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Beyond Meal Status:

A New Measure for Quantifying Poverty Levels in the City's Schools

Summary

For many years, eligibility for free or reduced-price lunch has served policymakers, researchers, and advocates as the primary means for quantifying the socioeconomic status of students in the city's public schools. But there are a number of concerns about using meal status as a measure of poverty—from the considerable number of forms that are incomplete or not returned, to the use of a 1960s-era nationwide definition of the poverty line that does not account for New York City's high cost of living as the basis of eligibility for free or reduced-price meals.

To address these and other shortcomings of the meal subsidy approach to quantifying student poverty, IBO has developed a measure that reflects the income of a typical household in a particular geographic community. This approach is not a measure of individual household incomes of students, but rather a measure of the incomes in the communities in which students live. We do this based on the median household income of the census tract where students reside. This approach can also be used to characterize a community's poverty status by comparing the community's median income level to a particular income threshold. In this report, IBO uses the poverty threshold calculated by the NYC Center for Economic Opportunity—which has developed a well-respected alternative way to measure poverty in the city—as a benchmark for our new school community income metric.

This background paper presents details on the development of our community income measure and how we ensure the reliability of our indicator. The paper then applies our measure to school year 2012-2013. Among our findings:

- Citywide, the average student's community income is about \$47,800, with the community income for about a quarter of students at roughly \$30,900 or less and another quarter at \$60,300 or more.
- The average school community income ranges from a low of about \$16,440 at P.S. 150 in Brownsville to a high of nearly \$168,090 at P.S. 89 in Tribeca.
- The 7.5 percent of schools with the largest share of students living in poor communities serve student populations where between 80 percent and nearly 99 percent of students live in areas where the community income is below the NYC Center for Economic Opportunity's poverty threshold. Conversely, roughly a third of schools have a student population where less than 10 percent come from such communities.

While eligibility for free or reduced-price meals can reflect the income of a student's household, that household exists within a broader community that also affects a student's identity and school performance. IBO's new measure begins to capture that community's socioeconomic status.



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Introduction

Policymakers and researchers often analyze the interaction between socioeconomic status and educational performance. The metric most commonly used relies on a student's eligibility for free or reduced-price lunch, a federally funded program run by the U.S. Department of Agriculture. A student's meal subsidy status is treated as a proxy for poverty; that is, if a student is eligible for free or reduced-price lunch, that student is considered to be from a low-income household. The meal eligibility metric measures an individual student's socioeconomic status, and reflects that student's particular household characteristics. But a student's household also exists within a broader community—a community that helps to mold that student's identity and therefore affects educational performance. In this paper, IBO introduces one measure that begins to capture a community's socioeconomic status using the median household income of the community as reported by the U.S. Census Bureau.

This paper will be organized as follows. First, we will review the New York City Department of Education's (DOE) process for identifying students who are eligible for free or reduced-price lunch and our concerns with using meal eligibility as a measure of poverty. Second, we introduce our new measure of community income and detail how we ensure reliability for our indicator. Third, we present three separate distributions of community income in New York City—a distribution of all households in the census dataset, a distribution of public school students, and a distribution of public schools. We also look at how changing the unit of analysis across these distributions (households to students to schools) changes the distributions of community income. Finally, we introduce a way to identify students who come from poor communities and aggregate to the school level to calculate each school's share. We compare IBO's measure with the widely used measure based on meal eligibility.

Background on the Use of Free or Reduced-Price Lunch

The process by which a student's meal subsidy status is determined is two-fold. First, the DOE automatically grants students eligibility for free lunch if they are cross-matched to one of the following lists maintained by the city's Human Resources Administration: children in households that receive public assistance either through Temporary Assistance to Needy Families or food stamps; children in foster care; children who are migrant, homeless, or runaway; or children enrolled in Head Start.¹ For other students, eligibility is determined by a school meals

application that is submitted by parents or guardians to the school. Self-reported information on household size and income earned by each adult living in the household is used to determine if students qualify for free lunch (household income below 130 percent of the poverty guideline for that household size) or reduced-price lunch (household income between 130 percent and 185 percent of the poverty guideline).²

In New York City public schools, the overwhelming majority of students are classified as poor: roughly 80 percent of students qualify for free or reduced-price lunch.³ There are four main concerns about the use of a student's meal subsidy status as a measure of poverty. First, the school lunch eligibility measure is binary—a student is classified as either “eligible for free or reduced lunch” or not. It does not allow us to differentiate among students within those two broad categories. Second, the self-reported form is an imperfect measure of household income, especially since many students do not return the form. Students that are deemed ineligible for subsidized meals due to a missing or incomplete form are assigned to the full-price lunch status. However, these students tend to perform academically more like students who qualify for free lunch rather than students who qualify for full price lunch based on a completed form.⁴ Therefore, the group of students considered ineligible for free or reduced-price lunch may not be as homogenous as it may seem, and may in fact include many students who would be deemed eligible if proper documentation was available. Third, many schools are increasingly participating in federally funded programs to provide free meals to all students in a school—through the Universal School Meals program or a similar program for middle schools in the city—regardless of an individual student's meal status. As these programs expand, schools have less of an incentive to collect the forms from each and every student.

The final concern relates to the U.S. Census Bureau's definition of the poverty line, which is based on assumptions from 1963. To determine who is in poverty, the price of a low-cost food budget, which was designed for different family compositions, is multiplied by three. This calculation assumes that food generally accounts for one-third of a family's expenses, as was the case when the measure was developed, whereas today food expenditures account for less than one-seventh of what a family spends.⁵ Furthermore the measure does not vary geographically or reflect relative cost of living differentials, which is of particular relevance in New York City. In 2012, the nationwide poverty line for a family of two adults and two

children was \$23,283. Despite these limitations, however, a student's meal subsidy status is still the only measure of an individual student's socioeconomic status that is generated by the DOE and therefore the most widely used.

Community Income Measure

For the 2015 edition of the [Education Indicators](#) report, IBO is introducing a measure that is meant to reflect the income of a typical household in a particular geographic community as a supplement to the traditional meal subsidy-based measure of student poverty. It is important to stress that this is not a measure of the income level of individual families, like the free or reduced-price eligibility measure, but rather a measure of income in the community in which students live. IBO's goal was to create a measure of income reflective not just of students from the lowest-income communities in city public schools, but one that can be used to analyze students at all points along the income distribution, thereby capturing a student's relative socioeconomic status. Of course, this continuous measure can also be used to create any number of binary measures, such as low-income/not low-income, high-income/not high-income, or middle income/not middle-income. Therefore, we feel that this neighborhood-based income measure is more versatile than the individual measure of poverty that is commonly used.

IBO has created a measure of income based on the median household income of the census tract where students reside using data from the U.S. Census Bureau.⁶ A census tract is a geographic area representing between 1,200 people and 8,000 people, and optimally covering 4,000 people.⁷ There are 2,167 census tracts across the city's five boroughs. In order to use data at the census tract level, IBO obtained five-year estimates from the 2012 American Community Survey (ACS), covering data from 2008 through 2012. The ACS produces estimates over one-, three-, and five-year time spans. Using the five-year estimates allowed us to work with the largest sample size, the most reliable data, and obtain precision for small geographic areas, such as the census tract. Five-year estimates for 2012 include data from surveys sampled each year from 2008 through 2012.⁸ The total sample size was 215,308 housing units over the 5 years, representing more than 3 million households. For each year, median household income covers the preceding 12 months and represents pretax income in 2012 inflation-adjusted dollars. The U.S. Census Bureau caps the reported median household income for a census tract at \$250,000.

One concern with using median household income data from the ACS is that it is an estimate based on surveys of a representative sample of the city's households. Unlike the school meals application that is distributed to every student, the ACS is administered only to a representative sample of New York City's households. As with all samples, estimates derived from the ACS have an associated margin of error. The margin of error for the census measure can be quantified. In order to use only the most reliable ACS data, IBO has excluded those estimates with large margins of error. There is also a margin of error associated with city data on meal subsidy status, but it cannot be quantified because only a portion of school meals application forms are properly filled out and returned.

IBO balanced the tradeoff between including the largest possible number of census tracts in our analysis and using only estimates that we deemed reliable. There were no reported income estimates for 55 census tracts (2.5 percent of the city's tracts) in the original data file because the U.S. Census Bureau considered those estimates to be unreliable, most likely due to very small sampling sizes; these census tracts were excluded from our analysis. IBO also excluded income data from other tracts where the margin of error exceeded a particular threshold. To do this, IBO calculated the coefficient of variation (CV), which can be interpreted as the percent of sampling error associated with an estimate. The CV is calculated from the published estimates for each census tract and their margins of error.⁹ A census tract with a relatively small CV is a tract with a more reliable estimate of income, usually reflective of a large sample size. For census tracts where the median income is capped, the margin of error is missing, and therefore the CV cannot be calculated. Based on several U.S. Census Bureau publications, the [American Community Survey User Guide](#) suggests the following implications for the quality of an estimate based on CV thresholds: CV less than or equal to 15 percent is considered good; CV between 15 percent and 30 percent is considered fair; CV greater than 30 percent is considered poor (to be used with caution). Although there is no hard-and-fast threshold that is used universally, IBO excluded income data for those census tracts where the margin of error was missing or the CV exceeded 30 percent (108 census tracts).¹⁰ In all, 163 census tracts were excluded leaving us with reliable income data from 2,004 census tracts. IBO chose to only present data from this set of census tracts in this paper and in our [Education Indicators](#) report.

The distribution for this set of census tracts weighted by the number of households represented in each

tract showed that the 2012 median household income averaged \$58,860, compared with median household income of about \$52,400 for the city as a whole. There is a large degree of variation in the distribution, with almost \$234,000 separating the census tract with the lowest median household income from the census tract with the highest median household income. Median household income ranges from \$9,700 in a census tract in the Seagate-Coney Island neighborhood in Brooklyn up to more than \$243,000 in a census tract in the Upper East Side-Carnegie Hill neighborhood in Manhattan. The median household income for a quarter of the city's households is roughly \$36,800 or below. At the other end of the spectrum, another quarter of the city's households live in areas with a median household income that is more than double that—\$75,400 or more.

Identifying Community Income for Public School Students Citywide and by Borough

Using home addresses for the city's 1,100,285 public school students (including students in charter schools) in the 2012-2013 school year, IBO was able to identify the 2012 median income of households in each student's tract of residence. We refer to this measure as the student's "community income" to differentiate it from the traditional measure of poverty derived from the school meals application forms.¹¹ Of the 1.1 million students, only 148 (0.01 percent) were from census tracts with no reported median income data. Similarly, relatively few students were from census tracts with a missing CV or one that exceeded 30 percent (34,649 students, or 3.1 percent of all students). Both groups of students are excluded from the summaries presented below—leaving 1,065,488 students.

Citywide, the average student's community income is about \$47,800 (see Table 1, below). The community income for a quarter of the city's students is roughly \$30,900 or below. At the other end of the spectrum, another quarter of the

city's students live in areas with a community income that is almost double that—about \$60,300 or more.

At the borough level, while the minimum student community income in each borough is roughly the same, there is already a considerable difference by the 25th percentile that persists throughout the distributions, especially for students in the Bronx. When ranked by community income, students in the lowest 25 percent of the distribution in the Bronx, Brooklyn, and Manhattan come from communities where the income level is at least \$14,600 below that of the lowest 25 percent of community income in both Queens and Staten Island. Those patterns remain the same for the median (50th percentile) of student community income, with the Bronx, Brooklyn, and Manhattan trailing Queens and Staten Island; the Bronx lags far behind the other boroughs. Half of the 243,402 students in the Bronx live in communities with an income level below \$29,200. At the other end of the spectrum, half of Staten Island's 66,600 students live in communities with an income level of \$74,900 or above.

Turning to the 75th percentile of the income distribution, students in the Bronx come from communities with income levels that are nearly \$12,100 lower than in Brooklyn, the next lowest borough. In every borough except Staten Island, there are big increases in community income levels between the 50th and 75th percentiles of the distribution and—as is typically the case in income distributions—the borough's means are greater than their medians. Staten Island is unusual in having a mean student community income below its median. This is due to one census tract in an industrial neighborhood in West New Brighton (serving less than 1 percent of the borough's students) that has a community income well below the other census tracts on Staten Island, bringing down the borough's average.

Looking at the full borough-level distributions, Manhattan has the greatest intra-borough student community income

Table 1. Distribution of Student Community Income, 2012-2013

Borough	Number of Students	Minimum	25th Percentile	Median	75th Percentile	Maximum	Mean	Difference 25th-75th Percentile
Bronx	243,402	\$13,556	\$22,404	\$29,167	\$40,254	\$105,682	\$33,100	\$17,850
Brooklyn	328,799	\$9,675	\$32,210	\$40,559	\$52,315	\$170,481	\$44,161	\$20,105
Manhattan	124,865	\$11,270	\$27,668	\$36,236	\$66,944	\$243,622	\$52,006	\$39,276
Queens	301,827	\$13,958	\$46,806	\$55,399	\$66,500	\$137,621	\$57,094	\$19,694
Staten Island	66,595	\$14,413	\$57,396	\$74,861	\$83,226	\$105,150	\$69,863	\$25,830
Citywide	1,065,488	\$9,675	\$30,893	\$43,598	\$60,263	\$243,622	\$47,823	\$29,370

SOURCES: IBO analysis of U.S. Census Bureau American Community Survey Five-Year Estimates 2008-2012 and Department of Education data

New York City Independent Budget Office

variation with the poorest neighborhood located in Midtown South and the richest neighborhood (excluding those census tracts whose community income was capped) located on the Upper East Side. Even excluding the lowest and highest income census tracts within the borough-level distributions, Manhattan has the largest difference in community income of the tracts at the 25th and 75th percentiles.

Aggregating to the School Level

IBO aggregated across students in each school to calculate a measure of average school community income. After identifying the community income for each student as described above, IBO calculated the school measure as the average income for the students it served. Those schools missing data from more than one-fifth of students, either because the student’s census tract lacked information on the margin of error or because the tract had a coefficient of variation greater than 30 percent, were excluded from the analysis. Notably, none of the excluded schools were high schools, which draw students from across the city and beyond the school’s physical neighborhood due to the choice process. Finally, we limit our analysis to schools in districts 1 through 32 that serve students in grades kindergarten through 12, including charter schools.¹² The final sample of schools includes 1,685 schools serving 982,816 students. We report school summaries citywide as well as by the grades served: high schools and all other schools. Our definition of a high school is a school that serves any students in any one of the high school grades—9 through 12.

Citywide, the average school community income is \$44,919 (see Table 2 below). That is roughly \$3,000 less than the average across students, which implies that there is a substantial concentration of low-income students in many schools. This trend is also evident when looking at the median school, which has an income level of \$40,559, also about \$3,000 less than the median for students. The average school community income ranges from a low of \$16,441 at P.S. 150 in Brownsville in Brooklyn’s

district 23 up to high of \$168,089 at P.S. 89 in Tribeca in Manhattan’s district 2. The average community income at Manhattan’s P.S. 89 is more than 10 times the average community income at Brooklyn’s P.S. 150. A quarter of the city’s schools have a community income level at or below \$33,200; at the other end of the spectrum, a quarter have an income level at or above \$52,600. The difference in average community income for the school at the 75th percentile and the school with the highest income is over \$115,500, which implies that there are also some schools with very high concentrations of high-income students. The difference at the low end of the distribution (between the minimum and 25th percentile) is a much lower \$16,800, or about one-seventh the difference at the high end.

Contrasting high schools with all other schools, it is clear that there is significantly less variation among high schools than there is for other schools, especially when looking at the top quarter of the distribution. The range in the school average income level for the school at the 75th percentile and the school with the greatest income level is much greater for non-high schools (about \$112,000) than for high schools (about \$41,000). The difference between the average community incomes for the schools at the 25th and 75th percentiles also reflects the greater variation among schools other than high schools.

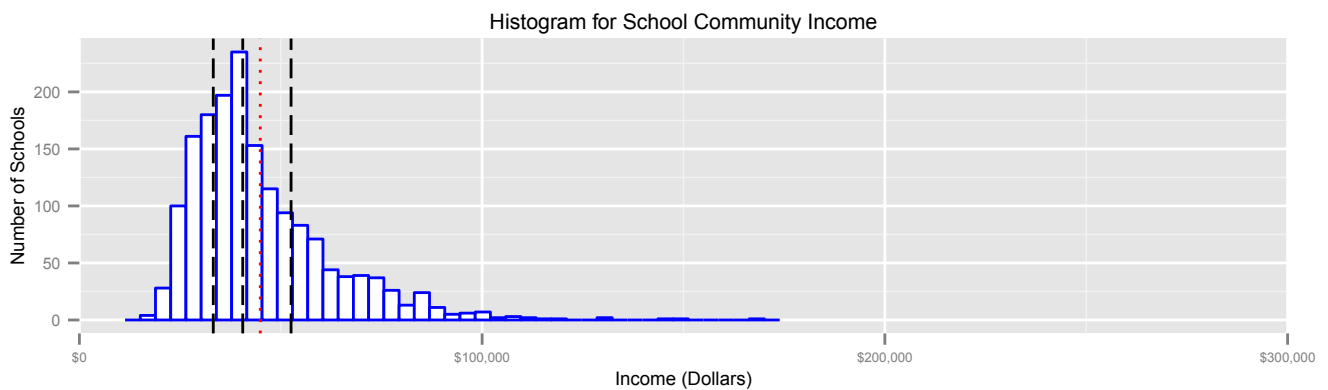
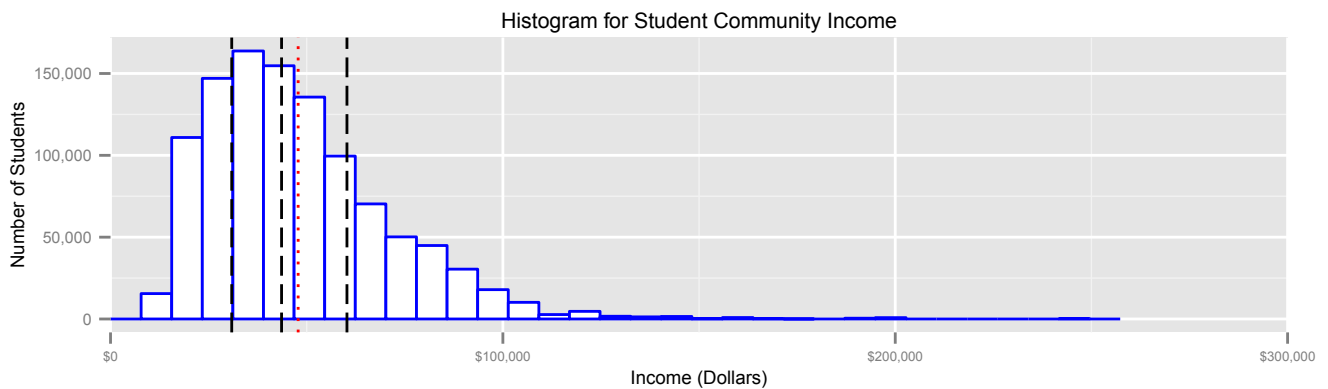
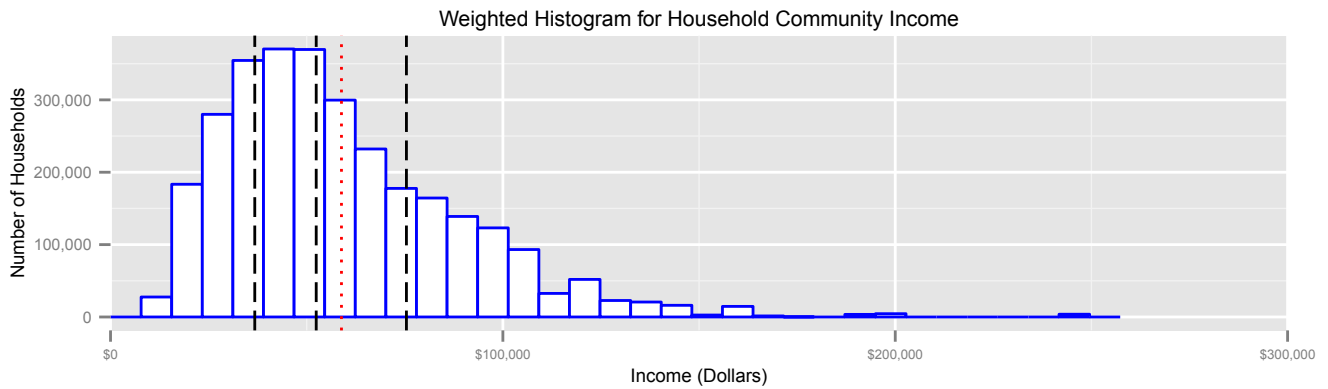
City, Student, and School Distributions of Community Income

The respective distributions of community income from all city households, to all New York City public school students, to all city public schools show that while the shapes are similar, the peak of the distribution moves slightly more towards the lower end of the income spectrum as we move from one metric to the next (see histograms on page 6). All three distributions are right-skewed, which means that the right side of the distribution extends far from the peak, or mode, of the distribution. As a result, the median falls above the peak, and the mean exceeds the median.

Table 2. Distribution of Average School Community Income, 2012-2013

Borough	Number of Schools	Minimum	25th Percentile	Median	75th Percentile	Maximum	Mean	Difference 25th-75th Percentile
High Schools	550	\$23,289	\$33,778	\$39,387	\$46,542	\$87,756	\$41,868	\$11,490
All Other Schools	1,135	\$16,441	\$32,820	\$41,588	\$55,760	\$168,089	\$46,397	\$19,441
Citywide	1,685	\$16,441	\$33,244	\$40,559	\$52,559	\$168,089	\$44,919	\$17,380

SOURCES: IBO analysis of U.S. Census Bureau American Community Survey Five-Year Estimates 2008-2012 and Department of Education data
New York City Independent Budget Office



SOURCES: IBO analysis of U.S. Census Bureau American Community Survey Five-Year Estimates 2008-2012 and Department of Education data
 NOTE: The black dashed lines represent the 25th, 50th (median), and 75th percentiles of the distribution of community income. The red dotted lines represent the mean.

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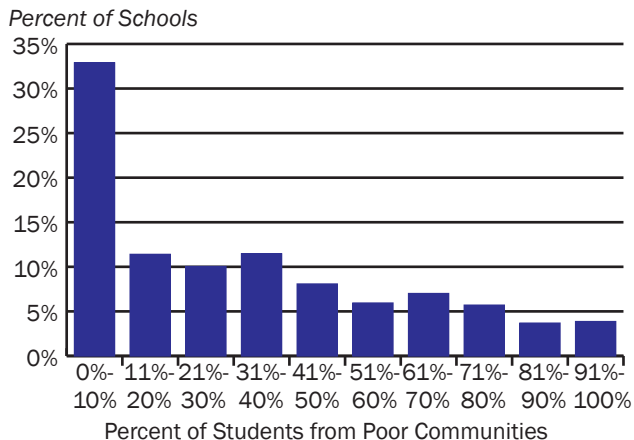
Classifying Students Who Come from Poor Communities

In addition to providing information about the relative level of community income based on where a student lives, this measure can also provide an absolute measure of community poverty by comparing the community's median income level to a particular income threshold. As discussed above, IBO felt that the poverty threshold used by the U.S. Census Bureau does not accurately reflect the true cost of living in New York City.

Instead of using the poverty line calculated by the U.S.

Census Bureau, IBO chose to use a poverty threshold calculated by the NYC Center for Economic Opportunity (CEO), an initiative under the Office of the Mayor. The CEO was launched by Mayor Michael Bloomberg in 2006. Its mission included an initiative to develop a more accurate way to measure poverty and count the poor in New York City. Since August 2008, the CEO has published an annual report that discusses the methodology behind the CEO-calculated threshold for poverty and compares conditions in the city using the CEO threshold and the U.S. Census Bureau's official threshold. The annual report was officially mandated in the New York City Charter in December 2013.

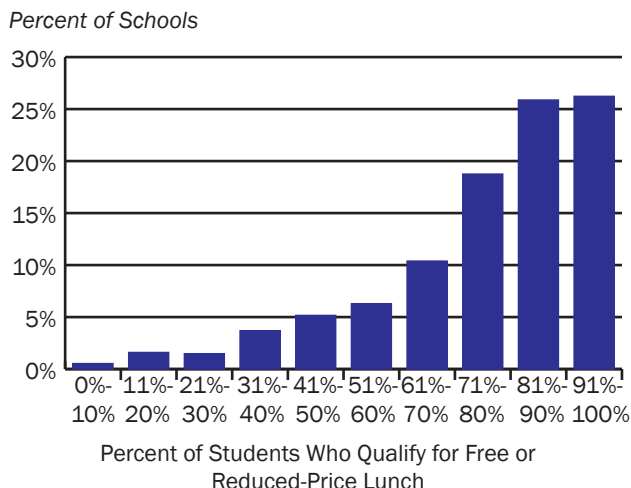
Distribution of Schools: Percent of Students From Poor Communities



SOURCES: IBO analysis of U.S. Census Bureau American Community Survey Five-Year Estimates 2008-2012 and Department of Education data

New York City Independent Budget Office

Distribution of Schools: Percent of Students Who Qualify for Free or Reduced-Price Lunch



SOURCES: IBO analysis of Department of Education data

New York City Independent Budget Office

The CEO threshold is calculated based on a five-year moving average of what families spend on basic necessities, including food, clothing, shelter, and utilities, and additionally accounts for higher housing costs in New York City.¹³ The CEO threshold was intended to be used in conjunction with the CEO income measure, which, in addition to pretax cash income, also includes the cash-equivalent of in-kind transfers such as food stamps and housing assistance. The CEO income measure additionally deducts income and payroll taxes and nondiscretionary spending costs such as commuting, child care, and out-of-pocket medical expenses. IBO is unable to replicate CEO’s adjustments to income data and therefore relies on available median household income data.¹⁴ While the size of the median household in a census tract can vary, IBO chose to use the CEO threshold amount of \$31,039 based on a family of four (two adults and two children) since that composition is widely used.¹⁵ The ratio of the CEO threshold to the official threshold for that specific family composition was 1.333 in 2012.

For each of the 982,816 students in the 1,685 schools in our sample, IBO classified a student as coming from a poor community if the median household income in the census tract where the student resided was below the CEO threshold. For each school, IBO calculated the share of students who come from poor communities. Roughly a third of schools serve a student population where less than 10 percent come from poor communities. In another third of schools, from 10 percent to 40 percent of students come from poor communities. The 7.5 percent of schools with the largest share of students from poor communities serve between 80.0 percent and 98.8 percent poor students.

IBO compared the distribution of schools by this new metric with the distribution of schools by the percent of students who are eligible for free or reduced-price lunch based on federal guidelines. There are two key differences in the two measures: the unit of analysis (census tract versus family) and the treatment of the threshold for defining poverty. First, the unit of analysis for meal subsidy eligibility is based on an individual student’s family income level (taking into account the number of people in the family), whereas IBO’s metric is based on the median income level of households within the community where the student resides. By construct, using the median household income in the community means that only those communities with a particular concentration of poor households will be classified as poor. Second, the income measure for meal subsidy eligibility is multiplied by 1.3 or 1.85 in determining free or reduced-price lunch eligibility, respectively. Because the guideline is multiplied by a factor, many city students come from families with reported income below the guideline. When determining if a community is poor, IBO used the CEO’s threshold directly when comparing against the median income from the community. Based on these differences in the construction of the measures, we would expect that the meal subsidy eligibility measure would classify many more students as poor—and thus eligible for free or reduced-price lunch—than IBO’s measure of the percent of students who come from poor communities.

As expected, more than half of the schools serve a student population where more than 80 percent qualify for free or reduced-price lunch. Another roughly 20 percent of schools serve from 70 percent to 80 percent of students who qualify.

On the other end of the spectrum, just 3.6 percent of schools have 30 percent or fewer students who qualify for free or reduced-price lunch. The distribution of schools using this metric is highly skewed towards the high end of the distribution—that is, most schools serve very high shares of students who qualify for free or reduced-price lunch.

While schools tend to be concentrated at one end of the distribution regardless of which measure of poverty we use, IBO’s measure of the percent of students from poor communities allows us to better differentiate among schools because fewer schools are concentrated at one end. Roughly two-thirds of schools are relatively evenly distributed in terms of the share of students from poor communities—ranging from 10 percent up to 98.8 percent. In contrast, more than 70 percent of schools serve from 70 percent to 100 percent of students who qualify for free or reduced-price lunch, limiting our ability to differentiate among schools.

Conclusion

IBO’s measure of community income can be a useful tool to better assess the income level of students’ communities citywide and also to better understand the student populations that individual schools serve. The distribution of student community income peaks near the low end of the distribution, but there are also many students who come from relatively high income communities. Looking at the schools that students attend, we find that there are many more schools at the lower end of the distribution. This is consistent with the fact that some elementary and middle schools serve high concentrations of students from low-income communities because they tend to be neighborhood schools. IBO also used this measure to identify students at the lowest end of the community income spectrum in a process analogous to the determination of a student’s eligibility for free or reduced-price lunch based on family income. When aggregating to the school level, we found that about a third of schools serve at most 10 percent of students from poor communities.

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Appendix

IBO chose to report separately on the schools that span multiple physical locations or cover whole geographic districts. Those schools include: district 75 schools serving only students with disabilities, home-schooled students, universal pre-kindergarten programs in community-based organizations (CBOs), and district 79 programs serving overage and under-credited students. District 75 schools and district 79 programs often span multiple sites. For each school district, DOE aggregates enrollment in pre-kindergarten in CBOs and home-school designations.

The citywide distribution of community income for those schools is reported below. District 75 schools serve students with a similar distribution of community income as with other city schools reported in Table 2. Among schools that span multiple locations or cover whole geographic districts, home-schooled students have the largest range in community income and the highest mean and median community income. District 79 appears to serve the most homogenous group of students in terms of income out of all the groups reported, and students in these schools tend to come from relatively poor communities.

Distribution of Average School Community Income for Select Schools, 2012-2013							
Borough	Minimum	25th Percentile	Median	75th Percentile	Maximum	Mean	Difference 25th-75th Percentile
District 75	\$28,478	\$35,913	\$40,822	\$53,514	\$72,315	\$44,608	\$11,687
Home School	\$25,006	\$40,254	\$50,460	\$62,085	\$105,856	\$52,298	\$18,162
CBO Pre-K	\$24,206	\$36,789	\$44,551	\$56,339	\$73,372	\$46,271	\$12,636
District 79	\$36,918	\$38,608	\$40,417	\$43,166	\$44,531	\$40,676	\$2,830
Citywide	\$24,206	\$36,918	\$43,091	\$56,224	\$105,856	\$46,650	\$13,786
<small>SOURCES: IBO analysis of U.S. Census Bureau American Community Survey Five-Year Estimates 2008-2012 and Department of Education data</small>							
<i>New York City Independent Budget Office</i>							

Endnotes

¹Regulation of the Chancellor #A-810, “Eligibility for Free and Reduced-Price Meals,” issued June 29, 2009.

²Eligibility for meal subsidy for students in the 2012-2013 school year was determined in August 2012 based on an estimation of the 2012 poverty line, which the U.S. Department of Health and Human Services calls the “federal poverty guideline.” This is different from the official poverty line because the guideline uses historical data, adjusted for inflation since the last official threshold. The preliminary official poverty line for 2012 was published in January 2013 and finalized in September 2013.

³“New York City Public School Indicators: Demographics, Resources, Outcomes,” New York City Independent Budget Office, May 2013.

⁴See relevant tables in section 4 of “New York City Public School Indicators: Demographics, Resources, Outcomes,” New York City Independent Budget Office, 2011.

⁵“The Development of the Orshansky Thresholds and Their Subsequent History as the Official U.S. Poverty Measure,” Gordon M. Fisher, U.S. Department of Health and Human Services, May 1992 (partially revised September 1997). More recent work by the NYC Center for Economic Opportunity has sought to provide a more accurate threshold for poverty for New York City.

⁶IBO also considered using income estimates only of (1) family households and (2) households with children under the age of 18 (school-age children), but the smaller sample size of both of those estimates led to high margins of error and IBO considered them unreliable at the census tract level.

⁷https://www.census.gov/geo/reference/gtc/gtc_ct.html, accessed 3/31/2015.

⁸IBO considered using data at the census block group, but that data is only available for the decennial census and we prefer to use the most current data possible.

⁹The U.S. Census Bureau’s presentation on “Things that May Affect Estimates from the American Community Survey” guided IBO’s CV calculations. The CV is the standard error divided by the estimate times 100 (interpreted as a percent). The standard error is equal to the published margin of error divided by 1.645, because the margin of error is based on a 90 percent confidence interval for ACS estimates.

¹⁰IBO also tested the sensitivity of this threshold using CV of 33 percent and 40 percent, but felt that those thresholds allowed for too much error in the income estimates.

¹¹Students for whom the DOE did not have an address on file or whose address was outside of the five boroughs were excluded from the analyses.

¹²The schools we report on separately in the appendix but exclude from the main analysis are: district 75 schools serving only students with disabilities, home schooled students, universal pre-kindergarten programs in community-based organizations, and district 79 programs serving overage and under credited students. Schools that had fewer than 20 students were also excluded.

¹³“The CEO Poverty Measure, 2005-2012: An Annual Report from the Office of the Mayor,” NYC Center for Economic Opportunity (CEO), April 2014.

¹⁴We acknowledge that in using median household income data, our measure counts more students as coming from poor communities than the full CEO methodology would. Therefore, our rates cannot be compared with the CEO’s published statistics for New York City and its neighborhoods. However, we still believe that using the CEO threshold is more accurate than using the official poverty threshold.

¹⁵A family size of four (two adults, two children) was chosen because it is widely used and probably a reasonable assumption for the census tracts that are included in our study. Because we exclude tracts with larger CVs, we also likely exclude tracts for which a different family structure is more prevalent. Additionally, the National Academy of Sciences found in 1995 that this was the most common structure among families with children less than 18 years of age. Citro, Constance F. and Robert T. Michael (eds). Measuring Poverty: A New Approach. Washington, DC: National Academy Press. 1995.

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