

The Funding Gap 2003: Technical Appendix

The *Funding Gap* report contains an analysis of disparities in funding between high- and low-poverty school districts. Based on school district-level financial data collected by the U.S. Census Bureau and the U.S. Department of Education (DOE) for the 2000 – 2001 school year, the latest year for which this data is available, the data was supplemented with other school- and district-level data regarding student enrollment and child poverty, also collected by the Census Bureau and the DOE.

The scope of the analysis included estimates for 49 individual states, and for the nation as a whole.¹ Vocational and special education systems were excluded from the study, as were supervisory or administrative districts (which usually serve multiple local districts). Also excluded from the study were state- and federally-operated institutions, such as Department of Defense schools. The final database used in the analysis included 13,944 school districts, enrolling approximately 46 million students.

Data Sources and Variables

The following is a list of data sources and individual variables used for each dataset required to perform this analysis. In addition, their designated abbreviations and website address are also included. At the time of publication, these represent the most current data of their kind available.

School District Financial Data: U.S. Census Bureau, *Federal, State, and Local Governments, Public Elementary-Secondary Education Finance Data for Year 2001* (often referred to as the National Center for Education Statistics “F-33” database).

<http://www.census.gov/govs/www/school.html>

- State identification number (STATE)
- School level code (SCHLEV)
- NCES ID Code (NCESID)
- Fall membership, October 2000, FY 2001 (V33)
- Total revenue from state sources in thousands of dollars (TSTREV)
- Total revenue from local sources in thousands of dollars (TLOCREV)

School District Enrollment Data: National Center for Education Statistics (NCES), *Common Core of Data (CCD), Local Education Agency (School District) Universe Survey Data, 2000-2001*.

<http://nces.ed.gov/ccd/pubagency.asp>

- NCES Local Education Agency ID (LEAID)²
- NCES code for type of agency (TYPE00)
- Special Education – IEP students (SPECED00)³

¹ Hawaii and the District of Columbia were excluded from the analysis because each state operates a single state-wide school district, making inter-district comparisons impossible. However, they were included as individual districts when studying inter-district funding gaps across the entire United States.

² Note: This is the same value as the “NCESID” in the F-33 dataset.

School Enrollment Data: NCES, *Common Core of Data, Public Elementary/ Secondary School Universe Survey Data for 2000-2001*.

<http://nces.ed.gov/ccd/pubschuniv.asp>

- NCES Local Education Agency ID (LEAID)
- American Indian / Alaskan Native students (AM00)
- Asian / Pacific Islander students (ASIAN00)
- Hispanic students (HISP00)
- Black, not Hispanic students (BLACK00)

NCES provides student enrollment data by race/ethnicity at the school level, but not the district level. For this analysis, minority enrollment at the district level was calculated as the sum of the minority enrollment in each school within the district.

School District Poverty Data: U.S. Census Bureau, *Small Area Income and Poverty Estimates, School District Estimates for 1999*.

<http://www.census.gov/hhes/www/saipe/schooltoc.html>

- CCD District ID (CCDID)⁴
- Estimated population of children 5 to 17 years of age (CPOP517)
- Estimated population of poor children 5 to 17 years of age (CPOP517P)

Note: This is a newly released dataset, based in part on recent census collections. The 2002 version of *The Funding Gap* used data from 1997. Therefore, the number of low-income students in various school districts has changed from those in previous reports, in some cases significantly. This may change the makeup of the districts designated as “highest-poverty” and “lowest-poverty” for the purposes of conducting this analysis. A district with a large change in poverty rates, positive or negative, may move from one quartile to another. This, in turn, can impact the poverty gap calculations for that state.

Cost of Education Index: NCES, *Chambers Cost of Education Index Dataset for 1993-1994*.

<http://nces.ed.gov/edfin/prodsurv/data.asp>

- NCES Agency ID (NLEA_ID)⁵
- Cost of Education Index (CEIL93)

The Cost of Education Index (CEI) was created by education researcher Jay Chambers, using several major data sources, including the Schools and Staffing Survey (SASS) administered by NCES in 1993-1994. The SASS was last administered in 1999-2000, but updated cost index information based on that survey has not yet been released. While the underlying dataset lags the 2000-2001 school year by a number of years, it remains an

³ IEP refers to an “Individualized Education Plan” – a personalized, written instructional plan for students with disabilities designated as special education students under the federal Individuals with Disabilities Education Act (IDEA).

⁴ This is the same number as the NCESID in the F-33 dataset, and the LEAID in the district and school universe datasets.

⁵ Also the same as NCESID, LEAID, and CCDID.

appropriate source of relative school district costs, as these costs are stable over time. A study that compared school district CEIs for 1993 – 1994 to calculations of CEIs for 1987 – 1988 and 1990 – 1991 shows a 98 percent correlation across each of the two three-year intervals, and a 96 percent correlation across the six-year interval. In other words, the relative cost differences among school districts appear to change very little over time. Small, remote Alaskan school districts that were expensive to serve in 1988 were still expensive in 1991 and 1994, and were likely still expensive in 2000. Therefore, it is reasonable to use an index based on 1993 – 1994 data to adjust revenue information for the 2000 – 2001 school year. It is expected that more updated adjustments will be available for future *Funding Gap* analyses.

Dataset Construction

To perform this analysis, data from each of the five datasets were merged into a single dataset. To calculate district-level data for minority student enrollment, school-level data was aggregated within each district. Once the datasets were merged, districts that did not meet certain criteria were eliminated from the study. Those included:

- Districts with no NCESID;
- Districts that received no state and local revenues;
- Districts that enrolled no students;
- Non-local school districts (TYPE00 values other than 1 or 2) , which excludes special state and federal districts serving special student populations, and regional or supervisory districts and;
- Districts with school levels other than elementary, secondary, or unified (SCHLEV values other than 1, 2, or 3). Excluded district types include vocational, special education, non-operating school system, and educational service agencies. These types often overlap with regular school districts, serving students from multiple districts.

Several districts were missing data for the Cost of Education Index. When this occurred, they were adjusted using the state average CEI. A few districts (less than 50) lacked updated 1999 poverty information. For these districts, 1997 poverty rates were used. Three districts that lacked data on race and Hispanic origin were eliminated from the dataset. In addition, one state – Tennessee – did not report such data to NCES for the year in question, therefore Tennessee was excluded from the section of the analysis that addresses minority funding gaps.

Funding Gap Calculations and Methodology

Once the data was assembled, the funding gaps were calculated as follows:

1) Calculate adjusted state and local revenue amount

Total state and local revenues for each school district are calculated as the sum of total state revenues (TSTREV) and total local revenues (TLOCREV).

This sum is adjusted for the district's Cost of Education Index. Districts with average costs have a CEI equal to 1. Those with below-average costs have a CEI of less than 1, and those with above-average costs have a CEI of greater than 1. The adjusted state and local district revenues (ADJREV) are calculated by taking the total state and local revenues and dividing by the cost index:

$$\text{ADJREV} = (\text{TSTREV} + \text{TLOCREV}) / \text{CEI}$$

This increases the resources that are effectively available in districts with below-average CEIs, and decreases the resources that are effectively available in districts with above-average CEIs.

2) Calculate adjusted pupil count

The pupil count used in the calculation of revenues per student was adjusted for the additional costs of serving two groups of students: students with disabilities, and students living in households with incomes below the federal poverty line.

To account for the additional cost of serving students with disabilities, the number of special education students with individual education plans (SPECED00) was multiplied by 1.9, reflecting the estimate that special education students cost, on average, 90% more to educate than non-special education students (individual costs vary widely, depending on the nature of the disability). This estimate is based on the recent study of special education spending, *What Are We Spending on Special Education Services in the United States, 1999-2000?* (Jay G. Chambers, Thomas B. Parrish, Jennifer J. Harr, American Institutes for Research, Center for Special Education Finance, September 2002).

To account for the additional cost of serving low-income students, the number of students living below the federal poverty line (\$17,463 for a family of four in 2001) was multiplied by a cost factor that varied among different tables in the report. For Table 1, no adjustment for poverty was used. For Table 2, a 20% cost adjustment was used, meaning that the number of low-income students was multiplied by 1.2, and Tables 3 & 4, used a 40% cost adjustment. Adjustments for the cost of educating low-income students are widely used in academic studies of education funding, as well as in recent analyses performed by the U.S. Department of Education and the U.S. General Accounting Office. For a further discussion of the source and rationale for these adjustments, see the main body of the text and accompanying footnotes.

It should be noted that some education funding analyses also make an adjustment for the cost of educating students with limited English proficiency (LEP). For a discussion, see Paternick, Smerdon, Fowler, Monk, *Using Cost and Need Adjustments to Improve the Measurement of School Finance Equity*, U.S. Department of Education, National Center for Education Statistics, 1997. LEP student enrollment data has been collected at the district level in recent years, but not enough states are reporting that data to include such an adjustment in this analysis.

The adjusted pupil count for each school district is calculated as follows:

Where:

V33 = Total enrollment, all students

SPECED00 = Total special education enrollment

POV00 = Total low-income enrollment, calculated as the percent of students living below the poverty line (CPOP517P / CPOP517) multiplied by total enrollment (V33)

The adjusted pupil count (ADJPUPIL) equals:

$$V33 + (\text{SPECED00} * 0.9) + (\text{POV00} * (\text{poverty adjustment}))$$

In Table 1, the poverty adjustment is 0.

In Table 2, the poverty adjustment is 0.2.

In Tables 3 & 4, the poverty adjustment is 0.4.

3) Calculate the cost-adjusted funding per-pupil

After calculating the total adjusted state and local revenues using the Cost of Education Index, we take that amount (ADJREV) and divide it by the adjusted pupil count (ADJPUPIL) for each school district:

$$\text{Adjusted revenues per student (ADRVSTD)} = \text{ADJREV} / \text{ADJPUPIL}$$

4) Identify the groups of districts with the highest and lowest percentages of low-income and minority students

To perform this calculation, we rank all the districts in a state from top to bottom in terms of the percent of low-income students (CPOP517P / CPOP517). We then divide the districts into four quartiles with approximately the same number of students in each group. For example, if a state had 1,000,000 students, each quartile would contain approximately 250,000 students. To identify the top quartile in this hypothetical state, begin with the highest-poverty district and then move down the list, adding up the cumulative enrollment in the districts until the sum reaches 250,000.

The student count in each quartile is not precisely the same, because each quartile group consists of whole school districts. In New York state, for example, one district – New York City – contains, by itself, significantly more than 25% of all students.

To calculate national funding gap amounts, this procedure was applied to all districts nationwide, including those in Hawaii and the District of Columbia, which were excluded from state-level analyses because they consist of one unified statewide school district.

To calculate minority funding gaps, the same procedure was used based on the percent of minority students within the district. That amount was calculated as the sum of American Indian, Asian, Black, and Hispanic students, divided by total enrollment:

$$(AM00 + ASIAN00 + BLACK00 + HISP00) / V33$$

4) Calculate average per-student revenues in the districts with the highest and lowest percentages of low-income students

Having identified the quartiles of students with the highest and lowest- percentage of low-income students, the average per-student funding level each quartile is calculated as the sum of district revenues within the quartile divided by the sum of district pupils within the quartile, or:

$$\sum (ADRVSTD * V33) / \sum (V33)$$

This process was repeated for the quartiles of school districts with the highest and lowest percentage of minority students within each state.

Both the poverty and minority calculations were repeated for the United State as a whole. The national funding gap numbers found at the bottom of Tables 2, 3, and 4 are *not* based on an average of the state funding gap amounts on those tables. Rather, they are based on creating four weighted quartiles for all districts nationwide, including Hawaii and the District of Columbia, which are not included in the individual state analyses.

Note: This appendix is based in large part on the appendix written for the 2002 version this report. That appendix was written by Greg F. Orlofsky.

The following table shows the dollar amounts to which the list of states on Table 1 refers.

State	Gap Between Revenues Available PER STUDENT in the highest- and lowest-poverty districts (cost-adjusted dollars, no adjustment for low-income students)	Gap Between Revenues Available PER STUDENT in the highest- and lowest-minority districts (cost-adjusted dollars, no adjustment for low-income students)
Alabama	\$691	\$900
Alaska	-\$1,166	-\$905
Arizona	\$989	\$355
Arkansas	-\$46	-\$369
California	-\$13	\$269
Colorado	\$137	\$516
Connecticut	-\$234	\$64
Delaware	-\$831	-\$45
Florida	-\$40	-\$59
Georgia	-\$764	-\$917
Idaho	-\$188	\$487
Illinois	\$1,950	\$1,079
Indiana	-\$321	-\$82
Iowa	\$72	\$448
Kansas	-\$248	\$1,746
Kentucky	-\$230	-\$410
Louisiana	\$719	\$390
Maine	\$207	\$562
Maryland	\$1,027	\$244
Massachusetts	-\$1,302	-\$1,633
Michigan	\$592	-\$195
Minnesota	-\$1,110	-\$767
Mississippi	-\$170	-\$273
Missouri	-\$356	-\$1,182
Montana	\$255	\$1,659
Nebraska	-\$134	\$1,738
Nevada	-\$302	-\$23
New Hampshire	\$877	\$1,459
New Jersey	-\$854	-\$810
New Mexico	-\$319	\$61
New York	\$1,672	\$1,720
North Carolina	\$46	-\$96
North Dakota	-\$631	\$1,716
Ohio	\$66	-\$96
Oklahoma	-\$288	\$377
Oregon	-\$178	-\$248
Pennsylvania	\$1,063	\$542
Rhode Island	\$21	-\$265
South Carolina	\$69	\$200
South Dakota	-\$558	\$1,119
Tennessee	-\$844	*
Texas	\$323	\$969
Utah	-\$630	\$363
Vermont	\$1,014	\$825
Virginia	\$948	-\$39
Washington	-\$1	\$236
West Virginia	\$158	-\$409
Wisconsin	\$71	\$807
Wyoming	-\$46	\$1,553