____        |
|                    |             |                      |                      |                 | R <sup>2</sup> =        | _____        |
|                    |             | Constant             | _____                |                 | MS <sub>e</sub> =       | _____        |
| Mingo              |             |                      |                      |                 |                         |              |
| <u>VOCABULARY</u>  | <u>15</u>   | Head Start           | <u>-1.15</u>         | <u>1.95</u>     | F =                     | <u>.97</u>   |
|                    |             |                      |                      |                 | R <sup>2</sup> =        | <u>.49</u>   |
|                    |             | Constant             | <u>40.24</u>         |                 | MS <sub>e</sub> =       | <u>8.90</u>  |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

Table 9-11 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
Longitudinal Children

| Dependent Variable         | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup><br>b | SE <sub>b</sub>       | Statistics <sup>c</sup>       |
|----------------------------|-------------|----------------------|---------------------------|-----------------------|-------------------------------|
| Greene & Humphreys         |             |                      |                           |                       |                               |
| <u>2 CRITICAL ELEMENTS</u> | <u>42</u>   | Head Start           |                           | Too Small<br>To Enter | F = <u>1.83</u>               |
|                            |             | Non-Head Start       |                           |                       | R <sup>2</sup> = <u>.24</u>   |
|                            |             | Constant             | <u>4.49</u>               |                       | MS <sub>e</sub> = <u>2.51</u> |
| St. Clair                  |             |                      |                           |                       |                               |
| <u>2 CRITICAL ELEMENTS</u> | <u>23</u>   | Head Start           | <u>-1.56</u>              | <u>1.02</u>           | F = <u>.811</u>               |
|                            |             |                      |                           |                       | R <sup>2</sup> = <u>.27</u>   |
|                            |             | Constant             | <u>4.82</u>               |                       | MS <sub>e</sub> = <u>4.10</u> |
| Maricopa                   |             |                      |                           |                       |                               |
| <u>2 CRITICAL ELEMENTS</u> | <u>0</u>    | Head Start           |                           | Too Small<br>To Enter | F = _____                     |
|                            |             | Non-Head Start       |                           |                       | R <sup>2</sup> = _____        |
|                            |             | Constant             |                           |                       | MS <sub>e</sub> = _____       |
| Mingo                      |             |                      |                           |                       |                               |
| <u>2 CRITICAL ELEMENTS</u> | <u>15</u>   | Head Start           | <u>-.60</u>               | <u>.57</u>            | F = <u>1.91</u>               |
|                            |             |                      |                           |                       | R <sup>2</sup> = <u>.66</u>   |
|                            |             | Constant             | <u>1.21</u>               |                       | MS <sub>e</sub> = <u>.67</u>  |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

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Table 9-11 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
Longitudinal Children

| Dependent Variable         | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                    | Statistics <sup>c</sup> |             |
|----------------------------|-------------|----------------------|----------------------|--------------------|-------------------------|-------------|
|                            |             |                      | b                    | SE <sub>b</sub>    |                         |             |
| Greene & Humphreys         |             |                      |                      |                    |                         |             |
| <u>3 CRITICAL ELEMENTS</u> | <u>42</u>   | Head Start           | <u>.64</u>           | <u>.59</u>         | F =                     | <u>2.66</u> |
|                            |             |                      |                      |                    | R <sup>2</sup> =        | <u>.39</u>  |
|                            |             | Constant             | <u>-1.46</u>         |                    | MS <sub>e</sub> =       | <u>2.96</u> |
| St. Clair                  |             |                      |                      |                    |                         |             |
| <u>3 CRITICAL ELEMENTS</u> | <u>23</u>   | Head Start           | <u>-.75</u>          | <u>.67</u>         | F =                     | <u>3.93</u> |
|                            |             |                      |                      |                    | R <sup>2</sup> =        | <u>.65</u>  |
|                            |             | Constant             | <u>-4.01</u>         |                    | MS <sub>e</sub> =       | <u>1.93</u> |
| Maricopa                   |             |                      |                      |                    |                         |             |
| <u>3 CRITICAL ELEMENTS</u> | <u>0</u>    | Head Start           |                      |                    | F =                     |             |
|                            |             |                      |                      |                    | R <sup>2</sup> =        |             |
|                            |             | Constant             |                      |                    | MS <sub>e</sub> =       |             |
| Mingo                      |             |                      |                      |                    |                         |             |
| <u>3 CRITICAL ELEMENTS</u> | <u>15</u>   | Head Start           |                      | Too Small To Enter | F =                     | <u>.45</u>  |
|                            |             |                      |                      |                    | R <sup>2</sup> =        | <u>.25</u>  |
|                            |             | Constant             | <u>2.73</u>          |                    | MS <sub>e</sub> =       | <u>3.30</u> |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square



Table 9-11 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
Longitudinal Children

| Dependent Variable         | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |             |
|----------------------------|-------------|----------------------|----------------------|-----------------|-------------------------|-------------|
|                            |             |                      | b                    | SE <sub>b</sub> |                         |             |
| Greene & Humphreys         |             |                      |                      |                 |                         |             |
| <u>4 CRITICAL ELEMENTS</u> | <u>42</u>   | Head Start           | <u>1.08</u>          | <u>.72</u>      | F =                     | <u>.64</u>  |
|                            |             |                      |                      |                 | R <sup>2</sup> =        | <u>.13</u>  |
|                            |             | Constant             | <u>5.25</u>          |                 | MS <sub>e</sub> =       | <u>4.42</u> |
| St. Clair                  |             |                      |                      |                 |                         |             |
| <u>4 CRITICAL ELEMENTS</u> | <u>23</u>   | Head Start           | <u>-1.13</u>         | <u>.93</u>      | F =                     | <u>1.35</u> |
|                            |             |                      |                      |                 | R <sup>2</sup> =        | <u>.39</u>  |
|                            |             | Constant             | <u>-1.67</u>         |                 | MS <sub>e</sub> =       | <u>3.65</u> |
| Maricopa                   |             |                      |                      |                 |                         |             |
| <u>4 CRITICAL ELEMENTS</u> | <u>0</u>    | Head Start           |                      |                 | F =                     |             |
|                            |             |                      |                      |                 | R <sup>2</sup> =        |             |
|                            |             | Constant             |                      |                 | MS <sub>e</sub> =       |             |
| Mingo                      |             |                      |                      |                 |                         |             |
| <u>4 CRITICAL ELEMENTS</u> | <u>15</u>   | Head Start           | <u>-.66</u>          | <u>1.01</u>     | F =                     | <u>1.18</u> |
|                            |             |                      |                      |                 | R <sup>2</sup> =        | <u>.47</u>  |
|                            |             | Constant             | <u>6.40</u>          |                 | MS <sub>e</sub> =       | <u>3.11</u> |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

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Table 9-11 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
Longitudinal Children

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                       | Statistics <sup>c</sup> |             |
|--------------------|-------------|----------------------|----------------------|-----------------------|-------------------------|-------------|
|                    |             |                      | b                    | SE <sub>b</sub>       |                         |             |
| Greene & Humphreys |             |                      |                      |                       |                         |             |
| <u>REPETITION</u>  | <u>42</u>   | Head Start           | <u>.74</u>           | <u>.73</u>            | F =                     | <u>1.84</u> |
|                    |             |                      |                      |                       | R <sup>2</sup> =        | <u>.31</u>  |
|                    |             | Constant             | <u>7.10</u>          |                       | MS <sub>e</sub> =       | <u>4.15</u> |
| St. Clair          |             |                      |                      |                       |                         |             |
| <u>REPETITION</u>  | <u>23</u>   | Head Start           | <u>-1.21</u>         | <u>.97</u>            | F =                     | <u>.70</u>  |
|                    |             |                      |                      |                       | R <sup>2</sup> =        | <u>.25</u>  |
|                    |             | Constant             | <u>5.46</u>          |                       | MS <sub>e</sub> =       | <u>3.79</u> |
| Maricopa           |             |                      |                      |                       |                         |             |
| <u>REPETITION</u>  | <u>0</u>    | Head Start           | _____                | _____                 | F =                     | _____       |
|                    |             |                      |                      |                       | R <sup>2</sup> =        | _____       |
|                    |             | Constant             | _____                |                       | MS <sub>e</sub> =       | _____       |
| Mingo              |             |                      |                      |                       |                         |             |
| <u>REPETITION</u>  | <u>15</u>   | Head Start           | _____                | Too Small<br>To Enter | F =                     | <u>1.53</u> |
|                    |             |                      |                      |                       | R <sup>2</sup> =        | <u>.53</u>  |
|                    |             | Constant             | <u>4.04</u>          |                       | MS <sub>e</sub> =       | <u>3.61</u> |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

Table 9-11 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
Longitudinal Children

| Dependent Variable  | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup>  |                 | Statistics <sup>c</sup> |              |
|---------------------|-------------|----------------------|-----------------------|-----------------|-------------------------|--------------|
|                     |             |                      | b                     | SE <sub>b</sub> |                         |              |
| Greene & Humphreys  |             |                      |                       |                 |                         |              |
| <u>ARTICULATION</u> | <u>42</u>   | Head Start           | <u>-.30</u>           | <u>.95</u>      | F =                     | <u>7.15</u>  |
|                     |             |                      |                       |                 | R <sup>2</sup> =        | <u>.63</u>   |
|                     |             | Constant             | <u>21.07</u>          |                 | MS <sub>e</sub> =       | <u>7.44</u>  |
| St. Clair           |             |                      |                       |                 |                         |              |
| <u>ARTICULATION</u> | <u>23</u>   | Head Start           | <u>.61</u>            | <u>1.55</u>     | F =                     | <u>1.91</u>  |
|                     |             |                      |                       |                 | R <sup>2</sup> =        | <u>.42</u>   |
|                     |             | Constant             | <u>9.46</u>           |                 | MS <sub>e</sub> =       | <u>10.63</u> |
| Maricopa            |             |                      |                       |                 |                         |              |
| <u>ARTICULATION</u> | <u>0</u>    | Head Start           | Too Small<br>To Enter |                 | F =                     | _____        |
|                     |             |                      |                       |                 | R <sup>2</sup> =        | _____        |
|                     |             | Constant             |                       |                 | MS <sub>e</sub> =       | _____        |
| Mingo               |             |                      |                       |                 |                         |              |
| <u>ARTICULATION</u> | <u>15</u>   | Head Start           | <u>-.89</u>           | <u>1.55</u>     | F =                     | <u>10.39</u> |
|                     |             |                      |                       |                 | R <sup>2</sup> =        | <u>.91</u>   |
|                     |             | Constant             | <u>10.87</u>          |                 | MS <sub>e</sub> =       | <u>6.61</u>  |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

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Table 9-11 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
Longitudinal Children

| Dependent Variable  | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup><br>b | SE <sub>b</sub> | Statistics <sup>c</sup>       |
|---------------------|-------------|----------------------|---------------------------|-----------------|-------------------------------|
| Greene & Humphreys  |             |                      |                           |                 |                               |
| NO. SPEECH PROBLEMS | 42          | Head Start           | <u>-.19</u>               | <u>.39</u>      | F = <u>6.36</u>               |
|                     |             |                      |                           |                 | R <sup>2</sup> = <u>.61</u>   |
|                     |             | Constant             | <u>1.53</u>               |                 | MS <sub>e</sub> = <u>1.29</u> |
| St. Clair           |             |                      |                           |                 |                               |
| NO. SPEECH PROBLEMS | 23          | Head Start           | <u>-.78</u>               | <u>.89</u>      | F = <u>1.13</u>               |
|                     |             |                      |                           |                 | R <sup>2</sup> = <u>.35</u>   |
|                     |             | Constant             | <u>5.44</u>               |                 | MS <sub>e</sub> = <u>2.78</u> |
| Maricopa            |             |                      |                           |                 |                               |
| NO. SPEECH PROBLEMS | 0           | Head Start           | <u>    </u>               | <u>    </u>     | F = <u>    </u>               |
|                     |             |                      |                           |                 | R <sup>2</sup> = <u>    </u>  |
|                     |             | Constant             | <u>    </u>               |                 | MS <sub>e</sub> = <u>    </u> |
| Mingo               |             |                      |                           |                 |                               |
| NO. SPEECH PROBLEMS | 15          | Head Start           | <u>.75</u>                | <u>.72</u>      | F = <u>4.00</u>               |
|                     |             |                      |                           |                 | R <sup>2</sup> = <u>.80</u>   |
|                     |             | Constant             | <u>-.18</u>               |                 | MS <sub>e</sub> = <u>1.24</u> |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment, status and mother's education

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

Table 9-12

Comparison of Pre/Posttest Speech and Language Comprehension Deficiencies

| Failure at Posttest   | Longitudinal Children (Sample A) in: |                |                  |               |                 |               |               |               |               |                |
|-----------------------|--------------------------------------|----------------|------------------|---------------|-----------------|---------------|---------------|---------------|---------------|----------------|
|                       | Greene & Humphreys Counties          |                | St. Clair County |               | Maricopa County |               | Mingo County  |               | All Sites     |                |
|                       | Passed at Pre                        | Failed at Pre  | Passed at Pre    | Failed at Pre | Passed at Pre   | Failed at Pre | Passed at Pre | Failed at Pre | Passed at Pre | Failed at Pre  |
| <b>Head Start</b>     |                                      |                |                  |               |                 |               |               |               |               |                |
| Any Deficiency        | n<br>2/ 12<br>16.7                   | 13/ 27<br>48.1 | 1/ 7<br>14.3     | 7/ 13<br>53.8 |                 |               | 1/ 2<br>50.0  | 7/ 13<br>53.8 | 4/ 21<br>19.0 | 27/ 52<br>51.9 |
|                       | p = 0.062                            |                | FET = 0.080      |               |                 |               | FET = 0.733   |               | p = 0.010     |                |
| Speech                | n<br>3/ 22<br>13.6                   | 8/ 15<br>53.3  | 1/ 12<br>8.3     | 3/ 7<br>42.9  |                 |               | 1/ 3<br>33.3  | 5/ 10<br>50.0 | 5/ 32<br>13.5 | 16/ 32<br>50.0 |
|                       | p = 0.009                            |                | FET = 0.117      |               |                 |               | FET = 0.563   |               | p = 0.001     |                |
| Language              | n<br>1/ 14<br>7.1                    | 8/ 25<br>32.0  | 1/ 10<br>10.0    | 6/ 9<br>66.7  |                 |               | 1/ 8<br>12.5  | 3/ 7<br>42.9  | 3/ 32<br>9.4  | 17/ 41<br>41.5 |
|                       | p = 0.007                            |                | FET = 0.017      |               |                 |               | FET = 0.231   |               | p = 0.002     |                |
| <b>Non-Head Start</b> |                                      |                |                  |               |                 |               |               |               |               |                |
| Any Deficiency        | n<br>0/ 5<br>6.0                     | 13/ 20<br>65.0 | 3/ 8<br>37.5     | 3/ 4<br>75.0  |                 |               | 0/ 2<br>0.0   | 8/ 11<br>72.7 | 3/ 15<br>20.0 | 24/ 35<br>68.6 |
|                       | p = 0.009                            |                | FET = 0.273      |               |                 |               | FET = 0.128   |               | p = 0.002     |                |
| Speech                | n<br>1/ 9<br>11.1                    | 4/ 15<br>26.7  | 3/ 9<br>33.3     | 2/ 3<br>66.7  |                 |               | 2/ 5<br>40.0  | 4/ 6<br>66.7  | 6/ 23<br>26.1 | 10/ 24<br>41.7 |
|                       | p = 0.364                            |                | FET = 0.364      |               |                 |               | FET = 0.392   |               | p = 0.260     |                |
| Language              | n<br>1/ 10<br>10.0                   | 9/ 15<br>60.0  | 3/ 10<br>30.0    | 0/ 2<br>0.0   |                 |               | 0/ 4<br>0.0   | 4/ 9<br>44.4  | 4/ 24<br>16.7 | 13/ 26<br>50.0 |
|                       | p = 0.012                            |                | FET = 0.545      |               |                 |               | FET = 0.126   |               | p = 0.013     |                |

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Table 9-13

Regression Analysis of Speech and Language Evaluation Measures  
All Posttest Children

| Dependent Variable     | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup>                           |                                |
|------------------------|-------------|----------------------|--|--------------------------------|
|                        |             |                      | b  | se <sub>b</sub>                |
| VOCABULARY             | 551         | Site                 |  |                                |
|                        |             | Greene & Humphreys   | <u>-.73*</u>                                   | <u>.35</u>                     |
|                        |             | St. Clair            | <u>-.96**</u>                                  | <u>4.0</u>                     |
|                        |             | Maricopa             | <u>.89</u>                                     | <u>.46</u>                     |
|                        |             | Mingo                | <u>          </u>                              | <u>          </u>              |
|                        |             | Program              |  |                                |
|                        |             | Head Start           | <u>.21</u>                                     | <u>.43</u>                     |
|                        |             | Non-Head Start       | <u>          </u>                              | <u>          </u>              |
|                        |             | Constant             | <u>21.13</u>                                   |                                |
| Statistics             |             |                      | F = <u>29.82**</u> R <sup>2</sup> = <u>.36</u> | MS <sub>e</sub> = <u>22.73</u> |
| 2 CRITICAL<br>ELEMENTS | 551         | Site                 |  |                                |
|                        |             | Greene & Humphreys   | <u>-.24*</u>                                   | <u>.12</u>                     |
|                        |             | St. Clair            | <u>-.31*</u>                                   | <u>.13</u>                     |
|                        |             | Maricopa             | <u>.47**</u>                                   | <u>.15</u>                     |
|                        |             | Mingo                | <u>          </u>                              | <u>          </u>              |
|                        |             | Program              |  |                                |
|                        |             | Head Start           | <u>.15</u>                                     | <u>          </u>              |
|                        |             | Non-Head Start       | <u>          </u>                              | <u>          </u>              |
|                        |             | Constant             | <u>3.11</u>                                    |                                |
| Statistics             |             |                      | F = <u>16.16**</u> R <sup>2</sup> = <u>.23</u> | MS <sub>e</sub> = <u>2.46</u>  |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

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Table 9-13 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
All Posttest Children

| Dependent Variable         | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup>             |                        |
|----------------------------|-------------|----------------------|----------------------------------|------------------------|
|                            |             |                      | b                                | se <sub>b</sub>        |
| <u>3 CRITICAL ELEMENTS</u> | 551         | Site                 |                                  |                        |
|                            |             | Greene & Humphreys   | -.33*                            | .14                    |
|                            |             | St. Clair            | -.40*                            | .16                    |
|                            |             | Maricopa             | .66**                            | .18                    |
|                            |             | Mingo                |                                  |                        |
|                            |             | Program              |                                  |                        |
|                            |             | Head Start           | .25                              | .18                    |
|                            |             | Non-Head Start       |                                  |                        |
|                            |             | Constant             | -.81                             |                        |
| Statistics                 |             |                      | F = 23.48** R <sup>2</sup> = .30 | MS <sub>e</sub> = 3.43 |
| <u>4 CRITICAL ELEMENTS</u> | 551         | Site                 |                                  |                        |
|                            |             | Greene & Humphreys   | -.41**                           | .14                    |
|                            |             | St. Clair            | -.46**                           | .16                    |
|                            |             | Maricopa             | .72**                            | .19                    |
|                            |             | Mingo                |                                  |                        |
|                            |             | Program              |                                  |                        |
|                            |             | Head Start           | -.09                             | .18                    |
|                            |             | Non-Head Start       |                                  |                        |
|                            |             | Constant             | -1.73                            |                        |
| Statistics                 |             |                      | F = 18.73** R <sup>2</sup> = .26 | MS <sub>e</sub> = 3.77 |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

1341

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Table 9-13 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
All Posttest Children

| Dependent Variable         | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup>                         |                                |
|----------------------------|-------------|----------------------|--|--------------------------------|
|                            |             |                      | b  | se <sub>b</sub>                |
|                            |             | Site                 |  |                                |
| <u>ARTICULATION</u>        | <u>551</u>  | Greene & Humphreys   | <u>.39</u>                                   | <u>.32</u>                     |
|                            |             | St. Clair            | <u>.25</u>                                   | <u>.36</u>                     |
|                            |             | Maricopa             | <u>.93*</u>                                  | <u>.41</u>                     |
|                            |             | Mingo                |  |                                |
|                            |             | Program              |  |                                |
|                            |             | Head Start           | <u>-.06</u>                                  | <u>.39</u>                     |
|                            |             | Non-Head Start       |  |                                |
|                            |             | Constant             | <u>17.50</u>                                 |                                |
|                            |             | Statistics           | F = <u>10.07**R<sup>2</sup></u> = <u>.16</u> | MS <sub>e</sub> = <u>18.46</u> |
|                            |             | Site                 |  |                                |
| <u>NO. SPEECH PROBLEMS</u> | <u>551</u>  | Greene & Humphreys   | <u>.06</u>                                   | <u>.12</u>                     |
|                            |             | St. Clair            | <u>.30*</u>                                  | <u>.14</u>                     |
|                            |             | Maricopa             | <u>-.41*</u>                                 | <u>.16</u>                     |
|                            |             | Mingo                |  |                                |
|                            |             | Program              |  |                                |
|                            |             | Head Start           | <u>-.10</u>                                  | <u>.15</u>                     |
|                            |             | Non-Head Start       |  |                                |
|                            |             | Constant             | <u>4.01</u>                                  |                                |
|                            |             | Statistics           | F = <u>6.46**R<sup>2</sup></u> = <u>.11</u>  | MS <sub>e</sub> = <u>2.73</u>  |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.



Table 9-13 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
All Posttest Children

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup>                           |                               |
|--------------------|-------------|----------------------|--|-------------------------------|
|                    |             |                      | b  | se <sub>b</sub>               |
|                    |             | Site                 |  |                               |
| <u>REPETITION</u>  | <u>551</u>  | Greene & Humphreys   | <u>.35*</u>                                    | <u>.17</u>                    |
|                    |             | St. Clair            | <u>-.36</u>                                    | <u>.19</u>                    |
|                    |             | Maricopa             | <u>-.21</u>                                    | <u>.22</u>                    |
|                    |             | Mingo                | <u>_____</u>                                   | <u>_____</u>                  |
|                    |             | Program              |  |                               |
|                    |             | Head Start           | <u>_____</u>                                   | <u>_____</u>                  |
|                    |             | Non-Head Start       | <u>_____</u>                                   | <u>_____</u>                  |
|                    |             | Constant             | <u>2.60</u>                                    |                               |
| Statistics         |             |                      | F = <u>10.10**</u> R <sup>2</sup> = <u>.14</u> | MS <sub>e</sub> = <u>5.13</u> |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

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Table 9-13 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
All Posttest Children

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup><br>b | SE <sub>b</sub> | Statistics <sup>c</sup>         |
|--------------------|-------------|----------------------|---------------------------|-----------------|---------------------------------|
| Greene & Humphreys |             |                      |                           |                 |                                 |
| <u>VOCABULARY</u>  | <u>174</u>  | Head Start           | <u>1.13</u>               | <u>.83</u>      | F <sup>**</sup> = <u>9.94**</u> |
|                    |             |                      |                           |                 | R <sup>2</sup> = <u>.30</u>     |
|                    |             | Constant             | <u>22.74</u>              |                 | MS <sub>e</sub> = <u>25.81</u>  |
| St. Clair          |             |                      |                           |                 |                                 |
| <u>VOCABULARY</u>  | <u>140</u>  | Head Start           | <u>.49</u>                | <u>1.06</u>     | F = <u>7.06**</u>               |
|                    |             |                      |                           |                 | R <sup>2</sup> = <u>.27</u>     |
|                    |             | Constant             | <u>9.26</u>               |                 | MS <sub>e</sub> = <u>35.87</u>  |
| Maricopa           |             |                      |                           |                 |                                 |
| <u>VOCABULARY</u>  | <u>94</u>   | Head Start           | <u>.14</u>                | <u>.62</u>      | F = <u>2.12*</u>                |
|                    |             |                      |                           |                 | R <sup>2</sup> = <u>.15</u>     |
|                    |             | Constant             | <u>41.47</u>              |                 | MS <sub>e</sub> = <u>6.81</u>   |
| Mingo              |             |                      |                           |                 |                                 |
| <u>VOCABULARY</u>  | <u>143</u>  | Head Start           | <u>-.79</u>               | <u>.74</u>      | F = <u>12.23**</u>              |
|                    |             |                      |                           |                 | R <sup>2</sup> = <u>.39</u>     |
|                    |             | Constant             | <u>23.43</u>              |                 | MS <sub>e</sub> = <u>14.91</u>  |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

Table 9-13 (continued).

Regression Analysis of Speech and Language Evaluation Measures  
All Posttest Children

| Dependent Variable     | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |          |
|------------------------|-------------|----------------------|----------------------|-----------------|-------------------------|----------|
|                        |             |                      | b                    | SE <sub>b</sub> |                         |          |
| Greene & Humphreys     |             |                      |                      |                 |                         |          |
| 2 CRITICAL<br>ELEMENTS | 174         | Head Start           | .24                  | .26             | F                       | = 6.23** |
|                        |             |                      |                      |                 | R <sup>2</sup>          | = .21    |
|                        |             | Constant             | 3.4                  |                 | MS <sub>e</sub>         | = 2.61   |
| St. Clair              |             |                      |                      |                 |                         |          |
| 2 CRITICAL<br>ELEMENTS | 140         | Head Start           | .19                  | .32             | F                       | = 3.39** |
|                        |             |                      |                      |                 | R <sup>2</sup>          | = .15    |
|                        |             | Constant             | 2.26                 |                 | MS <sub>e</sub>         | = 3.22   |
| Maricopa               |             |                      |                      |                 |                         |          |
| 2 CRITICAL<br>ELEMENTS | 94          | Head Start           | -.20                 | .24             | F                       | = .87    |
|                        |             |                      |                      |                 | R <sup>2</sup>          | = .07    |
|                        |             | Constant             | 7.83                 |                 | MS <sub>e</sub>         | = 1.04   |
| Mingo                  |             |                      |                      |                 |                         |          |
| 2 CRITICAL<br>ELEMENTS | 143         | Head Start           | .25                  | .30             | F                       | = 5.50** |
|                        |             |                      |                      |                 | R <sup>2</sup>          | = .22    |
|                        |             | Constant             | 2.03                 |                 | MS <sub>e</sub>         | = 2.47   |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

1345

Table 9-13 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
All Posttest Children

| Dependent Variable     | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |                  |
|------------------------|-------------|----------------------|----------------------|-----------------|-------------------------|------------------|
|                        |             |                      | b                    | SE <sub>b</sub> |                         |                  |
| Greene & Humphreys     |             |                      |                      |                 |                         |                  |
| 3 CRITICAL<br>ELEMENTS | 174         | Head Start           | <u>.67*</u>          | <u>.32</u>      | F                       | = <u>10.16**</u> |
|                        |             |                      |                      |                 | R <sup>2</sup>          | = <u>.30</u>     |
|                        |             | Constant             | <u>.18</u>           |                 | MS <sub>e</sub>         | = <u>3.71</u>    |
| St. Clair              |             |                      |                      |                 |                         |                  |
| 3 CRITICAL<br>ELEMENTS | 140         | Head Start           | <u>.13</u>           | <u>.31</u>      | F                       | = <u>8.15**</u>  |
|                        |             |                      |                      |                 | R <sup>2</sup>          | = <u>.27</u>     |
|                        |             | Constant             | <u>-2.07</u>         |                 | MS <sub>e</sub>         | = <u>3.00</u>    |
| Maricopa               |             |                      |                      |                 |                         |                  |
| 3 CRITICAL<br>ELEMENTS | 94          | Head Start           | <u>-.27</u>          | <u>.34</u>      | F                       | = <u>1.96</u>    |
|                        |             |                      |                      |                 | R <sup>2</sup>          | = <u>.14</u>     |
|                        |             | Constant             | <u>.49</u>           |                 | MS <sub>e</sub>         | = <u>2.11</u>    |
| Mingo                  |             |                      |                      |                 |                         |                  |
| 3 CRITICAL<br>ELEMENTS | 143         | Head Start           | <u>.14</u>           | <u>.40</u>      | F                       | = <u>4.98**</u>  |
|                        |             |                      |                      |                 | R <sup>2</sup>          | = <u>.21</u>     |
|                        |             | Constant             | <u>-1.32</u>         |                 | MS <sub>e</sub>         | = <u>4.28</u>    |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

Table 9-13 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
All Posttest Children

| Dependent Variable  | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup><br>b | SE <sub>b</sub> | Statistics <sup>c</sup> |
|---------------------|-------------|----------------------|---------------------------|-----------------|-------------------------|
| Greene & Humphreys  |             |                      |                           |                 |                         |
| 4 CRITICAL ELEMENTS | 174         | Head Start           | .34                       | .33             | F = 5.58**              |
|                     |             |                      |                           |                 | R <sup>2</sup> = .19    |
|                     |             | Constant             | .54                       |                 | MS <sub>e</sub> = 4.01  |
| St. Clair           |             |                      |                           |                 |                         |
| 4 CRITICAL ELEMENTS | 140         | Head Start           | too small to enter        |                 | F = 4.38**              |
|                     |             |                      |                           |                 | R <sup>2</sup> = .17    |
|                     |             | Constant             | -1.89                     |                 | MS <sub>e</sub> = 3.50  |
| Maricopa            |             |                      |                           |                 |                         |
| 4 CRITICAL ELEMENTS | 94          | Head Start           | -.26                      | .44             | F = 2.89**              |
|                     |             |                      |                           |                 | R <sup>2</sup> = .19    |
|                     |             | Constant             | -3.83                     |                 | MS <sub>e</sub> = 3.40  |
| Mingo               |             |                      |                           |                 |                         |
| 4 CRITICAL ELEMENTS | 143         | Head Start           | -.28                      | .39             | F = 5.42**              |
|                     |             |                      |                           |                 | R <sup>2</sup> = .22    |
|                     |             | Constant             | -2.47                     |                 | MS <sub>e</sub> = 4.06  |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

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Table 9-13 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
All Posttest Children

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |                 |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------|-----------------|
|                    |             |                      | b                    | SE <sub>b</sub> |                         |                 |
| Greene & Humphreys |             |                      |                      |                 |                         |                 |
| <u>REPETITION</u>  | <u>174</u>  |                      |                      |                 |                         |                 |
|                    |             | Head Start           | too small to enter   |                 | F                       | = <u>4.05**</u> |
|                    |             |                      |                      |                 | R <sup>2</sup>          | = <u>.13</u>    |
|                    |             | Constant             | <u>2.25</u>          |                 | MS <sub>e</sub>         | = <u>5.12</u>   |
| St. Clair          |             |                      |                      |                 |                         |                 |
| <u>REPETITION</u>  | <u>140</u>  |                      |                      |                 |                         |                 |
|                    |             | Head Start           | <u>-.39</u>          | <u>.40</u>      | F                       | = <u>5.48**</u> |
|                    |             |                      |                      |                 | R <sup>2</sup>          | = <u>.23</u>    |
|                    |             | Constant             | <u>-.19</u>          |                 | MS <sub>e</sub>         | = <u>5.13</u>   |
| Maricopa           |             |                      |                      |                 |                         |                 |
| <u>REPETITION</u>  | <u>94</u>   |                      |                      |                 |                         |                 |
|                    |             | Head Start           | <u>.19</u>           | <u>.51</u>      | F                       | = <u>1.13</u>   |
|                    |             |                      |                      |                 | R <sup>2</sup>          | = <u>.08</u>    |
|                    |             | Constant             | <u>1.89</u>          |                 | MS <sub>e</sub>         | = <u>4.66</u>   |
| Mingo              |             |                      |                      |                 |                         |                 |
| <u>REPETITION</u>  | <u>143</u>  |                      |                      |                 |                         |                 |
|                    |             | Head Start           | <u>.41</u>           | <u>.44</u>      | F                       | = <u>5.57**</u> |
|                    |             |                      |                      |                 | R <sup>2</sup>          | = <u>.22</u>    |
|                    |             | Constant             | <u>.75</u>           |                 | MS <sub>e</sub>         | = <u>5.23</u>   |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

Table 9-13 (continued)

Regression Analysis of Speech and Language Evaluation Measures,  
All Posttest Children

| Dependent Variable  | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |               |
|---------------------|-------------|----------------------|----------------------|-----------------|-------------------------|---------------|
|                     |             |                      | b                    | SE <sub>b</sub> |                         |               |
| Greene & Humphreys  |             |                      |                      |                 |                         |               |
| <u>ARTICULATION</u> | <u>174</u>  | Head Start           | <u>-.78</u>          | <u>.70</u>      | F =                     | <u>3.96**</u> |
|                     |             |                      |                      |                 | R <sup>2</sup> =        | <u>.14</u>    |
|                     |             | Constant             | <u>19.44</u>         |                 | MS <sub>e</sub> =       | <u>18.55</u>  |
| St. Clair           |             |                      |                      |                 |                         |               |
| <u>ARTICULATION</u> | <u>140</u>  | Head Start           | <u>-.43</u>          | <u>.68</u>      | F =                     | <u>1.31</u>   |
|                     |             |                      |                      |                 | R <sup>2</sup> =        | <u>.07</u>    |
|                     |             | Constant             | <u>25.03</u>         |                 | MS <sub>e</sub> =       | <u>14.82</u>  |
| Maricopa            |             |                      |                      |                 |                         |               |
| <u>ARTICULATION</u> | <u>94</u>   | Head Start           | <u>-.53</u>          | <u>.64</u>      | F =                     | <u>3.11**</u> |
|                     |             |                      |                      |                 | R <sup>2</sup> =        | <u>.20</u>    |
|                     |             | Constant             | <u>15.82</u>         |                 | MS <sub>e</sub> =       | <u>7.19</u>   |
| Mingo               |             |                      |                      |                 |                         |               |
| <u>ARTICULATION</u> | <u>143</u>  | Head Start           | <u>2.26*</u>         | <u>1.00</u>     | F =                     | <u>4.94**</u> |
|                     |             |                      |                      |                 | R <sup>2</sup> =        | <u>.20</u>    |
|                     |             | Constant             | <u>8.34</u>          |                 | MS <sub>e</sub> =       | <u>27.19</u>  |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

Table 9-13 (continued)

Regression Analysis of Speech and Language Evaluation Measures  
All Posttest Children

| Dependent Variable            | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |               |
|-------------------------------|-------------|----------------------|----------------------|-----------------|-------------------------|---------------|
|                               |             |                      | b                    | SE <sub>b</sub> |                         |               |
| <b>Greene &amp; Humphreys</b> |             |                      |                      |                 |                         |               |
| <u>NO. SPEECH PROBLEMS</u>    | <u>174</u>  | Head Start           | <u>-.11</u>          | <u>.26</u>      | F =                     | <u>4.48**</u> |
|                               |             |                      |                      |                 | R <sup>2</sup> =        | <u>.16</u>    |
|                               |             | Constant             | <u>3.72</u>          |                 | MS <sub>e</sub> =       | <u>2.61</u>   |
| <b>St. Clair</b>              |             |                      |                      |                 |                         |               |
| <u>NO. SPEECH PROBLEMS</u>    | <u>140</u>  | Head Start           | too small to enter   |                 | F =                     | <u>1.79</u>   |
|                               |             |                      |                      |                 | R <sup>2</sup> =        | <u>.07</u>    |
|                               |             | Constant             | <u>5.45</u>          |                 | MS <sub>e</sub> =       | <u>3.51</u>   |
| <b>Maricopa</b>               |             |                      |                      |                 |                         |               |
| <u>NO. SPEECH PROBLEMS</u>    | <u>94</u>   | Head Start           | <u>.24</u>           | <u>.32</u>      | F =                     | <u>2.34*</u>  |
|                               |             |                      |                      |                 | R <sup>2</sup> =        | <u>.16</u>    |
|                               |             | Constant             | <u>1.92</u>          |                 | MS <sub>e</sub> =       | <u>1.84</u>   |
| <b>Mingo</b>                  |             |                      |                      |                 |                         |               |
| <u>NO. SPEECH PROBLEMS</u>    | <u>143</u>  | Head Start           | <u>-.69*</u>         | <u>.30</u>      | F =                     | <u>2.69*</u>  |
|                               |             |                      |                      |                 | R <sup>2</sup> =        | <u>.12</u>    |
|                               |             | Constant             | <u>3.89</u>          |                 | MS <sub>e</sub> =       | <u>2.58</u>   |

<sup>a</sup> Adjusted for age, gender, race, per capita income, family employment status and mother's education

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square



Table 9-14

SPEECH AND LANGUAGE MEASURES FOR 3 YEAR OLD CHILDREN WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS ACROSS SITE

|                     | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|---------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                     | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| VOCABULARY (ACLIC)  | 103        | 36.00 | 40.00 | 44.50 | 39.60 | 5.72 | 123            | 34.50 | 39.00 | 44.00 | 37.41 | 8.93 | 2.22  | 0.027 |
| 2 CRITICAL ELEMENTS | 103        | 7.00  | 8.00  | 9.00  | 7.37  | 1.78 | 121            | 5.00  | 7.00  | 8.00  | 6.32  | 2.60 | 3.56  | 0.000 |
| 3 CRITICAL ELEMENTS | 103        | 4.00  | 5.00  | 7.00  | 5.32  | 2.19 | 120            | 3.00  | 5.00  | 6.00  | 4.52  | 2.34 | 2.65  | 0.009 |
| 4 CRITICAL ELEMENTS | 103        | 2.00  | 4.00  | 5.00  | 3.84  | 1.94 | 119            | 2.00  | 4.00  | 5.00  | 3.52  | 2.20 | 1.17  | 0.245 |
| ARTICULATION        | 93         | 22.00 | 25.00 | 27.00 | 24.45 | 3.57 | 111            | 18.00 | 23.00 | 27.00 | 21.36 | 7.22 | 3.97  | 0.000 |
| SENTENCE REPETITION | 93         | 6.00  | 8.00  | 9.00  | 7.05  | 2.72 | 117            | 3.00  | 7.00  | 9.00  | 5.86  | 3.46 | 2.79  | 0.006 |
| NUMBER OF PROBLEMS  | 95         | 0.00  | 1.00  | 2.00  | 1.21  | 1.41 | 91             | 0.00  | 1.00  | 3.00  | 1.97  | 2.01 | -2.96 | 0.004 |

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Table 9-15

SPEECH AND LANGUAGE MEASURES FOR 4 YEAR OLD CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS ACROSS SITE

|                     | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|---------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                     | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| VOCABULARY (ACLC)   | 198        | 41.00 | 44.00 | 46.00 | 42.39 | 6.92 | 145            | 39.00 | 44.00 | 47.00 | 42.50 | 5.97 | -0.15 | 0.883 |
| 2 CRITICAL ELEMENTS | 197        | 7.00  | 8.00  | 9.00  | 8.02  | 1.72 | 145            | 7.00  | 8.00  | 9.00  | 7.83  | 1.89 | 0.91  | 0.366 |
| 3 CRITICAL ELEMENTS | 197        | 5.00  | 7.00  | 8.00  | 6.43  | 1.99 | 144            | 5.00  | 6.00  | 7.50  | 5.89  | 2.21 | 2.31  | 0.021 |
| 4 CRITICAL ELEMENTS | 197        | 4.00  | 5.00  | 6.00  | 4.66  | 1.94 | 144            | 3.00  | 5.00  | 6.00  | 4.71  | 2.03 | -0.20 | 0.843 |
| ARTICULATION        | 173        | 22.00 | 26.00 | 28.00 | 24.29 | 5.36 | 117            | 23.00 | 26.00 | 28.00 | 24.74 | 5.13 | -0.72 | 0.473 |
| SENTENCE REPITITION | 174        | 7.00  | 9.00  | 10.00 | 7.77  | 2.50 | 118            | 7.00  | 9.00  | 10.00 | 7.70  | 2.61 | 0.22  | 0.828 |
| NUMBER OF PROBLEMS  | 179        | 0.00  | 1.00  | 3.00  | 1.58  | 1.94 | 124            | 0.00  | 1.00  | 2.00  | 1.56  | 1.76 | 0.09  | 0.930 |

Table 9-15 (continued)

SPEECH AND LANGUAGE MEASURES FOR 4 YEAR OLD CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS ACROSS SITE (EXCLUDING MARICOPA COUNTY)

|                     | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|---------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                     | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| VOCABULARY (ACLC)   | 169        | 40.00 | 43.00 | 46.00 | 42.02 | 7.08 | 127            | 39.00 | 43.00 | 46.00 | 42.00 | 6.17 | 0.03  | 0.976 |
| 2 CRITICAL ELEMENTS | 170        | 7.00  | 8.00  | 9.00  | 7.84  | 1.76 | 127            | 7.00  | 8.00  | 9.00  | 7.65  | 1.92 | 0.90  | 0.369 |
| 3 CRITICAL ELEMENTS | 170        | 5.00  | 6.00  | 8.00  | 6.33  | 2.05 | 126            | 4.00  | 6.00  | 7.00  | 5.62  | 2.15 | 2.87  | 0.004 |
| 4 CRITICAL ELEMENTS | 170        | 3.00  | 5.00  | 6.00  | 4.48  | 1.92 | 126            | 3.00  | 4.50  | 6.00  | 4.50  | 2.01 | -0.08 | 0.939 |
| ARTICULATION        | 147        | 21.00 | 26.00 | 28.00 | 23.93 | 5.55 | 106            | 22.00 | 26.00 | 28.00 | 24.48 | 5.30 | -0.80 | 0.426 |
| SENTENCE REPITITION | 148        | 7.00  | 9.00  | 10.00 | 7.78  | 2.57 | 107            | 6.50  | 9.00  | 10.00 | 7.70  | 2.61 | 0.23  | 0.817 |
| NUMBER OF PROBLEMS  | 153        | 0.00  | 1.00  | 3.00  | 1.73  | 1.99 | 108            | 0.00  | 1.00  | 3.00  | 1.69  | 1.82 | 0.17  | 0.866 |

Table 9-16

SPEECH AND LANGUAGE MEASURES FOR 5 YEAR OLD CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS ACROSS SITE

|                     | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|---------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                     | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| VOCABULARY (ACLC)   | 122        | 45.00 | 47.00 | 48.00 | 45.93 | 3.52 | 52             | 45.00 | 46.50 | 48.00 | 45.50 | 4.04 | 0.67  | 0.502 |
| 2 CRITICAL ELEMENTS | 122        | 8.00  | 9.00  | 10.00 | 8.76  | 1.33 | 51             | 9.00  | 9.00  | 10.00 | 9.04  | 1.26 | -1.29 | 0.199 |
| 3 CRITICAL ELEMENTS | 122        | 7.00  | 8.00  | 9.00  | 7.66  | 1.81 | 51             | 7.00  | 8.00  | 9.00  | 7.98  | 1.57 | -1.18 | 0.239 |
| 4 CRITICAL ELEMENTS | 122        | 5.00  | 6.00  | 8.00  | 6.32  | 2.16 | 51             | 5.00  | 7.00  | 8.00  | 6.76  | 2.09 | -1.26 | 0.210 |
| ARTICULATION        | 112        | 25.00 | 28.00 | 29.00 | 26.44 | 3.89 | 40             | 23.50 | 28.00 | 29.50 | 25.97 | 4.88 | 0.54  | 0.590 |
| SENTENCE REPETITION | 113        | 8.00  | 9.00  | 10.00 | 8.47  | 1.91 | 39             | 7.00  | 9.00  | 10.00 | 8.26  | 2.19 | 0.54  | 0.591 |
| NUMBER OF PROBLEMS  | 108        | 0.00  | 0.00  | 2.00  | 1.06  | 1.53 | 45             | 0.00  | 0.00  | 1.00  | 0.98  | 1.51 | 0.32  | 0.748 |

Table 9-16 (continued)

SPEECH AND LANGUAGE MEASURES FOR 5 YEAR OLD CHILDREN WITH UNADJUSTED COMPARISONS BETWEEN HEAD START AND NON-HEAD START GROUPS ACROSS SITE (EXCLUDING MARICOPA COUNTY)

|                     | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|---------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                     | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| VOCABULARY (ACLC)   | 68         | 44.00 | 46.00 | 49.00 | 45.78 | 3.62 | 23             | 45.00 | 47.00 | 49.00 | 45.83 | 4.59 | -0.04 | 0.967 |
| 2 CRITICAL ELEMENTS | 70         | 8.00  | 9.00  | 10.00 | 8.53  | 1.45 | 23             | 8.50  | 9.00  | 10.00 | 8.78  | 1.41 | -0.74 | 0.462 |
| 3 CRITICAL ELEMENTS | 70         | 6.00  | 8.00  | 9.00  | 7.37  | 1.80 | 23             | 6.50  | 8.00  | 9.00  | 7.83  | 1.67 | -1.11 | 0.273 |
| 4 CRITICAL ELEMENTS | 70         | 5.00  | 6.00  | 8.00  | 6.01  | 2.20 | 23             | 5.00  | 7.00  | 8.00  | 6.65  | 2.19 | -1.21 | 0.233 |
| ARTICULATION        | 60         | 24.00 | 27.50 | 29.00 | 26.03 | 4.32 | 20             | 23.00 | 28.00 | 30.00 | 25.35 | 5.80 | 0.48  | 0.632 |
| SENTENCE REPETITION | 62         | 8.00  | 9.00  | 10.00 | 8.61  | 1.96 | 20             | 8.00  | 9.50  | 10.00 | 8.45  | 2.16 | 0.30  | 0.767 |
| NUMBER OF PROBLEMS  | 62         | 0.00  | 1.00  | 2.00  | 1.23  | 1.44 | 21             | 0.00  | 1.00  | 2.00  | 1.52  | 1.86 | -0.67 | 0.509 |

Table 9-17

SPEECH AND LANGUAGE MEASURES FOR 3 YEAR OLD CHILDREN WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |       | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|-------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD    |       |       |
| <b>VOCABULARY (ACLC)</b>   |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Greene/Humphreys           | 42         | 37.00 | 40.00 | 45.00 | 40.24 | 5.25 | 42             | 34.00 | 38.00 | 40.00 | 35.98 | 7.95  | 2.90  | 0.005 |
| St. Clair                  | 34         | 35.00 | 38.00 | 43.00 | 38.21 | 5.99 | 35             | 30.00 | 35.00 | 39.50 | 33.09 | 10.90 | 2.43  | 0.018 |
| Mingo                      | 27         | 38.00 | 41.00 | 45.00 | 40.37 | 5.98 | 46             | 39.00 | 44.00 | 46.00 | 42.02 | 5.58  | -1.17 | 0.249 |
| <b>2 CRITICAL ELEMENTS</b> |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Greene/Humphreys           | 42         | 7.00  | 8.00  | 9.00  | 7.40  | 1.62 | 41             | 5.00  | 7.00  | 8.00  | 5.93  | 2.74  | 2.98  | 0.004 |
| St. Clair                  | 34         | 6.00  | 8.00  | 8.00  | 7.26  | 2.05 | 35             | 4.00  | 6.00  | 8.00  | 5.69  | 2.73  | 2.72  | 0.008 |
| Mingo                      | 27         | 6.50  | 8.00  | 9.00  | 7.44  | 1.72 | 45             | 7.00  | 8.00  | 9.00  | 7.18  | 2.14  | 0.58  | 0.563 |
| <b>3 CRITICAL ELEMENTS</b> |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Greene/Humphreys           | 42         | 4.00  | 5.50  | 7.00  | 5.38  | 2.21 | 40             | 3.00  | 5.00  | 6.00  | 4.25  | 2.20  | 2.32  | 0.023 |
| St. Clair                  | 34         | 4.00  | 5.00  | 6.00  | 5.00  | 2.12 | 35             | 3.00  | 4.00  | 6.00  | 4.00  | 2.13  | 1.96  | 0.055 |
| Mingo                      | 27         | 3.50  | 6.00  | 8.00  | 5.63  | 2.29 | 45             | 3.00  | 5.00  | 7.00  | 5.16  | 2.50  | 0.82  | 0.415 |
| <b>4 CRITICAL ELEMENTS</b> |            |       |       |       |       |      |                |       |       |       |       |       |       |       |
| Greene/Humphreys           | 42         | 3.00  | 4.50  | 5.00  | 4.12  | 2.11 | 40             | 1.00  | 3.00  | 4.00  | 2.97  | 2.06  | 2.49  | 0.015 |
| St. Clair                  | 34         | 2.00  | 4.00  | 5.00  | 3.62  | 1.83 | 35             | 2.00  | 3.00  | 4.00  | 3.14  | 2.28  | 0.96  | 0.342 |
| Mingo                      | 27         | 2.50  | 3.00  | 5.00  | 3.70  | 1.81 | 44             | 3.00  | 4.00  | 5.50  | 4.32  | 2.07  | -1.31 | 0.194 |

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Table 9-17 (continued)

SPEECH AND LANGUAGE MEASURES FOR 3 YEAR OLD CHILDREN WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>ARTICULATION</b>        |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 40         | 22.00 | 25.00 | 28.00 | 24.63 | 3.70 | 37             | 17.00 | 25.00 | 27.00 | 21.00 | 9.53 | 2.17  | 0.035 |
| St. Clair                  | 27         | 22.50 | 25.00 | 27.00 | 24.81 | 3.28 | 33             | 22.00 | 25.00 | 27.00 | 24.27 | 3.64 | 0.61  | 0.545 |
| Mingo                      | 26         | 21.00 | 24.00 | 27.00 | 23.81 | 3.72 | 41             | 16.00 | 20.00 | 23.00 | 19.34 | 6.31 | 3.64  | 0.001 |
| <b>SENTENCE REPITITION</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 39         | 6.00  | 8.00  | 9.00  | 7.41  | 2.53 | 39             | 2.50  | 7.00  | 9.50  | 5.87  | 3.89 | 2.07  | 0.042 |
| St. Clair                  | 28         | 6.00  | 8.00  | 9.00  | 7.04  | 2.56 | 34             | 4.00  | 7.00  | 9.00  | 6.00  | 3.17 | 1.42  | 0.160 |
| Mingo                      | 26         | 4.00  | 7.00  | 9.00  | 6.54  | 3.14 | 44             | 2.00  | 7.00  | 9.00  | 5.75  | 3.33 | 0.99  | 0.326 |
| <b>NUMBER OF PROBLEMS</b>  |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 39         | 0.00  | 1.00  | 2.00  | 1.15  | 1.41 | 32             | 0.00  | 1.00  | 2.50  | 1.59  | 1.81 | -1.12 | 0.266 |
| St. Clair                  | 31         | 0.00  | 1.00  | 2.00  | 1.26  | 1.55 | 29             | 1.00  | 1.00  | 3.00  | 2.21  | 2.13 | -1.96 | 0.055 |
| Mingo                      | 25         | 0.00  | 1.00  | 2.00  | 1.24  | 1.27 | 30             | 0.00  | 2.00  | 3.00  | 2.13  | 2.11 | -1.94 | 0.059 |

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Table 9-18

SPEECH AND LANGUAGE MEASURES FOR 4 YEAR OLD CHILDREN WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>VOCABULARY (ACLC)</b>   |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 58         | 40.00 | 43.00 | 45.00 | 41.86 | 6.20 | 49             | 38.00 | 42.00 | 45.00 | 40.18 | 6.64 | 1.34  | 0.182 |
| St. Clair                  | 54         | 38.00 | 42.00 | 47.00 | 40.31 | 9.36 | 38             | 37.00 | 43.00 | 46.00 | 42.03 | 5.69 | -1.09 | 0.280 |
| Maricopa                   | 29         | 44.00 | 46.00 | 47.00 | 44.55 | 5.52 | 18             | 45.00 | 46.00 | 47.00 | 46.00 | 2.30 | -1.25 | 0.219 |
| Mingo                      | 57         | 43.00 | 45.00 | 46.00 | 43.81 | 4.70 | 40             | 42.00 | 45.50 | 48.50 | 44.20 | 5.38 | -0.37 | 0.710 |
| <b>2 CRITICAL ELEMENTS</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 58         | 7.00  | 8.00  | 9.00  | 7.81  | 1.92 | 49             | 6.00  | 8.00  | 9.00  | 7.43  | 1.76 | 1.07  | 0.286 |
| St. Clair                  | 54         | 7.00  | 8.00  | 9.00  | 7.69  | 1.91 | 38             | 7.00  | 8.00  | 9.00  | 8.00  | 1.66 | -0.84 | 0.403 |
| Maricopa                   | 27         | 9.00  | 9.00  | 10.00 | 9.11  | 0.97 | 18             | 9.00  | 9.00  | 10.00 | 9.17  | 0.92 | -0.19 | 0.848 |
| Mingo                      | 58         | 7.00  | 8.00  | 9.00  | 8.02  | 1.41 | 40             | 7.00  | 8.00  | 9.00  | 7.57  | 2.31 | 1.08  | 0.284 |
| <b>3 CRITICAL ELEMENTS</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 58         | 5.00  | 6.00  | 8.00  | 6.29  | 2.19 | 49             | 4.00  | 5.00  | 7.00  | 5.16  | 1.91 | 2.85  | 0.005 |
| St. Clair                  | 54         | 5.00  | 6.00  | 8.00  | 6.28  | 2.04 | 38             | 5.00  | 6.00  | 7.00  | 5.71  | 2.10 | 1.29  | 0.201 |
| Maricopa                   | 27         | 6.00  | 7.00  | 8.00  | 7.04  | 1.51 | 18             | 7.00  | 8.00  | 9.00  | 7.78  | 1.66 | -1.52 | 0.138 |
| Mingo                      | 58         | 6.00  | 7.00  | 8.00  | 6.41  | 1.93 | 39             | 4.50  | 6.00  | 8.00  | 6.10  | 2.39 | 0.68  | 0.500 |
| <b>4 CRITICAL ELEMENTS</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 58         | 3.00  | 4.00  | 5.00  | 4.21  | 1.85 | 49             | 3.00  | 4.00  | 5.00  | 4.18  | 1.70 | 0.07  | 0.946 |
| St. Clair                  | 54         | 4.00  | 5.00  | 6.00  | 4.59  | 1.78 | 38             | 3.00  | 4.00  | 6.00  | 4.58  | 2.05 | 0.03  | 0.974 |
| Maricopa                   | 27         | 4.50  | 6.00  | 7.00  | 5.81  | 1.66 | 18             | 5.00  | 6.50  | 7.00  | 6.17  | 1.54 | -0.73 | 0.472 |
| Mingo                      | 58         | 4.00  | 5.00  | 6.00  | 4.66  | 2.12 | 39             | 3.00  | 5.00  | 7.00  | 4.82  | 2.30 | -0.36 | 0.721 |

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Table 9-18 (continued)

SPEECH AND LANGUAGE MEASURES FOR 4 YEAR OLD CHILDREN WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>ARTICULATION</b>        |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 48         | 23.00 | 27.00 | 29.00 | 25.06 | 5.00 | 42             | 23.00 | 25.50 | 29.00 | 24.71 | 4.96 | 0.33  | 0.742 |
| St. Clair                  | 46         | 21.00 | 26.00 | 28.00 | 23.93 | 5.47 | 34             | 24.00 | 26.00 | 28.00 | 24.94 | 5.00 | -0.85 | 0.395 |
| Maricopa                   | 26         | 25.00 | 27.00 | 28.00 | 26.35 | 3.50 | 11             | 26.50 | 27.00 | 28.00 | 27.27 | 1.62 | -1.10 | 0.279 |
| Mingo                      | 53         | 20.00 | 25.00 | 27.00 | 22.91 | 5.98 | 30             | 20.00 | 25.00 | 29.00 | 23.63 | 6.11 | -0.53 | 0.601 |
| <b>SENTENCE REPITITION</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 48         | 8.00  | 9.00  | 10.00 | 8.21  | 2.58 | 42             | 7.00  | 9.00  | 10.00 | 8.05  | 2.38 | 0.31  | 0.759 |
| St. Clair                  | 46         | 7.00  | 8.00  | 9.00  | 7.54  | 2.53 | 34             | 7.00  | 9.00  | 10.00 | 7.71  | 2.70 | -0.27 | 0.786 |
| Maricopa                   | 26         | 7.00  | 8.00  | 9.00  | 7.73  | 2.15 | 11             | 7.00  | 8.00  | 10.00 | 7.73  | 2.76 | 0.00  | 0.997 |
| Mingo                      | 54         | 7.00  | 8.50  | 10.00 | 7.59  | 2.58 | 31             | 6.00  | 8.00  | 9.00  | 7.23  | 2.81 | 0.60  | 0.553 |
| <b>NUMBER OF PROBLEMS</b>  |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 45         | 0.00  | 1.00  | 3.00  | 1.71  | 1.83 | 45             | 0.00  | 1.00  | 3.00  | 1.64  | 1.84 | 0.18  | 0.861 |
| St. Clair                  | 32         | 0.00  | 1.00  | 3.00  | 1.69  | 2.09 | 36             | 0.00  | 1.00  | 2.00  | 1.67  | 2.00 | 0.06  | 0.954 |
| Maricopa                   | 26         | 0.00  | 0.00  | 1.00  | 0.69  | 1.29 | 16             | 0.00  | 0.00  | 1.00  | 0.69  | 0.95 | 0.01  | 0.989 |
| Mingo                      | 46         | 0.00  | 1.00  | 3.00  | 1.78  | 2.10 | 27             | 0.50  | 1.00  | 3.00  | 1.78  | 1.60 | 0.01  | 0.991 |

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Table 9-19

SPEECH AND LANGUAGE MEASURES FOR 5 YEAR OLD CHILDREN WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>VOCABULARY (ACLC)</b>   |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 19         | 44.50 | 46.00 | 49.00 | 46.58 | 2.55 | 5              | 43.00 | 46.00 | 50.00 | 45.00 | 5.83 | 0.59  | 0.586 |
| St. Clair                  | 19         | 40.00 | 44.00 | 47.00 | 43.58 | 3.95 | 6              | 36.00 | 47.00 | 48.00 | 43.67 | 6.83 | -0.03 | 0.997 |
| Maricopa                   | 53         | 46.00 | 47.00 | 48.00 | 46.13 | 3.42 | 29             | 45.00 | 46.00 | 47.00 | 45.24 | 3.60 | 1.09  | 0.281 |
| Mingo                      | 31         | 45.00 | 47.00 | 49.50 | 46.64 | 3.49 | 12             | 45.50 | 47.00 | 49.00 | 47.25 | 1.86 | -0.73 | 0.469 |
| <b>2 CRITICAL ELEMENTS</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 19         | 8.00  | 9.00  | 9.00  | 8.68  | 0.88 | 5              | 8.00  | 9.00  | 9.00  | 8.20  | 1.30 | 0.78  | 0.468 |
| St. Clair                  | 20         | 7.50  | 9.00  | 9.00  | 8.05  | 1.93 | 6              | 6.00  | 9.00  | 10.00 | 8.17  | 2.14 | -0.12 | 0.908 |
| Maricopa                   | 52         | 9.00  | 9.00  | 10.00 | 9.08  | 1.08 | 28             | 9.00  | 10.00 | 10.00 | 9.25  | 1.11 | -0.67 | 0.505 |
| Mingo                      | 31         | 8.00  | 9.00  | 10.00 | 8.74  | 1.84 | 12             | 9.00  | 9.50  | 10.00 | 9.33  | 0.78 | -1.80 | 0.081 |
| <b>3 CRITICAL ELEMENTS</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 19         | 7.00  | 8.00  | 9.00  | 7.84  | 1.80 | 5              | 7.00  | 7.00  | 9.00  | 7.60  | 1.34 | 0.33  | 0.748 |
| St. Clair                  | 20         | 5.50  | 7.00  | 8.00  | 6.95  | 1.70 | 6              | 5.00  | 8.50  | 10.00 | 7.83  | 2.32 | -0.87 | 0.415 |
| Maricopa                   | 52         | 7.00  | 8.00  | 9.00  | 8.04  | 1.78 | 28             | 7.00  | 8.00  | 9.00  | 8.11  | 1.50 | -0.18 | 0.856 |
| Mingo                      | 31         | 6.50  | 7.00  | 9.00  | 7.35  | 1.84 | 12             | 6.50  | 8.50  | 9.00  | 7.92  | 1.56 | -1.00 | 0.325 |
| <b>4 CRITICAL ELEMENTS</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 19         | 5.00  | 6.00  | 7.50  | 6.21  | 1.81 | 5              | 5.00  | 7.00  | 7.00  | 6.40  | 1.34 | -0.26 | 0.802 |
| St. Clair                  | 20         | 4.00  | 6.00  | 7.00  | 5.50  | 2.33 | 6              | 5.00  | 5.50  | 7.00  | 5.83  | 2.64 | -0.28 | 0.789 |
| Maricopa                   | 52         | 6.00  | 7.00  | 8.00  | 6.73  | 2.07 | 28             | 5.00  | 7.00  | 8.00  | 6.86  | 2.05 | -0.26 | 0.794 |
| Mingo                      | 31         | 5.00  | 6.00  | 8.00  | 6.23  | 2.33 | 12             | 6.50  | 8.00  | 8.50  | 7.17  | 2.25 | -1.22 | 0.237 |

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Table 9-19 (CONTINUED)

SPEECH AND LANGUAGE MEASURES FOR 5 YEAR OLD CHILDREN WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                            | HEAD START |       |       |       |       |      | NON-HEAD START |       |       |       |       |      | T     | P     |
|----------------------------|------------|-------|-------|-------|-------|------|----------------|-------|-------|-------|-------|------|-------|-------|
|                            | N          | Q1    | MED   | Q3    | MEAN  | SD   | N              | Q1    | MED   | Q3    | MEAN  | SD   |       |       |
| <b>ARTICULATION</b>        |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 17         | 27.00 | 29.00 | 29.00 | 27.06 | 3.93 | 3              | ----- | ----- | ----- | 27.33 | 3.06 | -0.14 | 0.900 |
| St. Clair                  | 16         | 25.00 | 27.50 | 28.50 | 25.69 | 5.49 | 6              | 23.00 | 26.00 | 30.00 | 25.83 | 4.36 | -0.06 | 0.949 |
| Maricopa                   | 52         | 25.50 | 28.00 | 29.00 | 26.80 | 3.31 | 20             | 26.00 | 28.00 | 29.00 | 26.60 | 3.79 | 0.32  | 0.755 |
| Mingo                      | 27         | 23.50 | 26.00 | 29.00 | 25.59 | 3.81 | 11             | 21.50 | 28.00 | 30.00 | 24.54 | 7.10 | 0.46  | 0.652 |
| <b>SENTENCE REPITITION</b> |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 17         | 9.00  | 10.00 | 10.00 | 9.00  | 1.58 | 3              | ----- | ----- | ----- | 9.33  | 1.16 | -0.43 | 0.694 |
| St. Clair                  | 16         | 6.50  | 8.00  | 10.00 | 7.63  | 2.63 | 6              | 8.00  | 10.00 | 10.00 | 8.83  | 2.04 | -1.14 | 0.277 |
| Maricopa                   | 51         | 7.00  | 9.00  | 10.00 | 8.29  | 1.86 | 19             | 7.00  | 9.00  | 10.00 | 8.05  | 2.25 | 0.42  | 0.679 |
| Mingo                      | 29         | 9.00  | 9.00  | 10.00 | 8.93  | 1.58 | 11             | 7.50  | 9.00  | 10.00 | 8.00  | 2.45 | 1.17  | 0.262 |
| <b>NUMBER OF PROBLEMS</b>  |            |       |       |       |       |      |                |       |       |       |       |      |       |       |
| Greene/Humphreys           | 18         | 0.00  | 0.00  | 2.00  | 0.89  | 1.32 | 5              | 0.00  | 0.00  | 2.00  | 0.80  | 1.10 | 0.15  | 0.882 |
| St. Clair                  | 19         | 0.00  | 1.00  | 3.00  | 1.79  | 1.96 | 6              | 0.00  | 0.50  | 4.00  | 1.83  | 2.56 | -0.04 | 0.970 |
| Maricopa                   | 46         | 0.00  | 0.00  | 1.00  | 0.85  | 1.63 | 24             | 0.00  | 0.00  | 1.00  | 0.50  | 0.93 | 1.13  | 0.261 |
| Mingo                      | 25         | 0.00  | 1.00  | 2.00  | 1.04  | 0.89 | 10             | 0.00  | 1.00  | 3.00  | 1.70  | 1.77 | -1.13 | 0.284 |

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**CHAPTER TEN**

**APPENDIX TABLES**

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Table 10-1

Comparison of Evaluation Findings and those Reported in Head Start Health Records

| Head Start Records |   | Head Start Children (Samples A, B, and C) in: |             |                  |             |                 |             |              |             |           |             |
|--------------------|---|---|-------------|------------------|-------------|-----------------|-------------|--------------|-------------|-----------|-------------|
|                    |   | Greene & Humphreys Counties                   |             | St. Clair County |             | Maricopa County |             | Mingo County |             | All Sites |             |
|                    |   | Findings                                      | No Findings | Findings         | No Findings | Findings        | No Findings | Findings     | No Findings | Findings  | No Findings |
| Vision             | N | 9   | 43          | 10               | 40          | 13              | 88          | 4            | 32          | 36        | 203         |
| Agree              | n | 4   | 42          | 2                | 40          | 5               | 77          | 1            | 30          | 12        | 189         |
|                    | Z | 44.4  | 97.7        | 20.0             | 100.0       | 38.5            | 87.5        | 25.0         | 93.8        | 33.3      | 93.1        |
| Disagree           | n | 5   | 1           | 8                | 0           | 8               | 11          | 3            | 2           | 24        | 14          |
|                    | Z | 55.6  | 2.3         | 80.0             | 0.0         | 61.5            | 12.5        | 75.0         | 6.3         | 66.7      | 6.9         |
|                    |   | p < 0.01                                      |             | p < 0.01         |             | p < 0.021       |             | p < 0.20     |             | p < 0.01  |             |

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Table 10-2

## Comparison of Pretest and Posttest Deficiencies

| Vision Measure                         | Longitudinal (Sample A) Children in: |              |                  |               |                 |               |                |               |               |                |                |
|--|--------------------------------------|--------------|------------------|---------------|-----------------|---------------|----------------|---------------|---------------|----------------|----------------|
|  | Greene & Humphreys Counties          |              | St. Clair County |               | Maricopa County |               | Mingo County   |               | All Sites     |                |                |
|  | A*                                   | B*           | A*               | B*            | A*              | B*            | A*             | B*            | A*            | B*             |                |
| <b>Head Start</b>                      |                                      |              |                  |               |                 |               |                |               |               |                |                |
| Any Deficiency (Evaluation definition) | n<br>Z                               | 2/ 7<br>28.6 | 6/ 34<br>17.6    | 5/ 11<br>45.5 | 2/ 14<br>14.3   | 7/ 13<br>53.8 | 12/ 27<br>44.4 | 3/ 3<br>100.0 | 1/ 14<br>7.1  | 17/ 34<br>50.0 | 21/ 89<br>23.6 |
|  |                                      | p < 0.507    |                  | p < 0.085     |                 | p < 0.577     |                | FET = 0.006   |               | p < 0.005      |                |
| Any Deficiency (Head Start definition) | n<br>Z                               | 1/ 6<br>16.7 | 1/ 1<br>100.0    | 2/ 11<br>18.2 | 0/ 0            | 2/ 13<br>15.4 | 0/ 0           | 2/ 3<br>66.7  | 0/ 0          | 7/ 33<br>21.2  | 1/ 1<br>100.0  |
|  |                                      | FET = 0.286  |                  |               |                 |               |                |               |               | p = 0.067      |                |
| <b>Non-Head Start</b>                  |                                      |              |                  |               |                 |               |                |               |               |                |                |
| Any Deficiency (Evaluation definition) | n<br>Z                               | 0/ 0         | 5/ 28<br>17.9    | 4/ 7<br>57.1  | 1/ 7<br>14.3    | 4/ 4<br>100.0 | 7/ 11<br>63.6  | 3/ 3<br>100.0 | 3/ 13<br>23.1 | 11/ 14<br>78.6 | 16/ 59<br>27.1 |
|  |                                      |              |                  | FET = 0.133   |                 | FET = 0.242   |                | FET = 0.036   |               | p = 0.000      |                |
| Any Deficiency (Head Start definition) | n<br>Z                               | 0/ 0         | 0/ 0             | 1/ 7<br>14.3  | 0/ 0            | 0/ 6<br>0.0   | 0/ 0           | 2/ 3<br>66.7  | 0/ 0          | 3/ 14<br>21.4  | 0/ 0           |
|  |                                      | FET = 0.286  |                  |               |                 |               |                |               |               | p = 0.067      |                |

\*A: Children diagnosed to have vision deficiencies at pretest but not at posttest.

\*B: Children diagnosed to have no vision deficiencies at pretest but found to have problems at posttest.

Table 10-3

VISION PROBLEMS FOR HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS ACROSS SITE

|                   | HEAD START |     |      | NON-HEAD START |     |      | CHI SQ | DF | P     |
|-------------------|------------|-----|------|----------------|-----|------|--------|----|-------|
|                   | N          | n   | %    | N              | n   | %    |        |    |       |
| ANY DEFICIENCY    | 457        | 144 | 31.5 | 347            | 117 | 33.7 | 0.438  | 1  | 0.508 |
| OCULOMOTILITY     | 454        | 100 | 22.0 | 349            | 74  | 21.2 | 0.079  | 1  | 0.779 |
| STEREO ACUITY     | 445        | 89  | 20.0 | 333            | 55  | 16.5 | 1.532  | 1  | 0.216 |
| BINOULAR FUNCTION | 449        | 117 | 26.1 | 324            | 96  | 29.6 | 1.203  | 1  | 0.273 |
| STRABISMUS        | 458        | 35  | 7.6  | 350            | 38  | 10.9 | 2.495  | 1  | 0.114 |
| CONVERGENCE       | 458        | 24  | 5.2  | 349            | 20  | 5.7  | 0.092  | 1  | 0.761 |
| HYPEROPIA         | 448        | 27  | 6.0  | 339            | 14  | 4.1  | 1.406  | 1  | 0.236 |
| MYOPIA            | 448        | 2   | 0.4  | 339            | 4   | 1.2  | 1.372  | 1  | 0.241 |
| ASTIGMATISM       | 448        | 38  | 8.5  | 342            | 39  | 11.4 | 1.882  | 1  | 0.170 |
| VISUAL ACUITY     | 427        | 10  | 2.3  | 307            | 9   | 2.9  | 0.246  | 1  | 0.620 |

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Table 10-4

VISION PROBLEMS FOR HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|                    |   | Greene/Humphreys |      | St. Clair      |      | Maricopa       |      | Mingo          |      |
|--------------------|---|------------------|------|----------------|------|----------------|------|----------------|------|
|                    |   | HS               | NHS  | HS             | NHS  | HS             | NHS  | HS             | NHS  |
| ANY DEFICIENCY     | N | 127              | 99   | 106            | 83   | 106            | 60   | 118            | 105  |
|                    | n | 34               | 24   | 30             | 27   | 55             | 37   | 25             | 29   |
|                    | % | 26.8             | 24.2 | 28.3           | 32.5 | 51.9           | 61.7 | 21.2           | 27.6 |
|                    |   | CHI SQ = 0.187   |      | CHI SQ = 0.395 |      | CHI SQ = 1.483 |      | CHI SQ = 1.253 |      |
|                    |   | DF = 1           |      | DF = 1         |      | DF = 1         |      | DF = 1         |      |
|                    |   | P = 0.666        |      | P = 0.530      |      | P = 0.223      |      | P = 0.263      |      |
| OCULOMOTILITY      | N | 127              | 100  | 105            | 84   | 104            | 60   | 118            | 105  |
|                    | n | 4                | 4    | 37             | 24   | 15             | 9    | 44             | 37   |
|                    | % | 3.1              | 4.0  | 35.2           | 28.6 | 14.4           | 15.0 | 37.3           | 35.2 |
|                    |   | CHI SQ = 0.119   |      | CHI SQ = 0.949 |      | CHI SQ = 0.010 |      | CHI SQ = 0.101 |      |
|                    |   | DF = 1           |      | DF = 1         |      | DF = 1         |      | DF = 1         |      |
|                    |   | P = 0.730        |      | P = 0.330      |      | P = 0.920      |      | P = 0.751      |      |
| STERED ACUITY      | N | 127              | 95   | 101            | 76   | 106            | 60   | 111            | 102  |
|                    | n | 24               | 8    | 27             | 16   | 15             | 9    | 23             | 22   |
|                    | % | 18.9             | 8.4  | 26.7           | 21.1 | 14.2           | 15.0 | 20.7           | 21.6 |
|                    |   | CHI SQ = 4.835   |      | CHI SQ = 0.761 |      | CHI SQ = 0.022 |      | CHI SQ = 0.023 |      |
|                    |   | DF = 1           |      | DF = 1         |      | DF = 1         |      | DF = 1         |      |
|                    |   | P = 0.028        |      | P = 0.383      |      | P = 0.881      |      | P = 0.880      |      |
| BINOCULAR FUNCTION | N | 127              | 85   | 105            | 80   | 104            | 60   | 113            | 99   |
|                    | n | 32               | 20   | 18             | 22   | 36             | 30   | 31             | 24   |
|                    | % | 25.2             | 23.5 | 17.1           | 27.5 | 34.6           | 50.0 | 27.4           | 24.2 |
|                    |   | CHI SQ = 0.076   |      | CHI SQ = 2.874 |      | CHI SQ = 3.745 |      | CHI SQ = 0.280 |      |
|                    |   | DF = 1           |      | DF = 1         |      | DF = 1         |      | DF = 1         |      |
|                    |   | P = 0.782        |      | P = 0.090      |      | P = 0.053      |      | P = 0.597      |      |
| STRABISMUS         | N | 127              | 100  | 106            | 84   | 106            | 60   | 119            | 106  |
|                    | n | 7                | 13   | 5              | 9    | 16             | 10   | 7              | 6    |
|                    | % | 5.5              | 13.0 | 4.7            | 10.7 | 15.1           | 16.7 | 5.9            | 5.7  |
|                    |   | CHI SQ = 3.905   |      | CHI SQ = 2.470 |      | CHI SQ = 0.072 |      | CHI SQ = 0.005 |      |
|                    |   | DF = 1           |      | DF = 1         |      | DF = 1         |      | DF = 1         |      |
|                    |   | P = 0.048        |      | P = 0.116      |      | P = 0.789      |      | P = 0.943      |      |

Table 10-4 (continued)

VISION PROBLEMS FOR HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|               |   | Greene/Humphreys |     | St. Clair      |      | Maricopa       |      | Mingo          |      |
|---------------|---|------------------|-----|----------------|------|----------------|------|----------------|------|
|               |   | HS               | NHS | HS             | NHS  | HS             | NHS  | HS             | NHS  |
| CONVERGENCE   | N | 127              | 100 | 106            | 84   | 106            | 60   | 119            | 105  |
|               | n | 2                | 3   | 11             | 8    | 2              | 2    | 9              | 7    |
|               | % | 1.6              | 3.0 | 10.4           | 9.5  | 1.9            | 3.3  | 7.6            | 6.7  |
|               |   | CHI SQ = 0.528   |     | CHI SQ = 0.038 |      | CHI SQ = 0.341 |      | CHI SQ = 0.068 |      |
|               |   | DF = 1           |     | DF = 1         |      | DF = 1         |      | DF = 1         |      |
|               |   | P = 0.468        |     | P = 0.846      |      | P = 0.559      |      | P = 0.795      |      |
| HYPEROPIA     | N | 124              | 97  | 105            | 80   | 104            | 60   | 115            | 102  |
|               | n | 1                | 1   | 9              | 1    | 6              | 2    | 11             | 10   |
|               | % | 0.8              | 1.0 | 8.6            | 1.3  | 5.8            | 3.3  | 9.6            | 9.8  |
|               |   | CHI SQ = 0.031   |     | CHI SQ = 4.760 |      | CHI SQ = 0.487 |      | CHI SQ = 0.004 |      |
|               |   | DF = 1           |     | DF = 1         |      | DF = 1         |      | DF = 1         |      |
|               |   | P = 0.861        |     | P = 0.029      |      | P = 0.485      |      | P = 0.953      |      |
| MYOPIA        | N | 124              | 97  | 105            | 80   | 104            | 60   | 115            | 102  |
|               | n | 0                | 1   | 1              | 2    | 0              | 0    | 1              | 1    |
|               | % | 0.0              | 1.0 | 1.0            | 2.5  | 0.0            | 0.0  | 0.9            | 1.0  |
|               |   | CHI SQ = 1.284   |     | CHI SQ = 0.682 |      | CHI SQ = 0.007 |      | CHI SQ = 0.007 |      |
|               |   | DF = 1           |     | DF = 1         |      | DF = 1         |      | DF = 1         |      |
|               |   | P = 0.257        |     | P = 0.409      |      | P = 0.932      |      | P = 0.932      |      |
| ASTIGMATISM   | N | 127              | 101 | 106            | 84   | 106            | 61   | 109            | 96   |
|               | n | 3                | 4   | 16             | 12   | 13             | 11   | 6              | 12   |
|               | % | 2.4              | 4.0 | 15.1           | 14.3 | 12.3           | 18.0 | 5.5            | 12.5 |
|               |   | CHI SQ = 0.483   |     | CHI SQ = 0.024 |      | CHI SQ = 1.047 |      | CHI SQ = 3.119 |      |
|               |   | DF = 1           |     | DF = 1         |      | DF = 1         |      | DF = 1         |      |
|               |   | P = 0.487        |     | P = 0.876      |      | P = 0.306      |      | P = 0.077      |      |
| VISUAL ACUITY | N | 125              | 91  | 93             | 66   | 104            | 59   | 105            | 91   |
|               | n | 2                | 1   | 3              | 2    | 1              | 1    | 4              | 5    |
|               | % | 1.6              | 1.1 | 3.2            | 3.0  | 1.0            | 1.7  | 3.8            | 5.5  |
|               |   | CHI SQ = 0.097   |     | CHI SQ = 0.005 |      | CHI SQ = 0.167 |      | CHI SQ = 0.316 |      |
|               |   | DF = 1           |     | DF = 1         |      | DF = 1         |      | DF = 1         |      |
|               |   | P = 0.756        |     | P = 0.944      |      | P = 0.683      |      | P = 0.574      |      |

Table 10-4 (continued)

## VISION PROBLEMS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS AMONG SAMPLES WITHIN SITE

|                          | Greene/Humphreys                       |    |      | St. Clair                             |    |      | Maricopa                              |    |      | Mingo                                 |    |      |
|--------------------------|--|----|------|---------------------------------------|----|------|---------------------------------------|----|------|---------------------------------------|----|------|
|                          | N                                      | n  | %    | N                                     | n  | %    | N                                     | n  | %    | N                                     | n  | %    |
| <b>ANY DEFICIENCY</b>    |  |    |      |                                       |    |      |                                       |    |      |                                       |    |      |
| Sample A                 | 74                                     | 14 | 18.9 | 41                                    | 13 | 31.7 | 56                                    | 30 | 53.6 | 35                                    | 10 | 28.6 |
| Sample B                 | 56                                     | 8  | 14.3 | 40                                    | 13 | 32.5 | 11                                    | 6  | 54.5 | 31                                    | 5  | 16.1 |
| Sample C                 | 96                                     | 36 | 37.5 | 108                                   | 31 | 28.7 | 99                                    | 56 | 56.6 | 157                                   | 39 | 24.8 |
|                          | CHI SQ = 12.615<br>DF = 2<br>P = 0.002 |    |      | CHI SQ = 0.259<br>DF = 2<br>P = 0.878 |    |      | CHI SQ = 0.133<br>DF = 2<br>P = 0.935 |    |      | CHI SQ = 1.500<br>DF = 2<br>P = 0.472 |    |      |
| <b>OCULOMOTILITY</b>     |  |    |      |                                       |    |      |                                       |    |      |                                       |    |      |
| Sample A                 | 74                                     | 1  | 1.4  | 42                                    | 14 | 33.3 | 55                                    | 3  | 5.5  | 35                                    | 14 | 40.0 |
| Sample B                 | 56                                     | 1  | 1.8  | 40                                    | 13 | 32.5 | 11                                    | 3  | 27.3 | 31                                    | 16 | 51.6 |
| Sample C                 | 97                                     | 6  | 6.2  | 107                                   | 34 | 31.8 | 98                                    | 18 | 18.4 | 157                                   | 51 | 32.5 |
|                          | CHI SQ = 3.546<br>DF = 2<br>P = 0.170  |    |      | CHI SQ = 0.035<br>DF = 2<br>P = 0.983 |    |      | CHI SQ = 6.210<br>DF = 2<br>P = 0.045 |    |      | CHI SQ = 4.338<br>DF = 2<br>P = 0.114 |    |      |
| <b>STEREO ACUITY</b>     |  |    |      |                                       |    |      |                                       |    |      |                                       |    |      |
| Sample A                 | 73                                     | 8  | 11.0 | 41                                    | 12 | 29.3 | 56                                    | 7  | 12.5 | 31                                    | 11 | 35.5 |
| Sample B                 | 54                                     | 13 | 24.1 | 36                                    | 9  | 25.0 | 11                                    | 2  | 18.2 | 30                                    | 4  | 13.3 |
| Sample C                 | 95                                     | 11 | 11.6 | 100                                   | 22 | 22.0 | 99                                    | 15 | 15.2 | 152                                   | 30 | 19.7 |
|                          | CHI SQ = 5.410<br>DF = 2<br>P = 0.067  |    |      | CHI SQ = 0.847<br>DF = 2<br>P = 0.655 |    |      | CHI SQ = 0.335<br>DF = 2<br>P = 0.846 |    |      | CHI SQ = 5.104<br>DF = 2<br>P = 0.078 |    |      |
| <b>BINCULAR FUNCTION</b> |  |    |      |                                       |    |      |                                       |    |      |                                       |    |      |
| Sample A                 | 71                                     | 14 | 19.7 | 41                                    | 10 | 24.4 | 56                                    | 17 | 30.4 | 33                                    | 13 | 39.4 |
| Sample B                 | 53                                     | 6  | 11.3 | 39                                    | 11 | 28.2 | 11                                    | 5  | 45.5 | 30                                    | 8  | 26.7 |
| Sample C                 | 88                                     | 32 | 36.4 | 105                                   | 19 | 18.1 | 97                                    | 44 | 45.4 | 149                                   | 34 | 22.8 |
|                          | CHI SQ = 12.540<br>DF = 2<br>P = 0.002 |    |      | CHI SQ = 1.953<br>DF = 2<br>P = 0.377 |    |      | CHI SQ = 3.457<br>DF = 2<br>P = 0.178 |    |      | CHI SQ = 3.873<br>DF = 2<br>P = 0.144 |    |      |



Table 10-4 (continued)

## VISION PROBLEMS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS AMONG SAMPLES WITHIN SITE

|                    | Greene/Humphreys                      |    |      | St. Clair                             |    |      | Maricopa                              |    |      | Mingo                                 |    |      |
|--------------------|---------------------------------------|----|------|---------------------------------------|----|------|---------------------------------------|----|------|---------------------------------------|----|------|
|                    | N                                     | n  | %    | N                                     | n  | %    | N                                     | n  | %    | N                                     | n  | %    |
| <b>STRABISMUS</b>  |                                       |    |      |                                       |    |      |                                       |    |      |                                       |    |      |
| Sample A           | 74                                    | 4  | 5.4  | 42                                    | 2  | 4.8  | 56                                    | 8  | 14.3 | 35                                    | 4  | 11.4 |
| Sample B           | 56                                    | 3  | 5.4  | 40                                    | 6  | 15.0 | 11                                    | 2  | 18.2 | 31                                    | 0  | 0.0  |
| Sample C           | 97                                    | 13 | 13.4 | 108                                   | 6  | 5.6  | 99                                    | 16 | 16.2 | 159                                   | 9  | 5.7  |
|                    | CHI SQ = 4.444<br>DF = 2<br>P = 0.108 |    |      | CHI SQ = 4.351<br>DF = 2<br>P = 0.113 |    |      | CHI SQ = 0.152<br>DF = 2<br>P = 0.927 |    |      | CHI SQ = 3.958<br>DF = 2<br>P = 0.138 |    |      |
| <b>CONVERGENCE</b> |                                       |    |      |                                       |    |      |                                       |    |      |                                       |    |      |
| Sample A           | 74                                    | 0  | 0.0  | 42                                    | 3  | 7.1  | 56                                    | 1  | 1.8  | 35                                    | 5  | 14.3 |
| Sample B           | 56                                    | 1  | 1.8  | 40                                    | 6  | 15.0 | 11                                    | 1  | 9.1  | 31                                    | 1  | 3.2  |
| Sample C           | 97                                    | 4  | 4.1  | 108                                   | 10 | 9.3  | 99                                    | 2  | 2.0  | 158                                   | 10 | 6.3  |
|                    | CHI SQ = 3.374<br>DF = 2<br>P = 0.185 |    |      | CHI SQ = 1.558<br>DF = 2<br>P = 0.458 |    |      | CHI SQ = 2.245<br>DF = 2<br>P = 0.325 |    |      | CHI SQ = 3.567<br>DF = 2<br>P = 0.168 |    |      |
| <b>HYPEROPIA</b>   |                                       |    |      |                                       |    |      |                                       |    |      |                                       |    |      |
| Sample A           | 73                                    | 1  | 1.4  | 42                                    | 2  | 4.8  | 54                                    | 2  | 3.7  | 34                                    | 6  | 17.6 |
| Sample B           | 55                                    | 1  | 1.8  | 39                                    | 2  | 5.1  | 11                                    | 0  | 0.0  | 31                                    | 2  | 6.5  |
| Sample C           | 93                                    | 0  | 0.0  | 104                                   | 6  | 5.8  | 99                                    | 6  | 6.1  | 152                                   | 13 | 8.6  |
|                    | CHI SQ = 1.537<br>DF = 2<br>P = 0.464 |    |      | CHI SQ = 0.067<br>DF = 2<br>P = 0.967 |    |      | CHI SQ = 1.023<br>DF = 2<br>P = 0.600 |    |      | CHI SQ = 3.060<br>DF = 2<br>P = 0.217 |    |      |
| <b>MYOPIA</b>      |                                       |    |      |                                       |    |      |                                       |    |      |                                       |    |      |
| Sample A           | 73                                    | 1  | 1.4  | 42                                    | 1  | 2.4  | 54                                    | 0  | 0.0  | 34                                    | 0  | 0.0  |
| Sample B           | 55                                    | 0  | 0.0  | 39                                    | 1  | 2.6  | 11                                    | 0  | 0.0  | 31                                    | 1  | 3.2  |
| Sample C           | 93                                    | 0  | 0.0  | 104                                   | 1  | 1.0  | 99                                    | 0  | 0.0  | 152                                   | 1  | 0.7  |
|                    | CHI SQ = 2.037<br>DF = 2<br>P = 0.361 |    |      | CHI SQ = 0.653<br>DF = 2<br>P = 0.721 |    |      |                                       |    |      | CHI SQ = 2.234<br>DF = 2<br>P = 0.327 |    |      |

Table 10-4 (continued)

VISION PROBLEMS FOR COMBINED GROUPS OF HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS AMONG SAMPLES WITHIN SITE

|                      | Greene/Humphreys |   |     | St. Clair      |    |      | Maricopa       |    |      | Mingo          |    |     |
|----------------------|------------------|---|-----|----------------|----|------|----------------|----|------|----------------|----|-----|
|                      | N                | n | %   | N              | n  | %    | N              | n  | %    | N              | n  | %   |
| <b>ASTIGMATISM</b>   |                  |   |     |                |    |      |                |    |      |                |    |     |
| Sample A             | 74               | 1 | 1.4 | 41             | 8  | 19.5 | 56             | 9  | 16.1 | 36             | 3  | 8.3 |
| Sample B             | 56               | 2 | 3.6 | 40             | 5  | 12.5 | 11             | 2  | 18.2 | 31             | 2  | 6.5 |
| Sample C             | 98               | 4 | 4.1 | 109            | 15 | 13.8 | 100            | 13 | 13.0 | 138            | 13 | 9.4 |
|                      | CHI SQ = 1.119   |   |     | CHI SQ = 0.986 |    |      | CHI SQ = 0.414 |    |      | CHI SQ = 0.289 |    |     |
|                      | DF = 2           |   |     | DF = 2         |    |      | DF = 2         |    |      | DF = 2         |    |     |
|                      | P = 0.571        |   |     | P = 0.611      |    |      | P = 0.813      |    |      | P = 0.865      |    |     |
| <b>VISUAL ACUITY</b> |                  |   |     |                |    |      |                |    |      |                |    |     |
| Sample A             | 73               | 2 | 2.7 | 39             | 1  | 2.6  | 53             | 0  | 0.0  | 30             | 1  | 3.3 |
| Sample B             | 53               | 0 | 0.0 | 29             | 0  | 0.0  | 11             | 0  | 0.0  | 29             | 2  | 6.9 |
| Sample C             | 90               | 1 | 1.1 | 91             | 4  | 4.4  | 99             | 2  | 2.0  | 137            | 6  | 4.4 |
|                      | CHI SQ = 1.770   |   |     | CHI SQ = 1.452 |    |      | CHI SQ = 1.309 |    |      | CHI SQ = 0.474 |    |     |
|                      | DF = 2           |   |     | DF = 2         |    |      | DF = 2         |    |      | DF = 2         |    |     |
|                      | P = 0.413        |   |     | P = 0.484      |    |      | P = 0.520      |    |      | P = 0.789      |    |     |

Table 10-5

## Regression Analysis of the Vision Measures

## All Posttested Children

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup>         |                 |
|--------------------|-------------|----------------------|------------------------------|-----------------|
|                    |             |                      | b                            | se <sub>b</sub> |
| OCULOMOTILITY      | 684         | Site                 |                              |                 |
|                    |             | Greene & Humphreys   | -.16**                       | .02             |
|                    |             | St. Clair            | .13**                        | .03             |
|                    |             | Maricopa             | -.95**                       | .03             |
|                    |             | Mingo                | .98                          |                 |
|                    |             | Program              |                              |                 |
|                    |             | Head Start           | .52                          | .03             |
|                    |             | Non-Head Start       | -.52                         | .03             |
|                    |             | Constant             | 1.04                         |                 |
|                    |             | Statistics           | F = 12.35** R <sup>2</sup> = | .11             |
| STRABISMUS         | 684         | Site                 |                              |                 |
|                    |             | Greene & Humphreys   | -.12                         | .02             |
|                    |             | St. Clair            | -.71                         | .02             |
|                    |             | Maricopa             | .66**                        | .22             |
|                    |             | Mingo                | .17                          |                 |
|                    |             | Program              |                              |                 |
|                    |             | Head Start           | -.34                         | .02             |
|                    |             | Non-Head Start       | .34                          | .02             |
|                    |             | Constant             | 1.26                         |                 |
|                    |             | Statistics           | F = 3.44** R <sup>2</sup> =  | .03             |

<sup>a</sup> Adjusted for child's gender, race, mother's education

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

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Table 10-5 (continued)

Regression Analysis of the Vision Measures

All Posttested Children

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                      |
|--------------------|-------------|----------------------|----------------------|----------------------|
|                    |             |                      | b                    | se <sub>b</sub>      |
| CONVERGENCE        | 684         | Site                 |                      |                      |
|                    |             | Greene & Humphreys   | -.33*                | .01                  |
|                    |             | St. Clair            | .38*                 | .02                  |
|                    |             | Maricopa             | -.36*                | .02                  |
|                    |             | Mingo                | .31                  |                      |
|                    |             | Program              |                      |                      |
|                    |             | Head Start           | .52                  | .02                  |
|                    |             | Non-Head Start       | -.52                 | .02                  |
|                    |             | Constant             | 1                    |                      |
|                    |             | Statistics           | F = 2.65**           | R <sup>2</sup> = .03 |
| HYPEROPIA          | 684         | Site                 |                      |                      |
|                    |             | Greene & Humphreys   | -.31*                | .01                  |
|                    |             | St. Clair            | .21                  | .01                  |
|                    |             | Maricopa             | -.70                 | .02                  |
|                    |             | Mingo                | .80                  |                      |
|                    |             | Program              |                      |                      |
|                    |             | Head Start           | .15                  | .02                  |
|                    |             | Non-Head Start       | -.15                 | .02                  |
|                    |             | Constant             | 1.11                 |                      |
|                    |             | Statistics           | F = 1.61             | R <sup>2</sup> = .02 |

<sup>a</sup> Adjusted for child's gender, race, mother's education

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 10-5 (continued)

Regression Analysis of the Vision Measures

All Posttested Children

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                      |
|--------------------|-------------|----------------------|----------------------|----------------------|
|                    |             |                      | b                    | se <sub>b</sub>      |
| <u>MYOPA</u>       | 684         | Site                 |                      |                      |
|                    |             | Greene & Humphreys   | too small            | to enter             |
|                    |             | St. Clair            | .24                  | .01                  |
|                    |             | Maricopa             | -.85                 | .01                  |
|                    |             | Mingo                |                      |                      |
|                    |             | Program              |                      |                      |
|                    |             | Head Start           | -.13                 | .01                  |
|                    |             | Non-Head Start       | .13                  | .01                  |
|                    |             | Constant             | 1.02                 |                      |
|                    |             | Statistics           | F = .79              | R <sup>2</sup> = .01 |
| <u>ASTIGMATISM</u> |             | Site                 |                      |                      |
|                    |             | Greene & Humphreys   | -.69**               | .02                  |
|                    |             | St. Clair            | .37                  | .02                  |
|                    |             | Maricopa             | .43                  | .02                  |
|                    |             | Mingo                | -.11                 | .02                  |
|                    |             | Program              |                      |                      |
|                    |             | Head Start           | -.31                 | .02                  |
|                    |             | Non-Head Start       | .31                  | .02                  |
|                    |             | Constant             | 1.28                 |                      |
|                    |             | Statistics           | F = 3.68**           | R <sup>2</sup> = .04 |

<sup>a</sup> Adjusted for child's gender, race, mother's education

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 10-5 (continued)

## Regression Analysis of the Vision Measures

All Posttested Children

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup>      |                             |
|--------------------|-------------|----------------------|---------------------------|-----------------------------|
|                    |             |                      | b                         | se <sub>b</sub>             |
| STEREO ACUITY      | 684         | Site                 |                           |                             |
|                    |             | Greene & Humphreys   | <u>-.18</u>               | <u>.02</u>                  |
|                    |             | St. Clair            | <u>.83**</u>              | <u>.03</u>                  |
|                    |             | Maricopa             | <u>-.51</u>               | <u>.03</u>                  |
|                    |             | Mingo                | <u>-.14</u>               |                             |
|                    |             | Program              |                           |                             |
|                    |             | Head Start           | <u>.51</u>                | <u>.03</u>                  |
|                    |             | Non-Head Start       | <u>-.51</u>               | <u>.03</u>                  |
|                    |             | Constant             | <u>1.06</u>               |                             |
|                    |             | Statistics           | F = <u>2.02*</u>          | R <sup>2</sup> = <u>.02</u> |
| VISUAL ACUITY      | 684         | Site                 |                           |                             |
|                    |             | Greene & Humphreys   | <u>-.13</u>               | <u>.01</u>                  |
|                    |             | St. Clair            | <u>.85</u>                | <u>.01</u>                  |
|                    |             | Maricopa             | <u>-.14</u>               | <u>.01</u>                  |
|                    |             | Mingo                | <u>-.58</u>               |                             |
|                    |             | Program              |                           |                             |
|                    |             | Head Start           | <u>too small to enter</u> |                             |
|                    |             | Non-Head Start       |                           |                             |
|                    |             | Constant             | <u>1.14</u>               |                             |
|                    |             | Statistics           | F = <u>1.86</u>           | R <sup>2</sup> = <u>.02</u> |

<sup>a</sup> Adjusted for child's gender, race, mother's education

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 10-5 (continued)

Regression Analysis of the Vision Measures

All Posttested Children

| Dependent Variable    | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                             |                              |
|-----------------------|-------------|----------------------|----------------------|-----------------------------|------------------------------|
|                       |             |                      | b                    | se <sub>b</sub>             |                              |
| BINOCULAR<br>FUNCTION | 684         | Site                 |                      |                             |                              |
|                       |             | Greene & Humphreys   | <u>-.85</u>          | <u>.03</u>                  |                              |
|                       |             | St. Clair            | <u>-.51</u>          | <u>.03</u>                  |                              |
|                       |             | Maricopa             | <u>.87*</u>          | <u>.03</u>                  |                              |
|                       |             | Mingo                | <u>.49</u>           |                             |                              |
|                       |             | Program              |                      |                             |                              |
|                       |             | Head Start           | <u>-.53</u>          | <u>.03</u>                  |                              |
|                       |             | Non-Head Start       | <u>.53</u>           | <u>.03</u>                  |                              |
|                       |             | Constant             | <u>1.21</u>          |                             |                              |
| Statistics            |             |                      | F = <u>4.64**</u>    | R <sup>2</sup> = <u>.05</u> | MS <sub>e</sub> = <u>.19</u> |

<sup>a</sup> Adjusted for child's gender, race, mother's education

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square.

Table 10-6

## Regression Analysis of Vision Measures

All Posttested Children

| Dependent Variable     | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |                |
|------------------------|-------------|----------------------|----------------------|-----------------|-------------------------|----------------|
|                        |             |                      | b                    | SE <sub>b</sub> |                         |                |
| Greene & Humphreys     |             |                      |                      |                 |                         |                |
| STEREOSCOPIC<br>VISION | 204         | Head Start           | <u>.15**</u>         | <u>.05</u>      | F                       | = <u>2.94*</u> |
|                        |             |                      |                      |                 | R <sup>2</sup>          | = <u>.06</u>   |
|                        |             | Constant             | <u>1.02</u>          |                 | MS <sub>e</sub>         | = <u>.11</u>   |
| St. Clair              |             |                      |                      |                 |                         |                |
| STEREOSCOPIC<br>VISION | 204         | Head Start           | <u>.50</u>           | <u>.07</u>      | F                       | = <u>2.01</u>  |
|                        |             |                      |                      |                 | R <sup>2</sup>          | = <u>.04</u>   |
|                        |             | Constant             | <u>1.81</u>          |                 | MS <sub>e</sub>         | = <u>.17</u>   |
| Maricopa               |             |                      |                      |                 |                         |                |
| STEREOSCOPIC<br>VISION | 204         | Head Start           | <u>-.10</u>          | <u>.06</u>      | F                       | = <u>.40</u>   |
|                        |             |                      |                      |                 | R <sup>2</sup>          | = <u>.01</u>   |
|                        |             | Constant             | <u>1.48</u>          |                 | MS <sub>e</sub>         | = <u>.12</u>   |
| Mingo                  |             |                      |                      |                 |                         |                |
| STEREOSCOPIC<br>VISION | 204         | Head Start           | <u>-.28</u>          | <u>.06</u>      | F                       | = <u>.69</u>   |
|                        |             |                      |                      |                 | R <sup>2</sup>          | = <u>.02</u>   |
|                        |             | Constant             | <u>.92</u>           |                 | MS <sub>e</sub>         | = <u>.13</u>   |

<sup>a</sup> Adjusted for gender, race, mother's education.<sup>b</sup> Centered without weights<sup>c</sup> MS<sub>e</sub> is residual mean square

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Table 10-6 (continued)

## Regression Analysis of Vision Measures

## All Posttested Children

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |               |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------|---------------|
|                    |             |                      | b                    | SE <sub>b</sub> |                         |               |
| Greene & Humphreys |             |                      |                      |                 |                         |               |
| <u>STRABISMUS</u>  | <u>204</u>  | Head Start           | <u>-.51</u>          | <u>.04</u>      | F                       | = <u>1.47</u> |
|                    |             |                      |                      |                 | R <sup>2</sup>          | = <u>.03</u>  |
|                    |             | Constant             | <u>1.29</u>          |                 | MS <sub>e</sub>         | = <u>.07</u>  |
| St. Clair          |             |                      |                      |                 |                         |               |
| <u>STRABISMUS</u>  | <u>204</u>  | Head Start           | <u>-.56</u>          | <u>.04</u>      | F                       | = <u>1.50</u> |
|                    |             |                      |                      |                 | R <sup>2</sup>          | = <u>.04</u>  |
|                    |             | Constant             | <u>1.09</u>          |                 | MS <sub>e</sub>         | = <u>.07</u>  |
| Maricopa           |             |                      |                      |                 |                         |               |
| <u>STRABISMUS</u>  | <u>204</u>  | Head Start           | <u>-.87</u>          | <u>.06</u>      | F                       | = <u>1.85</u> |
|                    |             |                      |                      |                 | R <sup>2</sup>          | = <u>.04</u>  |
|                    |             | Constant             | <u>1.40</u>          |                 | MS <sub>e</sub>         | = <u>.13</u>  |
| Mingo              |             |                      |                      |                 |                         |               |
| <u>STRABISMUS</u>  | <u>204</u>  | Head Start           | <u>-.60</u>          | <u>.03</u>      | F                       | = <u>.36</u>  |
|                    |             |                      |                      |                 | R <sup>2</sup>          | = <u>.01</u>  |
|                    |             | Constant             | <u>1.11</u>          |                 | MS <sub>e</sub>         | = <u>.05</u>  |

<sup>a</sup> Adjusted for gender, race, mother's education.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

Table 10-6 (continued)

## Regression Analysis of Vision Measures

All Posttested Children

| Dependent Variable   | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                        | Statistics <sup>c</sup> |                 |
|----------------------|-------------|----------------------|----------------------|------------------------|-------------------------|-----------------|
|                      |             |                      | b                    | SE <sub>b</sub>        |                         |                 |
| Greene & Humphreys   |             |                      |                      |                        |                         |                 |
| <u>OCULOMOTILITY</u> | <u>204</u>  | Head Start           | to small to enter    |                        | F                       | = <u>4.31**</u> |
|                      |             |                      |                      |                        | R <sup>2</sup>          | = <u>.06</u>    |
|                      |             | Constant             |                      | <u>1.04</u>            | MS <sub>e</sub>         | = <u>.02</u>    |
| St. Clair            |             |                      |                      |                        |                         |                 |
| <u>OCULOMOTILITY</u> | <u>204</u>  | Head Start           |                      | <u>.90</u> <u>.08</u>  | F                       | = <u>2.00</u>   |
|                      |             |                      |                      |                        | R <sup>2</sup>          | = <u>.05</u>    |
|                      |             | Constant             |                      | <u>.30</u>             | MS <sub>e</sub>         | = <u>.21</u>    |
| Maricopa             |             |                      |                      |                        |                         |                 |
| <u>OCULOMOTILITY</u> | <u>204</u>  | Head Start           |                      | <u>-.12</u> <u>.06</u> | F                       | = <u>.18</u>    |
|                      |             |                      |                      |                        | R <sup>2</sup>          | = <u>.004</u>   |
|                      |             | Constant             |                      | <u>1.28</u>            | MS <sub>e</sub>         | = <u>.13</u>    |
| Mingo                |             |                      |                      |                        |                         |                 |
| <u>OCULOMOTILITY</u> | <u>204</u>  | Head Start           |                      | <u>-.30</u> <u>.08</u> | F                       | = <u>.81</u>    |
|                      |             |                      |                      |                        | R <sup>2</sup>          | = <u>.02</u>    |
|                      |             | Constant             |                      | <u>1.33</u>            | MS <sub>e</sub>         | = <u>.22</u>    |

<sup>a</sup> Adjusted for gender, race, mother's education.<sup>b</sup> Centered without weights<sup>c</sup> MS<sub>e</sub> is residual mean square

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Table 10-6 (continued)

## Regression Analysis of Vision Measures

All Posttested Children

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup>      |                 | Statistics <sup>c</sup> |               |
|--------------------|-------------|----------------------|---------------------------|-----------------|-------------------------|---------------|
|                    |             |                      | b                         | SE <sub>b</sub> |                         |               |
| Greene & Humphreys |             |                      |                           |                 |                         |               |
| <u>CONVERGENCE</u> | <u>204</u>  | Head Start           | <u>-.48</u>               | <u>.01</u>      | F                       | = <u>.51</u>  |
|                    |             |                      |                           |                 | R <sup>2</sup>          | = <u>.01</u>  |
|                    |             | Constant             | <u>1.00</u>               |                 | MS <sub>e</sub>         | = <u>.01</u>  |
| St. Clair          |             |                      |                           |                 |                         |               |
| <u>CONVERGENCE</u> | <u>204</u>  | Head Start           | <u>.52</u>                | <u>.04</u>      | F                       | = <u>.80</u>  |
|                    |             |                      |                           |                 | R <sup>2</sup>          | = <u>.02</u>  |
|                    |             | Constant             | <u>.86</u>                |                 | MS <sub>e</sub>         | = <u>.07</u>  |
| Maricopa           |             |                      |                           |                 |                         |               |
| <u>CONVERGENCE</u> | <u>204</u>  | Head Start           | <u>-.15</u>               | <u>.03</u>      | F                       | = <u>.11</u>  |
|                    |             |                      |                           |                 | R <sup>2</sup>          | = <u>.002</u> |
|                    |             | Constant             | <u>.98</u>                |                 | MS <sub>e</sub>         | = <u>.03</u>  |
| Mingo              |             |                      |                           |                 |                         |               |
| <u>CONVERGENCE</u> | <u>204</u>  | Head Start           | <u>too small to enter</u> |                 | F                       | = <u>.44</u>  |
|                    |             |                      |                           |                 | R <sup>2</sup>          | = <u>.01</u>  |
|                    |             | Constant             | <u>1.11</u>               |                 | MS <sub>e</sub>         | = <u>.07</u>  |

<sup>a</sup> Adjusted for gender, race, mother's education.<sup>b</sup> Centered without weights<sup>c</sup> MS<sub>e</sub> is residual mean square

Table 10-6 (continued)

## Regression Analysis of Vision Measures

All Posttested Children

| Dependent Variable | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |             |
|--------------------|-------------|----------------------|----------------------|-----------------|-------------------------|-------------|
|                    |             |                      | b                    | SE <sub>b</sub> |                         |             |
| Greene & Humphreys |             |                      |                      |                 |                         |             |
| <u>HYPEROPIA</u>   | <u>204</u>  | Head Start           | <u>-.29</u>          | <u>.01</u>      | F =                     | <u>1.97</u> |
|                    |             |                      |                      |                 | R <sup>2</sup> =        | <u>.02</u>  |
|                    |             | Constant             | <u>1.12</u>          |                 | MS <sub>e</sub> =       | <u>.01</u>  |
| St. Clair          |             |                      |                      |                 |                         |             |
| <u>HYPEROPIA</u>   | <u>204</u>  | Head Start           | <u>.71</u>           | <u>.04</u>      | F =                     | <u>1.42</u> |
|                    |             |                      |                      |                 | R <sup>2</sup> =        | <u>.04</u>  |
|                    |             | Constant             | <u>.84</u>           |                 | MS <sub>e</sub> =       | <u>.06</u>  |
| Maricopa           |             |                      |                      |                 |                         |             |
| <u>HYPEROPIA</u>   | <u>204</u>  | Head Start           | <u>.62</u>           | <u>.03</u>      | F =                     | <u>.08</u>  |
|                    |             |                      |                      |                 | R <sup>2</sup> =        | <u>.001</u> |
|                    |             | Constant             | <u>1.05</u>          |                 | MS <sub>e</sub> =       | <u>.04</u>  |
| Mingo              |             |                      |                      |                 |                         |             |
| <u>HYPEROPIA</u>   | <u>204</u>  | Head Start           | too small to enter   |                 | F =                     | <u>.99</u>  |
|                    |             |                      |                      |                 | R <sup>2</sup> =        | <u>.02</u>  |
|                    |             | Constant             | <u>1.34</u>          |                 | MS <sub>e</sub> =       | <u>.06</u>  |

<sup>a</sup> Adjusted for gender, race, mother's education.<sup>b</sup> Centered without weights<sup>c</sup> MS<sub>e</sub> is residual mean square

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Table 10-6 (continued)

Regression Analysis of Vision Measures

All Posttested Children

| Dependent Variable            | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup><br>b | SE <sub>b</sub> | Statistics <sup>c</sup>       |
|-------------------------------|-------------|----------------------|---------------------------|-----------------|-------------------------------|
| <b>Greene &amp; Humphreys</b> |             |                      |                           |                 |                               |
| <u>MYOPIA</u>                 | <u>204</u>  | Head Start           | <u>-.13</u>               | <u>.01</u>      | F = <u>.50</u>                |
|                               |             |                      |                           |                 | R <sup>2</sup> = <u>.01</u>   |
|                               |             | Constant             | <u>1.00</u>               |                 | MS <sub>e</sub> = <u>.004</u> |
| <b>St. Clair</b>              |             |                      |                           |                 |                               |
| <u>MYOPIA</u>                 | <u>204</u>  | Head Start           | <u>.12</u>                | <u>.01</u>      | F = <u>.22</u>                |
|                               |             |                      |                           |                 | R <sup>2</sup> = <u>.01</u>   |
|                               |             | Constant             | <u>.98</u>                |                 | MS <sub>e</sub> = <u>.01</u>  |
| <b>Maricopa</b>               |             |                      |                           |                 |                               |
| <u>MYOPIA</u>                 | <u>204</u>  | Head Start           | _____                     | _____           | F = _____                     |
|                               |             |                      |                           |                 | R <sup>2</sup> = _____        |
|                               |             | Constant             | _____                     |                 | MS <sub>e</sub> = _____       |
| <b>Mingo</b>                  |             |                      |                           |                 |                               |
| <u>MYOPIA</u>                 | <u>204</u>  | Head Start           | _____                     | _____           | F = <u>2.00</u>               |
|                               |             |                      |                           |                 | R <sup>2</sup> = <u>.03</u>   |
|                               |             | Constant             | <u>1.09</u>               |                 | MS <sub>e</sub> = <u>.01</u>  |

<sup>a</sup> Adjusted for gender, race, mother's education.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

Table 10-6 (continued)  
 Regression Analysis of Vision Measures  
 All Posttested Children

| Dependent Variable            | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup><br>b | SE <sub>b</sub> <sup>b</sup> | Statistics <sup>c</sup>      |
|-------------------------------|-------------|----------------------|---------------------------|------------------------------|------------------------------|
| <b>Greene &amp; Humphreys</b> |             |                      |                           |                              |                              |
| <u>ASTIGMATISM</u>            | <u>204</u>  | Head Start           | <u>-.76</u>               | <u>.02</u>                   | F = <u>2.31</u>              |
|                               |             |                      |                           |                              | R <sup>2</sup> = <u>.04</u>  |
|                               |             | Constant             | <u>1.15</u>               |                              | MS <sub>e</sub> = <u>.03</u> |
| <b>St. Clair</b>              |             |                      |                           |                              |                              |
| <u>ASTIGMATISM</u>            | <u>204</u>  | Head Start           | <u>.20</u>                | <u>.06</u>                   | F = <u>.49</u>               |
|                               |             |                      |                           |                              | R <sup>2</sup> = <u>.01</u>  |
|                               |             | Constant             | <u>1.28</u>               |                              | MS <sub>e</sub> = <u>.12</u> |
| <b>Maricopa</b>               |             |                      |                           |                              |                              |
| <u>ASTIGMATISM</u>            | <u>204</u>  | Head Start           | <u>-.74</u>               | <u>.06</u>                   | F = <u>.61</u>               |
|                               |             |                      |                           |                              | R <sup>2</sup> = <u>.02</u>  |
|                               |             | Constant             | <u>1.33</u>               |                              | MS <sub>e</sub> = <u>.12</u> |
| <b>Mingo</b>                  |             |                      |                           |                              |                              |
| <u>ASTIGMATISM</u>            | <u>204</u>  | Head Start           | <u>-.69</u>               | <u>.05</u>                   | F = <u>.88</u>               |
|                               |             |                      |                           |                              | R <sup>2</sup> = <u>.02</u>  |
|                               |             | Constant             | <u>1.22</u>               |                              | MS <sub>e</sub> = <u>.08</u> |

<sup>a</sup> Adjusted for gender, race, mother's education.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

Table 10-6 (continued)

Regression Analysis of Vision Measures  
All Posttested Children

| Dependent Variable    | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |             |
|-----------------------|-------------|----------------------|----------------------|-----------------|-------------------------|-------------|
|                       |             |                      | b                    | SE <sub>b</sub> |                         |             |
| Greene & Humphreys    |             |                      |                      |                 |                         |             |
| <u>VISUAL ACULITY</u> | <u>204</u>  | Head Start           | <u>.86</u>           | <u>.02</u>      | F =                     | <u>1.26</u> |
|                       |             |                      |                      |                 | R <sup>2</sup> =        | <u>.02</u>  |
|                       |             | Constant             | <u>1.08</u>          |                 | MS <sub>e</sub> =       | <u>.01</u>  |
| St. Clair             |             |                      |                      |                 |                         |             |
| <u>VISUAL ACULITY</u> | <u>204</u>  | Head Start           | <u>.90</u>           | <u>.03</u>      | F =                     | <u>1.09</u> |
|                       |             |                      |                      |                 | R <sup>2</sup> =        | <u>.03</u>  |
|                       |             | Constant             | <u>1.29</u>          |                 | MS <sub>e</sub> =       | <u>.03</u>  |
| Maricopa              |             |                      |                      |                 |                         |             |
| <u>VISUAL ACULITY</u> | <u>204</u>  | Head Start           | <u>-.73</u>          | <u>.02</u>      | F =                     | <u>.16</u>  |
|                       |             |                      |                      |                 | R <sup>2</sup> =        | <u>.004</u> |
|                       |             | Constant             | <u>1.13</u>          |                 | MS <sub>e</sub> =       | <u>.01</u>  |
| Mingo                 |             |                      |                      |                 |                         |             |
| <u>VISUAL ACULITY</u> | <u>204</u>  | Head Start           | too small to enter   |                 | F =                     | <u>1.37</u> |
|                       |             |                      |                      |                 | R <sup>2</sup> =        | <u>.02</u>  |
|                       |             | Constant             | <u>1.34</u>          |                 | MS <sub>e</sub> =       | <u>.05</u>  |

<sup>a</sup> Adjusted for gender, race, mother's education.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

Table 10-6 (continued)  
 Regression Analysis of Vision Measures  
 All Posttested Children

| Dependent Variable      | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |                 |
|-------------------------|-------------|----------------------|----------------------|-----------------|-------------------------|-----------------|
|                         |             |                      | b                    | SE <sub>b</sub> |                         |                 |
| <u>BINOCULAR VISION</u> | <u>204</u>  | Greene & Humphreys   |                      |                 |                         |                 |
|                         |             | Head Start           | <u>.39</u>           | <u>.06</u>      | F                       | = <u>3.70**</u> |
|                         |             | Constant             | <u>1.09</u>          |                 | R <sup>2</sup>          | = <u>.07</u>    |
|                         |             |                      |                      |                 | MS <sub>e</sub>         | = <u>.17</u>    |
| <u>BINOCULAR VISION</u> | <u>204</u>  | St. Clair            |                      |                 |                         |                 |
|                         |             | Head Start           | <u>-.79</u>          | <u>.06</u>      | F                       | = <u>1.09</u>   |
|                         |             | Constant             | <u>1.41</u>          |                 | R <sup>2</sup>          | = <u>.03</u>    |
|                         |             |                      |                      |                 | MS <sub>e</sub>         | = <u>.15</u>    |
| <u>BINOCULAR VISION</u> | <u>204</u>  | Maricopa             |                      |                 |                         |                 |
|                         |             | Head Start           | <u>-.16</u>          | <u>.08</u>      | F                       | = <u>1.52</u>   |
|                         |             | Constant             | <u>2.23</u>          |                 | R <sup>2</sup>          | = <u>.04</u>    |
|                         |             |                      |                      |                 | MS <sub>e</sub>         | = <u>.24</u>    |
| <u>BINOCULAR VISION</u> | <u>204</u>  | Mingo                |                      |                 |                         |                 |
|                         |             | Head Start           | <u>-.28</u>          | <u>.07</u>      | F                       | = <u>.93</u>    |
|                         |             | Constant             | <u>1.39</u>          |                 | R <sup>2</sup>          | = <u>.02</u>    |
|                         |             |                      |                      |                 | MS <sub>e</sub>         | = <u>.19</u>    |

<sup>a</sup> Adjusted for gender, race, mother's education.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square



**CHAPTER ELEVEN**

**APPENDIX TABLES**

Table 11-1

Comparison of Evaluation Findings and those Reported in Head Start Health Records

| Head Start Records |   | Head Start Children (Samples A, B, and C) in: |             |                  |             |                 |             |              |             |           |             |
|--------------------|---|---|-------------|------------------|-------------|-----------------|-------------|--------------|-------------|-----------|-------------|
|                    |   | Greene & Humphreys Counties                   |             | St. Clair County |             | Maricopa County |             | Mingo County |             | All Sites |             |
|                    |   | Findings                                      | No Findings | Findings         | No Findings | Findings        | No Findings | Findings     | No Findings | Findings  | No Findings |
| Vision             | N | 3   | 42          | 2                | 43          | 10              | 90          | 10           | 74          | 25        | 249         |
| Agree              | n | 0   | 39          | 0                | 40          | 5               | 82          | 6            | 64          | 11        | 225         |
|                    | Z | 0.0   | 92.9        | 0.0              | 93.0        | 50.0            | 91.9        | 60.0         | 86.5        | 44.0      | 90.4        |
| Disagree           | n | 3   | 3           | 2                | 3           | 5               | 8           | 4            | 10          | 14        | 24          |
|                    | Z | 100.0   | 7.1         | 100.0            | 7.0         | 50.0            | 8.9         | 40.0         | 13.5        | 56.0      | 9.6         |
|                    |   | p < 0.632                                     |             | p < 0.699        |             | p < 0.000       |             | p < 0.000    |             | p < 0.000 |             |

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Table 11-2

HEARING PROBLEMS FOR HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|   | Greene/Humphreys |                | St. Clair |                | Maricopa |                | Mingo |                |      |
|---|------------------|----------------|-----------|----------------|----------|----------------|-------|----------------|------|
|   | HS               | NHS            | HS        | NHS            | HS       | NHS            | HS    | NHS            |      |
| ANY HEARING LOSS  | N                | 124            | 80        | 105            | 75       | 105            | 60    | 119            | 105  |
|   | n                | 16             | 14        | 15             | 11       | 7              | 4     | 16             | 9    |
|   | %                | 12.9           | 15.6      | 14.3           | 14.7     | 6.7            | 6.7   | 13.4           | 8.6  |
|   |                  | CHI SQ = 0.304 |           | CHI SQ = 0.005 |          | CHI SQ = 0.000 |       | CHI SQ = 1.336 |      |
|   |                  | DF = 1         |           | DF = 1         |          | DF = 1         |       | DF = 1         |      |
|   |                  | P = 0.581      |           | P = 0.943      |          | P = 1.000      |       | P = 0.248      |      |
| HEARING LOSS<br>IN SPEAKING RANGE<br>(500, 1000, 2000 HZ) | N                | 123            | 90        | 101            | 75       | 105            | 59    | 117            | 104  |
|   | n                | 13             | 13        | 12             | 10       | 7              | 3     | 15             | 9    |
|   | %                | 10.6           | 14.4      | 11.9           | 13.3     | 6.7            | 5.1   | 12.8           | 8.7  |
|   |                  | CHI SQ = 0.728 |           | CHI SQ = 0.083 |          | CHI SQ = 0.165 |       | CHI SQ = 0.987 |      |
|   |                  | DF = 1         |           | DF = 1         |          | DF = 1         |       | DF = 1         |      |
|   |                  | P = 0.393      |           | P = 0.773      |          | P = 0.684      |       | P = 0.320      |      |
| HEARING LOSS<br>AT 4000 HZ                                | N                | 124            | 90        | 103            | 75       | 105            | 59    | 117            | 104  |
|   | n                | 9              | 8         | 9              | 6        | 6              | 4     | 15             | 8    |
|   | %                | 7.3            | 8.9       | 8.7            | 8.0      | 5.7            | 6.8   | 12.8           | 7.7  |
|   |                  | CHI SQ = 0.190 |           | CHI SQ = 0.031 |          | CHI SQ = 0.075 |       | CHI SQ = 1.553 |      |
|   |                  | DF = 1         |           | DF = 1         |          | DF = 1         |       | DF = 1         |      |
|   |                  | P = 0.663      |           | P = 0.861      |          | P = 0.784      |       | P = 0.213      |      |
| DEFICIENCY IN<br>MIDDLE EAR<br>IMPEDANCE                  | N                | 105            | 85        | 99             | 69       | 104            | 60    | 113            | 109  |
|   | n                | 5              | 10        | 11             | 7        | 10             | 1     | 24             | 16   |
|   | %                | 4.8            | 11.8      | 11.1           | 10.1     | 9.6            | 1.7   | 21.2           | 14.7 |
|   |                  | CHI SQ = 3.168 |           | CHI SQ = 0.040 |          | CHI SQ = 3.842 |       | CHI SQ = 1.616 |      |
|   |                  | DF = 1         |           | DF = 1         |          | DF = 1         |       | DF = 1         |      |
|   |                  | P = 0.075      |           | P = 0.842      |          | P = 0.050      |       | P = 0.204      |      |

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Table 11-2 Continued

HEARING PROBLEMS FOR HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS  
BETWEEN HEAD START AND NON-HEAD START GROUPS WITHIN SITE

|   |   | Greene/Humphreys |     | St. Clair      |      | Maricopa       |     | Mingo          |      |
|---|---|------------------|-----|----------------|------|----------------|-----|----------------|------|
|   |   | HS               | NHS | HS             | NHS  | HS             | NHS | HS             | NHS  |
| OTITIS MEDIA  | N | 127              | 101 | 108            | 86   | 106            | 61  | 119            | 109  |
|   | n | 17               | 10  | 13             | 13   | 16             | 6   | 15             | 12   |
|   | % | 13.4             | 9.9 | 12.0           | 15.1 | 15.1           | 9.8 | 12.6           | 11.0 |
|   |   | CHI SQ = 0.654   |     | CHI SQ = 0.391 |      | CHI SQ = 0.936 |     | CHI SQ = 0.139 |      |
|   |   | DF = 1           |     | DF = 1         |      | DF = 1         |     | DF = 1         |      |
|   |   | P = 0.418        |     | P = 0.532      |      | P = 0.333      |     | P = 0.709      |      |
| HEARING LOSS AT<br>500 HZ AND<br>DEFICIENCY IN<br>IMPEDANCE | N | 104              | 78  | 94             | 62   | 104            | 59  | 111            | 104  |
|   | n | 4                | 6   | 7              | 5    | 4              | 0   | 13             | 8    |
|   | % | 3.8              | 7.7 | 7.4            | 8.1  | 3.8            | 0.0 | 11.7           | 7.7  |
|   |   | CHI SQ = 1.270   |     | CHI SQ = 0.020 |      | CHI SQ = 2.326 |     | CHI SQ = 0.984 |      |
|   |   | DF = 1           |     | DF = 1         |      | DF = 1         |     | DF = 1         |      |
|   |   | P = 0.260        |     | P = 0.887      |      | P = 0.127      |     | P = 0.321      |      |
| HEARING LOSS AT<br>500 HZ AND<br>OTITIS MEDIA               | N | 124              | 90  | 101            | 75   | 105            | 59  | 117            | 104  |
|   | n | 3                | 3   | 4              | 6    | 1              | 1   | 6              | 5    |
|   | % | 2.4              | 3.3 | 4.0            | 8.0  | 1.0            | 1.7 | 5.1            | 4.8  |
|   |   | CHI SQ = 0.160   |     | CHI SQ = 1.311 |      | CHI SQ = 0.173 |     | CHI SQ = 0.012 |      |
|   |   | DF = 1           |     | DF = 1         |      | DF = 1         |     | DF = 1         |      |
|   |   | P = 0.689        |     | P = 0.252      |      | P = 0.678      |     | P = 0.913      |      |

Table 11-3

Hearing Problems for Combined Groups of Head Start and Non-Head Start  
Children with Unadjusted Comparisons Among Samples Within Site

|   | Greene/Humphreys |    |      | St. Clair      |    |      | Marticopa      |   |      | Mingo          |    |      |
|---|------------------|----|------|----------------|----|------|----------------|---|------|----------------|----|------|
|   | N                | n  | %    | N              | n  | %    | N              | n | %    | N              | n  | %    |
| <b>ANY HEARING LOSS</b>                   |                  |    |      |                |    |      |                |   |      |                |    |      |
| Sample A                                  | 73               | 9  | 12.3 | 42             | 5  | 11.9 | 56             | 6 | 10.7 | 35             | 3  | 8.6  |
| Sample B                                  | 53               | 6  | 11.3 | 37             | 3  | 8.1  | 11             | 0 | 0.0  | 31             | 1  | 3.2  |
| Sample C                                  | 88               | 15 | 17.0 | 101            | 18 | 17.8 | 98             | 5 | 5.1  | 158            | 21 | 13.3 |
|   | CHI SQ = 1.162   |    |      | CHI SQ = 2.353 |    |      | CHI SQ = 2.646 |   |      | CHI SQ = 2.928 |    |      |
|   | DF = 2           |    |      | DF = 2         |    |      | DF = 2         |   |      | DF = 2         |    |      |
|   | P = 0.559        |    |      | P = 0.308      |    |      | P = 0.266      |   |      | P = 0.231      |    |      |
| <b>HEARING LOSS IN SPEAKING RANGE</b>     |                  |    |      |                |    |      |                |   |      |                |    |      |
| Sample A                                  | 72               | 6  | 8.3  | 42             | 5  | 11.9 | 56             | 6 | 10.7 | 34             | 3  | 8.8  |
| Sample B                                  | 53               | 6  | 11.3 | 37             | 3  | 8.1  | 11             | 0 | 0.0  | 29             | 1  | 3.4  |
| Sample C                                  | 88               | 14 | 15.9 | 97             | 14 | 14.4 | 97             | 4 | 4.1  | 158            | 20 | 12.7 |
|   | CHI SQ = 2.172   |    |      | CHI SQ = 0.997 |    |      | CHI SQ = 3.459 |   |      | CHI SQ = 2.319 |    |      |
|   | DF = 2           |    |      | DF = 2         |    |      | DF = 2         |   |      | DF = 2         |    |      |
|   | P = 0.337        |    |      | P = 0.607      |    |      | P = 0.177      |   |      | P = 0.314      |    |      |
| <b>HEARING LOSS AT 4000 HZ</b>            |                  |    |      |                |    |      |                |   |      |                |    |      |
| Sample A                                  | 73               | 7  | 9.6  | 42             | 3  | 7.1  | 56             | 5 | 8.9  | 34             | 2  | 5.9  |
| Sample B                                  | 53               | 2  | 3.8  | 37             | 2  | 5.4  | 11             | 0 | 0.0  | 29             | 1  | 3.4  |
| Sample C                                  | 88               | 8  | 9.1  | 99             | 10 | 10.1 | 97             | 5 | 5.2  | 158            | 20 | 12.7 |
|   | CHI SQ = 1.689   |    |      | CHI SQ = 0.887 |    |      | CHI SQ = 1.649 |   |      | CHI SQ = 3.171 |    |      |
|   | DF = 2           |    |      | DF = 2         |    |      | DF = 2         |   |      | DF = 2         |    |      |
|   | P = 0.430        |    |      | P = 0.642      |    |      | P = 0.438      |   |      | P = 0.211      |    |      |
| <b>DEFICIENCY IN MIDDLE EAR IMPEDANCE</b> |                  |    |      |                |    |      |                |   |      |                |    |      |
| Sample A                                  | 65               | 4  | 6.2  | 39             | 3  | 7.7  | 56             | 4 | 7.3  | 35             | 8  | 22.9 |
| Sample B                                  | 44               | 3  | 6.8  | 34             | 2  | 5.9  | 11             | 1 | 9.1  | 31             | 3  | 9.7  |
| Sample C                                  | 81               | 8  | 9.9  | 95             | 13 | 13.7 | 98             | 6 | 6.1  | 156            | 29 | 18.6 |
|   | CHI SQ = 0.779   |    |      | CHI SQ = 2.078 |    |      | CHI SQ = 0.182 |   |      | CHI SQ = 2.049 |    |      |
|   | DF = 2           |    |      | DF = 2         |    |      | DF = 2         |   |      | DF = 2         |    |      |
|   | P = 0.677        |    |      | P = 0.354      |    |      | P = 0.913      |   |      | P = 0.359      |    |      |

Table 11-3 Continued

Hearing Problems for Combined Groups of Head Start and Non-Head Start  
Children with Unadjusted Comparisons Among Samples Within Site

|  | Greene/Humphreys                      |    |      | St. Clair                             |    |      | Maricopa                              |    |      | Mingo                                 |    |      |
|--|---------------------------------------|----|------|---------------------------------------|----|------|---------------------------------------|----|------|---------------------------------------|----|------|
|  | N                                     | n  | %    | N                                     | n  | %    | N                                     | n  | %    | N                                     | n  | %    |
| <b>OTITIS MEDIA</b>                                  |                                       |    |      |                                       |    |      |                                       |    |      |                                       |    |      |
| Sample A   | 74                                    | 5  | 6.8  | 42                                    | 5  | 11.9 | 56                                    | 7  | 12.5 | 36                                    | 2  | 5.6  |
| Sample B   | 56                                    | 7  | 12.5 | 41                                    | 5  | 12.2 | 11                                    | 1  | 9.1  | 31                                    | 1  | 3.2  |
| Sample C   | 98                                    | 15 | 15.3 | 111                                   | 16 | 14.4 | 100                                   | 14 | 14.0 | 161                                   | 24 | 14.9 |
|  | CHI SQ = 2.983<br>DF = 2<br>P = 0.225 |    |      | CHI SQ = 0.231<br>DF = 2<br>P = 0.891 |    |      | CHI SQ = 0.242<br>DF = 2<br>P = 0.886 |    |      | CHI SQ = 5.016<br>DF = 2<br>P = 0.081 |    |      |
| <b>HEARING LOSS-500 HZ.<br/>IMPEDANCE DEFICIENCY</b> |                                       |    |      |                                       |    |      |                                       |    |      |                                       |    |      |
| Sample A   | 64                                    | 3  | 4.7  | 39                                    | 3  | 7.7  | 55                                    | 3  | 5.5  | 33                                    | 3  | 9.1  |
| Sample B   | 42                                    | 1  | 2.4  | 31                                    | 1  | 3.2  | 11                                    | 0  | 0.0  | 29                                    | 1  | 3.4  |
| Sample C   | 76                                    | 6  | 7.9  | 86                                    | 8  | 9.3  | 97                                    | 1  | 1.0  | 153                                   | 17 | 11.1 |
|  | CHI SQ = 1.708<br>DF = 2<br>P = 0.426 |    |      | CHI SQ = 1.185<br>DF = 2<br>P = 0.553 |    |      | CHI SQ = 3.166<br>DF = 2<br>P = 0.205 |    |      | CHI SQ = 1.644<br>DF = 2<br>P = 0.439 |    |      |
| <b>HEARING LOSS AT 500<br/>HZ AND OTITIS MEDIA</b>   |                                       |    |      |                                       |    |      |                                       |    |      |                                       |    |      |
| Sample A   | 73                                    | 1  | 1.4  | 42                                    | 2  | 4.8  | 56                                    | 1  | 1.8  | 34                                    | 1  | 2.9  |
| Sample B   | 53                                    | 0  | 0.0  | 37                                    | 0  | 0.0  | 11                                    | 0  | 0.0  | 29                                    | 0  | 0.0  |
| Sample C   | 88                                    | 5  | 5.7  | 97                                    | 8  | 8.2  | 97                                    | 1  | 1.0  | 158                                   | 10 | 6.3  |
|  | CHI SQ = 4.754<br>DF = 2<br>P = 0.093 |    |      | CHI SQ = 3.487<br>DF = 2<br>P = 0.175 |    |      | CHI SQ = 0.313<br>DF = 2<br>P = 0.855 |    |      | CHI SQ = 2.427<br>DF = 2<br>P = 0.297 |    |      |

Table 11-4

HEARING PROBLEMS FOR HEAD START AND NON-HEAD START CHILDREN WITH UNADJUSTED COMPARISONS  
 BETWEEN HEAD START AND NON-HEAD START GROUPS ACROSS SITE

|   | HEAD START |    |      | NON-HEAD START |    |      | CHI SQ | DF | P     |
|---|------------|----|------|----------------|----|------|--------|----|-------|
|   | N          | n  | %    | N              | n  | %    |        |    |       |
| ANY HEARING LOSS                                | 453        | 54 | 11.9 | 330            | 38 | 11.5 | 0.030  | 1  | 0.862 |
| HEARING LOSS IN<br>SPEAKING RANGE               | 446        | 47 | 10.5 | 328            | 35 | 10.7 | 0.004  | 1  | 0.953 |
| HEARING LOSS AT<br>4000 HZ                      | 449        | 39 | 8.7  | 328            | 26 | 7.9  | 0.142  | 1  | 0.706 |
| DEFICIENCY IN MIDDLE<br>EAR IMPEDANCE           | 421        | 50 | 11.9 | 323            | 34 | 10.5 | 0.333  | 1  | 0.564 |
| OTITIS MEDIA                                    | 460        | 61 | 13.3 | 357            | 41 | 11.5 | 0.580  | 1  | 0.446 |
| HEARING LOSS AT 500 HZ,<br>IMPEDANCE DEFICIENCY | 413        | 28 | 6.8  | 303            | 19 | 6.3  | 0.074  | 1  | 0.786 |
| HEARING LOSS AT 500<br>HZ AND OTITIS MEDIA      | 447        | 14 | 3.1  | 328            | 15 | 4.6  | 1.091  | 1  | 0.296 |

1398

Table 11-5

Regression Analysis of Hearing Evaluation  
Measures on Posttest Sample (A,B,C)

| Dependent Variable                            | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |  |
|---|-------------|----------------------|----------------------|--|
|   |             |                      | b                    | SE <sub>b</sub>  |
|   |             | Site                 |                      |  |
| <u>HEARING LOSS<br/>IN SPEAKING<br/>RANGE</u> | <u>683</u>  | Greene & Humphreys   | <u>.37</u>           | <u>.02</u>   |
|   |             | St. Clair            | <u>.46</u>           | <u>.02</u>   |
|   |             | Maricopa             | <u>.51</u>           | <u>.02</u>   |
|   |             | Mingo                | <u>-1.34</u>         |  |
|   |             | Program              |                      |  |
|   |             | Head Start           | <u>.98</u>           | <u>.02</u>   |
|   |             | Non-Head Start       | <u>-.98</u>          | <u>.02</u>   |
|   |             | Constant             | <u>.16</u>           |  |
|   |             | Statistics           | F = <u>1.24</u>      | R <sup>2</sup> = <u>.02</u> MS <sub>e</sub> = <u>.09</u> |
|   |             | Site                 |                      |  |
| <u>HEARING LOSS<br/>AT 4000 HZ</u>            | <u>683</u>  | Greene & Humphreys   | <u>-.69</u>          | <u>.02</u>   |
|   |             | St. Clair            | <u>.11</u>           | <u>.02</u>   |
|   |             | Maricopa             | <u>-.29</u>          | <u>.02</u>   |
|   |             | Mingo                | <u>.87</u>           |  |
|   |             | Program              |                      |  |
|   |             | Head Start           | <u>.17</u>           | <u>.02</u>   |
|   |             | Non-Head Start       | <u>-.17</u>          | <u>.02</u>   |
|   |             | Constant             | <u>.21</u>           |  |
|   |             | Statistics           | F = <u>1.80</u>      | R <sup>2</sup> = <u>.02</u> MS <sub>e</sub> = <u>.07</u> |

<sup>a</sup> Adjusted for race, sex, mother's education, family per capita income and family employment status.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square



Table 11-5  
(Continued)

Regression Analysis of Hearing Evaluation  
Measures on Posttest Sample (A,B,C)

| Dependent Variable                            | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                             |
|---|-------------|----------------------|----------------------|-----------------------------|
|   |             |                      | b                    | SE <sub>b</sub>             |
| TYMPANOGRAM                                   | 683         | Site                 |                      |                             |
|   |             | Greene & Humphreys   | <u>-.12</u>          | <u>.02</u>                  |
|   |             | St. Clair            | <u>-.53</u>          | <u>.02</u>                  |
|   |             | Maricopa             | <u>-.44</u>          | <u>.02</u>                  |
|   |             | Mingo                | <u>1.09</u>          |                             |
|   |             | Program              |                      |                             |
|   |             | Head Start           | <u>.33</u>           | <u>.02</u>                  |
|   |             | Non-Head Start       | <u>-.33</u>          | <u>.02</u>                  |
|   |             | Constant             | <u>.23</u>           |                             |
|   |             | Statistics           | F = <u>3.06</u>      | R <sup>2</sup> = <u>.04</u> |
| HEARING LOSS<br>AT 500 HZ AND<br>OTITIS MEDIA | 683         | Site                 |                      |                             |
|   |             | Greene & Humphreys   | <u>-.21</u>          | <u>.01</u>                  |
|   |             | St. Clair            | <u>.36</u>           | <u>.02</u>                  |
|   |             | Maricopa             | <u>-.27</u>          | <u>.01</u>                  |
|   |             | Mingo                | <u>.12</u>           |                             |
|   |             | Program              |                      |                             |
|   |             | Head Start           | <u>-.78</u>          | <u>.01</u>                  |
|   |             | Non-Head Start       | <u>.78</u>           | <u>.01</u>                  |
|   |             | Constant             | <u>.56</u>           |                             |
|   |             | Statistics           | F = <u>1.29</u>      | R <sup>2</sup> = <u>.02</u> |

<sup>a</sup> Adjusted for race, sex, mother's education, family per capita income and family employment status.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

1400

Table 11-5  
(Continued)

Regression Analysis of Hearing Evaluation  
Measures on Posttest Sample (A,B,C)

| Dependent Variable                                      | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                             |
|---|-------------|----------------------|----------------------|-----------------------------|
|   |             |                      | b                    | SE <sub>b</sub>             |
| OTITIS MEDIA  | 683         | Site                 |                      |                             |
|   |             | Greene & Humphreys   | <u>-.17</u>          | <u>.02</u>                  |
|   |             | St. Clair            | <u>.18</u>           | <u>.03</u>                  |
|   |             | Maricopa             | <u>.28</u>           | <u>.03</u>                  |
|   |             | Mingo                | <u>-.29</u>          |                             |
|   |             | Program              |                      |                             |
|   |             | Head Start           | <u>.21</u>           | <u>.03</u>                  |
|   |             | Non-Head Start       | <u>-.21</u>          | <u>.03</u>                  |
|   |             | Constant             | <u>.42</u>           |                             |
|   |             | Statistics           | F = <u>.93</u>       | R <sup>2</sup> = <u>.01</u> |
| HEARING LOSS<br>AT 500 HZ AND<br>TYMPANOGRAM<br>FAILURE | 683         | Site                 |                      |                             |
|   |             | Greene & Humphreys   | <u>-.75</u>          | <u>.02</u>                  |
|   |             | St. Clair            | <u>.25</u>           | <u>.02</u>                  |
|   |             | Maricopa             | <u>-.48</u>          | <u>.02</u>                  |
|   |             | Mingo                | <u>.98</u>           |                             |
|   |             | Program              |                      |                             |
|   |             | Head Start           | <u>.17</u>           | <u>.02</u>                  |
|   |             | Non-Head Start       | <u>-.17</u>          | <u>.02</u>                  |
|   |             | Constant             | <u>.14</u>           |                             |
|   |             | Statistics           | F = <u>1.59</u>      | R <sup>2</sup> = <u>.02</u> |

<sup>a</sup> Adjusted for race, sex, mother's education, family per capita income and family employment status.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square



Table 11-5  
(Continued)

Regression Analysis of Hearing Evaluation  
Measures on Posttest Sample (A,B,C)

| Dependent Variable                   | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup>          |                 | Statistics <sup>c</sup> |               |
|--------------------------------------|-------------|----------------------|-------------------------------|-----------------|-------------------------|---------------|
|                                      |             |                      | b                             | SE <sub>b</sub> |                         |               |
| Greene & Humphreys'                  |             |                      |                               |                 |                         |               |
| HEARING LOSS<br>IN SPEAKING<br>RANGE | 176         | Head Start           | <u>-.10</u>                   | <u>.04</u>      | F                       | = <u>2.03</u> |
|                                      |             |                      |                               |                 | R <sup>2</sup>          | = <u>.07</u>  |
|                                      |             | Constant             | <u>.36</u>                    |                 | MS <sub>e</sub>         | = <u>.08</u>  |
| St. Clair                            |             |                      |                               |                 |                         |               |
| HEARING LOSS<br>IN SPEAKING<br>RANGE | 176         | Head Start           | <u>-.14</u>                   | <u>.06</u>      | F                       | = <u>.56</u>  |
|                                      |             |                      |                               |                 | R <sup>2</sup>          | = <u>.02</u>  |
|                                      |             | Constant             | <u>.17</u>                    |                 | MS <sub>e</sub>         | = <u>.12</u>  |
| Maricopa                             |             |                      |                               |                 |                         |               |
| HEARING LOSS<br>IN SPEAKING<br>RANGE | 176         | Head Start           | <u>too small<br/>to enter</u> |                 | F                       | = <u>1.03</u> |
|                                      |             |                      |                               |                 | R <sup>2</sup>          | = <u>.03</u>  |
|                                      |             | Constant             | <u>.70</u>                    |                 | MS <sub>e</sub>         | = <u>.05</u>  |
| Mingo                                |             |                      |                               |                 |                         |               |
| HEARING LOSS<br>IN SPEAKING<br>RANGE | 176         | Head Start           | <u>.55</u>                    | <u>.05</u>      | F                       | = <u>.60</u>  |
|                                      |             |                      |                               |                 | R <sup>2</sup>          | = <u>.02</u>  |
|                                      |             | Constant             | <u>.13</u>                    |                 | MS <sub>e</sub>         | = <u>.10</u>  |

<sup>a</sup> Adjusted for race, sex, mother's education, family per capita income and family employment status.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

1402

Table 11-5  
(Continued)

Regression Analysis of Hearing Evaluation  
Measures on Posttest Sample (A,B,C)

| Dependent Variable            | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                       | Statistics <sup>c</sup> |      |     |
|-------------------------------|-------------|----------------------|----------------------|-----------------------|-------------------------|------|-----|
|                               |             |                      | b                    | SE <sub>b</sub>       |                         |      |     |
| HEARING<br>LOSS AT<br>4000 HZ | 176         | Greene & Humphreys   |                      | too small<br>to enter |                         |      |     |
|                               |             | Head Start           |                      | F                     | =                       | 4.88 |     |
|                               |             | Constant             | .37                  | R <sup>2</sup>        | =                       | .10  |     |
|                               |             |                      |                      | MS <sub>e</sub>       | =                       | .05  |     |
| HEARING<br>LOSS AT<br>4000 HZ | 176         | St. Clair            |                      |                       |                         |      |     |
|                               |             | Head Start           | .85                  | .05                   | F                       | =    | .47 |
|                               |             | Constant             | .12                  |                       | R <sup>2</sup>          | =    | .02 |
|                               |             |                      |                      | MS <sub>e</sub>       | =                       | .07  |     |
| HEARING<br>LOSS AT<br>4000 HZ | 176         | Maricopa             |                      |                       |                         |      |     |
|                               |             | Head Start           | -.25                 | .04                   | F                       | =    | .53 |
|                               |             | Constant             | .91                  |                       | R <sup>2</sup>          | =    | .02 |
|                               |             |                      |                      | MS <sub>e</sub>       | =                       | .06  |     |
| HEARING<br>LOSS AT<br>4000 HZ | 176         | Mingo                |                      |                       |                         |      |     |
|                               |             | Head Start           | .73                  | .05                   | F                       | =    | .63 |
|                               |             | Constant             | .15                  |                       | R <sup>2</sup>          | =    | .02 |
|                               |             |                      |                      | MS <sub>e</sub>       | =                       | .10  |     |

<sup>a</sup> Adjusted for race, sex, mother's education, family per capita income and family employment status.

<sup>b</sup> Centered without weights.

<sup>c</sup> MS<sub>e</sub> is residual mean square

Table 11-5

(Continued)

Regression Analysis of Hearing Evaluation  
Measures on Posttest Sample (A,B,C)

| Dependent Variable                   | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |             |
|--------------------------------------|-------------|----------------------|----------------------|-----------------|-------------------------|-------------|
|                                      |             |                      | b                    | SE <sub>b</sub> |                         |             |
| Greene & Humphreys                   |             |                      |                      |                 |                         |             |
| TYMPANOGRAM<br>FAILURE<br>EITHER EAR | 176         | Head Start           | <u>-.56</u>          | <u>.04</u>      | F =                     | <u>2.89</u> |
|                                      |             |                      |                      |                 | R <sup>2</sup> =        | <u>.09</u>  |
|                                      |             | Constant             | <u>.41</u>           |                 | MS <sub>e</sub> =       | <u>.04</u>  |
| St. Clair                            |             |                      |                      |                 |                         |             |
| TYMPANOGRAM<br>FAILURE<br>EITHER EAR | 176         | Head Start           | <u>.32</u>           | <u>.05</u>      | F =                     | <u>.68</u>  |
|                                      |             |                      |                      |                 | R <sup>2</sup> =        | <u>.03</u>  |
|                                      |             | Constant             | <u>.19</u>           |                 | MS <sub>e</sub> =       | <u>.08</u>  |
| Maricopa                             |             |                      |                      |                 |                         |             |
| TYMPANOGRAM<br>FAILURE<br>EITHER EAR | 176         | Head Start           | <u>.99</u>           | <u>.04</u>      | F =                     | <u>1.17</u> |
|                                      |             |                      |                      |                 | R <sup>2</sup> =        | <u>.04</u>  |
|                                      |             | Constant             | <u>.48</u>           |                 | MS <sub>e</sub> =       | <u>.06</u>  |
| Mingo                                |             |                      |                      |                 |                         |             |
| TYMPANOGRAM<br>FAILURE<br>EITHER EAR | 176         | Head Start           | <u>.61</u>           | <u>.06</u>      | F =                     | <u>.86</u>  |
|                                      |             |                      |                      |                 | R <sup>2</sup> =        | <u>.03</u>  |
|                                      |             | Constant             | <u>.28</u>           |                 | MS <sub>e</sub> =       | <u>.14</u>  |

<sup>a</sup> Adjusted for race, sex, mother's education, family per capita income and family employment status.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

1404

Table 11-5

(Continued)

Regression Analysis of Hearing Evaluation  
Measures on Posttest Sample (A,B,C)

| Dependent Variable                            | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup>          |                 | Statistics <sup>c</sup> |               |
|---|-------------|----------------------|-------------------------------|-----------------|-------------------------|---------------|
|   |             |                      | b                             | SE <sub>b</sub> |                         |               |
| Greene & Humphreys                            |             |                      |                               |                 |                         |               |
| HEARING LOSS<br>AT 500 HZ AND<br>OTITIS MEDIA |             | Head Start           | <u>.12</u>                    | <u>.02</u>      | F                       | = <u>.49</u>  |
|   |             |                      |                               |                 | R <sup>2</sup>          | = <u>.01</u>  |
|   |             | Constant             | <u>.31</u>                    |                 | MS <sub>e</sub>         | = <u>.02</u>  |
| St. Clair                                     |             |                      |                               |                 |                         |               |
| HEARING LOSS<br>AT 500 HZ AND<br>OTITIS MEDIA |             | Head Start           | <u>-.63</u>                   | <u>.04</u>      | F                       | = <u>.96</u>  |
|   |             |                      |                               |                 | R <sup>2</sup>          | = <u>.04</u>  |
|   |             | Constant             | <u>.78</u>                    |                 | MS <sub>e</sub>         | = <u>.07</u>  |
| Maricopa                                      |             |                      |                               |                 |                         |               |
| HEARING LOSS<br>AT 500 HZ AND<br>OTITIS MEDIA |             | Head Start           | <u>too small<br/>to enter</u> |                 | F                       | = <u>1.83</u> |
|   |             |                      |                               |                 | R <sup>2</sup>          | = <u>.06</u>  |
|   |             | Constant             | <u>.84</u>                    |                 | MS <sub>e</sub>         | = <u>.01</u>  |
| Mingo   |             |                      |                               |                 |                         |               |
| HEARING LOSS<br>AT 500 HZ AND<br>OTITIS MEDIA |             | Head Start           | <u>too small<br/>to enter</u> |                 | F                       | = <u>1.44</u> |
|   |             |                      |                               |                 | R <sup>2</sup>          | = <u>.03</u>  |
|   |             | Constant             | <u>.56</u>                    |                 | MS <sub>e</sub>         | = <u>.05</u>  |

<sup>a</sup> Adjusted for race, sex, mother's education, family per capita income and family employment status.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

Table 11-5

(Continued)

Regression Analysis of Hearing Evaluation  
Measures on Posttest Sample (A,B,C)

| Dependent Variable                                      | Sample Size | Factors <sup>a</sup> | Effects <sup>b</sup> |                 | Statistics <sup>c</sup> |               |
|---|-------------|----------------------|----------------------|-----------------|-------------------------|---------------|
|   |             |                      | b                    | SE <sub>b</sub> |                         |               |
| Greene & Humphreys                                      |             |                      |                      |                 |                         |               |
| HEARING LOSS<br>AT 500 HZ AND<br>TYMPANOGRAM<br>FAILURE | 176         | Head Start           | <u>-.26</u>          | <u>.03</u>      | F                       | = <u>1.61</u> |
|   |             |                      |                      |                 | R <sup>2</sup>          | = <u>.05</u>  |
|   |             | Constant             | <u>.25</u>           |                 | MS <sub>e</sub>         | = <u>.05</u>  |
| St. Clair   |             |                      |                      |                 |                         |               |
| HEARING LOSS<br>AT 500 HZ AND<br>TYMPANOGRAM<br>FAILURE | 176         | Head Start           | <u>.96</u>           | <u>.05</u>      | F                       | = <u>.31</u>  |
|   |             |                      |                      |                 | R <sup>2</sup>          | = <u>.01</u>  |
|   |             | Constant             | <u>.12</u>           |                 | MS <sub>e</sub>         | = <u>.07</u>  |
| Maricopa  |             |                      |                      |                 |                         |               |
| HEARING LOSS<br>AT 500 HZ AND<br>TYMPANOGRAM<br>FAILURE | 176         | Head Start           | <u>.44</u>           | <u>.03</u>      | F                       | = <u>.71</u>  |
|   |             |                      |                      |                 | R <sup>2</sup>          | = <u>.03</u>  |
|   |             | Constant             | <u>.53</u>           |                 | MS <sub>e</sub>         | = <u>.03</u>  |
| Mingo   |             |                      |                      |                 |                         |               |
| HEARING LOSS<br>AT 500 HZ AND<br>TYMPANOGRAM<br>FAILURE | 176         | Head Start           | <u>.52</u>           | <u>.05</u>      | F                       | = <u>.67</u>  |
|   |             |                      |                      |                 | R <sup>2</sup>          | = <u>.02</u>  |
|   |             | Constant             | <u>.13</u>           |                 | MS <sub>e</sub>         | = <u>.09</u>  |

<sup>a</sup> Adjusted for race, sex, mother's education, family per capita income and family employment status.

<sup>b</sup> Centered without weights

<sup>c</sup> MS<sub>e</sub> is residual mean square

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