

Technical Notes

**FRSS 88: Public School Principals' Perceptions of Their School Facilities,
Fall 2005**

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Fast Response Survey System

The Fast Response Survey System (FRSS) was established in 1975 by the National Center for Education Statistics (NCES), U.S. Department of Education. FRSS is designed to collect issue-oriented data within a relatively short time frame. FRSS collects data from state education agencies, local education agencies, public and private elementary and secondary schools, public school teachers, and public libraries. To ensure minimal burden on respondents, the surveys are generally limited to three pages of questions, with a response burden of about 30 minutes per respondent. Sample sizes are relatively small (usually about 1,000 to 1,500 respondents per survey) so that data collection can be completed quickly. Data are weighted to produce national estimates of the sampled education sector. The sample size permits limited breakouts by classification variables. However, as the number of categories within the classification variables increases, the sample size within categories decreases, which results in larger sampling errors for the breakouts by classification variables.

Sample and Response Rates

The sample for the survey consisted of 1,205 regular public elementary and secondary/combined schools in the 50 states and the District of Columbia. It was selected from the 2002–03 NCES Common Core of Data (CCD) Public School Universe file, which was the most current file available at the time of selection. The sampling frame included about 84,500 regular elementary and secondary/combined schools; about 63,400 of the schools were classified as elementary schools and about 21,100 were classified as secondary/combined schools. Special education, vocational education, and alternative/other schools were excluded from the sampling frame, along with schools with a highest grade below first grade, those outside the 50 states and the District of Columbia, and schools with zero or missing enrollment.

To select the sample, the frame of schools was stratified by instructional level (elementary, secondary/combined), enrollment size (less than 300, 300 to 499, 500 to 599, 600 to 749, and 750 or more for elementary schools; less than 300, 300 to 499, 500 to 999, 1,000 to 1,499, and 1,500 or more for secondary/combined schools), and percentage of students eligible for free or reduced-price lunch (less than 35 percent, 35 to 49 percent, 50 to 74 percent, and 75 percent or more). Within each stratum, schools were sampled systematically and with equal probabilities at predetermined rates that varied from stratum to stratum. To improve the representativeness of the sample, an implicit stratification was induced by sorting the schools within each stratum by type of locale (city, urban fringe, town, and rural) and region (Northeast, Southeast, Central, and West) prior to sampling.

All survey data were reported for fall 2005 when the survey was conducted. Questionnaires and cover letters for the study were mailed to the principal of each sampled school in mid-September 2005. The letter requested that the questionnaire be completed only by the principal. Telephone follow-up for survey nonresponse and data clarification was initiated in early October 2005 and completed in late

January 2006. During data collection, 47 schools were found to be ineligible for the survey, primarily because they had closed or merged with other schools. For the eligible schools, the response rate was 90 percent (1,045 responding schools divided by the 1,158 eligible schools in the sample). The weighted response rate was 91 percent. Of the schools that completed the survey, 18 percent completed it by Web, 47 percent completed it by mail, 9 percent completed it by fax, and 27 percent completed it by telephone.

Although item nonresponse for key items was very low, missing data were imputed for the eight items with a response rate of less than 100 percent. The missing items included both numerical data (the number of students the school is designed to serve), as well as categorical data such as how satisfactory the heating is in classrooms. The missing data were imputed using a “hot-deck” approach to obtain a “donor” school from which the imputed values were derived. Under the hot-deck approach, a donor school that matched selected characteristics of the school with missing data (the recipient school) was identified. The matching characteristics included instructional level, enrollment size, and percent of students in the school eligible for free or reduced-price lunch. In addition, relevant questionnaire items were used to form appropriate imputation groupings. Once a donor was found, it was used to obtain the imputed values for the school with missing data. For categorical items, the imputed value was simply the corresponding value from the donor school. All missing categorical items for a given school were imputed from the same donor. For the numerical item, an appropriate ratio was calculated for the imputation class mean, and this ratio was applied to available data for the recipient school to obtain the corresponding imputed value. Imputation flags are included in the data.

Weighting Procedures and Sampling Errors

The response data were weighted to produce national estimates (see table 1). The weights were designed to adjust for the variable probabilities of selection and differential nonresponse. FRSS survey data are based on complex sample designs that require the use of weights to compensate for variable probabilities of selection, differential response rates, and possible deficiencies in the sampling frame. The reciprocal of the probability of selection, referred to as the “base weight,” will produce unbiased (or consistent) estimates of population totals and ratios if there is no nonresponse in the survey. Since a stratified sample design was employed for the survey, the base weight for the i -th school in stratum h was computed as $w_{hi} = 1/f_h$ where f_h is the overall sampling rate used to select schools in stratum h .

Although the survey had a high response rate, adjustment of the base weights was necessary to compensate for the survey nonrespondents (i.e., whole questionnaire or unit nonresponse). To compensate for unit nonresponse, an adjustment factor was computed as the inverse of the base-weighted response rate within selected weighting classes. This factor was then used to inflate the base weights of the schools in the weighting class to obtain the final nonresponse-adjusted weight.

The survey findings were presented in a report titled *Public School Principals Report on Their School Facilities: Fall 2005*. The reported findings are estimates based on the sample selected and, consequently, are subject to sampling variability. The standard error is a measure of the variability of an estimate due to sampling. It indicates the variability of a sample estimate that would be obtained from all possible samples of a given design and size. Standard errors are used as a measure of the precision expected from a particular sample. If all possible samples were surveyed under similar conditions, intervals of 1.96 standard errors below to 1.96 standard errors above a particular statistic would include the true population parameter being estimated in about 95 percent of the samples. This is a 95 percent confidence interval. For example, the estimated percentage of public schools that have portable

(temporary) buildings is 37.1 percent, and the estimated standard error is 1.9 percent. The 95 percent confidence interval for the statistic extends from $37.1 - (1.9 \text{ times } 1.96)$ to $37.1 + (1.9 \text{ times } 1.96)$, or from 33.4 to 40.8 percent. The coefficient of variation (“c.v.,” also referred to as the “relative standard error”) of an estimate (y) is defined as $\text{c.v.} = (\text{s.e.} / y) \times 100$, where s.e. is the standard error of the estimate y .

Table 1. Number and percent of responding public schools in the study sample, and estimated number and percent of public schools the sample represents, by school characteristics: 2005

School characteristic	Respondent sample (unweighted)		National estimate (weighted)	
	Number	Percent	Number	Percent
All public schools.....	1,045	100	80,910	100
Instructional level				
Elementary.....	530	51	61,590	76
Secondary/combined.....	515	49	19,320	24
Enrollment size				
Less than 350.....	256	25	27,300	34
350 to 699.....	349	33	32,710	40
700 or more.....	440	42	20,900	26
School locale				
City.....	267	26	19,510	24
Urban fringe/large town.....	367	35	27,710	34
Small town/rural.....	411	39	33,690	42
Region				
Northeast.....	183	18	14,760	18
Southeast.....	233	22	17,250	21
Central.....	282	27	23,010	28
West.....	347	33	25,890	32
Percent minority enrollment				
Less than 6 percent.....	237	23	19,540	24
6 to 20 percent.....	242	23	20,440	25
21 to 49 percent.....	215	21	15,760	19
50 percent or more.....	330	32	22,900	28
Percent of students eligible for free or reduced-price lunch				
Less than 35 percent.....	427	41	32,880	41
35 to 49 percent.....	175	17	13,400	17
50 to 74 percent.....	216	21	18,620	23
75 percent or more.....	227	22	16,010	20

NOTE: Percent minority enrollment was not available for 21 schools. Those schools were included in the totals and in the analyses by other school characteristics. Detail may not sum to totals because of rounding or missing data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Fast Response Survey System, “Public School Principals’ Perceptions of Their School Facilities: Fall 2005,” FRSS 88, 2005.

Because the data from the FRSS survey on principals’ perceptions of their school facilities were collected using a complex sampling design, the variances of the estimates from this survey (e.g., estimates of proportions) are typically different from what would be expected from data collected with a simple

random sample. Not taking the complex sample design into account can lead to an underestimation of the standard errors associated with such estimates. Estimates of standard error were computed using a technique known as jackknife replication. As with any replication method, jackknife replication involves constructing a number of subsamples (replicates) from the full sample and computing the statistic of interest for each replicate. The mean square error of the replicate estimates around the full sample estimate provides an estimate of the variance of the statistic. To construct the replications, 50 stratified subsamples of the full sample were created and then dropped 1 at a time to define 50 jackknife replicates. A computer program (WesVar) was used to calculate the estimates of standard errors.

Nonsampling Errors, Coding, and Editing

The survey estimates are also subject to nonsampling errors that can arise because of nonobservation (nonresponse or noncoverage) errors, errors of reporting, and errors made in data collection. These errors can sometimes bias the data. Nonsampling errors may include such problems as misrecording of responses; incorrect editing, coding, and data entry; differences related to the particular time the survey was conducted; or errors in data preparation. While general sampling theory can be used to determine how to estimate the sampling variability of a statistic, nonsampling errors are not easy to measure and, for measurement purposes, usually require that an experiment be conducted as part of the data collection procedures or that data external to the study be used.

To minimize the potential for nonsampling errors, the questionnaire was pretested with principals of elementary and secondary schools. During the design of the survey and the survey pretest, an effort was made to check for consistency of interpretation of questions and to eliminate ambiguous items. The questionnaire and instructions were extensively reviewed by NCES.

Editing of the questionnaire responses was conducted to check the data for accuracy and consistency. Cases with missing or inconsistent items were recontacted by telephone. A coding source file and editing specifications were used to produce the codebook. The codebook served as the main tool for coding, editing, and processing completed questionnaires. Coders used the codebook to identify cases requiring data retrieval or clarification and prepare cases for entry into the web application. The source file served as a data dictionary and included the data file layout, a description of each data item, a list of valid response codes or range formats with codes for nonresponse and inapplicable, and defined skip patterns. The coding source file was used to develop the ACCESS database for data verification.

Logics, ranges, and validation checks were prepared prior to data collection and included online edit checks, manual logic checks, and automated checks using SAS. Online checks were incorporated into the web application and manual edits were conducted to process cases received by mail, fax, or telephone. Steps were taken to ensure that the method of entering data from web and hardcopy questionnaires was the same, regardless of mode. For example, to enter survey data received by mail, fax, or telephone, the data processing staff accessed the survey website as “respondents” and “completed” the survey using the responses on the hardcopy survey. Subjecting all survey responses to the same set of built-in logics, ranges, and validation checks helps to ensure that data entry does not produce systematic differences in the survey data. In addition, all hardcopy data were subject to 100 percent verification using “double-keying.”

Definitions of Selected Analysis Variables

Many of the school characteristics, described below, may be related to each other. For example, school enrollment size and locale are related, with city schools typically being larger than small town or rural schools. Other relationships between these analysis variables may exist.

Instructional level—Schools were classified according to their grade span in the 2002–03 Common Core of Data (CCD) Public Elementary/Secondary School Universe File. Secondary and combined schools were grouped together for both sampling and analysis. Data are reported for the following categories:

Elementary school—Had grade 6 or lower and no grade higher than grade 8.

Secondary/combined school—All other schools.

Enrollment size—This variable indicates the total number of students enrolled in the school based on responses to question 15 on the survey questionnaire. The variable was collapsed into the following three categories:

Less than 350 students (small)

350 to 699 students (medium)

700 or more students (large)

School locale—This variable indicates the type of community in which the school is located, as defined in the 2002–03 CCD Public Elementary/Secondary School Universe File (which uses definitions based on U.S. Census Bureau classifications). The variable was based on the eight-category locale variable from CCD and collapsed into the following three categories.

City – A large or midsize central city of a Metropolitan Core Based Statistical Area (CBSA).

Urban fringe/large town – Any incorporated place, Census-designated place, or non-place territory within a CBSA of a large or midsize city, and defined as urban by the Census Bureau, and an incorporated place or Census-designated place with a population greater than or equal to 25,000 and located outside a Metropolitan CBSA.

Small town/rural – An incorporated place or Census-designated place with a population less than 25,000 and greater than or equal to 2,500 and located outside a Metropolitan CBSA, and any incorporated place, Census-designated place, or non-place territory defined as rural by the Census Bureau.

Region—This variable classifies schools into one of the four geographic regions used by the Bureau of Economic Analysis of the U.S. Department of Commerce and the National Assessment of Educational Progress. Data were obtained from the 2002–03 CCD School Universe file. The geographic regions are:

Northeast – Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont

Southeast – Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia

Central – Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin

West – Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oklahoma, Oregon, Texas, Utah, Washington, and Wyoming

Percent minority enrollment—This variable indicates the percentage of students enrolled in the school whose race or ethnicity is classified as one of the following: American Indian or Alaska Native; Asian or Pacific Islander; Black, non-Hispanic; or Hispanic; based on data in the 2002–03 CCD School Universe file. Data on this variable were missing for 21 schools; schools with missing data were excluded from all analyses by percent minority enrollment. The percent minority enrollment variable was collapsed into the following four categories:

Less than 6 percent minority
6 to 20 percent minority
21 to 49 percent minority
50 percent or more minority

Percent of students eligible for free or reduced-price lunch—This variable was based on responses to question 22 on the survey questionnaire. This item served as a measurement of the concentration of poverty at the school. The categories are:

Less than 35 percent
35 to 49 percent
50 to 74 percent
75 percent or more

Data Disclosure Warning

Under law, public use data collected and distributed by the National Center for Education Statistics (NCES) within the Institute of Education Sciences may be used only for statistical purposes.

Any effort to determine the identity of any reported case by public-use data users is prohibited by law. Violations are subject to Class E felony charges of a fine up to \$250,000 and/or a prison term up to 5 years.

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Data perturbations were conducted on some background data to preclude identification of individuals and institutions.