The Small Area Income and Poverty Estimates (SAIPE) Program

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Presentation to 27th SCORUS Conference
Theme: Compilation, Estimation and Documentation
August 11-13, 2010
Purpose of SAIPE

- To provide timely and reliable estimates of poverty and income for small areas for intercensal periods
  - The administration of federal programs and
  - The allocation of federal funds to local jurisdictions and state and local programs that depend on income and poverty estimates
  - Provide school district estimates of school-age children in poverty as the primary input to distribute Title I grants under the No Child Left Behind Act of 2001
Outline

• What SAIPE measures
• SAIPE estimation methodology
  – Input data sources
  – State and county estimation
  – School district estimation
• Current and future research
What SAIPE Conceptually Measures - Primary Measure

• Number of children ages 5-17 IN FAMILIES in poverty that RESIDE in a given school district
  – Not a measure of school district enrollment
  – Includes children attending private schools, home schooling, and attending outside the school district

• Excludes children unrelated to the householder
What SAIPE Measures

States and counties:
• All people in poverty
• Children under age 18 in poor families
• Children ages 5 - 17 in poor families
• Children under age 5 in poverty (states only)
• Median household income

School districts
• Total population
• Children ages 5-17
• **Children ages 5-17 in poor families**
Data Sources for SAIPE

- Uniformly available and represent the same thing in all areas
  - American Community Survey (ACS)
  - Decennial census estimates
  - Federal Tax Information (FTI)
  - SNAP (formerly Food Stamp) participation records
  - Intercensal population estimates
  - Supplemental Security Income (SSI) participation (state model only)
  - School District Review Program (SDRP)
American Community Survey (ACS)

- Replaces decennial census for social and economic statistics
- 3 million addresses annually, collected over a twelve month period
- ACS estimates
  - Single-year estimates for areas with population greater than or equal to 65,000
  - Three-year for populations down to 20,000
  - Five-year for populations less than 20,000
- SAIPE uses state and county, single-year ACS estimates
Figure 1. Illustration of Rolling (Overlapping) Reference Period of Income in the Past 12 Months by Month of ACS Interview: 2005
Federal Tax Information (FTI)

- Select information from tax returns – exemptions, adjusted gross income (AGI), and street address
- Exemptions determine household size and composition.
- Child exemptions, proxy for children under 18
- If AGI on a return is below the official poverty threshold for a family of the size implied by the number of exemptions, all the exemptions (people) on the return are treated as poor
Federal Tax Geocoding

• Geocode tax returns to states and counties
• Geocode tax returns to blocks within counties
• Tax returns coded to blocks can be geocoded to school districts
  – School District Review Program (SDRP)
• Not all returns can be geocoded to blocks
  – Concentrated in rural and fast growing areas
  – About 12% non-geocoding rate
Supplemental Nutrition Assistance Program (SNAP)

- Available for states and counties only
  - For states, 12-month average of recipients
  - For counties, month of July for most states
  - Adjust county-level numbers to state numbers
- Adjust isolated extreme values so that they are compatible with long-term trends
- Adjust Alaska and Hawaii for more lenient eligibility requirements
Intercensal Population Estimates (PEP)

- Total resident population
  - Reference period July 1
  - Use cohort-component method

- Use by SAIPE
  - Predictor variables in the state and county models.
  - PEP used to convert estimated poverty ratios to numbers of people
  - Used to calculate poverty rates
Treatment of Unusable Data

• Counties lacking data or extreme/implausible data for a variable
  – Imputed or allocated

• Detection
  – Comparison to other data in county
  – Changes across years
The State and County Models

• Separate models for states and counties
  – Dependent variable - single-year ACS
  – Poverty rate model for states
  – Log-level model for counties

• Fay-Herriot model
  – Two level model
  – First level relates survey estimate to population quantity
  – Second level is a regression model

• Estimator is a weighted average of regression prediction and direct survey estimate based on relative precision
Variables in Ages 5-17 In Families In Poverty County Model

• Dependent variable
  – log (ACS, ages 5-17 in poor families)

• Predictors
  – log (IRS child tax-poor exemptions)
  – log (SNAP participants)
  – log (Census 2000, ages 5-17 poor families)
  – Tax non-filers concept
    • log (population estimates, ages 0-17)
    • log (IRS child tax exemptions)
Comparison of Single-Year Coefficients of Variation

Number of Related Children, Age 5-17 in Poverty

Percent

Counts : XL=>250k, LG = 65-250k, M = 20-65k, S = 10-20k, XS = <10k

ACS SAIPE
Comparison with 3-year ACS

Coef. of Variation (%) Comparison
Number of Children in Poverty, 5-17 related

Counties: XL = >250k, LG = 65-250k, M = 20-65k, S - 10-20k, XS = <10k

ACS 05-07 Multiyear  SAIPE Single-Year
School District Method

- Synthetic method
- School districts can be in more than one county – school district pieces (SDP)
- A share method to allocate SAIPE county poverty estimates to school district pieces
  - A share is the proportion of poor school-age children in a county that are in the school district
- Prior to 2005, used Census share method
- Since 2005, a share method based on a mixture of tax-poverty shares and Census shares
IRS Income Tax Data for School Districts

Motivation – Relax the assumption that the within county distribution of poor children does not change between censuses.

1. Income data from tax returns is informative about poverty status.

2. Contains geographic detail to link income tax returns, thus exemptions, to individual school districts.

3. Covers all school districts.

4. IRS data already shown to be useful in predicting child poverty for states and counties.
Key Steps in School District Estimation

- School District Review Program completed every two years
  - Boundary update
  - Assign children to districts
    - Assign grade ranges to district
    - Assign children to grades by age
- Tabulate Federal Tax Information and Census 2000 data by School District
- Estimation using share method
- Controlling to SAIPE county estimates
IRS Income Tax Data

Issues in using tabulations to school district pieces of child income tax exemptions

1. Inability to geocode some income tax returns to school district pieces

2. Age information not recorded for child exemptions
Allocating Non-geocoded Exemptions

Minimum Change (MC)

- Uses IRS tax shares for geocoded exemptions
- Allocate the non-geocoded exemptions to minimize the differences in the resulting School District Piece shares and the corresponding shares from the previous census.
Estimation for school district

- Preliminary estimate of school district piece (SDP) poor children rate

\[
\frac{SDP \ MC \ Poor\ Child\ Share}{SDP \ MC \ Child\ Share} \times (SAIPE\ County\ Child\ Pov\ Rate)
\]

- Multiply by school district children population
- Estimates raked to county estimate of school-age children in poor families
- School district pieces aggregated to school districts
Current and Future Research

- Model the county sample variance estimates
- Standard errors for school districts
- Standard errors for intertemporal and cross-sectional comparisons for counties
- Alternate county models
  - Poverty rate model
  - Model for zero survey estimates
- Improve sub-county geocoding of tax returns
- Use multi-year ACS estimates in SAIPE county models and school district estimation
Advantages of SAIPE

• Designed for Title I – used for many purposes
• All sizes of school districts treated the same – nationwide
• Reliable single-year estimates for states and counties
• Multiple data sources combined to reduce statistical uncertainty
• Smoothes the survey estimates
• Methods extended to state and county health insurance coverage estimates
Contact Information

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