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ABSTRACT

Two categories of elementary-secondary data collected by the National Center on Education Statistics (NCES) are discussed: teacher data, and school finance data. Current NCES practices and their limitations are discussed, additional data needs for research and policymaking are identified, and modifications for data collection are suggested. Teachers are viewed as one aspect of educational resources for which finances are allocated. Current NCES financial data collection, which includes the Common Core of Data (CCD) State Fiscal Report and Public School District Finance Report, distinguish the sources of revenue and the types of services supported. State data are reported in the Condition of Education and Digest of Education Statistics. Problems with these reports include the time lag before publication, the lack of published data on school district-level expenses and revenue, and the changes in data categories used, with decreasing detail. This makes it difficult to relate expenditure data to information about resources. NCES has collected very little data on teachers, even though concerns about teacher quality, compensation, and supply and demand are high. Inter-school district comparative data are badly needed. Suggestions for improvement include compilation of state-by-state data on teacher characteristics, construction of a general database, study of teacher pay systems, and longitudinal studies. (GDC)

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NCES DATA ON SCHOOL FINANCE AND TEACHERS:
ASSESSMENT AND RECOMMENDATIONS

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revised
August 1985

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INTRODUCTION

In this paper, I comment on the two categories of NCES elementary-secondary data with which I am most familiar from my own work: data on school finance and data on teachers. In discussing each, I review current NCES offerings and their limitations, identify additional data needed to serve policymaking and research, and suggest modifications (mainly expansions) of NCES data collection efforts.

The two data categories I deal with, school finance and teachers, may seem at first to be only distantly related to one another, but the connection between the two becomes more apparent when one thinks of teacher data as a subset of data on educational resources. There is a logical chain of variables running from money to resources to services to educational results, and the two categories considered here correspond to adjacent links in that sequence. Information on school finance indicates how money for education is raised and how it is expended; information on resources (specifically, teachers) indicates what money buys and how the inputs into schooling are used. As I will argue below, the failure of current data to illuminate the finance-resource connection is a major shortcoming of the existing NCES data system.¹

The following comments are limited in several important respects. First, I have stopped well short of proposing specific data system designs, both because that task is too large for this type of paper and because of my own limited expertise. Second, I have not addressed technical questions of data quality because I have nothing to add on that subject

¹I would have preferred to look at resource data across the board but did not have time to undertake that task. However, much of what is said here about teachers applies to instructional personnel generally and hence to the most important resource category.

to what NCES already knows. Third, I have not taken budget constraints into account in discussing what data NCES should collect. If that gives my suggestions an air of unreality, I apologize, but I thought that someone should consider, without prior restraints, what information an advanced country might reasonably want to gather about its own educational system.

SCHOOL FINANCE DATA

NCES has long been in the business of collecting school finance data and reporting basic finance statistics for states and, at times, for local school districts. These data have often been used for making gross fiscal comparisons (e.g., of per pupil spending among states) and charting broad trends in support for the schools, but they have been of little use for addressing the central "adequacy" and "equity" issues of school finance, analyzing resource allocation patterns, or relating funds and resources to educational results. My main purpose in this section is to explain why the existing finance data are inadequate for such purposes and to suggest what it will take to make them more useful.

Current NCES Finance Data

The NCES currently produces what might fairly be described as skeletal information on school finance. The principal data collection instruments, the Common Core of Data (CCD) State Fiscal Report and Public School District Finance Report, distinguish among revenues from local, intermediate, state, and federal sources and among outlays for instruction, support services, and noninstructional services. They also break out, on the

revenue side, receipts from property taxes, tuitions, and intergovernmental transfers and, on the outlay side, spending for salaries, employee benefits, debt service, and construction. State-by-state data are reported in the Condition of Education and Digest of Education Statistics (hereafter, "Condition" and "Digest," respectively), typically with lags of three to four years.² Financial data for selected large local districts have been published irregularly in the past, but the latest such data to appear in the Digest are for the 1979-80 school year.³ Although district-level data have supposedly been collected annually in the CCD surveys, neither the data themselves nor any findings based upon them (except for state totals) have, to my knowledge, been published. I do not know whether or for what purpose such data are used once they have been collected. In particular, I note that there are no NCES publications describing the distributions of revenues or expenditures among local school districts, either nationally or within states, even though distributional statistics (especially indicators of intrastate disparities) have long been the central concerns of school finance policymakers and researchers.

It is also notable that the categories used by NCES to collect and report state and local finance data are now less detailed than in earlier years. Formerly, distinctions were made on the expenditure side among such traditional school accounting categories as instruction, administration, plant operation and maintenance, fixed charges, etc. Now there appears

²For example, the Digest, 1983-84, presents revenues and expenditures for 1980-81 (pp. 78-79), and the Condition, 1984, gives expenditures and revenues for 1981-82 (the latter, for some reason, from NEA estimates rather than NCES' own sources).

³Digest, 1983-84, pp. 60-61. The identical 1979-80 finance data also appeared in the 1982-83 edition.

to be only the three-way CCD breakout indicated above. This is only a small loss, however, since as I will discuss below, the expenditure information of greatest interest is, and always has been, concealed within the overbroad "instruction" category.

To put the NCES efforts in context, one must also take into account the separate system of school finance data collection and reporting operated by the Governments Division of the Census Bureau. The annual Census survey (a census in some states and a sample survey in others) covers most districts in the U.S. The Bureau's reports, entitled Finances of Public School Systems, present expenditure and revenue data for states and for individual school districts of over 15,000 enrollment. They are produced with a time lag of under two years (i.e., the 1982-83 data have appeared). The categories used, while generally no more detailed than those of NCES, reflect certain important distinctions not made in the NCES reports (see below).

Data Shortcomings and their Consequences

There has been much discussion over the years of certain technical problems concerning the school finance data, including problems of coverage, definition, and data comparability (e.g., in the treatment of pensions). These issues are familiar to NCES staff, and there is little I could add that would be helpful. I focus instead on what I believe are some broader issues bearing on the usefulness of the finance data for research and policymaking. I consider, first, the lack of sufficient expenditure detail to make the connection between finances and resources; second, the absence of distributional statistics pertinent to major school finance

concerns; third, gaps in the information on school revenue; and finally, the problem of instability over time in school finance data collection.

The Lack of Expenditure Detail and the Disjunction
between Expenditure and Resource Information

The education expenditure data currently reported by NCES are serviceable, at best, for making gross fiscal comparisons among states and examining broad trends in public support for the schools. Even in those applications they can be misleading, because differences in dollar outlays among states and over time do not necessarily correspond to differences in educational resources. But more important, they are not suitable for other purposes to which potential users would like to apply a school finance (or finance/-resource) data base. Setting aside the distributional issues for separate consideration, these applications include such things as the following:

- o Analyses of what education money is used for (i.e., what money buys) in different states and LEAs,
- o Comparisons of amounts spent and prices paid for particular kinds of resources (especially teachers and other instructional staff) in different places or at different times,
- o Analyses of amounts expended for different levels or types of instruction, or on behalf of different categories of pupils,
- o Research on relationships between school spending and educational services and outcomes.

Two reasons for the limited usefulness of current data are that expenditure data are not collected in sufficient detail to be connected with resource categories, and expenditure and resource categories are not coordinated. Consequently, information on dollar outlays cannot be linked to anything real. Most expenditures of direct educational

interest, in fact, are contained within the single, overbroad, traditional category, "instruction," which is not decomposed either by type of resource or by the various purposes for which instructional resources are used. Other costs of instructional resources, notably fringe benefits, are hidden within the mysterious category, "fixed charges." In consequence, one cannot tell how much of a state's or an LEA's education budget is expended on classroom teachers, as opposed, say, to administrators, specialists, or instructional materials; nor how much is spent for staff compensation, counting nonsalary as well as salary costs; nor what is spent in high schools, as compared with elementary schools, or for vocational, as opposed to academic, programs; nor, in comparing states, whether differences in instructional outlays per pupil are due to differences in staffing ratios, differences in salary per staff member, or both. Without being able to make such distinctions, one has very limited ability to make sense of interjurisdictional financial comparisons or to address the issues of resource and financial adequacy.

There is little doubt about what is needed to create these missing analytical capabilities. In general, the expenditure data need to be disaggregated and rearranged into educationally and economically meaningful categories. For instance, to connect finances to resource allocation (and, ultimately, to services and effectiveness), it would be necessary to disaggregate expenditures (especially but not exclusively outlays for "instruction") into appropriate resource, or "object," categories. Specifically, I envision a system of combined expenditure and resource accounts, in which instructional outlays are explicitly linked to numbers of instruc-

tional staff, amounts of other resources, staff compensation, and other prices in a manner something like the following:⁴

Instruction

Instructional personnel

Classroom teachers: (number) x (avg. salary) = (outlay)

Specialist teachers: (number) x (avg. salary) = (outlay)

Teaching aides: (number) x (avg. salary) = (outlay)

... etc ...

Instructional materials: (outlay)

Total Instruction: (outlay)

Given such a data set (especially with the data expressed in per pupil form), it would be immediately apparent whether differences in spending levels among places or over time reflect differences in real resources or differences in salaries and other prices. If nothing else, this should promote more meaningful interstate and intertemporal comparisons. But going beyond mere comparisons, I would expect such data to make possible a variety of analyses of resource allocation patterns and behavior now feasible only with ad hoc data bases from selected states. One would be able to ask, for example, what shares of the incremental education dollar tend to go for more teachers, higher-paid teachers, administrators, etc. and how those shares vary among school districts with different characteristics. Thus, expansion of the expenditure data along the lines

⁴For simplicity, I treat personnel cost in this example as synonymous with salary, whereas more appropriately it should be measured by total compensation, which in turn should be decomposed into current salary, deferred compensation (retirement programs) and other fringe benefits.

indicated should lead to an improved understanding of what money buys and how the inputs into schooling are likely to be affected by changes in finance.

A very different question from what money is spent on is what it is spent for--i.e., for what purposes or programs or on whose behalf. There has long been interest, for example, in how funds and resources are distributed between the elementary, middle, and high school levels, among programs (e.g., academic versus vocational), and among "target groups" (handicapped, disadvantaged, limited-English proficient), but the data have not been available to provide answers. In this case, however, it is not so easy to fault NCES for failing to provide relevant breakdowns of outlays because, except for the relatively straightforward breakdown by level of school, it is not clear that valid disaggregation is feasible.

The problem, basically, is that school districts do not maintain the kinds of cost accounting systems that would be needed to attribute costs to particular pupil categories or programs. Segregating such costs would be easy if, for example, disadvantaged and handicapped pupils were educated separately from regular pupils and vocational pupils separately from academic pupils, but such is rarely the case. Typically, the different types of pupils attend the same schools and many of the same classes, are served jointly by at least some of the same instructional staff, and share the same facilities and support services. Under such conditions, it would take very detailed time and cost accounting systems to allocate outlays properly.

Given that few districts operate such accounting systems, an attempt by NCES to collect outlay data by pupil category or program would probably

do more harm than good. Reporting by local and state officials would probably be based more on the availability of earmarked state or federal funds for particular programs or groups than on actual costs incurred. The resulting data would be unlikely to represent properly either the total costs or the "add-on" costs of the programs in question. I conclude, therefore, that whereas disaggregation by level of school is feasible (because costs are incurred by distinct organizational units), disaggregation by program or pupil category is impractical at this time. Acquiring the ability to disaggregate by the latter categories should be treated as a longer term goal, to which NCES methodology development resources might reasonably be devoted. Meanwhile, disaggregation by level is worthwhile in its own right (e.g., so that data on high school resources--not high school and elementary resource combined--can be juxtaposed to data on high school outcomes) and should be pursued as a shorter-term goal.

The Lack of Statistics on Distributions of Spending and Revenue within States

Unlike aggregative financial data for states, financial data for local school districts are not meaningful or accessible until they have been analyzed and summarized statistically. Users cannot scan local expenditure and revenue data for thousands of districts in search of patterns, as they can the data for 50 states. Nor can they rearrange, manipulate, and summarize the district-level data to suit their needs, unless they are equipped (and funded) for large-scale data analyses. The value of the district-level finance data to most users depends, therefore, on how extensively and appropriately such data are analyzed and summarized statistically by NCES itself.

Different kinds of summaries and analyses are useful, of course, for different purposes. NCES, in the past, has provided certain summary statistics of district-level finances (notably, in publications entitled Statistics of Local Public School Systems, Finances). For instance, it has compared levels of spending among size strata of districts, among geographical regions, and among central city, suburban, and nonmetropolitan districts. Such analyses have not recently appeared, however. They are moderately useful, and it would be helpful if they were revived or, preferably, expanded to cover additional district characteristics and cross-classifications.

Far more important, however, is that NCES has always studiously avoided producing the statistics wanted most by scholars and policymakers involved in school finance, namely, statistics on the distributions of expenditures and revenues among school districts within states. Such statistics (e.g., indicators of intradistrict inequality in school spending and tax rates), though well within NCES' technical capacity to prepare, have been considered too politically sensitive by NCES leadership. Their publication might offend some state education agencies (presumably those of high-disparity states), and they could even be used as evidence in Serrano-type school finance lawsuits. Thus, NCES has feared that developing such statistics, or even facilitating their development by others (e.g., by making available edited, "user-friendly" district-level data files), could undercut the state-agency cooperation on which NCES depends for much of its access to state-local data.

The NCES position regarding distributional statistics was brought out most clearly in the well-known (among school finance specialists)

"Profiles" episode of 1979-80. At that time, federal interest in school finance equity had reached a peak, and NCES had been directed explicitly by the Congress (P.L. 95-561, Sec. 1201) to produce a set of "profiles of state school finance equalization," showing the extent of fiscal disparities and deviations from fiscal neutrality in each state. This profiles report was to be the first of an ongoing biennial series. NCES did not want to produce such a document, primarily, as I understand it, for the reason alluded to above. Its avoidance strategy was one of protracted technical delay. Numerous outlines and drafts of a profiles report were prepared, some by contractors and consultants and some by NCES staff, all to be sent back for reworking or rejected outright by internal review committees. The strategy worked. By late 1980, the federal interest in school finance equity had declined precipitously, and NCES was able to fulfill its formal obligation by sending a report to Congress, while suppressing its further publication. Needless to say, nothing has been heard of since of the permanent biennial series of profiles reports; nor has anything else emerged from NCES (despite the availability of the CCD district-level data) on patterns of school financing within the states.

This history raises several issues. First, of course, there is the specific question of whether NCES should abstain from producing statistics pertinent to the central concerns of school finance (or, for that matter, to any other educational concern) because such publication might displease some states. To gain some perspective on the issue, consider what the reaction would be if the appropriate federal agencies failed to produce data on infant mortality, crime rates, inadequate housing, poverty, or for that matter, the educational attainment of the population because

officials in the low-ranking states might be upset. It is unlikely, in such areas, that state embarrassment, displeasure, or even the implicit threat of future noncooperation would be deemed acceptable reasons for delimiting the federal government's information gathering role. The same, in my view, should be true in education and, in particular, in school finance.

There is, second, the broader issue of NCES' posture vis-a-vis the states. Often, NCES has gone to state agencies as a supplicant, seeking approval to collect even data that (a) bear directly on matters of national concern or (b) are needed to produce a coherent picture of the nation's education system. Although I cannot prove it, I believe that the sparsity of NCES data on finance, teachers, and other aspects of education is due in considerable part to this excessive diffidence. Whatever the merits, or imperatives, of a supplicant posture may have been in the past, there is now good reason to reconsider. A conservative administration has chosen to disseminate, for the first time, state-by-state comparative data on pupil performance, despite the unhappiness this doubtless causes states at the bottom of the performance ladder. In the area of finance and elsewhere, NCES might well profit by that example.

Third, there is an issue of less social significance but considerable importance to the future role of NCES, namely, how far the agency should generally be expected to go in analyzing, as opposed to collecting and compiling, education data. Current NCES practice in that regard is very uneven. For instance, the agency has sponsored many analyses of its longitudinal survey data (the National Longitudinal Survey and High School and Beyond), even extending to the development of sophisticated behavioral

models, but has not supported even rudimentary analyses of the school finance data. I cannot offer a general recommendation regarding the appropriate limits on the analytical role. The answer obviously depends, among other things, on the agency's mission in a reorganized Office of Educational Research and Improvement. It seems to me, however, that there is one valid threshold criterion: NCES should be expected to undertake enough descriptive (as opposed to inferential) statistical analysis to present meaningful syntheses and analyses of patterns in its major publications. This has not been done in either of the two areas covered by this paper.

Deficiencies in NCES Revenue Data

Published NCES data on public school revenue are useful mainly for making interstate comparisons and examining broad trends in revenue levels and shares of revenue from federal, state, and local sources. They are of little use for any further analysis of revenue sources or revenue-raising instruments. I suggest here three steps that would increase substantially the usefulness of the revenue information: elaboration of the revenue categories, production of data on revenue bases, and compilation of nonstatistical, descriptive data on state-local school revenue systems.

Revenue Categories. The three-way classification of revenue by federal, state, and local sources is useful as far as it goes, but it conceals some important, policy-relevant information about the forms and channels through which revenue is obtained. The following changes in revenue categories would provide a more accurate and complete picture. First, revenue from local sources should be decomposed into tax revenue (distinguishing between property taxes and other taxes), current charges

or user fees (mainly tuitions), contributions from parent governments, and "other revenue."⁵ The distinction between taxes raised by independent local districts and the contributions, or appropriations, that dependent districts receive from their parent counties, municipalities, or townships is especially important (and has long been recognized in the Census Bureau's Finances of Public School Systems). Second, research on school finance systems and school finance equity would be aided if distinctions were made between general, or unrestricted, state aid to local districts and categorical, or restricted, aid (the latter including aid earmarked for particular programs, beneficiaries, or objects of expenditure). It would also be helpful to arrange the data on state and federal aid in a manner that brings together both federal and state support for closely related special programs. Third, a distinction should be made between direct federal education aid to local agencies and aid that is "passed through," and often redistributed by, the states (this distinction is standard in the Census publications).

Revenue Bases and Tax Rates. The relationships among revenues, revenue bases, and rates of taxation for schools (effort) are important questions in school finance, but NCES does not provide data on bases or rates. Thus, one cannot use NCES data to determine how variations in spending or tax rates among districts are influenced by variations in local tax bases or, from the equity standpoint, to determine the degree to which school spending is a function of local wealth. During the late

⁵Some of the items mentioned, including receipts from property taxes and tuitions, are already included as "special exhibits" in the CCD surveys (according to NCES, "The Elementary/Secondary Education Data Acquisition Program," an unpublished summary description of NCES elementary-secondary data acquisition systems).

1970's, NCES did attempt to produce data on equalized property tax bases by district, but the effort was beset by technical difficulties and has not been repeated. The technical difficulties are indeed substantial, since each state has its own methods of defining and measuring the tax base, and it would be undesirable to publish a national set of tax base data before the main problems of comparability are overcome. In the interim, however, NCES could provide a useful service by reporting relative local tax bases and tax rates, using the official definitions of each state. Although this would not allow interstate comparisons of wealth, it would support analyses of intrastate relationships between spending and wealth and comparisons of the findings from such analyses among states. Thus, the ability to analyze school finance systems could be enhanced significantly at very little cost to NCES.

In the longer run, NCES could make a valuable contribution to school finance research by producing not only comparable data on local wealth but also data on a broader range of local economic variables. The mapping of decennial Census data by school district is important in this regard because it provides information on income and poverty in each district and on many related demographic characteristics. Selected Census data items should be merged with NCES' school finance data and made available as a user file. With such a data set, it would be possible to link fiscal and resource variables to multiple district attributes and to address a variety of concerns about how different communities finance their schools.

Descriptive Information on Revenue Systems. Although NCES is a statistical agency, it is well within its charter to collect and compile the nonstatistical, descriptive information needed to make sense of its

numerical data. In the area of school revenue, two bodies of such descriptive information are important: descriptions of state aid mechanisms and formulas and descriptions of each state's legal framework governing the raising of local school revenue. Neither type of information is now provided by NCES.

Over the years, some information on these matters has been produced by other offices of the Education Department. Specifically, a series of volumes edited by Esther Tron and published irregularly by the Department provided state-by-state descriptions of school finance systems, and materials published by the Education Commission of the States (ECS), under sponsorship of NIE, provided tabular summaries of system characteristics.⁶ For various reasons, however, neither effort has filled the requirement for comprehensive, consistent, and timely descriptions of how each state raises its public education funds.

It seems reasonable that NCES, as the information-gathering arm of the Department, should take on the responsibility for maintaining a continually updated file of such information. Specifically, I suggest that NCES should determine and publish on a regular annual basis the method used by each state to fund its schools (including full mathematical details of the formulas) and the rules under which each state's LEAs are permitted to raise revenue (i.e., taxing authority, definitions of tax bases, fiscal constraints, referendum requirements, etc.). With that information in hand, analysts and policymakers would be much better

⁶The most recent of the Tron compendia is Public School Finance Programs, 1978-79, U.S. Government Printing Office, Washington, D.C., 1980. The ECS tabulations are published as a series of wall charts, entitled School Finance at a Glance, the most recent of which is for 1983-84.

situated to interpret and use the improved and expanded financial statistics called for above.

Stability Over Time

Apart from any deficiencies of content, an NCES practice that has detracted from the value of the school finance data is allowing the data production effort to fluctuate from year to year in response to political currents. Most recently, when federal interest in issues of school finance adequacy and equity plunged toward zero in 1980-81, NCES cut back its school finance effort, reducing the coverage and detail of its surveys as well as its data processing and publication activity.

This is short-sighted behavior. Although the federal demand for school finance studies is now nil (there does remain, however, substantial state-level interest in school finance adequacy, equity, and reform), experience indicates that interest in such topics is cyclical. The surge of interest that led to the aforementioned Profiles requirement and a Congressionally mandated school finance study in 1979-80 was preceded by another such surge in 1971 (the President's Commission on School Finance). It is safe to say that interest in the topic will rise again in the future. When it does, NCES will find itself with (a) large holes in the historical data base, due to failure to sustain its basic surveys, (b) antiquated data systems, due to lack of development effort, and (c) no capability to generate new data without a substantial time lag.

This on-again, off-again behavior makes little sense with respect to an area as fundamental to policymaking as school finance. The continuity of the data base is as important a determinant of its usefulness as is data quality. I recommend that stable, annual collection and publication

of financial data (preferably with a much-reduced time lag) be adopted as an agency norm under the new ten-year data improvement plan.

DATA ON TEACHERS

The recent upsurge of interest in teacher quality, teacher compensation, and teacher supply and demand has drawn attention to an area in which NCES' efforts are particularly weak: the production of data on teachers and teaching. Current NCES data on these subjects do not suffice even to provide general background information pertinent to policy concerns, much less to support research on problems and possible solutions. Moreover, although demands for information on teachers are now unusually intense, they cannot be characterized as unanticipated or "new." Questions of teacher supply and demand, for example, have concerned policymakers through multiple cycles of "shortage" and "surplus;" misgivings about teacher quality are perennial; and the adequacy and form of teacher compensation are matters of continuing public and professional interest, quite apart from the current fascination with career ladders and merit pay. Thus, the point in faulting NCES for the paucity of its teacher data is not that it has responded slowly to the issue of the moment but that it has neglected an area of long-term policy concern.

Current NCES Data on Teachers

NCES today is able to tell us little more about American teachers than how many there are. The CCD surveys obtain annual data on numbers of full-time equivalent elementary and secondary teachers (and other

employees) by state and LEA. The state-level data are reported in the Condition and Digest; the LEA-level data go unpublished and, apparently, unanalyzed (see below). NCES collects no information on the composition and characteristics of state or local teaching forces, nor on assignments or working conditions of teachers, nor on salaries or other aspects of compensation. The only data on teacher salaries now published by NCES are estimates of average salary by state reprinted from publications of the National Education Association.⁷ The occasional and fragmentary data on teacher characteristics and assignments published by NCES (only for the nation as a whole) are also borrowed from NEA.⁸ No information whatsoever is provided by NCES (or NEA) on variations in teacher characteristics or assignments among states or LEAs; nor on aspects of compensation other than the mean teachers' salary in each state.

Aware of these increasingly conspicuous gaps, NCES has recently taken tentative steps to produce teacher data. In a new survey (the data from which are now being processed), teachers in a nationally representative sample of schools were asked to report on their teaching experience, training, assignments, work hours, compensation, and certain personal characteristics.⁹ In addition, NCES is about to sponsor an effort to design a new, more extensive survey of characteristics of the teaching

⁷For example, the Digest, 1983-84 reprints data on average salaries of teachers and instructional staff from National Education Association, Estimates of School Statistics, 1982-83 (pp. 54-56).

⁸For example, the Digest, 1983-84 presents findings from NEA sample surveys on the composition of U.S. teachers by race, sex, highest degree, etc.; on average age and experience; and on average hours and days taught, class sizes, and salaries (Table 43, p. 51).

⁹National Center for Education Statistics, "The Elementary/Secondary Education Data Acquisition Program."

force. I understand, however, that neither the just-completed survey nor the projected more extensive survey is designed to produce interjurisdictional comparative data, and so, unless further action is taken, most of the aforementioned data gaps will remain.

NCES also conducts more specialized surveys aimed at responding to concerns about teacher supply and demand. In a survey of "Teacher Demand and Shortage," LEAs and other educational institutions are asked to report on teaching positions, vacancies, new hires, certification status of teachers, and teacher assignments but not on teacher characteristics or compensation. As I will explain below, this survey is flawed not only because key items are missing but also because it is not based on economically meaningful definitions of "shortage" or "demand." Some information on newly hired teachers and their characteristics, including salary information, is also obtained from a triennial survey of recent college graduates. Neither of these surveys provides interjurisdictional comparative data, however, or brings together the multiple types of data needed for policy analyses. Thus, both are useful only for very limited purposes.

Issues and Information Needs

To show why the aforementioned gaps in NCES teacher data are troubling and what types of additional data are required, I now consider some current and perennial policy concerns and research questions pertaining to teachers and the types of information needed to address them. Specifically, I comment on three topics of current concern: teacher quality, teacher compensation, and teacher demand and supply.

Teacher Quality

Even before the reports of the Commission on Excellence and other reform commissions began to appear in 1983, teacher quality was a major concern of educators and policymakers, and now it has become one of the central foci of efforts to improve the schools. According to the reformers, low teacher quality is at the heart of our educational problems, and drastic changes in teacher compensation, certification, and training are called for. However, little is known about even the most basic quality-related attributes of the teaching force or about the relationships of teacher quality to other factors, and the paucity of NCES data plays a role in preserving this ignorance.

Among the issues potentially illuminable by better data are how the teaching force is and has been changing with respect to certain quality-related attributes; how quality-related characteristics of teachers vary among states, school districts, and schools; how such characteristics relate to teacher compensation, other conditions of teaching, and the state of the teacher market; whether teachers with different characteristics tend to be assigned to different types of schools and pupils; and how teacher attributes relate to pupil achievement and other measures of educational outcome. Without good, disaggregated data on teacher characteristics and assignments, one can do little more than speculate about such concerns.

NCES cannot be faulted for failing to provide data on teacher quality per se, since there is little agreement on how "quality" can or should be measured. On the other hand, there are many teacher attributes, arguably germane to the quality issue, that are not only feasible but relatively

easy to measure. A list of some of the more obvious items is as follows:

- o Personal characteristics: age, race, sex, languages spoken, etc.,
- o Educational background: attainment, fields of study, degrees, institutions or types of institutions attended,
- o Experience: years of teaching, assignments, experience in other occupations,
- o Career pattern: entry, exit, reentry; rank, promotion, plans and expectations,
- o Assignment: grade level, subject, types of pupils, type of school, special programs,
- o Work load/working conditions: hours per day (teaching, other), days per year, class size, pupil load, special pupils, support staff, nonteaching responsibilities,
- o Compensation: salary, retirement and other fringe benefits.

There are different methods of obtaining such data. The possibilities include sample surveys of individual teachers, surveys of sample districts (or conceivably all districts), and surveys of states. When one adds a longitudinal dimension, the possibilities multiply. As usual, the appropriateness of any given method depends on the purpose for which the data are to be used. I discuss below, under the heading "possible data collection strategies," some of the alternative approaches and their uses. For the moment, I note only the following: first, that the approach toward which NCES now seems to be leaning--collection of data on the characteristics of a nationally representative sample of teachers--is suitable for only a limited range of applications; second, that work on the major issues of teacher quality requires interjurisdictional comparative data on teacher characteristics--something that seems not to be contemplated in current NCES plans.

Teacher Compensation

The system of teacher pay is now receiving an extraordinary amount of attention because of recent reform commission recommendations in favor of merit pay, career ladders, and other forms of teacher incentives. Some states are already acting to install such systems and others are considering the possibility, so there is much interest in assessing existing and alternative salary structures. Even without this special interest, however, teacher compensation is a matter of continual concern to policy-makers. Teachers' salaries are the largest single element of education cost, and the level of teachers' pay has long been assumed to be a major determinant of the quality of the teaching force. A valuable side effect of the current debate over teacher incentives has been to make clear how little organized information exists on how teachers are paid in different places and how pay systems are changing and on the consequences thereof for educational costs, the make-up of the teaching force, and ultimately the quality of teaching and educational outcomes.¹⁰

NCES now collects no information of its own on teacher compensation. Even in the past, before abdicating the responsibility and leaving it to NEA, it collected only average salary data. But average salary figures tell very little about how states or districts pay their teachers. Districts can have identical average salaries but different salary schedules and distributions of experience and training; or, districts can have identical

¹⁰The National Education Association is said to possess a large computer file of individual district salary schedules. Such information could be used to answer a variety of questions about how teachers are paid in different types of school districts and how salaries vary with teacher experience and training. However, the NEA apparently does not use its data base for such analytical purposes or, if it does, does not publish the results.

salary schedules but different levels of average pay. It is presumably the salary schedule rather than average pay that determines the attractiveness of a district to teachers and hence the ability of a district to attract quality staff. Thus, even if NCES reinstated collection of state average salary data, that would hardly suffice to address current concerns about teacher quality and cost.

To see what kinds of data might be worth collecting, consider, first, what it would take to provide reasonably complete answers to the questions, "how are teachers in the United States paid?" and "how does the compensation of teachers vary among school systems and states?" Going beyond undifferentiated salary averages, one would want to know how salaries vary in relation to teacher characteristics, including not only the education and experience factors on which salaries are based but also such other factors as age, sex, race, subject-area specialty, and grade-level assignment. It is more informative, for example, to make interjurisdictional comparisons of the salaries paid teachers with standard qualifications (e.g., a master's degree and five years of experience) than of overall salary averages. Moreover, to go beyond averages in another respect, one would want to know how the teachers in any given category are distributed among salary brackets. For instance, what percentages of high school teachers, or more specifically, of high school mathematics teachers, earn less than \$15,000, \$15,000 to \$20,000, \$20,000 to \$25,000, and so forth. In addition, to form more complete pictures of teachers' rewards and teacher personnel costs, and to facilitate interjurisdictional and interoccupational comparisons, one would want to broaden the scope of data collection to encompass retirement contributions and other fringe benefits as well as the salary

component of compensation. Finally, to describe fully how teachers are paid requires data on salary schedules as well as on levels or distributions of pay--that is, on starting salaries, increments paid for additional units of training and experience, and any incentive features of salary systems.

As to the appropriate unit of analysis, or level of disaggregation, that naturally depends on how the data are to be used. It would be desirable, for example, in conjunction with recent Education Department efforts to compare educational resources and outcomes across states, to produce state-by-state salary data, broken out by some of the categories suggested above. For other purposes, salary data by type of district (i.e., by district size, urbanicity, socioeconomic composition, etc.) would be more appropriate; and for more detailed analyses, data by type of district within each state, or simply data for individual districts, would be needed. In particular, any application requiring information on salary schedules, automatically implies selection of the individual district as the unit of analysis.

Supply and Demand

NCES has attempted, as mentioned earlier, to respond to concerns about teacher supply and demand by conducting its special surveys of "teacher demand and shortage," but there are several respects in which these efforts need to be strengthened. The main shortcomings, in my view, are (1) the lack of economic underpinnings and the consequent omission of categories of information essential to an analysis of demand and supply, and (2) inadequate coverage of the flow of persons into and out of the teaching force.

The absence of a guiding economic conception of supply and demand is most evident from the failure of the survey designers to recognize that supply, demand, surplus, and shortage all have something to do with prices (salaries), and consequently that salary information must be brought together with data on positions, vacancies, new hires, and the like. If there are to be comparative analyses of the supply-demand situations facing different districts or states, differences in salaries offered by those jurisdictions are likely to be key explanatory factors. Thus, the collection of salary information (which, for reasons explained above, means considerably more than information on average salaries) should be integrated with collection of other information bearing on supply-demand issues.

Another important missing element is the concept of a teacher market, or market area. Where many districts seek to hire teachers in the same market (e.g., in a major metropolitan area), the supply of teachers to any single district becomes a function not only of its own salary schedule, working conditions, and other attributes but also of the characteristics of the competing districts. For example, \$15,000 per year is a high starting salary in a market where the typical offer is \$12,000 but a low one where it is \$18,000. To contribute to a better understanding of teacher markets, therefore, NCES should collect data not only on the salaries offered by each jurisdiction but also on how those salaries compare with prevailing salaries in the particular market in question.

A third missing item, related to the two already mentioned, is information on nonteaching salaries in the various teacher markets. Such information is germane because it is relative pay that affects teacher supply. A given teacher pay scale may be highly competitive where nonteaching

opportunities for college-educated workers are few but inadequate where such opportunities are plentiful. Analyses of teacher supply and demand, therefore, require data not only on teacher salaries but on salaries in other occupations as well. This does not mean that NCES should get into the business of collecting data on wages and salaries outside education, but it does suggest that such data should be obtained by NCES (e.g., from the Bureau of Labor Statistics) and merged with information on teacher pay.

Turning to the flow of teachers into and out of the system, NCES seems to have recognized the importance of half this phenomenon, the movement of new entrants into teaching, but not the other half, the outflow (turnover) of existing teachers. Moreover, even with respect to the inflow, more information needs to be collected to understand supply-demand relationships and, especially, the changes therein due to changes in teacher standards and compensation. Reporting on the number of new hires, as in the NCES "Demand and Shortage" survey, is not enough. Information should be obtained, in addition, on characteristics of the newly hired teachers, where they come from, and what they are paid. In particular, it is through the hiring process that new state incentive pay plans and tightened certification requirements are likely to have their effects, if any, on teacher quality. Consequently, it would be desirable for NCES to monitor the characteristics of teachers newly hired during the coming years, so that these important policy changes can be assessed.

The teacher turnover/retention process is as important as the entry process in shaping the character of the teaching force, but this is a process about which little is known. To carry out a comprehensive analysis of teacher supply and demand, one would need information on which types

of teachers depart with what frequency from districts with different characteristic and different pay and promotion policies. In particular, it is now becoming important to observe how teacher turnover patterns are affected in states that adopt new performance-based pay and promotion plans. These matters are not covered, to my knowledge, by current or projected NCES data collection efforts--an important gap that needs to be filled.

I have learned recently, in the course of an international comparative study of teachers' salaries, that some other countries are able to report routinely on geographically disaggregated flows of personnel into and out of teaching. This would mean, for the United States, reporting each year on (a) the number of persons entering teaching in each state, broken down by source (i.e., new college graduates, teachers transferring from other states, persons shifting from other occupations, etc.), and (b) the number of persons leaving teaching in each state due to death, retirement, involuntary termination, transfers to other states, shifts to other occupations, and departures from the labor force. Such a flow matrix would provide the framework for a wide variety of supply-demand studies. It seems well worthwhile at least to investigate the cost and feasibility of creating such a data set.

Possible Data Collection Strategies

If NCES does become involved in a major way in collection of data on teachers, it will have to make some strategic decisions at the outset. Among these, the most basic concern the choices of units of analysis, respondents, and level of detail. I consider here some of the diverse

purposes for which teacher data might be wanted and the degrees to which these purposes might be served by different data collection modes.

One possible objective, clearly of current interest to the Education Department, is to assemble state-by-state data on teachers to add to the comparative displays of state education statistics (the famous "wall charts") distributed by the Department this year and last. The only teacher data now included are pupil-teacher ratios. Other items of potential interest include statewide averages of teacher experience, training, and other characteristics and indicators of the level of teacher compensation in each state, such as the salaries paid, on average, to teachers with specified standard characteristics. Such information could be obtained from state education agencies (which, in some cases, would have to institute new data collection procedures of their own to obtain the information from LEAs); from NCES censuses or, possibly, sample surveys of individual districts; or, in part, from state-representative sample surveys of individual teachers.

Another, much broader objective is to construct a general teacher data base that can be used to support a variety of research and policy inquiries. Such a profile should include information on teacher characteristics, teacher compensation, and the conditions of teaching. Disaggregation to the state level is the minimum required for such a file to be at all useful, and for most research purposes that level of detail would not suffice. For instance, it would be difficult to derive valid conclusions about teacher quality, patterns of compensation, or relationships between teacher characteristics and outcomes without distinguishing, at least, among urban, suburban, and rural districts; districts of different sizes;

and districts of different levels of income or wealth. For in-depth analyses in any of these areas, individual district data would be required. Such data could be obtained through state agencies or from LEAs directly. The choice between the two seems to hinge on (a) the apportionment of the data collection burden and (b) the trade-off between decentralization and data quality. If NCES did choose the direct data collection strategy, it would seem reasonable to take advantage of the main district-level data collection mechanism already in place by appending a detailed set of teacher-related items to the Common Core of Data.

A somewhat more specialized research-oriented objective is to assemble the data needed to address teacher supply and demand issues, including the key issue of how teacher supply, and in particular its quality dimension, responds to changes in compensation and other market conditions. Some aspects of these issues, especially questions on the supply side, can be addressed through sample surveys of individual teachers or college graduates--provided, however, that the samples are drawn not merely to be nationally representative but to allow comparisons among states and types of districts. Other questions, including many on the demand side, require in-depth data from samples of school districts, such as salary schedules and the distributions of teachers upon them. In particular, an analysis of the flow of persons into and out of teaching would seem to require district-level data, specifically including detailed information on those entering and leaving the teaching force.

Finally, a narrower, but currently high-priority objective is to assemble data sets suitable for evaluating the effects of the major changes in teacher pay systems and certification standards now being instituted

around the country. This would probably require data from sample districts in states establishing the new systems (i.e., merit pay, career ladders, teacher proficiency examinations, etc.), with special emphasis on data concerning newly hired teachers and teacher turnover. It would also require collection of longitudinal data to determine the effects of the policy changes over time.

This list by no means exhausts the possibilities, but it suffices to make several points. First, geographically disaggregated teacher data are essential for research and policy uses. State-by-state data will serve some purposes, but for many research applications, district-level data will be required. Second, national data, and hence surveys based only on nationally representative samples, are of very limited value. They provide general background information and good numbers to use in speeches but contribute little to understanding how the teacher system works. Third, whatever the unit of analysis and whatever data collection strategy is used, it is important that data on all the relevant aspects of teaching be collected together. That is, data on teacher characteristics, compensation, working conditions, etc. should all be collected from the same respondents at the same times, so that relationships among these variables can be explored. Fourth and last, a nonsubstantive point: different potential uses of teacher data lead to different demands for data, and it is not readily apparent which demands should have precedence. Therefore, if NCES is to enter the field of teacher data collection in a serious way (which I assume it must), it should first engage in a series of priority-setting exercises and feasibility studies to produce a coherent plan. I would hope that such a review could begin with as

blank a slate as possible--i.e., without preconceptions regarding the modes of data collection or the continuation of current or projected NCES surveys in their present forms.

STATE-LOCAL STATISTICAL REPORTS
AS A NATIONAL (AND NCES) RESOURCE

In closing, I offer one additional observation that cuts across the areas of school finance and teachers (and probably other areas of NCES data collection as well). I have long believed that a great deal of useful data for educational research and policy studies is produced by states (and, in some cases, by local districts) but that the lack of an organized, central collection greatly limits its use. I suggest, therefore, that NCES take on the role of bringing such material together in a well-maintained central repository.

In the finance area, virtually every state produces an annual report on the finances of its school districts. These reports typically present district-by-district expenditure and revenue data in substantial detail and also cover tax bases and tax rates. The level of detail is often considerably greater than NCES could be expected to collect. Even though such data are often not comparable among all states, there are some cases in which such data could be used to supplement and fill gaps in NCES' own data bases, and there are many more cases in which data for selected states would serve the purposes of research and policy studies. By systematically acquiring the annual reports of all the states, therefore, NCES would be able to create a valuable, multipurpose analytical tool. In addition, much useful information could be extracted from the budgetary

documents and financial reports of local districts, selected samples of which (e.g., from large districts) should be included in such a collection.

In the teacher area, state reports are more variable in coverage and format, but many states do produce reports on numbers of teachers (and other staff), certain staff characteristics, and staff salaries by district. Some of these reports are extremely detailed. California, for instance, has produced for many years an annual volume providing not only the full salary schedule of each district in the state but also the number of teachers in every cell of that schedule. In some cases, official state documents on teachers and their salaries are supplemented by reports produced by teachers' unions, containing data on salaries, salary schedules, and working conditions in the various districts. Like the state-local data on finances, the data on teachers, if brought together, could satisfy a wide variety of data needs. In addition, during the several years it will undoubtedly take NCES to produce new teacher data of its own, compilations of selected teacher data from state sources might fill some of the currently unmet information needs.

Establishing a central data repository seems a natural role for the national education statistics agency. The availability of such a resource in-house might also have the beneficial side effects of keeping NCES staff in closer touch with developments in the states and providing means of cross-checking NCES' own data. At least a preliminary inquiry seems warranted to determine what data are regularly produced by the states, what uses they might serve, and how much it would cost NCES to develop and maintain such a collection.