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ABSTRACT

The purpose of this report is to explain the procedures by which the Chicago public schools have attempted to equalize local school per-pupil costs. It is a case study designed to illustrate what one urban school system is doing to finance equity among schools. There are five major considerations related to the program to equalize per-pupil costs: distribution of resources, development of comparable per-pupil cost data, action to equalize per-pupil costs, analysis of per-pupil cost data, and need for evaluation. Four specific programs were promoted to equalize per-pupil staffing costs: the maximum class size program, the equalization program, the Elementary and Secondary Education Act comparability program, and the moratorium on teacher transfers. Statistical analysis of the 1972-73 data is presented in an appendix. (Author/IRT)

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FINANCING EQUITY AMONG SCHOOLS IN LARGE CITIES

Chicago Public Schools: A Case Study

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Chicago Public Schools: A Case Study
Financing Equity Among Schools In Large Urban Areas

The purpose of this report is to explain the procedures by which the Chicago public schools have attempted to equalize local school per pupil costs. It is a case study designed to illustrate what one urban school system is doing to finance equity among schools.

There are five major considerations related to the program to equalize per pupil costs in the Chicago public schools:

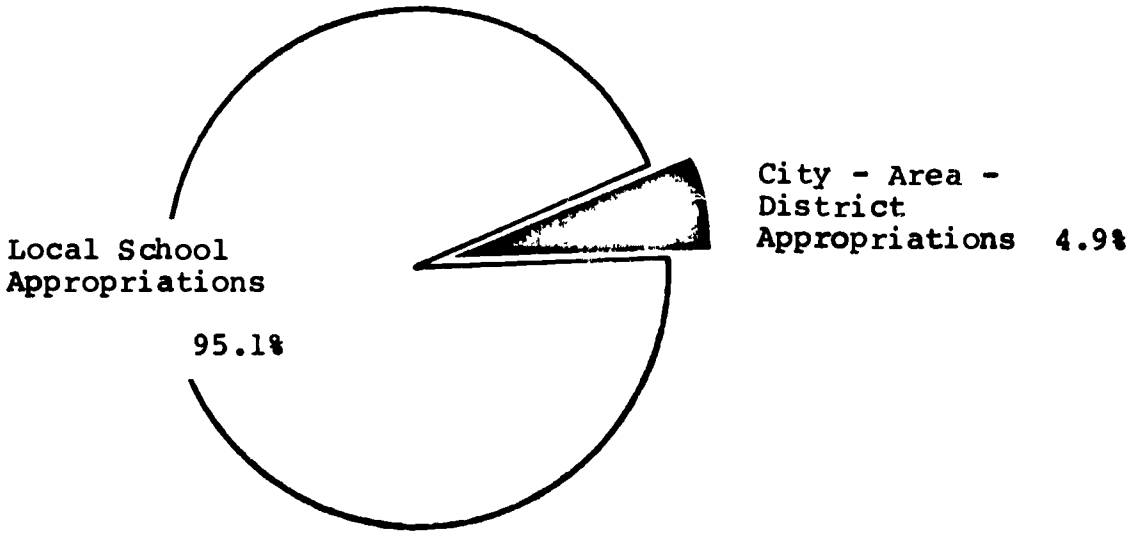
1. Distribution of Resources
2. Development of Comparable Per Pupil Cost Data
3. Action to Equalize Per Pupil Costs
4. Analysis of Per Pupil Cost Data
5. Need for Evaluation

The Board of Education of the City of Chicago has been committed to the equalization of per pupil costs long before the federal government required school districts to prove comparability of costs for eligibility to receive federal monies under Title I of the Elementary and Secondary Act; before the Office for Civil Rights, Department of Health, Education, and Welfare stipulated that equalization of professional services was one of the regulations of Title VI of the Civil Rights Act; and before court decisions on the equalization of expenditures. In Chicago a class action

civil rights claim was filed against the Board of Education and the General Superintendent of Schools in 1971 alleging that the Board arbitrarily allocated educational funds in a manner which systematically discriminated on a racial and economic basis against non-Caucasian and poor children.

Distribution of Resources

There are several major observations to be noted on the distribution of resources in the Chicago public schools. Analysis of appropriations in the final budgets which are, in fact, the educational plans of the system over the last several years consistently indicate that over 95 percent of the appropriations are at the local school level and less than 5 percent are for city-wide maintenance and support services.

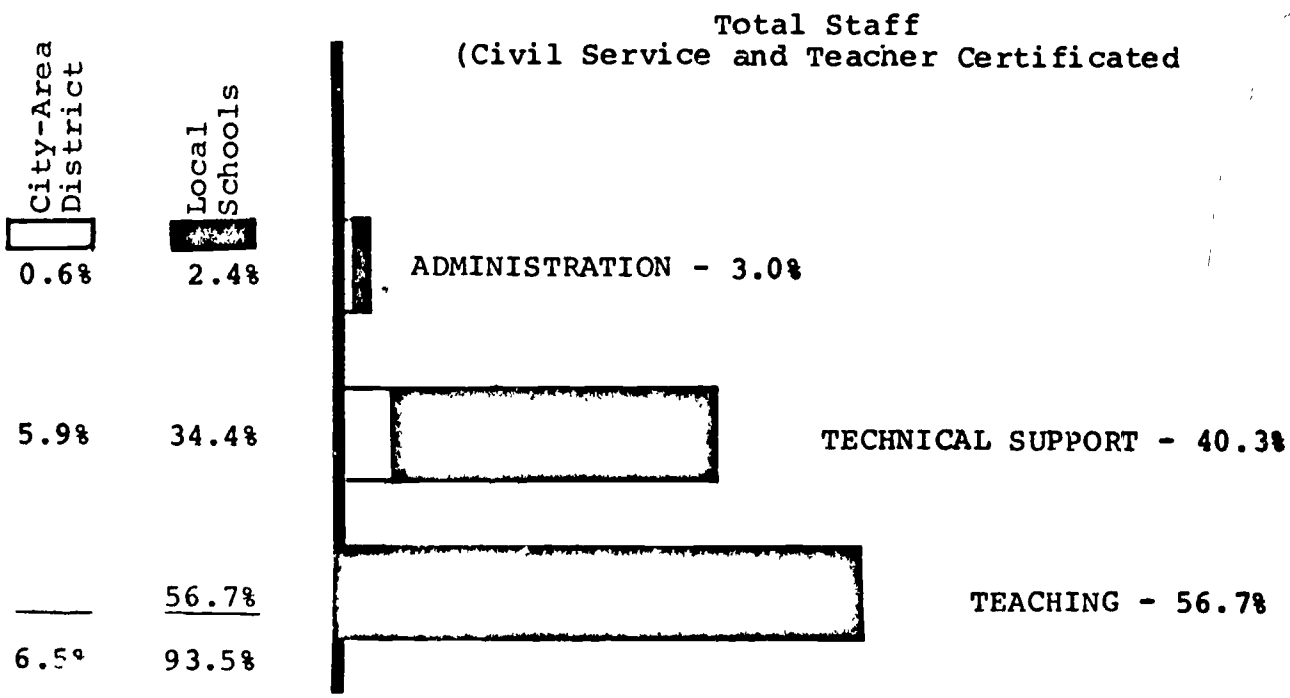


The question of financing equity in the Chicago public schools narrows on consideration of the type of appropriations at the local school level. There are six basic categories of appropriations in the budget for each school. These are appro-

priations for salaries, textbooks, supplies, furniture, educational equipment, permanent improvements and repairs.

Textbooks, supplies, furniture and equipment and educational equipment are provided to the schools on a per pupil allocation basis establishing an inherent "built-in" equity factor. Appropriations for permanent improvements and repairs are based on staff, community, and sometimes consultant review in terms of need and availability of funds. The largest percentage of funds in the Chicago public schools is expended for salaries of staff employed in the local school, determined by formula with the unions--teacher, maintenance and operating staff.

Over 93 percent of the people who work for the Chicago public schools work in the local schools providing direct services to students and/or teachers:



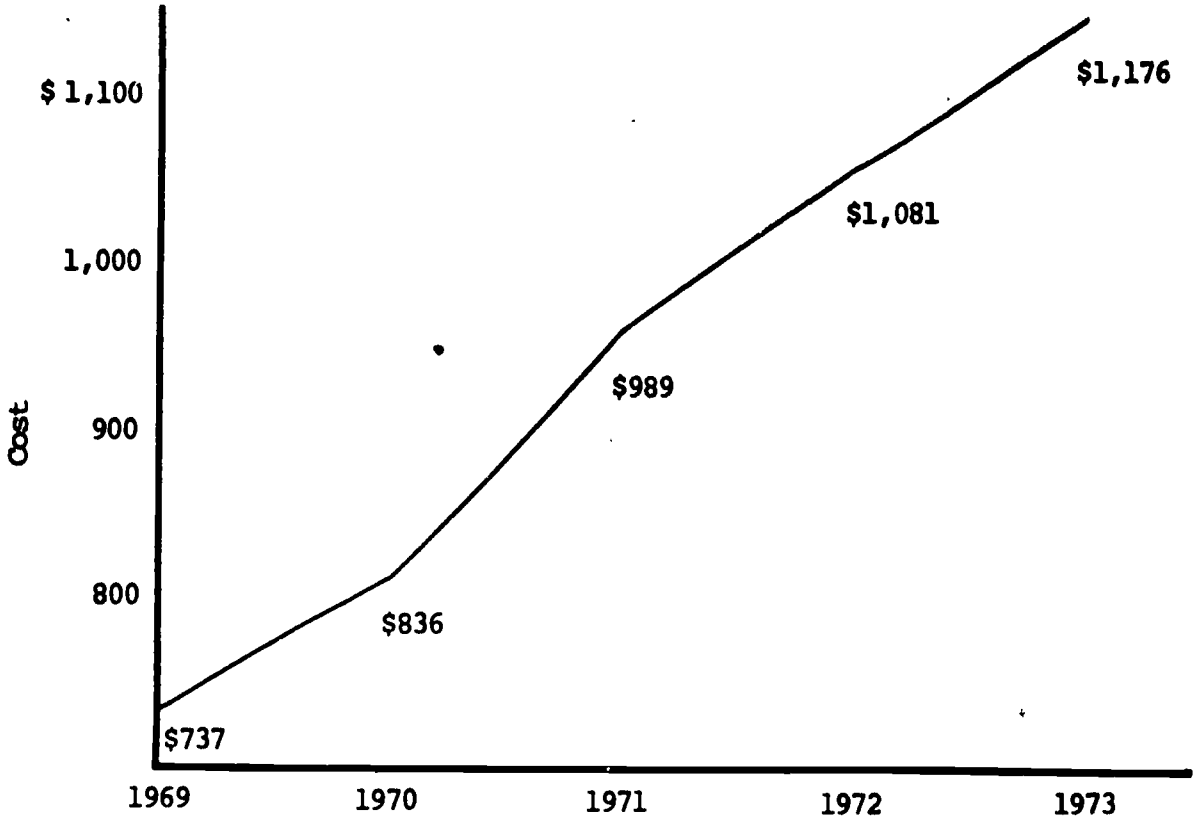
It should be noted that over 98 percent of the teaching staff work in the schools.

The significance of these data is the constraints or limitations which school districts have in financing equity among schools. Decisions which have been made in the allocation of resources either by statute, contractual agreements, or policy and modifications, in view of limited resources available, are restrictive. Staff in the Chicago public schools became acutely aware of this problem in 1969 when the Board of Education officially requested that a report be developed which would isolate expenditures on a school-by-school basis so that a "per pupil expenditure figure" could be established for each school.

Development of Comparable Local School Cost Data

As generally used, the term "per pupil expenditure" indicates the total of the direct and of the indirect costs (all other costs except those for building construction and bond redemption) of educating all of the children in the school district, divided by the number of children served.

In computing the per pupil expenditure on a school basis, the usual procedure is to determine the direct costs involved in educating the children in each school and then add to this figure for each school a percentage of all of the other costs of operating the school system (except those for building construction and bond redemption). This per pupil expenditure has increased dramatically over the last several years. See illustration following.



Per Pupil Expenditures

This accounting procedure used in determining the per pupil expenditures reflected in the above chart assumes that all of the costs not charged directly to a school are allocated uniformly to each school, which is not the case.

A. Problems

As members of the Chicago public school staff worked on the development of comparable per pupil expenditures, two problems immediately became apparent:

1. it technically was not possible to isolate and charge to an individual school all of the direct costs involved in educating the children in that school

2. numerous variables existed in individual schools which distorted the per pupil expenditures and resulted in figures which were not comparable from school to school.

The following are examples of expenditures which are not distributed equally among the schools but which, at the same time, it was not possible to isolate on a school-by-school basis so that the school could be charged with the services it used:

- teacher-nurse, attendance officer, and psychological services are provided to the schools on the basis of need but salaries are charged to the offices of the district superintendents
- some schools have lunchroom service and others do not, but the charges are to one line item appropriation and not to the schools which receive the service
- salaries for additional teachers assigned to a school because of increased enrollment subsequent to the passage of the budget were charged to a line appropriation for new teachers, not to the specific school to which the teachers are assigned
- teachers in selected inner-city schools are paid for attendance at in-service education meetings, but their salaries are not reflected in the per pupil expenditures for their schools but are charged to a specific line elsewhere in the budget
- the salaries of teachers and of other personnel involved in special programs for socially maladjusted children which has been implemented in selected schools are not charged to the school but to a special line item in the budget.

In addition to the problem of being unable to isolate certain expenditures so that they could be charged to individual schools, it also became apparent, that numerous variables exist in individual schools which distort the per pupil expenditures and resulted in pupil expenditure figures which are not comparable from school to school. For example:

- the more special education classes there are in a school, the greater the per pupil expenditure because there are more teachers for a given number of children

- when a school serves as a resource center or office for teachers who serve a large number of schools, the per pupil expenditure level for the school will be abnormally high if the salaries of the itinerant teachers are charged to the school

- high school branches which share buildings with elementary schools are likely to show low per pupil expenditures because the elementary school rather than the high school branch is charged for all of the custodial and maintenance salaries and supplies

- schools with Government Funded programs which operate within the school day are likely to have inflated per pupil expenditures in relation to the expenditure level for other schools

- the inclusion of monies spent for such major permanent improvement items as toilet or electrical rehabilitation also distort per pupil expenditures since these are one-time expenditures and are not related to the program of education in the same way that teachers' salaries or textbooks are related.

Thus, variables which exist from school to school make it difficult to secure per pupil expenditure figures which may be compared with one another to determine whether or not some schools are receiving less or some schools more of the funds available for education.

It became apparent that an improved instrument for decision making in relation to per pupil expenditures had to be developed. Since over 80 percent of the total operating fund is expended for salaries, and in working with the data it became obvious that, in spite of many variables, it is the differences in the salary levels in a school which determine whether the per pupil expenditure is

high, low, or average, it was determined that salaries could be used as the basis for calculating per pupil costs which would be comparable from school to school.

Thus, the Chicago public schools developed "per pupil staffing" costs -- the cost assigned to each student for the salaries paid to Board of Education funded professional staff who serve the students in regular classroom on a full-time or part-time basis. These per pupil staffing costs may be compared from school-to-school because they were derived in the same way.

B. Procedures Used To Compute Per Pupil Staffing Costs

Classroom teacher and auxiliary teacher costs are the basis for the calculation of per pupil staffing costs in the Chicago public schools which are presented in three components:

1. classroom teachers--the salary for the second pay period in October, extended at the same rate for the school year, with adjustments for two weeks of vacation pay, for all Board of Education funded classroom teachers reported by the principal on his organization report, divided by the number of children in membership

2. auxiliary teachers--a proportion of the salary of Board of Education funded staff members in the five classifications listed below, assigned to the local school for the second pay period in October, extended at the same rate for the school year with adjustments for two weeks of vacation pay, divided by the number of children in membership

    - administrators--principals and free assistant principals
    - adjustment teachers/counselors
    - physical education teachers
    - teacher librarians
    - other ancillary staff not counted in the pupil-teacher ratio

3. total costs--the cost for classroom teachers plus the cost for auxiliary teachers as indicated.

In order to determine the fraction of each salary to be assigned to auxiliary costs, a separate formula was developed for each of the categories and applied uniformly to the salaries of all members of that category. The rationale underlying each of the formulas was based on the proportion of time that members of a category might typically be expected to spend serving students in various levels, excluding that proportion of time devoted to special education and kindergarten.

Action To Equalize Per Pupil Staffing Cost

As per pupil staffing cost figures which were comparable from school to school became available and were analyzed, the Board of Education took steps to equalize staffing costs to the extent that funds were available.

The first step toward this goal was taken in 1970 in connection with the implementation of a maximum class size clause in the agreement with the Chicago Teachers Union. In selecting the elementary schools where class size was to be lowered, consideration was given to the schools with the lowest per pupil staffing costs and these schools were selected to receive the additional teachers if space was available to make it possible to actually lower class size and if the schools also had large numbers of underachievers and high mobility, or were in changing communities. The availability of space to actually lower class size, however, was found to be a major deterrent to implementing this program in such a way that it had the maximum effect on

per pupil staffing costs in the low ranking schools, and, in some instances, schools with higher costs had to be designated because of the "no space" problem.

In 1971 two specific and more effective programs were implemented to move at a more rapid rate toward the equalization of per pupil staffing costs in the elementary schools through increasing the level of staffing--that is, the number of teachers in relation to the number of students.

- maximum class size program: agreement was reached with the Chicago Teachers Union so that elementary schools with the lowest per pupil staffing costs, based on the 1970-71 ranking, received first priority in the designation of maximum class size schools even though they did not have space in which to establish actual classes of smaller size
- equalization program: additional teachers were assigned to elementary schools where the per pupil staffing costs continued to be low in spite of the staff added because of designation of the schools as maximum class size schools.

In connection with each of these programs, guidelines were developed so that the teachers added would be utilized to improve the instructional program with emphasis on reading and on the teaching of children whose first language was not English.

However, in 1973 all elementary schools were placed on the maximum class size program thus eliminating one procedure by which the Board of Education was able to equalize per pupil costs. The equalization program has continued. The following graph shows the total amount of Board of Education funds which have been directed toward the equalization of per pupil staffing costs.

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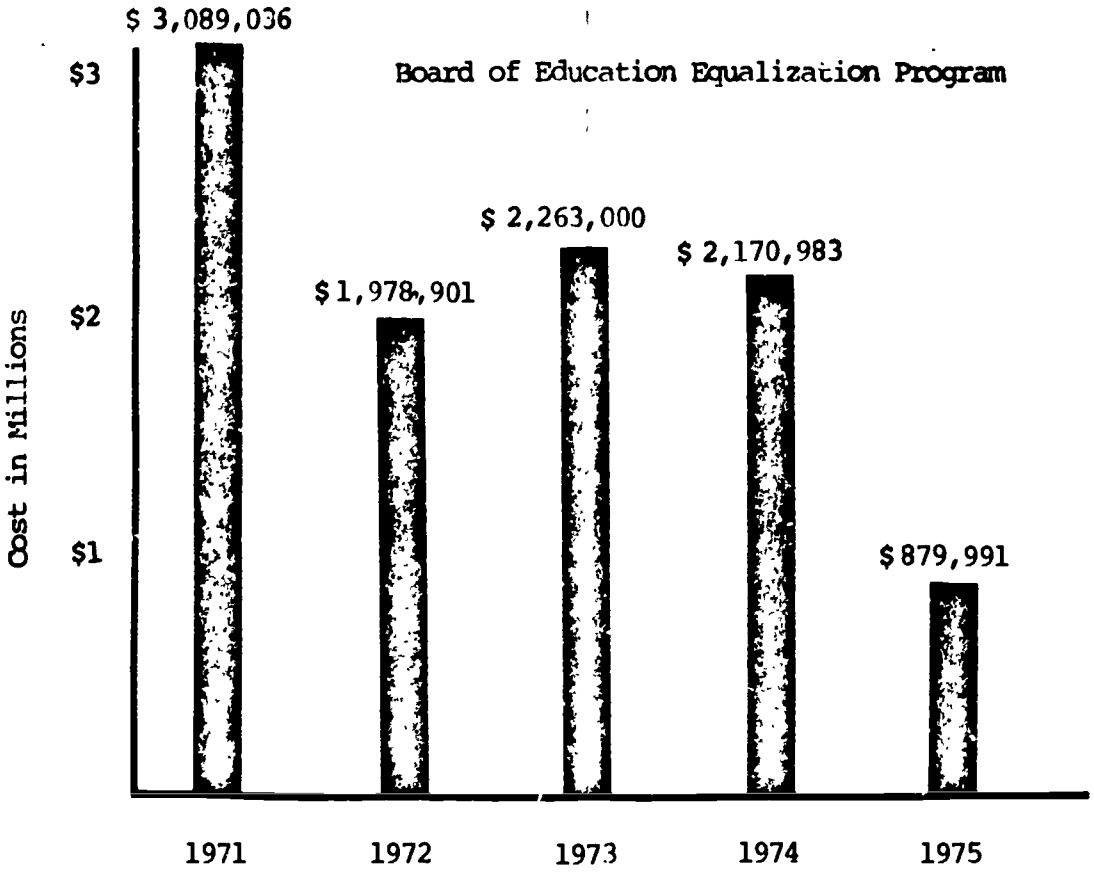


A third program pointed toward equalizing per pupil staffing costs through increasing the level of staffing is that termed the "ESEA comparability program." The ESEA guidelines require that Title I participating schools have equal or lower pupil-teacher ratios and equal or higher per pupil instructional costs than the average for non-Title I schools, within five percent.

An additional program which affects the per pupil staffing costs in the Chicago public schools is the moratorium on the teacher transfer list which was negotiated with the Union for the 1970-71 and 1971-72 school years. To be particularly noted is the fact that the moratorium on the transfer list affects per pupil staffing costs not by altering the level of staffing, but rather by altering the distribution of experienced and inexperienced teachers.

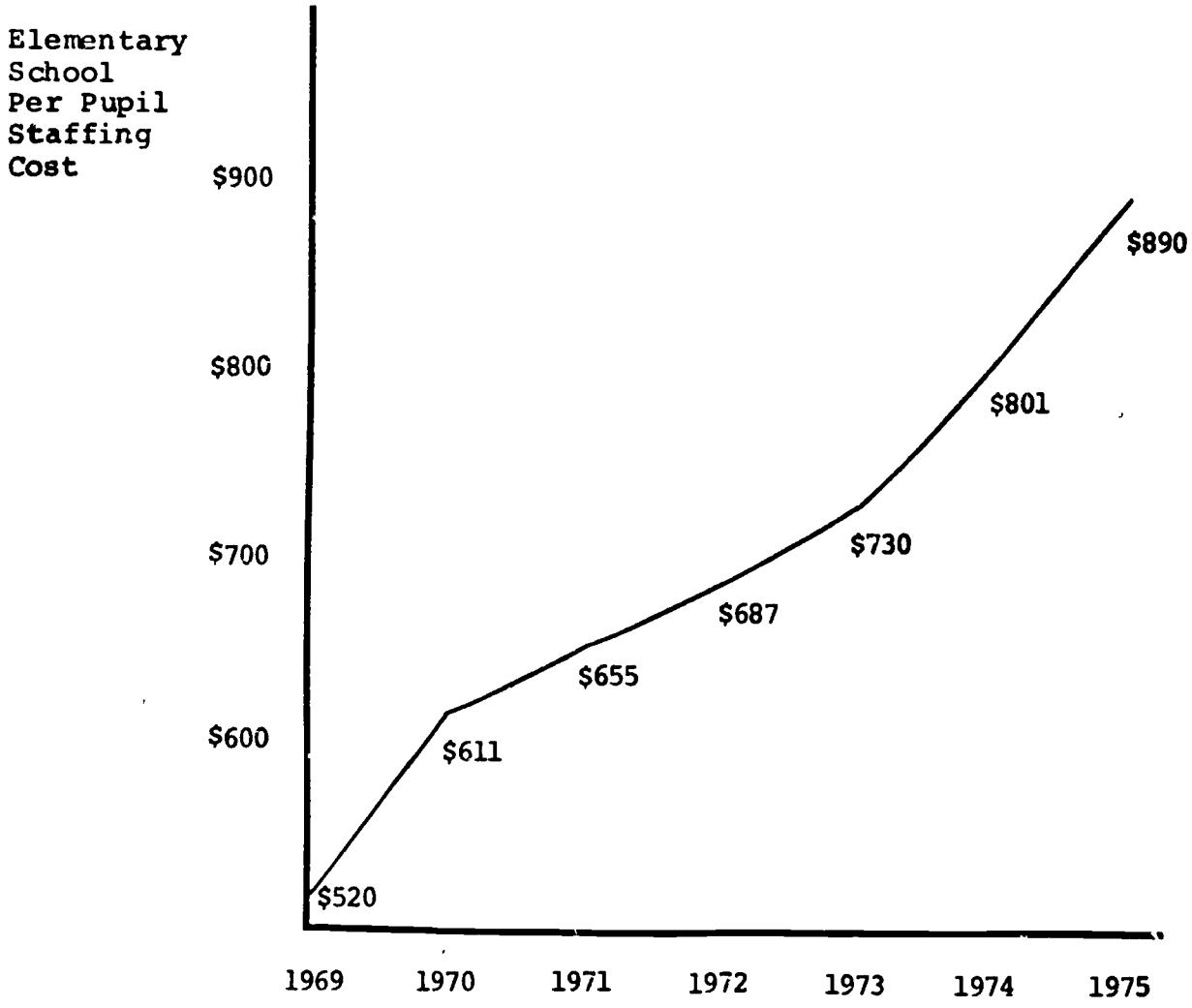
Under the transfer moratorium no regular transfers of teachers of a voluntary nature from one school to another within the school system were effected in September of 1971 or in 1972, the usual time for teacher transfers. Instead, the vacancies to which these more experienced teachers would have been transferred if there were no moratorium were filled, for the most part, by teachers new to the school system, most of whom were in the lower range of the salary schedule; and, at the same time, more experienced teachers were retained in schools from which they might normally transfer.

Thus there was a tendency toward lower per pupil staffing costs in schools which usually received transfers in vacancies created by attrition or membership growth, and, on the other hand, a tendency toward higher per pupil staffing costs in schools from which, were it not for the moratorium, more experienced teachers would be transferring to be replaced by teachers lower on the salary schedule. The moratorium on transfers was "partially lifted" in 1973 but has been reestablished for a three year period beginning in September, 1976.

Thus, there are four specific programs in the Chicago public schools which have promoted the equalization of per pupil staffing costs:

- the maximum class size program
- the equalization program
- the ESEA comparability program
- the moratorium on teacher transfers

The median per pupil staffing costs has increased during the last seven years particularly in the elementary schools:



4. Analysis of the Data

Basic Factors Affecting Per Pupil Staffing Costs

Study of the cost data indicate, that variations in staffing costs from school to school are the result of two basic factors:

- the educational preparation and experience of the teachers, as indicated by their lane and step on the salary schedule

- the level of staffing (number of teachers) in the classroom and in the auxiliary areas in relation to the number of students.

The effect of the educational preparation and experience of teachers on the per pupil staffing costs for both classroom teachers and auxiliary teachers is easily understood in view of the salary schedule of 15 steps related to experience and four lanes related to education--the more experienced the teachers in a school are and the better educated they are in terms of advanced degrees and courses, the higher their salaries are and, given a comparable level of staffing, the higher the school's per pupil staffing costs are.

The effect of the level of staffing of per pupil staffing costs is also well understood, but the reasons for variations in the level of staffing from school to school are less evident.

The reasons why one school may have more classroom teachers than another school differ but would include the following:

- a school may have a very small enrollment and may need to operate at a low pupil-teacher ratio, with possibly a resulting high cost, in order to avoid having too wide a range in age or grade groups in one classroom

- one school may be near the upper limit of the pupil-teacher ratio range, with possibly a low per pupil cost, but if it were to have one teacher more, it would be under the accepted ratio range; conversely, another school may be at the lower limit of the range with possibly a high per pupil staffing cost, but if it were to have one position less, it would have a pupil-teacher ratio above the accepted range

- a school may be a maximum class size school, or it may have had teachers added to move toward equalization of its staffing costs or to achieve ESEA comparability, and thus may have more teachers for the same number of children than does another school

- some school have classrooms which accommodate fewer than the usual number of children and thus require a larger number of teachers for the same number of children than do schools with standard size classrooms.

The reasons why some schools may have more auxiliary teachers than others also vary, but include the following:

- some schools have special needs which are met by the assignment of auxiliary staff not found in all schools--for example, some schools have large numbers of children whose first language is not English and may have one or more teachers assigned to work with these children; some schools have large numbers of inexperienced teachers and may have resource or master teachers to work with the new teachers

- some schools are participants in new or experimental programs and have auxiliary teachers working in these programs--for example, the schools participating in the intensive reading program or the magnet or the READ schools

- some schools utilized the maximum class size, the equalization positions, or the comparability positions assigned to them for auxiliary teachers

- one school may be at the lower end of the acceptable range for the assignment of physical education and library teachers while another is at the upper end of the range and if it had even one more classroom of students, it would have an extra half-time teacher in one of the areas or in each of the areas

- small schools, generally speaking, have higher auxiliary costs than large schools, because there are some standard services which are provided for even limited numbers of children

- schools with branches frequently have high auxiliary costs because physical education and library teachers require travel time as well as time in each building for such things as the safety patrol, book cataloging and the like.

The effects of the Board policies to equalize costs depends on the extent to which the various factors listed above are operating to create differences between per pupil staffing costs. By studying the results of the interactions of the Board policies and various other factors which affect per pupil staffing costs, it is possible to gain some insights into the characteristics of the schools with low per pupil costs.

B. School Data

In general, the schools with the lowest per pupil cost are in areas where the population is shifting at an above average rate, those which are experiencing or have recently experienced large increases in membership, and those which tend to be larger than average in membership.

Summarized briefly, the per pupil staffing cost data indicates the following:

- there is little difference between the means of the per pupil staffing costs of the ethnic groups studied
- when the schools are ranked from lowest to highest according to per pupil costs, there are fewer low ranking predominantly white schools and predominantly black schools than would be expected if the per pupil staffing costs were evenly distributed across schools in all five ethnic groups. There are however significantly more low ranking predominantly white schools than there were in the two previous years for which an analysis was made. The disproportionately small number of low ranking predominantly black schools is a new phenomenon
- the mean and median for ESEA schools are slightly larger than those for non-ESEA schools and there are relatively fewer ESEA schools at the lower end of the distribution of costs and more at the upper end but the differences are not significant.

These observations are based on the ongoing analysis of the per pupil staffing cost data. Included as an appendix to this report is a detailed statistical analysis of the 1972-73 data. This analysis was presented to the Board of Education three years after it initiated its equalization program. The program is now in its seventh year.

NEED FOR EVALUATION

There have been several positive results of the equalization program in the Chicago public schools. However, these results have been related to the management and administrative policies in the Chicago public schools.

In 1969 the U. S. Department of Justice notified the Chicago Board of Education that it was in violation of the Civil Rights Act of 1964 because of its policies and practices of faculties and staff assignments. In addition to the complaint related to the racial/ethnic composition of faculties, the Board was charged with depriving minority children of their rights because a disproportionate number of new, inexperienced, less educated, and non-certificated teachers were assigned to schools with predominantly minority children.

By mutual request of the Chicago Board of Education and the Department of Justice, the Department of Health, Education and Welfare prepared a plan for faculty desegregation and equalization. A major goal of that plan was the equalization of per pupil expenditures. The Board of Education was able to "dovetail" its own program for equalizing per pupil staff costs with the recommendations of the Department of Health, Education and Welfare.

In addition, the Board's equalization program helped meet the requirements of the federal government that Title I participating schools have equal or higher per pupil instructional costs than non-Title I schools.

In 1971, a class action civil rights claim was filed against the Chicago Board of Education and the General Superintendent of Schools alleging that the Board arbitrarily allocated additional funds in a manner which systematically discriminated on a racial and economic basis against non-caucasian and poor children. The court dismissed the complaint against the Chicago Board of Education and found in part that the Board's corrective measures, specifically the equalization program, made injunctive relief unnecessary.

On October of 1975, the Office for Civil Rights, Department of Health, Education and Welfare, informed the Board of Education that it was not in compliance with Title VI of the Civil Rights Act of 1964. One of the requests by the Office for Civil Rights was for the Chicago public schools to equalize professional staff services in the local schools. On February 8, 1976, the Board responded to the request from the Office for Civil Rights for a plan to comply with the regulations of Title VI. Included in the plan was the commitment to continue the equalization program and thereby provide for the equalization of professional staff services.

The Board of Education of the city of Chicago is committed to the provision of equal educational opportunity for each and every child. The equalization program is one method by which

this commitment is being fulfilled. However, there is a great need to examine what the effect of this program has been on the improvement of instruction and achievement. Have the additional teachers who have been assigned to schools with low per pupil costs made a difference on the achievement levels in those schools? Basic to this question, of course, is whether or not students in schools with low per pupil costs are, in fact, being deprived of equal educational opportunities. These questions need to be answered and we are currently attempting to provide evaluative data to support the continuation of the equalization program in Chicago.

FINANCING EQUITY AMONG SCHOOLS IN LARGE CITIES

Chicago Public Schools: A Case Study

APPENDIX

Statistical Analysis of 1972-73 Data

Presented by
Joan M. Raymond
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The purpose of this report is to:

- to study the degree to which the 1972-73 programs to equalize per pupil staffing costs affected differences in the cost between schools of various racial and ethnic composition

- to study the degree to which the 1972-73 Board programs to equalize per pupil staffing costs affected differences in the costs between ESEA and non-ESEA schools. In this case, ESEA participation is used as the criterion for dividing the schools into two economic groups. It should be noted that the rationale for determining costs in this study differs from that set forth in ESEA comparability guidelines so that no comparisons can be made between the results obtained herein and those in the ESEA comparability report

- to study the degree to which the 1972-73 programs succeeded in raising the per pupil costs of schools which were low in 1971-72

- to study the degree to which the 1972-73 programs succeeded in reducing the variations in costs between schools

- to study the 87 schools whose total per pupil staffing costs in 1972-73 fall in the lowest quintile (lowest 20 percent). It is hoped that by studying the factors affecting the costs in these schools procedures and policies can be instituted which would prevent the per pupil staffing costs of these types of schools from deviating radically from the median per pupil staffing cost.

As was done in the July, 1972 report, the schools[1] were divided into five groups according to the racial and ethnic composition of each school's students:

- predominantly black--90 percent or more black

- other plurality black--other schools where blacks were in plurality

- predominantly white--90 percent or more white

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[1] Excluding the Disney Magnet and Black Mini-magnet schools

- other plurality white--other schools where the whites were in plurality
- plurality Latin[1]--schools where Latins were in plurality.

A comparison of the 1971-72 and 1972-73 data indicates that due to two salary increases, one of 5.5 percent in 1972 and one of 2.5 percent in 1973, the mean per pupil staffing costs were larger in 1972-73 than in 1971-72 for all five groups (see Table 1, page V-17). However, the size of the gains varied from group to group. The gains occurred in the following order from largest to smallest--plurality black ($71.32), plurality white ($43.87), predominantly black ($41.25), plurality Latin ($36.39), and predominantly white ($30.25). As was the case last year, the smallest gain was made by the predominantly white schools. This is a desirable outcome in terms of equalizing costs because, in at least the past several years, the mean of the predominantly white group was the highest of all the groups. Consequently, as a result of this relatively small gain by the predominantly white schools, the differences between the means of the predominantly white group and other groups have been reduced. The large gain in the mean of the plurality black schools is misleading because the large cost for the Haven ($1619.51), a very small school, contributes heavily to the mean and distorts it as a good measure of the overall average (central tendency) for this category.

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[1]The term "Latin" for purposes of this report designates schools in which there is a plurality of Spanish surnamed children enrolled.

The difference between the means of the predominantly black schools and the predominantly white schools is only $5.55, an inconsequential amount. This difference is only 1.0 percent of the predominantly black mean, whereas, last year it was 3.4 percent and the year before, 8.3 percent.

It should be noted that when the positions added by the Board to equalize per pupil staffing costs are not included in the computations, the mean for predominantly black schools is $526.06 and for predominantly white schools is $539.17. The difference between these two means is $13.11, which is not a large difference, but nevertheless of some importance. Thus, one of the effects of the direct effort by the Board to equalize per pupil staffing costs by adding positions can be seen herein, i.e., the difference between the black and white means is $5.55 with the equalization positions, but without these positions it would have been $13.11.

The schools with the lowest means for both years have been classified as "other plurality white." However, for both years, the plurality Latin schools have the lowest median. The reason for the large differences between the means and medians for the plurality Latin schools lies in the manner in which the costs are distributed; there are a number of high cost plurality Latin schools, but relatively few plurality Latin schools in the middle of the distribution.

The distribution of the Latin schools indicate that, as well as observing the means and medians of each group, it is equally important to study how the costs

of the schools in each group are distributed in relation to the costs of all the schools. To this end, the schools were grouped in quintiles according to their rank in 1971-72 and in 1972-73 and Table 3, page V-18 shows how many schools in each of the five ethnic groups fall into each quintile.

Before proceeding with a discussion of the distributions, it is worth noting that if the per pupil staffing costs for the five groups were evenly distributed, then there would be approximately 20 percent of each group in each quintile.

In spite of the fact that the number of predominantly white schools had decreased from 93 to 90 between the school years 1971-72 and 1972-73, the number of predominantly white schools in the lowest quintile has increased from 7 to 10; the percent of predominantly white schools in the lowest quintile was 7.5 percent in 1971-72 and is 11.1 percent in 1972-73.

At the same time, the percent of predominantly black in the lowest quintile decreased from 20.6 percent to 16.8 percent, the plurality Latin decreased slightly from 30.8 percent to 28.9 percent, the plurality white increased slightly from 25.6 percent to 26.6 percent and the plurality black increased from 26.9 percent to 40.0 percent.

In the highest quintile, all groups moved in the desired direction toward a value of 20 percent. The predominantly white went from 28.0 percent to 22.2 percent, the plurality white, from 14.6 percent to 19.0 percent, the predominantly black from

18.5 percent to 19.8 percent, the plurality black from 30.8 percent to 24.0 percent, and the plurality Latin from 12.8 percent to 15.6 percent.

An examination of the distribution of schools within each ethnic group reveals that: the predominantly white group is above the expected value of 20 percent in the top three quintiles with a heavy concentration in the third quintile; the plurality white group has a heavy concentration in the bottom quintile and is particularly light in the fourth quintile; the distribution of the predominantly black schools is fairly even with the exception that there are too few schools in the bottom quintile; the plurality black group has a heavy concentration at the top and bottom, but it is light in the second and third quintiles; and the plurality Latin has a heavy concentration in the bottom two quintiles.

In general, the ranks of the per pupil staffing costs of the schools are more evenly distributed across ethnic groups in 1972-73 than they were in 1971-72.

Table 2, page V-17 shows the means for three groups when the "predominantly white" and "other plurality white" categories are combined into a single "plurality white" category, and "predominantly black" and "other plurality black" are combined to form a "plurality black" category. The data would seem to indicate that in 1972-73 the plurality black has the highest mean, but this category includes the Haven school which has a very high per pupil cost. Without the Haven school, the mean for the

plurality black is $532.59. A comparison of this mean with the means for the plurality white, $532.22, and for the plurality Latin, $533.71, indicates that there is no essential difference between the means.

The general conclusion is that the differences between the overall averages (central tendency) for the different ethnic groups are now negligible, but differences still exist in the distribution of the ranks within each group. However, this situation has improved between 1971-72 and 1972-73 in that there are fewer predominantly white schools in the higher two quintiles and more in the lower two quintiles. There is no evidence to indicate that the uneven distribution in the ethnic groups is related to race since the plurality white as well as the plurality black and plurality Latin have a disproportionately high number of schools in the lower quintiles while the predominantly white and predominantly black have a disproportionately low number of schools. The factors affecting the costs for the schools in the lowest quintile will be discussed in greater detail later in this section.

The mean difference in per pupil staffing costs between ESEA schools and non-ESEA schools is $13.06 with the ESEA schools having the higher mean. (Table 5, page V-19). The median per pupil cost of the ESEA schools is higher than that of non-ESEA schools. In the distribution of school per pupil staffing costs by quintiles, the ESEA schools have proportionately fewer cases in the lowest and highest quintiles than they do in the three middle quintiles whereas the non-ESEA schools seem to be distributed fairly evenly throughout. (Table 4, pages V-19).

Differences between the ESEA and non-ESEA groups are not significant both in terms of measures of the central tendency and of the form of their distributions.

Turning to the effects of the Board's programs for improving the status of the schools with the lowest per pupil costs, of the lowest 100 ranked schools in 1971-72 which could be matched with 1972-73 data, 70 were relatively closer to the median in 1972-73 (as measured by the percentage of deviation from the respective medians of per pupil staffing costs for each of the years).

For the lowest 100 ranked schools in 1971-72 which could be matched with 1972-73 data, the 1972-73 per pupil costs of 62 schools were closer to the median in 1972-73 than their 1971-72 costs were to the median in 1971-72. This is especially important since if only the increase in salary due to the two across-the-board raises was operating to affect changes in costs, the schools should have been further from the median in 1972-73 than they were in 1971-72. Since 62 of the 100 are closer, it is apparent that other favorable factors are operating to create the desired change.

In 1972-73, the mean of schools to which equalization positions were added because the schools were low in per pupil cost was $29.83 higher than it would have been without the equalization positions, thus significantly reducing the percentage of deviation of these schools from the mean.

Of the 100 lowest ranked schools in 1971-72, 34 are not among the lowest 100 in 1972-73 and eight of the 34 are above the median. This factor indicates that the ranks are not static and that it is possible to change the relative positions of the schools significantly within one year.

It would appear that for a large number of the lowest 100 schools the Board efforts were effective. For most of the others, it would seem that a rapid growth in membership was still the controlling factor in the determination of their per pupil staffing cost.

The Board programs were also aimed at reducing the differences between per pupil costs of all schools with the exception of several special schools. This year's results were rather disappointing. On the average, schools whose pupil costs were below the median in 1971-72 were closer to the 1971-72 median than those which were below the median in 1972-73 were to the 1972-73 median. The average deviation from the median of schools below the median in 1972-73 was $37.44 while the average deviation of schools below the median in 1971-72 was $31.85. Of course, the average deviation for 1972-73 would be expected to be higher than that for 1971-72 if only because of the across-the-board teacher raises, but the size of the difference between the average deviations indicates that there are other factors contributing to the difference. An examination of the schools reveals that the schools that are contributing the most to the difference are in the lowest quintile.

The relative variation (as measured by the coefficient of variation) in per pupil staffing cost from school to school was less in 1971-72 than it was in 1972-73. (Comparing coefficients of variations is one of the standard statistical techniques for comparing the relative variation of two distributions--the smaller the percentage the smaller the relative variation). The 1971-72 mean and standard deviation were, respectively, $494.33 and $60.96, whereas, in 1972-73 they were $535.05 and $82.72. Dividing the standard deviation by the mean yields a coefficient of 12.3 percent in 1971-72 and 15.5 percent in 1972-73, which indicates the relative differences between per pupil staffing costs was greater in 1972-73 than in 1971-72.

Since it was indicated earlier that there was substantial improvement in the deviation from the median among the lowest 100 schools, it would seem that schools not among the lowest 100 in 1971-72 are contributing to the larger 1972-73 deviations. A check of the data reveals this to be the case.

As an aid in making administrative decisions about equalization of per pupil staffing costs, data on the schools in the lowest quintile will now be discussed in greater detail.

On page V-20 there is a map indicating the location of 87 schools in the lowest quintile (lowest per pupil staffing cost). These schools appear to occur in clusters--the west end of the Austin High School area, the South Shore High School area, east side of Ashland from Addison to Devon, Fenger High School area, 95th Street from 800 east to 2400 east, Ashland Avenue from 47th to 87th, the area contiguous to and bound by

Pulaski, Fullerton, Chicago and Ashland, and the area bound by 22nd, Laramie, Western, and 31st Street. Most schools in these locations are now experiencing or have recently experienced a period of rapid growth in membership. Some are former branches that have split away from the main administrative units.

The table below shows the frequency distributions of schools in the lowest quintile and the remaining elementary schools according to their membership. There is a paucity of small schools and a disproportionate number of schools with high memberships among the schools in the lowest quintile. This result is consistent with those obtained last year as indicated on page II-6 of this report--size of school membership is related to per pupil staffing cost, the larger the school, the smaller the per pupil cost tends to be, and vice versa.

FREQUENCY DISTRIBUTIONS OF THE MEMBERSHIP
OF THE SCHOOLS IN THE LOWEST QUINTILE
AND IN THE TOP FOUR QUINTILES

Membership Interval	Lowest Quintile		All Other Schools	
	N	%	N	%
1-499	6	6.9	95	27.2
500-999	49	56.3	209	59.9
1000-1499	21	24.1	34	9.7
1500 and above	11	12.6	11	3.2
Total	87		349	

In the last two years, while most schools were dropping in membership, 43 of the 87 had experienced either a 10 percent rise in membership or had an increase in membership of 96 or more students (3 teachers). These schools were adding new teachers to their staff with the subsequent loss in per pupil staffing costs described on page V-1. Five other schools in the lowest quintile had been opened within the last three years. Ten schools not already discussed above had relatively high pupil-teacher ratios because they were not designated maximum class size. This factor, accompanied by a loss in staff experience due to retirements and the moratorium, contributed heavily to the ten schools' low per pupil staffing costs.

For 11 schools the dominant factor was a low auxiliary cost; for some of these schools, the low cost was primarily due to the fact that they were just below the formula breaking point for obtaining additional auxiliary staff. For another 11 schools, the classroom teachers' per pupil costs were low for various reasons which would need to be listed on an individual school basis. Finally, seven schools were low because of an interaction between the classroom teacher costs and the auxiliary costs. For example, the classroom teacher rank for one school was 118 and the auxiliary rank was 113, but the total rank was only 83.

Clearly, costs for many of the schools in the lowest quintile were influenced by more than one of the factors affecting cost, but an attempt was made to select the main contributing factor.

Finally, of the 31 elementary schools who had a 10 percent increase in membership or had an increase of 96 students or more in the last year, 25 were in the lowest quintile.

In general, the schools with the lowest per pupil cost are in areas where the population is shifting at an above average rate, those which are experiencing or have recently experienced large increases in membership, and those which tend to be larger than average in membership.

Summarized briefly, the per pupil staffing cost data indicates the following:

- there is little difference between the means of the per pupil staffing costs of the ethnic groups studied
- when the schools are ranked from lowest to highest according to per pupil costs, there are fewer low ranking predominantly white schools and predominantly black schools than would be expected if the per pupil staffing costs were evenly distributed across schools in all five ethnic groups. There are however significantly more low ranking predominantly white schools than there were in the two previous years for which an analysis was made. The disproportionately small number of low ranking predominantly black schools is a new phenomenon
- the mean and median for ESEA schools are slightly larger than those for non-ESEA schools and there are relatively fewer ESEA schools at the lower end of the distribution of costs and more at the upper end but the differences are not significant
- there has been a significant improvement in the status of a large number of schools which were in the lowest 100 with respect to per pupil staffing costs in 1971-72

- the variation in per pupil staffing costs is disappointingly higher in 1972-73 than in 1971-72, given the extent of the Board's effort to equalize staffing costs

- an examination of the schools in the lowest quintile reveals that most of them are located in areas undergoing unusual population shifts, are increasing or have recently increased rapidly in membership and are above average in total memberships.

Per Pupil Staffing Cost Projections

Means and Medians by Ethnic Group for School Years 1971-72 and 1972-73 *

Table 1

	Predominantly White			Other Plurality White			Predominantly Black			Other Plurality Black			Plurality Latin		
	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	Mean	Median
		$	$		$	$		$	$		$	$		$	$
1971-72	93	509.14	504.10	82	480.18	476.38	189	492.59	482.21	26	494.88	485.40	39	496.82	464.33
1972-73	90	539.39	529.68	79	524.05	515.86	197	533.84	526.98	25	566.20	539.90	45	533.71	505.45
Gain		30.25			43.87			41.25			71.32			36.89	

Table 2

	Plurality White		Plurality Black		Plurality Latin	
	N	Mean	N	Mean	N	Mean
		$		$		$
1971-72	175	495.57	215	492.87	39	496.82
1972-73	169	532.22	222	537.49	45	533.71
Gain		36.65		44.62		36.89

*Including equalization teachers

Table 3

Distribution in Quintile of Per Pupil Cost by Ethnic Groups For The School Years 1971-72 and 1972-73*

Ranked Low to High

Quintile	Predominantly White				Plurality White				Predominantly Black				Plurality Black				Plurality Latin			
	1971		1972		1971		1972		1971		1972		1971		1972		1971		1972	
	N	%**	N	%**	N	%**	N	%**	N	%**	N	%**	N	%**	N	%**	N	%**	N	%**
1	7	7.5	10	11.1	21	25.6	21	26.6	39	20.6	33	16.8	7	26.9	10	40.0	12	30.8	13	28.9
2	16	17.2	19	21.1	18	22.0	16	20.3	38	20.1	39	19.8	5	19.2	2	8.0	9	23.1	11	24.4
3	18	19.4	22	24.4	22	26.8	18	22.8	38	20.1	41	20.8	4	15.4	2	8.0	3	7.7	5	11.1
4	26	28.0	19	21.1	9	11.0	9	11.4	39	20.6	45	22.8	2	7.7	5	20.0	10	25.6	9	20.0
5	26	28.0	20	22.2	12	14.6	15	19.0	35	18.5	39	19.8	8	30.8	6	24.0	5	12.8	7	15.6
Total	93		90		82		79		189		197		26		25		39		45	

*Including equalization teachers
**Percentage of number of schools in Ethnic group

Table 4

Distribution in Quintile of Per Pupil Cost by Economic Groups For The School Years 1971-72 and 1972-73

Ranked Low to High

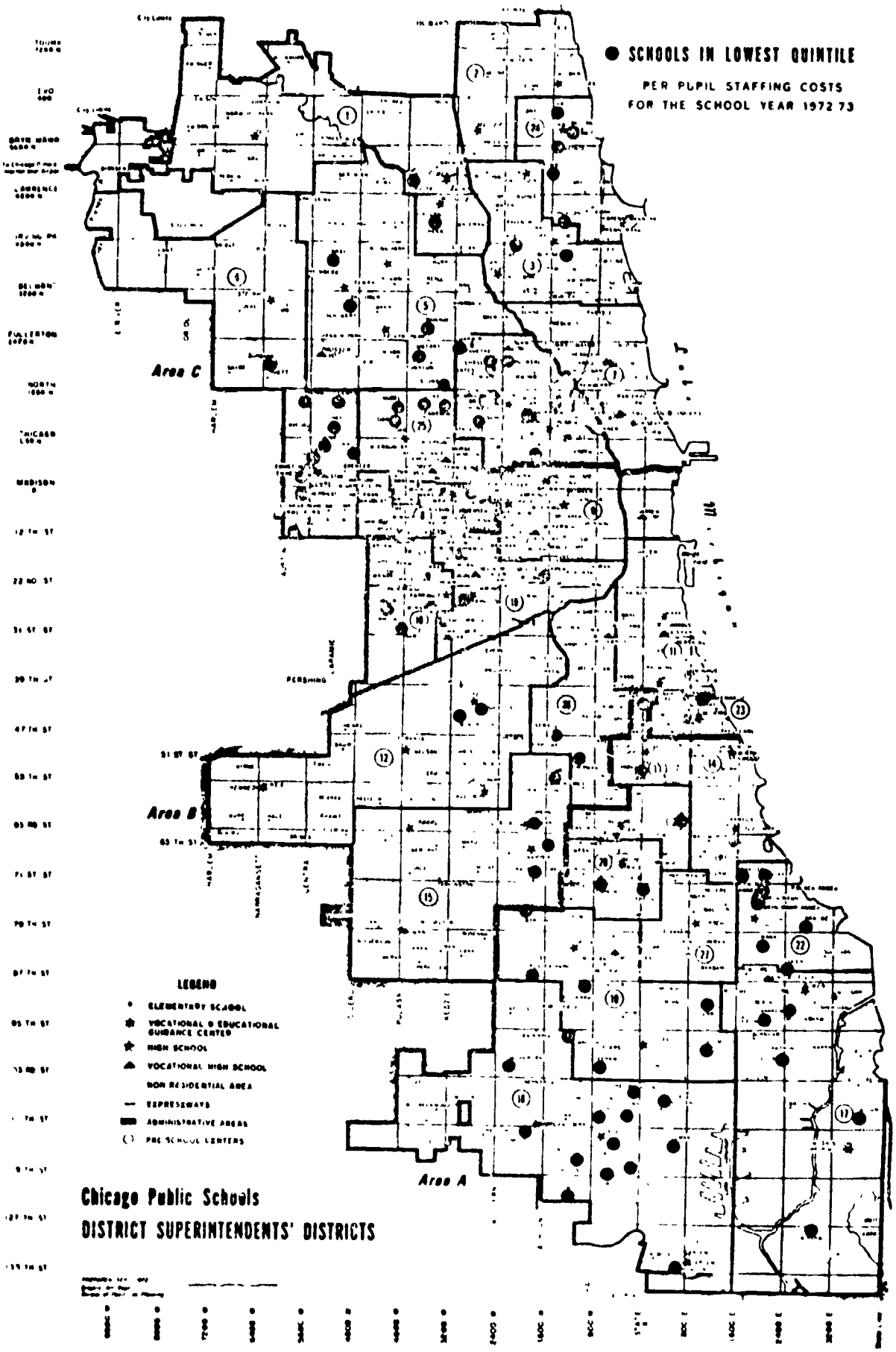
Quintile	ESEA				NON-ESEA			
	1971		1972		1971		1972	
	N	%**	N	%**	N	%**	N	%**
1	24	15.5	23	14.6	62	22.6	64	22.9
2	33	21.3	32	20.4	53	19.3	55	19.7
3	31	20.0	36	22.9	54	19.7	52	18.6
4	41	26.5	38	24.2	45	16.4	49	17.6
5	26	16.8	28	17.8	60	21.9	59	21.1
Total	155		157		274		279	

Table 5

Means and Medians by Economic Groups For The School Years 1971-72 and 1972-73 *

	ESEA			NON-ESEA		
	N	Mean	Median	N	Mean	Median
		$	$		$	$
1971-1972	155	497.83	486.09	274	492.35	484.55
1972-1973	157	543.41	528.26	279	530.35	521.79
Gain		45.58			38.00	

*Includes equalization teachers
**Percentage of number of schools in socio-economic group


● SCHOOLS IN LOWEST QUINTILE
PER PUPIL STAFFING COSTS
FOR THE SCHOOL YEAR 1972 73
Area C
Area B
Area A
LEGEND
ELEMENTARY SCHOOL
VOCATIONAL & EDUCATIONAL GUIDANCE CENTER
HIGH SCHOOL
VOCATIONAL HIGH SCHOOL
NON RESIDENTIAL AREA
EXPRESSWAYS
ADMINISTRATIVE AREAS
PRE SCHOOL CENTERS
Chicago Public Schools
DISTRICT SUPERINTENDENTS' DISTRICTS