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Profiles of Participants in the National School Lunch Program

Data From Two National Surveys

Constance Newman
Katherine Ralston



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Constance Newman and Katherine Ralston

Abstract

The National School Lunch Program (NSLP) serves more than 29 million children each day, but there is little information on the characteristics of those children. This study reports new estimates of NSLP participant characteristics using two national surveys: the 2001 Panel of the Survey of Income and Program Participation (SIPP) and the 1999-2002 National Health and Nutrition Examination Survey (NHANES). Study results also show that these two surveys are suitable sources of data on NSLP participants since they are consistent with more aggregated administrative data of the Food and Nutrition Service. The surveys supplement periodic characteristics data available from the School Nutrition and Dietary Assessment (SNDA) surveys.

Keywords: NSLP, participant characteristics, SIPP, NHANES

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Summary

In 2004, the National School Lunch Program (NSLP) served an average of 29 million lunches daily, at a Federal cost of \$7.6 billion. Schools are reimbursed by the U.S. Department of Agriculture's (USDA) Food and Nutrition Service (FNS) according to the number of each type of meal served.

Schools provide three payment alternatives:

- Schools provide full-price meals to any students who wish to participate and pay full price.
- Schools provide reduced-price meals to students if their household income is less than or equal to 185 percent of the Federal poverty level.
- Schools provide free meals to students if their household income is less than or equal to 130 percent of poverty or if their household receives food stamps or assistance from the Temporary Assistance for Needy Families (TANF) program.

What Is the Issue?

FNS administrative data do not include information on the demographic characteristics of school meal participants—information that could help program administrators more effectively target the program.

This study examines the demographic characteristics of students who are served by the NSLP. And it looks at whether nationally representative surveys that include NSLP data can adequately estimate participant characteristics.

The most recent FNS estimates of student characteristics were based on the School Nutrition and Dietary Assessment I (SNDA I) conducted in 1992. This study uses two more recent national surveys—the 2001 Panel of the Survey of Income and Program Participation (SIPP) and the 1999-2002 National Health and Nutrition Examination Survey (NHANES)—to present new estimates of NSLP participant characteristics.

What Did the Study Find?

We examined student participants' ethnicity, household composition, age groups, income-to-poverty groups, and household participation in other assistance programs.

- Both SIPP and NHANES suggest that free-lunch recipients are about evenly divided among White, African-American, and Hispanic participants. Within ethnic groups, Whites had the smallest share of students receiving free lunches, but they were just as likely as other groups to receive reduced-price meals.
- SIPP shows that two-thirds of participants from female-headed households received free lunches.
- Both NHANES and SIPP show that participation within each lunch payment category (free, reduced-price, and paid) was higher for children ages 8-13.

- Almost one-half of NSLP participants lived in households with incomes of 0-185 percent of poverty compared with a little more than one-third of all students, according to SIPP.
- According to SIPP, almost all students in households participating in the Food Stamp Program (FSP) or TANF received free lunches. But almost two-thirds of households with students receiving a free lunch were not participating in either the FSP or TANF.

Estimates from NHANES and SIPP are generally similar to each other. Both provide estimates that are statistically close to FNS administrative data for overall participation in free, reduced-price, and full-price lunches. Therefore, we find that these two national surveys are useful sources of data for examining participant characteristics and NSLP effectiveness.

How Was the Study Conducted?

We estimated NSLP participant characteristics from SIPP using Federal fiscal year 2001 and NHANES using calendar years 1999-2002. We tested whether the FNS administrative data were within the 95-percent confidence intervals of estimates from each of the two surveys. We compared the results of the two surveys with each other. We also compared estimates from earlier rounds of SIPP and NHANES with estimates from the 1992 SNDA I.

Introduction

In 2004, the National School Lunch Program (NSLP) served an average of 29 million lunches daily, at a Federal cost of \$7.6 billion (USDA, Food and Nutrition Service, 2005). Schools provide meals to any student who wishes to participate and pay full price. Students can receive a reduced-price lunch if their household income is less than or equal to 185 percent of the Federal poverty level.¹ Students qualify for a free lunch if their household income is less than or equal to 130 percent of poverty or if their household receives food stamps or assistance from the Temporary Assistance for Needy Families (TANF) program. Schools are reimbursed by the U.S. Department of Agriculture's (USDA) Food and Nutrition Service (FNS) according to the number of each type of meal served.

This report has two objectives: (1) to provide information on the demographic characteristics of NSLP participants and (2) to assess the quality of alternative data sources on NSLP participation. Statistics on demographic characteristics help assess how well the program is targeted for both efficiency and program access. FNS administrative data include information on the number of participants and how those numbers are distributed across the free, reduced-price, and full-price meal categories. But the administrative data do not include information about the economic and demographic characteristics of school meal participants. FNS publishes such data when available from their School Nutrition Dietary Assessments (from SNDA I in 1992 and the forthcoming SNDA III), but availability of these data is infrequent.

Two nationally representative surveys, the Survey of Income and Program Participation (SIPP) and the National Health and Nutrition Examination Survey (NHANES), are examined here as alternative sources of data on NSLP characteristics. These surveys are used by many analysts to estimate NSLP-related issues, and they are used to answer different kinds of questions: SIPP is more typically used to look at eligibility issues, and NHANES is used to look at health and nutrition outcomes. A joint comparison of results in each survey to the other and to FNS data serves both communities of users. The data from these surveys provide estimates statistically similar in magnitude to administrative data from FNS on the distribution of participants by payment type and thus can be reasonably assumed to provide reliable estimates of NSLP demographic characteristics. (See appendix for statistical comparisons of estimates from SIPP, NHANES, FNS, and SNDA I.)

SIPP, designed to measure national program participation, provides a rich set of monthly data for the same households over 3-4 years, depending on the survey panel. NHANES is another nationally representative survey that contains information about participation in the school meals programs, as well as data on nutrition and health outcomes (see box, "Data Sources"). SIPP estimates discussed here are from Federal fiscal year 2001, and the NHANES estimates are from the combined calendar years of 1999-2002. Each survey has an advantage over the other: SIPP has more detailed data on different characteristics, while NHANES has data on how often in a week a student purchased a school meal compared with SIPP data on whether the student purchased a meal in the last month.

¹We divide household income by the Federal poverty guideline, which is the threshold below which a household is considered poor. Higher thresholds apply to larger households.

Data Sources

The data sources compared here represent different approaches to measuring school lunch participation, with different definitions of participation and different reference periods. Details on data sources are provided here.

USDA Food and Nutrition Service (FNS) Administrative Data. FNS reports NSLP participation in terms of the number of lunches served, adjusted for absentees, so that reported statistics represent the average number of children considered to be participating daily. Statistics are reported monthly and annually, where annual statistics are averaged over 9 months of the school year. The number of lunches served and whether the lunches were purchased at full or reduced price or received for free are taken from individual school district reports.

School Nutrition Dietary Assessment I 1992 (SNDA). SNDA I collected data on school meal program operations from a nationally representative sample of 545 schools and dietary and demographic data from a nationally representative sample of 3,381 students attending those schools. Sample weights were

assigned in order to compensate for oversampling of schools in some size classes, as well as for differences in response rates. In-person interviewers visited 330 schools, while 215 other schools were interviewed by mail survey with telephone followup. Students were interviewed in-person for dietary intake in all surveyed schools, while demographic information on students was collected by mail survey with telephone followup.

In addition to school-level variables on NSLP operations, SNDA collects data on student characteristics, including certification status—whether the child was certified for free or reduced-price meals. Lunch participation was determined from food intake recall data. If the lunch was recorded as being obtained at school and if the intake record showed at least three of the five foods required for reimbursable lunch, the student was counted as consuming an NSLP-reimbursable lunch. Under the “offer vs. serve” provision of NSLP regulations, meals may be counted as reimbursable if the student takes at least three of the five foods.

Survey of Income and Program Participation (SIPP). SIPP is a longitudinal survey that collects detailed information on income, labor force participation, demographic characteristics, and program participation for all individuals in a sampled household. The survey has been conducted as a series of national panels since 1983, and the panels have lasted from 2½-4 years. The 2001 panel consists of 36,700 sample households and covers 3 years from October 2000 through January 2004.

Over the course of the survey, some participants chose to drop out, changing the composition of the sample. The Census Bureau provides person weights for each month in order to match the initial sample design, as well as adjusting for intentional over-sampling of some groups. We use those weights in our analysis.

In SIPP, households are asked whether any children in the household “received a school lunch in the last month,” and if the answer is yes, they are asked, how many children and whether the

lunch (or lunches) was available for free or reduced-price. The reference period for the question is the month just before the one in which the interview takes place. The survey did not ask whether the student was officially certified to receive free or reduced-price meals.

National Health and Nutrition Examination Study (NHANES).

NHANES was conducted in 1971-75, 1976-80, 1988-94, and then annually since 1999, with data currently available through 2002. Analytical guidelines recommend combining data for 1999-2002, where possible, in order to obtain adequate sample size.

The 1999-2002 NHANES had a combined sample size of 21,004 individuals, of whom 7,073 were children ages 5-18. Information on school lunch participation was collected as part of a questionnaire on nutrition behavior that was administered to participants in the NHANES Mobile Examination Center (MEC). Students were asked whether their school served a complete lunch sold at a fixed price every day, how many times per week they ate or got a

complete school lunch, and whether lunch was full price, reduced-price, or free. The time reference unit is roughly the school year in which the question is asked. Ninety-four percent of students attended schools that served the NSLP lunch, and of these, over one-half purchased the lunch every day (see table below). The survey did not ask whether the student was officially certified to receive free or reduced-price meals.

NSLP availability and participation frequency, NHANES, 1999-2002

Availability and participation frequency	Share of students
	<i>Percent</i>
NSLP availability:	
Children attend school that serves lunch	93.8
Children attend school that does not serve lunch	6.1
Participation frequency (from NSLP schools):	
Never	20.5
One time per week	6.1
Two times per week	4.7
Three times per week	5.9
Four times per week	4.1
Five times per week	58.4

Source: ERS analysis of the National Health and Nutrition Examination Study, 1999-2002.

Note: All estimates are weighted by NHANES person weights.

The question used to determine participation changed slightly for the 2001-02 survey. In 1999-2000, the survey asked, “During the school year APPROXIMATELY how many times does the sample person usually EAT a complete school lunch?” In 2001-02, the survey asked, “During the school year ABOUT how many times does the sample person usually GET a complete school lunch?”

One limitation of earlier rounds of NHANES is that the mobile examination unit did not travel to Northern States during the winter; these States were typically covered in the summer. Students or parents who were interviewed in the summer about school lunch participation during the previous school year may have given different responses than they would have during the school year. Under the continuing design begun in 1999, however, the interview schedule is designed to reduce this possible bias (National Research Council, 2005).

Although program participation is known to be underreported in national surveys, SIPP and NHANES data can provide an unbiased estimate of the share of different kinds of school meal participants by group as long as different kinds of respondents are not more or less likely to report their participation on a survey. A potential issue in both surveys is that survey respondents may incorrectly assume that they are being asked about any meal items purchased at school, including those not included in the official NSLP lunch. To the extent that such interpretations were made, the statistics for all NSLP participants and for the category of participants paying full price would be biased. NHANES tries to avoid this bias by defining a school lunch as “a complete lunch that costs the same every day” and then asking how often the respondent usually eats a “complete school lunch.” Misinterpretations are still possible, however.

Participant Characteristics From SIPP and NHANES

Table 1 shows the distribution of all students and NSLP participants by demographic characteristics in SIPP. In fiscal year 2001,² 55.2 percent of NSLP participants were White, 19.1 percent were African-American, 20.5 percent were Hispanic, 3.3 percent were Asian, and 2.0 percent were Native American, Aleut, or Eskimo. Compared with the population of all students, Whites and Asians were less likely to participate in the NSLP, while minority groups were more likely to participate.

The youngest age group, 5- to 7-year-olds, made up 21.2 percent of all NSLP participants; 8- to 10-year-olds made up 25.9 percent; 11- to 13-year-olds, 24.3 percent; 14- to 15-year-olds, 13.9 percent; and 16- to 18-year-olds, 14.7 percent. Children ages 8-13 were more highly represented among NSLP participants than among all students, and children ages 16-18 were less represented.

According to SIPP, NSLP participants were likely to have lower income relative to poverty than were all students: Almost one-half of NSLP participants (48.3 percent) had income from 0 to 185 percent of poverty compared with a little more than one-third of all students (36.3 percent).

Of all participants, 62 percent lived in married-couple households, while 7.1 percent lived in male-headed households and 30.9 percent in female-headed households. Most NSLP participants (82.3 percent) did not participate in either the Food Stamp Program (FSP) or TANF, while 11.2 percent participated in the FSP alone.

Table 2 shows the distribution of all students and NSLP participants by demographic characteristics in NHANES. Although NHANES reports how many times per week students participated in NSLP, we count all participants equally, regardless of how often they participate (table 2). The estimates without weighting for participation frequency are the most comparable to SIPP, which reports for each month whether or not individual children in the household participate. In the following comparisons to FNS data and in the appendix, however, we weight students in NHANES by participation frequency in order to obtain estimates more comparable to FNS administrative data and SNDA I.

NHANES estimates for the share of participants in each ethnic group were within 1 percentage point of SIPP estimates, except for estimates for Black students, which were about 2 percentage points lower in NHANES than in SIPP. Similarly, the share in each age group from the NHANES sample was within 1 percentage point of the share in SIPP, except for students ages 16-18. The share of NSLP participants below the poverty line in NHANES (26.2 percent) is similar to the corresponding share in SIPP (24.1 percent). Data on household composition and food stamp and TANF participation were not released in NHANES 1999-2002.

²For SIPP calculations, we calculate the average monthly characteristics over the 2001 Federal fiscal year, which began October 1, 2000, and ended September 30, 2001.

Table 1

**Characteristics of students and NSLP participants,
SIPP, fiscal year 2001¹**

Characteristics	All students, ages 5-18	All NSLP participants
	<i>Percent</i>	
Ethnicity:		
Non-Hispanic White	63.5	55.2
Non-Hispanic Black	15.2	19.1
Hispanic	15.9	20.5
Native American, Aleut, or Eskimo	1.6	2.0
Asian or Pacific Islander	3.8	3.3
Total	100.0	100.0
Age group:		
5-7	20.9	21.2
8-10	22.0	25.9
11-13	21.8	24.3
14-15	14.1	13.9
16-18	21.2	14.7
Total	100.0	100.0
Income/poverty ratio:		
0-50	6.9	9.6
51-100	10.1	14.5
101-130	6.7	9.1
131-185	12.5	15.1
186+	63.7	51.7
Total	100.0	100.0
Household composition:		
Married couple	68.8	62.0
Male householder	6.8	7.1
Female householder	24.3	30.9
Group quarters	.1	.1
Total	100.0	100.0
Other programs:		
FSP only	6.9	11.2
TANF only	.7	1.0
Both FSP and TANF	3.4	5.5
Neither FSP nor TANF	89.0	82.3
Total	100.0	100.0

NSLP = National School Lunch Program; SIPP = Survey of Income and Program Participation; FSP = Food Stamp Program; TANF = Temporary Assistance for Needy Families.

Note: All estimates are calculated with SIPP person weights.

¹Measured according to the 2001 Federal fiscal year, which is from October 1, 2000, to September 30, 2001.

Source: ERS analysis of Survey of Income and Program Participation 2001 panel.

Table 2

**Characteristics of NSLP participants, NHANES,
calendar years 1999-2002**

Characteristics	All students, ages 5-18	All NSLP participants
	<i>Percent</i>	
Ethnicity:		
Non-Hispanic White	59.2	55.3
Non-Hispanic Black	15.1	16.9
Hispanic	19.3	21.1
Other ethnicity	6.4	6.7
Total	100.0	100.0
Age group:		
5-7	20.9	20.6
8-10	22.4	26.4
11-13	23.1	24.7
14-15	15.2	14.4
16-18	17.0	13.0
19-20	1.4	.8
Total	100.0	100.0
Income/poverty ratio:		
0-50	8.4	9.6
51-100	14.6	16.6
101-130	10.1	10.4
131-185	11.9	13.0
186+	55.0	50.4
Total	100.0	100.0

NSLP = National School Lunch Program; NHANES = National Health and Nutrition Examination Survey.

Note: All estimates are calculated with NHANES person weights.

Source: ERS analysis of National Health and Nutrition Examination Survey, 1999-2002.

Participation by Payment Type: Compared Across SIPP, NHANES, and FNS Data

We compare estimates from the SIPP and NHANES with FNS statistics on average participation levels by benefit type and find that both surveys provide estimates close to FNS participation data by payment type. The FNS data are taken as the most reliable benchmark because they are derived directly from administrative data on lunches served and not subject to statistical sampling variability. Percentages are calculated from the FNS data on average daily meals served, which they adjust for student attendance. Table 3 shows average participation for each year from fiscal years 1999 to 2003 by meal type: full price (or “paid”), reduced price, or free. Almost one-half of all NSLP lunches were free (46.9-48.2 percent), and 8.9-9.5 percent were available at a reduced price, depending on the year. The remaining lunches were full price.

SIPP and NHANES participation estimates by payment type are both close to the FNS data (table 4). The SIPP estimate for free lunch participation (45.3 percent) differs from the FNS statistic for 2001 (46.9 percent) by about 2 percentage points, while the NHANES estimate for free lunch participation (46.4 percent) differs from the 1999-2002 FNS estimates by at most 2 percentage points. For reduced-price lunches, the NHANES estimate (9.2 percent) is the same as the FNS statistic for 2000 and not more than 1 percentage point different from the other years. The SIPP estimate for reduced-price lunches (10.0 percent) is less than 1 percentage point different from the FNS data for 2001 (9.5 percent). Statistical tests for the significance of these differences are presented in the appendix.

Table 3
Average NSLP participation by lunch payment type, FNS

Fiscal year ¹	Paid	Reduced-price	Free
1999	43.0	8.9	48.1
2000	43.6	9.2	47.6
2001	43.6	9.5	46.9
2002	42.9	9.3	47.5
2003	41.9	9.5	48.2

NSLP = National School Lunch Program; FNS = Food and Nutrition Service, USDA.

¹Measured according to the Federal fiscal year, which is from October 1 to September 30. For example, fiscal year 2000 goes from October 1999 to September 2000. Participation data are 9-month averages (summer months are excluded). As reported by FNS, the participation data represent average daily meals adjusted by an attendance factor of 0.927.

Source: FNS website (<http://www.fns.usda.gov/pd/slsummar.htm>)

Table 4
NSLP participation by lunch payment type, SIPP and NHANES

Survey and year	Paid	Reduced-price	Free
SIPP, Federal fiscal year 2001	44.7	10.0	45.3
NHANES, calendar years 1999-2002	44.4	9.2	46.4

NSLP = National School Lunch Program; SIPP = Survey of Income and Program Participation; NHANES = National Health and Nutrition Examination Survey.

Note: All NHANES estimates are weighted by household and by frequency of NSLP meal purchase. All SIPP estimates are calculated with SIPP person weights.

Source: ERS analysis of Survey of Income and Program Participation 2001 panel and National Health and Nutrition Examination Survey, 1999-2002.

Distribution of Payment Types Within Demographic Subgroups

Next, we look at the distribution of NSLP participants by type of benefit received within different demographic subgroups (tables 5 and 6). Both SIPP and NHANES provide information about ethnicity, age groups, and income-to-poverty groups. SIPP also provides information about household composition and participation in FSP and TANF.

The results from SIPP suggest that, among White NSLP participants, 25.5 percent received free lunches in 2001 and 9.9 percent received reduced-price lunches. The rest, 64.6 percent, received paid lunches. Among African-American NSLP participants, 65.8 percent received free lunches, while 13.0 percent received reduced-price lunches. Hispanic and Native American participants had the highest share receiving free lunches, 76.6 percent for Hispanics and 78.3 percent for Native Americans. For reduced-price lunches, 8.1 percent of Hispanic participants and 6.3 percent of Native Americans received them. Asian participants fell in the middle of the other groups: 42.6 percent received free lunches, and 9.2 percent received reduced-price lunches. All minority groups were more likely to receive free lunches than were Whites, but Whites were about as likely as others to receive reduced-price lunches.

NHANES shows a similar distribution of payment types by ethnicity as SIPP does. For the combined years of 1999-2002, 69.6 percent of African-American participants received free lunches and 10.7 percent received reduced-price lunches. NHANES shows a slightly smaller share than SIPP does of White participants receiving free lunches (24.9 percent) and reduced-price lunches (7.0 percent). NHANES estimates for Hispanics receiving free lunches is also lower (64.2 percent) but higher for those receiving reduced-price lunches (12.8 percent). NHANES does not have information on Asian or Native American participants as separate groups but has a general group, "Other Ethnicity," of whom 47.6 percent received free lunches and 10.2 percent received reduced-price lunches.

Estimates of NSLP participation by age group also differ by survey, but like ethnicity estimates, they show similar comparative rankings across characteristics within each survey. Both NSLP and SIPP show that younger participants received the highest share of free lunches and that the share declines with each older age group. SIPP estimates range from 49.6 percent for students ages 5-7 to 38.1 percent for those ages 16-18, while NHANES estimates range from 49.3 percent for students ages 5-7 to 32.7 percent for those 16-18. SIPP shows a higher share of participants ages 11-13 (11.5 percent) and 14-15 (11.4 percent) receiving reduced-price lunches than other age groups did. NHANES shows a higher share of participants ages 8-10 (10.9 percent) receiving reduced-price lunches than other age groups did.

Nearly 9 in 10 NSLP participants from poor households received free lunches according to both surveys: 87-88 percent of participants in households with income to poverty of 0-50 percent and 85-86 percent of those with income

to poverty of 51-100 percent. For households with incomes above 185 percent of poverty, 7-8 in 10 participants (72.1 percent in SIPP, 79.9 percent in NHANES) paid full price for lunches. Estimates from SIPP and NHANES diverge somewhat for the share of higher income participants receiving free lunches. But both show roughly one-half (55.3 percent in SIPP, 45.6 percent in NHANES) of participants at 131-185 percent of poverty receiving free lunches and about 1 in 10 (12.3 percent in NHANES) to 2 in 10 (17.9 percent in SIPP) above 185 percent of poverty receiving them.

Income eligibility for meal benefits is determined in SIPP by monthly income and poverty averaged over the year and in NHANES by annual income and poverty. SIPP collects the most detailed income data of any national surveys, while NHANES collects income more generally by category. This difference

Table 5

Distribution of NSLP lunch payment types by demographic characteristics, SIPP, fiscal year 2001¹

Characteristics	Paid	Reduced-price	Free	Total
	<i>Percent</i>			
Ethnicity:				
Non-Hispanic White	64.6	9.9	25.5	100
Non-Hispanic Black	21.3	13.0	65.8	100
Hispanic	15.2	8.1	76.6	100
Native American, Aleut, or Eskimo	15.4	6.3	78.3	100
Asian or Pacific Islander	48.2	9.2	42.6	100
Age group:				
5-7	41.8	8.6	49.6	100
8-10	41.5	9.8	48.7	100
11-13	44.2	11.5	44.4	100
14-15	46.9	11.4	41.6	100
16-18	53.0	8.8	38.1	100
Income/poverty ratio:				
0-50	8.8	3.9	87.3	100
51-100	9.0	5.9	85.1	100
101-130	13.4	9.7	76.9	100
131-185	26.6	18.1	55.3	100
186+	72.1	10.0	17.9	100
Household composition:				
Married couple	57.5	9.5	33.0	100
Male householder	40.5	11.0	48.5	100
Female householder	20.0	10.8	69.1	100
Group quarters	25.8	13.7	60.5	100
Other programs:				
FSP only	4.1	3.3	92.6	100
TANF only	11.3	7.1	81.6	100
Both FSP and TANF	1.8	1.0	97.2	100
Neither FSP nor TANF	53.5	11.6	34.9	100

NSLP = National School Lunch Program; SIPP = Survey of Income and Program Participation; FSP = Food Stamp Program; TANF = Temporary Assistance for Needy Families.

Note: All estimates are calculated with SIPP person weights.

¹Measured according to the 2001 Federal fiscal year, which is from October 1, 2000, to September 30, 2001.

Source: ERS analysis of Survey of Income and Program Participation 2001 panel.

may explain some of the mismatch between the eligibility categories and the types of meals received, but errors in matching students to the right benefits are known to be present. Further, students eligible for reduced-price lunches (131-185 percent of poverty) may be subsidized by State and local governments in order to receive free lunches.

Female-headed households were the most likely among household types to have participants receiving free lunches according to SIPP. More than two-thirds (69.1 percent) of participants from female-headed households, almost one-third (33.0 percent) from married-couple households, and one-half (48.5 percent) from male-headed households received free lunches. For reduced-price lunches, 10.8 percent of participants from female- and 11.0 percent from male-headed households received reduced-price lunches, while 9.5 percent of participants from married-couple households received them.

SIPP shows that FSP or TANF participants were more likely to receive free lunches than any other type of lunch. Among the FSP-only participants, 92.6 percent received free lunches while 3.3 percent received reduced-price lunches. Among participants in both FSP and TANF, 97.2 percent received free lunches and 1.0 percent received reduced-price lunches. Among TANF-only participants, however, the rate for receiving free lunches was lower, 81.6 percent. As much as 100 percent of FSP or TANF participants could have received free lunches because participation in those programs automatically certifies the household as eligible in the NSLP.

Table 6

Distribution of NSLP lunch payment types by demographic characteristics, NHANES, calendar years 1999-2002

Characteristics	Paid	Reduced-price	Free	Total
	<i>Percent</i>			
Ethnicity:				
Non-Hispanic White	68.1	7.0	24.9	100
Non-Hispanic Black	19.8	10.7	69.6	100
Hispanic	23.1	12.8	64.2	100
Other ethnicity	42.2	10.2	47.6	100
Age group:				
5-7	41.5	9.2	49.3	100
8-10	45.5	10.9	43.6	100
11-13	48.2	8.3	43.5	100
14-15	55.1	7.7	37.2	100
16-18	59.9	7.4	32.7	100
Income/poverty ratio:				
0-50	9.5	2.8	87.7	100
51-100	8.0	6.2	85.8	100
101-130	16.4	8.0	75.5	100
131-185	31.1	23.3	45.6	100
186+	79.9	7.8	12.3	100

NSLP = National School Lunch Program; NHANES = National Health and Nutrition Examination Survey.

Note: All estimates are calculated with NHANES person weights.

Source: ERS analysis of National Health and Nutrition Examination Survey, 1999-2002.

Distribution of Demographic Subgroups Within Payment Types

Both SIPP and NHANES suggest that free lunch recipients in 2001 were roughly divided equally by the three major ethnic groups: Whites (31.1 percent in SIPP, 32.6 percent in NHANES), African-Americans (27.7 percent in SIPP, 27.9 percent in NHANES), and Hispanics (34.6 percent in SIPP, 32.0 percent in NHANES) (tables 7 and 8). In SIPP, Native Americans were 3.5 percent of free lunch recipients and Asians were 3.1 percent, and in NHANES, the comparable “Other Ethnicity” category were 7.5 percent. Among reduced-price lunch recipients in SIPP, 54.5 percent were White, 24.7 percent were African-American, and 16.5 percent were Hispanic. The share of Whites among reduced-price recipients is almost the same as the share (55.2 percent) among all NSLP participants (table 1). NHANES shows a lower share of White reduced-price lunch recipients (42.8 percent) and African-American (19.9 percent) but a higher share of Hispanic (29.7 percent).

The distribution by age in SIPP of free lunch recipients is similar to the age breakdown for overall participation: 23.2 percent were ages 5-7; 27.8 percent, ages 8-10; 23.8 percent, ages 11-13; 12.8 percent, ages 14-15; and 12.4 percent, ages 16-18. Results from NHANES are mostly within 1-2 percentage points of the SIPP estimates. According to SIPP, older children are slightly more highly represented among reduced-price recipients than among free lunch recipients: 18.2 percent were ages 5-7; 25.2 percent, ages 8-10; 27.8 percent, ages 11-13; 15.9 percent, ages 14-15; and 13.0 percent, ages 16-18. NHANES estimates are more concentrated toward younger children, with 21.3 percent of reduced-price recipients ages 5-7 and 32.3 percent ages 8-10.

SIPP shows that students receiving free lunches were less likely to be from a married-couple household (45.2 percent) and more likely to be from a female-headed household (47.1 percent) than were students in other NSLP categories. Among reduced-price recipients, 58.8 percent were from married-couple households, 7.7 percent were from male-headed households, and 33.3 percent were from female-headed households.

According to SIPP, 63.4 percent of free lunch recipients did not participate in either FSP or TANF, while 22.8 percent participated in FSP and 11.9 percent participated in both FSP and TANF. Both programs have restrictions that may keep households out of either program, but that only 34.7 percent participated in FSP is somewhat surprising. Almost all of the paid (98.5 percent) and reduced-price (95.1 percent) recipients participated in neither program, as would be expected.

SIPP shows that 38.8 percent of participants receiving free lunches had income-to-poverty ratios above 130 percent—the eligibility threshold for a free lunch. NHANES estimates show 27.3 percent of free lunch recipients above 130 of poverty. Similarly, many reduced-price lunch recipients (51.7 percent in SIPP, 39.5 percent in NHANES) had income-to-poverty ratios out of the range of eligibility for reduced-price lunches. Again,

Table 7

Characteristics of NSLP participants by lunch payment type, SIPP, fiscal year 2001¹

Characteristics	Paid	Reduced-price	Free
		<i>Percent</i>	
Ethnicity:			
Non-Hispanic White	79.7	54.5	31.1
Non-Hispanic Black	9.1	24.7	27.7
Hispanic	7.0	16.5	34.6
Native American, Aleut, or Eskimo	.7	1.3	3.5
Asian or Pacific Islander	3.5	3.0	3.1
Total	100.0	100.0	100.0
Age group:			
5-7	19.9	18.2	23.2
8-10	24.1	25.2	27.8
11-13	24.0	27.8	23.8
14-15	14.6	15.9	12.8
16-18	17.4	13.0	12.4
Total	100.0	100.0	100.0
Income/poverty ratio:			
0-50	1.9	3.8	18.4
51-100	2.9	8.5	27.3
101-130	2.7	8.8	15.4
131-185	9.0	27.2	18.4
186+	83.5	51.7	20.4
Total	100.0	100.0	100.0
Household composition:			
Married couple	79.7	58.8	45.2
Male householder	6.4	7.7	7.6
Female householder	13.8	33.3	47.1
Group quarters	.1	.2	.1
Total	100.0	100.0	100.0
Other programs:			
FSP only	1.0	3.6	22.8
TANF only	.3	.7	1.8
Both FSP and TANF	.2	.6	11.9
Neither FSP nor TANF	98.5	95.1	63.4
Total	100.0	100.0	100.0

NSLP = National School Lunch Program; SIPP = Survey of Income and Program Participation; FSP = Food Stamp Program; TANF = Temporary Assistance for Needy Families.

Note: All estimates are calculated with SIPP person weights.

¹Measured according to the 2001 Federal fiscal year, which is from October 1, 2000, to September 30, 2001.

Source: ERS analysis of Survey of Income and Program Participation 2001 panel.

however, using annual data to estimate a household's monthly income at the time of application provides a rough match, and some children eligible for reduced-price lunches may have received free lunches due to State and local subsidies.

Table 9 shows the mean income-to-poverty ratios of all students and of NSLP participants by ethnic group, age group, and household composition from SIPP, which provides some context to the characteristics patterns that we see in the other tables. When considering all NSLP participants, White (non-Hispanic) student households had higher income-to-poverty ratios (4.2) compared with Black (3.3), Hispanic (3.4), Native American (3.4), and Asian (4.0). Married-couple households were better off than other types of households (4.2), while female-headed households were the least well off (3.1). Households with older students had consistently higher income-to-poverty ratios than households with younger students did, although the differences were not great. Households with students ages 16-18 had an average income-to-poverty ratio of 4.0, while households with the youngest students had an average income-to-poverty ratio of 3.7.

Table 8
Characteristics of NSLP participants by lunch payment type, NHANES, calendar years 1999-2002

Characteristics	Paid	Reduced-price	Free
	<i>Percent</i>		
Ethnicity:			
Non-Hispanic White	77.3	42.8	32.6
Non-Hispanic Black	6.9	19.9	27.9
Hispanic	10.0	29.7	32.0
Other ethnicity	5.8	7.6	7.5
Total	100.0	100.0	100.0
Age group:			
5-7	17.8	21.3	24.2
8-10	24.9	32.3	27.3
11-13	24.7	23.5	25.6
14-15	16.5	12.4	12.8
16-18	16.2	10.8	10.1
Total	100.0	100.0	100.0
Income/poverty ratio:			
0-50	2.1	3.2	19.9
51-100	3.2	12.4	34.1
100-130	4.1	9.9	18.7
131-185	9.4	35.0	14.1
186+	81.2	39.5	13.2
Total	100.0	100.0	100.0

NSLP = National School Lunch Program; NHANES = National Health and Nutrition Examination Survey.

Note: All estimates are calculated with NHANES person weights.

Source: ERS analysis of National Health and Nutrition Examination Survey, 1999-2002.

Table 9

Mean income relative to poverty of students and NSLP participants, SIPP, fiscal year 2001¹

Characteristics	All students, ages 5-18	All NSLP participants
	<i>Ratio</i>	
Ethnicity:		
Non-Hispanic White	4.4	4.2
Non-Hispanic Black	3.6	3.3
Hispanic	3.6	3.4
Native American, Aleut, or Eskimo	3.7	3.4
Asian or Pacific Islander	4.2	4.0
Household composition:		
Married couple	4.4	4.2
Male householder	4.1	3.9
Female householder	3.4	3.1
Group quarters	3.2	3.6
Age group:		
5-7	4.1	3.7
8-10	4.1	3.8
11-13	4.2	3.9
14-15	4.2	3.9
16-18	4.3	4.0

NSLP = National School Lunch Program; SIPP = Survey of Income and Program Participation.

Note: All estimates are calculated with SIPP person weights.

¹Measured according to the 2001 Federal fiscal year, which is from October 1, 2000, to September 30, 2001.

Source: ERS analysis of Survey of Income and Program Participation 2001 panel.

Conclusions

NHANES and SIPP provide useful estimates of NSLP participant characteristics. This analysis also provides a bridge across the two national surveys that are used to study different aspects of the NSLP: from eligibility issues studied with SIPP to nutrition impacts studied with NHANES. Both surveys provide estimates that are similar to available FNS administrative data for participation by payment type. The weighting of NHANES observations by reported purchase frequency results in estimates that are closer to FNS reports for distribution by payment type than observations weighted by only the NHANES population projection factors. The data on purchase frequency represent the advantage of NHANES for some purposes, while monthly data and data on additional household composition and program participation variables represent the advantage of SIPP. SIPP estimates for fiscal year 2001 were also close to FNS reports for distribution by payment type. Two limitations of these data include: (1) the possibility that survey respondents include receiving school foods that are not part of the USDA meal programs when they say that they participate, and (2) the lack of information about whether the participating students are actually certified for free or reduced-price lunches.

Both surveys suggest that free lunch recipients are evenly divided among White, African-American, and Hispanic participants, while full-price meal recipients are predominantly White, reflecting the higher average incomes for the latter group. Although Whites had the smallest share receiving free lunches, they were about as likely as other groups to receive reduced-price meals. Both NHANES and SIPP show that participation for all payment categories is higher for children ages 8-13. This finding is related to younger students being from households with lower income-to-poverty ratios, but the finding that participation is higher for younger children has also been found in studies to be linked to greater feelings of stigma and independence among older students (Glantz et al., 1994).

Additional information from SIPP shows that two-thirds of participants from female-headed households received free lunches, reflecting lower incomes in this group. About 9 in 10 participants in households receiving food stamps, 82 percent receiving TANF, and 97 percent receiving both received free lunches. But almost two-thirds of households with students receiving free lunches were not participating in either FSP or TANF. These data suggest that access to the NSLP could be expanded among participants in FSP and TANF. And there appears to be room for expanding access to FSP or TANF among the many NSLP free-lunch beneficiaries who are possibly eligible.

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Appendix: Comparing SIPP and NHANES to FNS Administrative Data and the 1992 SNDA I

Here we compare SIPP and NHANES results with FNS administrative data as a validation step. We also compare NSLP participation rates from SNDA I with 1991-94 NHANES data and 1992 SIPP data because those years best match when SNDA I data were collected (spring 1992).

Comparing SIPP and NHANES Estimates With FNS Administrative Data

We test the estimates of the distribution by payment category against FNS reports by checking whether the 95-percent confidence intervals around our estimates contain the FNS reported breakdowns. If the confidence interval does not contain the FNS statistic, the difference between the survey result and the FNS report would be considered statistically significant—that is, unlikely to be due to chance. Our confidence in the survey results would be diminished if the confidence intervals did not contain the FNS statistics.

The SIPP data are sufficiently detailed to test monthly data against FNS annual data. The results show that estimated breakdowns from SIPP traced FNS reports well on a month-by-month basis through 2001. For every month, the estimate was within the 95-percent confidence interval (app. table 1).

The NHANES estimates are tested for a 4-year average because analysis guidelines for NHANES recommend taking the 1999-2002 samples as a whole (app. table 2). NHANES estimates are produced two ways. The first set of NHANES estimates are characteristics used in the report. They are simply weighted by the projection factors supplied by NHANES. These estimates are different from the FNS reports by a statistically significant amount: The 95-percent confidence intervals do not contain the FNS reports, except for the reduced-price meals.

The second set of estimates are the NHANES estimates weighted by respondents' answers on how frequently they purchase the NSLP lunch—1-5 times per week in order to better match FNS data (i.e., in addition to using the person weights). Respondents who reported that they purchase lunch every day are counted fully, while those who purchase four times per week are weighted at 80 percent of their full NSLP projection factor, and so on, down to 20 percent of the projection factor for those who purchase once per week. This weighting is intended to account for differences in purchase frequency across payment categories and thus more closely approximate the FNS data, which are based on actual lunches purchased. The weighted breakdowns were not significantly different from the FNS statistics: The confidence intervals for these estimates do contain the FNS reports.

Appendix table 1

**Monthly NSLP participation estimates and 95-percent confidence intervals
by lunch payment type, SIPP, fiscal year 2001¹**

Monthly estimates	Paid			Reduced-price			Free		
	Mean ²	Lower bound	Upper bound	Mean ²	Lower bound	Upper bound	Mean ²	Lower bound	Upper bound
	<i>Percent</i>								
October	45.1	41.5	48.7	8.5	6.5	10.6	46.3	42.7	49.9
November	44.9	42.4	47.4	9.6	8.1	11.1	45.5	43.0	48.0
December	44.9	42.4	47.4	9.6	8.1	11.1	45.5	43.0	48.0
January	44.7	43.0	46.5	10.4	9.3	11.5	44.9	43.1	46.6
February	44.8	43.0	46.6	10.5	9.4	11.6	44.7	42.9	46.4
March	44.9	43.1	46.7	10.4	9.3	11.5	44.7	42.9	46.5
April	45.1	43.3	46.9	10.4	9.3	11.5	44.5	42.7	46.3
May	45.6	43.9	47.4	10.1	9.0	11.2	44.3	42.5	46.0
September	45.4	43.6	47.2	9.8	8.7	10.8	44.8	43.1	46.6

NSLP = National School Lunch Program; SIPP = Survey of Income and Program Participation.

¹Measured according to the 2001 Federal fiscal year, which is from October 1, 2000, to September 30, 2001.

²Bold numbers indicate that Food and Nutrition Service estimates fall within the 95-percent confidence interval for the month and payment type. The standard errors (SE) calculated here are based on the formula provided in 2/14/2005 Source and Accuracy Statement for 2001 SIPP Panel, equation (7), which is the equation for calculating the "SE of Estimated Percentages." The formula is as follows:

$$s(x,p) = \sqrt{[(b/x)*p*(1-p)]}$$

where b is a parameter provided by Census, x is the total weighted population, and p is the percentage of the weighted population of interest in the total weighted population (and $0 < p < 100$).

Source: ERS analysis of Survey of Income and Program Participation 2001 panel.

Appendix table 2

**Monthly NSLP participation estimates and 95-percent confidence intervals
by lunch payment type, NHANES, calendar years 1999-2002**

Monthly estimates	Paid			Reduced-price			Free		
	Mean ¹	Lower bound	Upper bound	Mean ¹	Lower bound	Upper bound	Mean ¹	Lower bound	Upper bound
	<i>Percent</i>								
FNS	43.2	NA	NA	9.2	NA	NA	47.5	NA	NA
NHANES, used to compare with SIPP	48.6	45.2	52.1	9.0	7.7	10.2	42.4	39.0	45.8
NHANES, weighted by purchase frequency	44.3	40.7	47.9	9.2	7.9	10.6	46.4	42.9	49.9

NSLP = National School Lunch Program; NHANES = National Health and Nutrition Examination Survey; NA = Not applicable; FNS = Food and Nutrition Service; SIPP = Survey of Income and Program Participation.

¹Bold numbers indicate that Food and Nutrition Service estimates fall within the 95-percent confidence interval. The confidence intervals were estimated using SAS "proc surveyfreq," which corrects for stratified sample design. FNS averages were computed for this 4-year period from data reported at <http://www.fns.usda.gov/pd/slsummar.htm>.

Comparing SIPP and NHANES Estimates With SNDA I Data

Characteristics of NSLP and the School Breakfast Program (SBP) participants were reported by Wemmerus et al. (1996) using data from the School Nutrition Dietary Assessment I of 1992. We compare earlier rounds of NHANES and SIPP with results from SNDA I as an additional validation step. However, school meal participation information was collected differently in the 1992 SIPP Panel and NHANES 1991-94 (also known as NHANES III, Phase 2), the years most comparable to the 1992 SNDA I. The 1992 SIPP asked whether any children in the household received school lunch and school breakfast in the last month, whether the meal was free or reduced-price, and the total number of children who received a meal. The main limitation is that the individual recipients were not identified. NHANES 1991-94 asked how often per week children received school lunch and school breakfast, but did not ask whether meals were free or reduced price, and asked only about children ages 16 or younger.

Another important difference between the surveys is that neither NHANES 1991-94 nor SIPP 1992 collected data on the certification status of students while SNDA I did. If a student is “certified” to receive a free lunch, for example, the school has evaluated his or her application and deemed the student eligible for a free lunch. Also, the definition of participation in SNDA I is more precise than that in SIPP and NHANES. Within each certification category, students were counted as participants or nonparticipants; they were participants if they ate at least three of five foods required for reimbursable lunches (because, under the “offer vs. serve” provision of NSLP regulations, meals may be counted as reimbursable if the student takes at least three of the five foods).

The other difference between the surveys is that SIPP and NHANES have more than double the sample size of SNDA I. Though SNDA I was designed explicitly to measure NSLP and SBP program participants and the other two surveys were not, its sample is much smaller in comparison. In Wemmerus et al., the total NSLP and SBP certified-free meal sample is 873 and the number of reduced-price certified students is 154. The distribution of participant characteristics is drawn from even smaller samples and may not represent certain demographic characteristics if the sample was not stratified to capture them. In contrast, 1 month in SIPP, March 1992, has a sample size of 2,154 free and 483 reduced-price “participating” students (where participation is self-reported). NHANES 1991-94 has 2,774 free and 512 reduced-price “participating” students (where, again, participation is self-reported).

Appendix table 3 gives participation rates by grade for students in NSLP-participating schools from SNDA and NHANES 1991-94. The estimates from NHANES are weighted by frequency of participation, as just explained. Participation rates from NHANES 1991-94 are higher than SNDA I results in every grade group. While weighting by frequency appears to improve the match to FNS administrative data, students may be over-reporting the number of times per week they get the school lunch. The possible bias in NHANES 1991-94 of visiting the North in the summer might contribute as well because the South has higher rates of certification for free meals than the Northeast and Midwest do. (This possible bias was corrected in later versions of the survey.)

When we compare SIPP 1992 with SNDA I, we find that the results are generally very different (app. table 4). We can compare ethnic groups and income-to-poverty groups, if we assume that those are constant across the household. In order to keep the measures at the individual level, we assume that the youngest members of the household are the ones receiving the meal benefits. The results show that, compared with SIPP, SNDA I has a higher share of Whites among all students and a lower share of minorities, especially Hispanics. Comparing both SIPP and SNDA I with ethnicity data from the Common Core Data (CCD) of America's Public Schools from the National Center for Education Statistics, the SIPP estimates are closer than the SNDA I estimates. We cannot compare SIPP 1992 with SNDA I for age groups because we do not have information on individuals in SIPP 1992. However, SNDA I age group statistics are similar to those from the CCD.

Income-to-poverty statistics are also very different for several reasons. First, methods of measuring income differ, and Wemmerus et al. note that the income is generally under-reported in SNDA I. In contrast, SIPP is generally considered the best income data available because of its comprehensiveness. Second, SNDA I data measure certified students, and certified students are more likely to have been accurately screened for eligibility, unlike SIPP students. Third, SIPP income and poverty data are monthly, and the estimates are average income-to-poverty ratios across all 1992 fiscal year months. This difference in measurement might explain some of the difference in results because SNDA I data are presumably from annual income-to-poverty data.

Given the large differences between both SIPP and NHANES and SNDA, we wondered to what extent the SNDA I estimates approximate FNS

Appendix table 3

Share of students participating in the NSLP by school grade level, SNDA I and NHANES, 1991-94

School grade level	SNDA I, NHANES,	
	1992	1991-94
	<i>Percent</i>	
1 st or 2 nd	69	75
3 rd or 4 th	66	73
5 th or 6 th	63	76
7 th or 8 th	47	68
9 th or 10 th	45	71
11 th or 12 th	35	NA
Mean participation rate	60	71

NSLP = National School Lunch Program; SNDA I = School Nutrition Dietary Assessment; NHANES = National Health and Nutrition Examination Survey; NA = Not applicable.

Sources: SNDA I from Wemmerus et al., 1996, table V.3. NHANES III phase 2 from ERS analysis of NHANES III data, calculated with NHANES person weights and frequency of participation. NHANES 1991-94 asked about NSLP participation for children ages 5-16 but not for children ages 17-19 as is done in SNDA I.

administrative data reports. FNS reports do not combine lunch and breakfast as do Wemmerus et al. But, given that we found very little difference in SIPP between the share of students receiving combined lunch and breakfast and the share receiving only lunch, we believe that they may not be that different in general. According to FNS statistics, 45 percent of all NSLP participants in 1992 received free lunches; 7 percent, reduced-price lunches; and 48 percent, paid lunches. According to SNDA I, 39 percent of all participants in 1992 received free lunches; 6 percent, reduced-price lunches; and 54 percent, paid lunches. Estimates are not possible from SIPP 1992 because of problems with the data on paid participants.

**Share of all students and NSLP/SBP participants,
SNDA I and SIPP, 1991-92**

Characteristics	NSLP/SBP participants		All students
	SNDA I, 1992	SIPP, 1992	CCD, 1991-92
	<i>Percent</i>		
All students:			
School grade level—			
1 st or 2 nd	18.4	—	18.4
3 rd or 4 th	20.9	—	17.7
5 th or 6 th	18.0	—	17.3
7 th or 8 th	15.1	—	16.5
9 th or 10 th	15.5	—	16.6
11 th or 12 th	12.2	—	13.4
Total	100.0	—	100.0
Ethnicity—			
Non-Hispanic White	74.7	68.3	67.1
Non-Hispanic Black	17.2	14.3	15.8
Hispanic	4.4	12.8	12.6
Asian, Pacific Islander	1.9	3.5	3.5
Native American, Aleut, or Eskimo	.9	1.1	1.0
Total	100.0	100.0	100.0
Income/poverty ratio—			
0-50	2.9	6.9	—
51-100	18.8	10.1	—
101-130	7.3	6.7	—
131-185	12.4	12.5	—
186+	58.6	63.7	—
Total	100.0	100.0	—
Participants certified for free lunch:			
Ethnicity—			
Non-Hispanic White	48.3	31.4	—
Non-Hispanic Black	39.3	27.8	—
Hispanic	1.0	34.2	—
Asian, Pacific Islander	1.0	1.6	—
Native American, Aleut, or Eskimo	1.4	3.3	—
Total	100.0	100.0	—
Income/poverty ratio:			
0-50	11.3	17.9	—
51-100	61.4	26.9	—
101-130	13.2	15.2	—
131-185	8.5	18.5	—
186+	5.6	21.4	—
Total	100.0	100.0	—

NSLP = National School Lunch Program; SBP = School Breakfast Program; SNDA I = School Nutrition Dietary Assessment; SIPP = Survey of Income and Program Participation; CCD = Common Core of Data for America's Public Schools; — = Not available.

Sources: SNDA I estimates are from Wemmerus et al., 1996, tables V.5a, V.6, and V.8. SIPP fiscal year 1992 estimates are from ERS analysis. The age of individual recipients was estimated with an assumption that the youngest household members were more likely to participate. Therefore, age group estimates are not available from SIPP 1992. CCD 1991-92 is from the Common Core of Data for America's Public Schools, National Center for Education Statistics (<http://nces.ed.gov/ccd/bat/>) for school year 1991-92. These data were not available for free or reduced-price meal recipients.

Estimates are not available from NHANES because NHANES does not ask for details on payment type. But the comparison of SNDA I and FNS data is not as close as we expected it to be.

We think that each of these data sources has its pros and cons. While SNDA data are probably best for many measures (such as age), SIPP and NHANES appear to have other advantages (such as representing ethnicity and income, and matching FNS statistics on payment type distribution).