The Education Trust
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Equal is not Good Enough: An Analysis of School Funding Equity Across the U.S. and Within Each State
TECHNICAL APPENDIX

OVERVIEW

This report describes an analysis of funding disparities between the highest and lowest poverty school districts, as well as districts serving the most and the fewest students of color or English learners. The analysis considers disparities in state and local revenues. It does not include federal revenues, which are intended to support supplemental services to specific groups of students such as students from low-income backgrounds, English learners, and students with disabilities. The only federal dollars included in our analysis are those that are specifically meant to replace state and local funds: Impact Aid.

Our analysis includes a total of 12,747 regular public school districts that serve 47.5 million students. Because the Census Bureau data on which this analysis relies (the Public Elementary and Secondary Education Finance Data and the Small Area Income and Population Estimates) do not include independently operated charter schools or districts that only operate charter schools, our analysis excludes these districts.

Districts are classified as high-poverty and low-poverty based on the percentage of students living below the poverty line in calendar year 2020. Districts are classified as serving the most or the fewest students of color or English learners based on student enrollment data from the 2019–20 school year. Our revenue estimates are based on a three-year average of district financial information (for fiscal years 2018–2020) to minimize the impact of year-to-year revenue fluctuations, such as those arising from capital investments. State and local revenues are adjusted to remove revenue that is passed through to independently operated charter schools or districts, and adjusted for inflation and regional differences in labor market costs.

We measure funding disparities by calculating the differences in state and local revenues per student between groups of districts serving the most and the fewest students in poverty, the most and the fewest students of color, and the most and fewest English learners.

This technical appendix describes our data sources and methodology in detail.

DATA SOURCES

This analysis uses district-level data from several federal sources — the U.S. Census Bureau, the National Center for Education Statistics (NCES), and the Bureau of Labor Statistics (BLS). The following is a list of data sources and variables used in this analysis.

District Financial Data: U.S. Census Bureau, "Public Elementary and Secondary Education Finance Data," accessed May 2022, https://www.census.gov/programs-surveys/school-finances.html.

These files contain the results of Census' Annual Survey of School System Finances, which has been administered to all public elementary and secondary school systems annually since 1977. Charter districts operated by entities that are not governmental bodies are not included in these files.

The analysis uses data from FY 2018, FY 2019, and FY 2020, and the following variables:

- NCES unique identification number
- School-level code
- Fall membership
- Total revenue from state sources
- Total revenue from local sources
- Impact Aid (B10)
- Payments to charters (V92)
- NCES local revenue (C24)

District Enrollment Data: U.S. Department of Education National Center for Education Statistics Common Core of Data (CCD), "Local Education Agency (School District) Universe Survey," accessed May 2022, https://nces.ed.gov/ccd/elsi/.

The Common Core of Data (CCD) contains a listing of every education agency in the country that provides public elementary and/or secondary education or educational support services, complete with information on location, type of district, student demographics, and more.

The analysis uses data from 2019-20 and the following variables:

- NCES unique identification number
- Education agency type code
- Education agency boundary change code
- Black, Latino, Native, and English learner student enrollment
- Total enrollment

District Poverty Data: U.S. Census Bureau, "Small Area Income and Poverty Estimates by School District," accessed May 2022, https://www.census.gov/programs-surveys/saipe.html.

The Small Area Income and Poverty Estimates (SAIPE) dataset contains estimates of the overall number of 5- to 17-year-olds, as well as the number of 5- to 17-year-olds from low-income backgrounds in each school district, based on data from the Census American Community Survey (ACS).

The analysis uses data from 2020 and the following variables:

- State FIPS code
- NCES identification number
- Number of children in district, ages 5-17
- Number of children in district, ages 5-17, in poverty

Geographic Cost of Living Adjustment Data: U.S. Department of Education National Center for Education Statistics, "American Community Survey Comparable Wage Index for Teachers (ACS-CWIFT)" accessed May 2020, https://nces.ed.gov/programs/edge/Economic/TeacherWage.

The comparable wage index (CWI) measures systematic variations in the salaries of college graduates who are not educators to estimate the geographic differences in labor market costs outside of school district control. The CWI adjustment allows for better comparison of finances across districts, states, and the nation.

The analysis uses data from 2019-20, 2018-19, and 2017-18, and the following variables:

- NCES unique identification number
- ACS-based Comparable Wage Index
- ACS-based Comparable Wage Index for states

Inflation Data: Bureau of Labor Statistics, "Consumer Price Index — All Urban Consumers, U.S. City Average," accessed May 2020, https://beta.bls.gov/dataViewer/view/timeseries/CUUR0000SA0.

This index gives data on changes in the prices paid by urban consumers for a representative basket of goods and services, allowing for comparisons of financial values at different points in time. The analysis uses the annual CPI for all urban consumers for 2018, 2019, and 2020.

DATASET CONSTRUCTION

To conduct our analysis, we began with the 2020 Census financial file to determine the sample of districts to be included in the analysis. This file was merged with the 2018 and 2019 Census financial files, and student enrollment data, poverty estimates, and CWI data using the NCES district identification numbers.

The following types of districts are excluded from the analysis because they are outside the scope of the analysis or were missing key data points:

1. Districts that were not classified as "regular" elementary, middle, or high school districts:
    a. Districts categorized in the Census finance file as having a School Level Code equal to Vocational or Special Education School System (05), Nonoperating School System (06), or Educational Service Agency (07). These districts serve special populations of students, are no longer functional, or are funded in unique ways that put them beyond the scope of this analysis.
    b. Districts that were classified as a "State-operated agency," "Federal-operated agency," or "Other education agency" (types 5, 6, or 8) in the CCD file were removed from the sample, as they also serve special populations of students.
    c. Districts that only operate charter schools (type 7 in the CCD file) were excluded since the majority of charter districts are not included in the Census finance data collection.
2. Districts missing key financial or enrollment data needed for the analysis:
    a. A small number of districts that had no student enrollment in 2020.
    b. Districts with no state or local revenues.
3. Districts that had revenue and enrollment data, but were missing key demographic information needed for the analysis:
    a. Districts missing total enrollment in the CCD file.
    b. Districts missing poverty data in the SAIPE file.
    c. Districts missing a comparable wage index value in the CWI file.
4. States with data quality concerns:
    a. Alaska: Because the state's geography and climate drive differences in the cost of education that are not fully reflected in wages and therefore not accounted for in the regional cost of labor adjustment.[1]
    b. Vermont: Because of data reporting inconsistencies across datasets.

CALCULATING DISTRICT REVENUES

Our analysis is based on three-year averages of state and local revenues per student for every district, adjusted for geographic cost differences and inflation. We estimated total district revenues by multiplying the adjusted three-year average by 2020 district enrollment to approximate the total resources available to the district given the number of students served in 2020.

This section describes the district-level, three-year average calculations. Note that we created three revenue estimates for each district — one that is based on state + local revenue, one that includes state revenue only, and one that includes local revenue only.

1. ADJUSTED DISTRICT-LEVEL REVENUES

To adjust state revenue for each district and for each year, we:

- Subtracted a proportional share of payments to charter schools (V92), because payments to charter schools inflate district revenues; we prorate based on the percentage of each district's revenue that comes from the state because we do not know how much revenue from each source is sent to charters
- Subtracted revenue that the Census Bureau considers state revenue, but NCES considers local revenue (C24)
- Multiplied by 1,000

To adjust local revenue for each district and for each year, we:

- Added Impact Aid revenue (B10)
- Subtracted a proportional share of payments to charter schools (V92), because payments to charter schools inflate district revenues; we prorate based on the percentage of each district's revenue that comes from the locality because we do not know how much revenue from each source is sent to charters
- Added revenue that the Census Bureau considers state revenue, but NCES considers local revenue (C24)
- Multiplied by 1,000

Next, we adjusted 2018 and 2019 state and local revenue values to 2020 values using their respective CPI values.[2]

Then, we accounted for the fact that the costs of providing education services vary from one region to another by adjusting the district revenues for each district, in each year, using the ACS-CWIFT.

2. CALCULATED A THREE-YEAR AVERAGE, PER-STUDENT REVENUE

Next, we calculated three-year average revenues per student — weighted by student enrollment, so that no one year's finances had an effect on the three-year average beyond that of its enrollment.

3. ESTIMATED TOTAL REVENUES FOR EACH DISTRICT

Finally, we calculated total revenues for each district by multiplying the average revenue per student by 2020 enrollment.

CALCULATING GAPS IN REVENUES BETWEEN THE HIGHEST AND LOWEST POVERTY DISTRICTS

To calculate funding gaps between the highest and lowest poverty districts, we assigned districts to quartiles based on poverty rates, ensuring that each quartile had approximately 25% of students. We then compared the average, per-student revenues for the highest and lowest poverty quartiles.

In the state-by-state analysis, districts were sorted by poverty rate and assigned to quartiles within each state. For the national analysis, districts were sorted by poverty rate, regardless of state, and assigned to nationwide quartiles.

While Hawaii is included in the national analysis, it is excluded from the within-state analyses because it has only one school district. Nevada is also excluded from the within-state analyses because its student population is heavily concentrated in one district and could not be sorted into quartiles. Finally, note that because so many New York students are concentrated in New York City, we sorted districts in that state into two halves, as opposed to four quartiles, for all within-state analyses.

1. CALCULATED THE PERCENTAGE OF CHILDREN IN POVERTY FOR EACH DISTRICT

We divided the number of children ages 5 to 17 in the district from low-income backgrounds by the total number of children ages 5 to 17 in the district from the SAIPE file.

2. SORTED DISTRICTS INTO QUARTILES

To assign districts to within-state quartiles, we sorted districts from the highest poverty rate to the lowest poverty rate — in each state for the within-state analyses or nationally for the nationwide analyses, and then divided them into four quartiles so that each quartile had approximately 25 percent of all students — in the state or in the country.

3. CALCULATED AVERAGE, PER-STUDENT REVENUES FOR EACH QUARTILE

Next, we calculated per-student revenues in each state and nationally. For each quartile, we summed the adjusted revenue values across all districts and divided by the sum of total enrollment across all districts.

4. CALCULATED FUNDING GAP BETWEEN THE HIGHEST AND LOWEST POVERTY QUARTILE

Finally, we subtracted the per-student funding value of the lowest poverty quartile from that of the highest poverty quartile and calculated the gap as a percentage of the per-student funding value for the lowest poverty quartile.

CALCULATING GAPS IN REVENUES BETWEEN DISTRICTS SERVING THE MOST AND THE FEWEST STUDENTS OF COLOR OR ENGLISH LEARNERS

In addition to poverty gaps, we also examined gaps between districts serving the most and fewest students of color or English learners, both within states and nationwide. To run these analyses, we used the same dataset and methodology as used in the poverty gap analysis, except districts were assigned to quartiles based on the percentage of students of color or English learners they serve. For each district, the percentage of students of color was calculated by dividing the total number of Black, Latino, and Native students by the total number of students; similarly, the percentage of English learners was calculated by diving the total number of English learners by the total number of students.

As in the poverty analysis, Hawaii and Nevada were excluded from the within-state analysis, while New York was divided into halves as opposed to quartiles. The analyses based on the concentration of students of color also exclude Maine, Vermont, New Hampshire, and West Virginia because students of color make up less than 10% of enrollment in these states, which is substantially less than the representation of students of color in all other states. The analyses based on the concentration of English learners also exclude Mississippi, Montana, New Hampshire, West Virginia, and Wyoming because students who are classified as English learners make up less than 3% of each of those states' total student enrollment.

Endnotes

1. Lori L. Taylor, Jay Chambers, and Joseph P. Robinson, "A New Geographic Cost of Education Index for Alaska: Old Approaches with Some New Twists," *Journal of Education Finance*, Vol 30, No 1 (Summer 2004), pp. 51-78, http://www.jstor.org/stable/40704220.
2. CPI values for 2018, 2019, and 2020 are 248.126, 253.268, and 257.23, respectively.