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TITLE: Creating Census-Based School-Area Poverty Estimates: A Pilot Project for the National School Lunch Program
PROPOSAL: First Choice - Session #1105: School Demography
Second Choice – Session #1302: Poster Session

Background and Research Relevance

Free and Reduced-Price Lunch counts from the National School Lunch Program (NSLP) have become the de facto standard for identifying school-level poverty. Although these data have significant and well-known shortcomings, no other systematic source of school-level poverty data currently exists. Consequently, many state, federal, and non-governmental programs rely on NSLP school-lunch data to target resources to high-poverty schools, adding incentive for school officials to maximize the reported number of eligible children. Unfortunately, the lack of an independent, comparable, and systematically available school-level poverty indicator hampers attempts to evaluate NSLP data quality and program efficacy. As part of its ongoing effort of program improvement, NSLP administrators initiated discussion with the U.S. Census Bureau to explore whether independent, school-level poverty estimates might be derived from the decennial census. Such independent estimates, if reliable, may benefit NSLP program evaluation and aid researchers investigating the relationship between school poverty and various educational inputs and outcomes.

Research Questions

The decennial census provides poverty information for many small geographic areas, but it does not systematically do so for school attendance areas. However, the absence of school areas in standard decennial census data products does not preclude their creation. Rather, this circumstance raises an interesting set of research questions: Could school-level poverty estimates be developed from 2000 census data? More specifically, could 2000 census data be used to create school level estimates of students eligible for each NSLP program reimbursement category, i.e., Free lunch, Reduced Price lunch, and Full Price lunch? If so, what methods would be required, and what would be the quality of the resulting estimates? More importantly, how would Census estimates compare to reported NSLP program counts?

Data and Methods

Geographic Data and Methods

This investigation relied on a case-study analysis of 233 school attendance areas in the Philadelphia Public School District (1999-2000). Philadelphia was recommended for the case study because of its large size (hundreds of schools), high rate of NSLP eligibility (tens of thousands of participating students), and unique attempts by the district to streamline local NSLP program administration. In order to tabulate census population within non-standard geographic units like school attendance areas, it was first necessary to establish the spatial relationship between census blocks and the school areas. We used GIS to build block associations for each school area, and then integrated digital ortho-quad imagery to help adjudicate assignment of omitted blocks and blocks associated with multiple school areas. The resulting unique school geographies contained relatively large total populations. For example, population in the average Philadelphia High School area (66,039) is larger than some Principal Cities, while population in the average Philadelphia Elementary School area (8,039) is larger than the population in 56% of all U.S. school *districts* (2000 Census).

Demographic Data and Methods

Data for the census-based school area estimates came from the Census 2000 long-form unit record files. The school-level analytic sample identified people in Philadelphia who were enrolled in public school and relevant to a given school attendance area (based on a person's grade level and the grade span for which a school area claimed responsibility). Once this relevant population was identified

for each school area, we created school-level estimates for each of the NSLP program categories for each school: Free lunch (students at or below 130% of the poverty threshold); Reduced Price lunch (students above 130% but at or below 185% of the poverty threshold); and Full Price lunch (NSLP provides a .20 cent reimbursement for students above 185% of the poverty threshold). The resulting census-based school-level estimates were then compared with reported 1999-2000 NSLP program counts for each of the 233 school attendance areas to identify statistically significant differences.

Results

Supporting tables for this analysis are still under Census statistical review and cannot be published until final delivery of this special tabulation (expected 4th quarter of 2004). However, the analysis produced seven key findings. First, the number and percent of Free lunch eligible students reported by NSLP was systematically higher than the census estimated number and percent of eligible Free lunch students. Second, the number and percent of students reported by NSLP as eligible for Reduced Price lunch tended to be lower than the number and percent of Reduced Price lunch students estimated from Census 2000. Third, NSLP data and census estimates differed in the composition of students eligible for either Free or Reduced Price lunch. If analysis is restricted to the population of students eligible for Free or Reduced Price lunch, the NSLP data showed a larger percentage of that population eligible for Free lunch than was estimated by Census 2000. Fourth, standard errors were substantially reduced when school-level data were aggregated into larger groups (clusters specified by the tabulation sponsor). Fifth, the grouping exercise also demonstrated that significant differences between NSLP and census estimates did not vary systematically according to the poverty level of the school group. Differences occurred regardless of school socio-economic status. Sixth, NSLP and census estimates showed significant differences even after accounting for differences in data collection methods (standard method vs. pilot method). Finally, this analysis suggests that reimbursements based on census-estimated claiming percentages would likely change the level of NSLP reimbursement based on the current pilot data collection method.

Conclusions

NSLP eligibility data play a critical role in the national educational data infrastructure because they are the only systematic data source of school-level poverty and they have serious financial consequences for local education agencies. This investigation provides a useful example of how school-level poverty or program estimates might be produced and what benefits and limitations might be expected from future analyses. More importantly, the unique fusion of geographic and demographic data allows for statistical analysis at a geographic scale (school-level rather than school district) seldom seen in the NSLP evaluation literature. While school-level census estimates would not provide a panacea for NSLP program evaluators, they may offer useful information to support future NSLP decision-making.