

Recent Trends in Poverty in the Appalachian Region:

**The Implications of the U.S. Census Bureau Small Area
Income and Poverty Estimates
on the ARC Distressed Counties Designation**

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EXECUTIVE SUMMARY

The following report, funded by the Appalachian Regional Commission (ARC), explores recent poverty trends for the 399 counties that comprise Appalachia, and examines the Census Bureau's *Small Area Income and Poverty Estimates*'¹ effects on the ARC *distressed county* designation. We begin with an examination of the changes in total poverty in Appalachia between 1979 and the mid-1990s, with particular emphasis paid to the post-1990 period. The gap in poverty between Appalachia and the rest of the country declined as poverty outside Appalachia increased during the 1980s while remaining virtually unchanged in Appalachia. The U.S. average poverty rate declined from 15.1 percent to 13.8 percent between 1993 and 1995, while poverty among Appalachian counties declined from an average of 16.1 percent in 1993 to 14.6 percent in 1995. The ARC counties with relatively higher rates of poverty are generally concentrated in Kentucky, as well as West Virginia, southern Ohio, and Mississippi. Although Appalachia has long been struggling economically, Appalachia's total poverty rate in 1995 was only slightly higher than in the rest of the country.

Child poverty in Appalachia increased slightly between 1989 and 1995, following the national pattern. In particular, young children in Appalachia have experienced the greatest increases in poverty, compared with older children and the general population. The geographical patterns of total poverty and child poverty are overwhelmingly similar, with higher rates of child poverty concentrated in eastern Kentucky, and significant portions of northern Tennessee, West Virginia, southern Ohio, and Mississippi. Between 1993 and 1995 relative increases in child poverty were most expansive in Alabama, the Carolinas, and New York, followed by Kentucky, West Virginia, Virginia, Pennsylvania, Mississippi, and Georgia. Only Ohio and Tennessee experienced fairly consistent relative declines in child poverty during the period. Similar to the overall poverty rates for the sub-regions, the Central sub-region continued to experience the highest child poverty rates within Appalachia. More than one-third of the children who lived in the Central sub-region lived in households with incomes under the poverty line, with the poverty rates in the other regions just over 20 percent. Poverty rates for children ages 0-4 years were,

¹ The Census Bureau's *Small Area Income and Poverty Estimates* are abbreviated as SAIPE. These will also be referred to as "SAIP estimates" to focus on the numerical estimates themselves rather than the overall statistical estimates program

and continue to be, considerably higher than for children ages 5-17 years both nationally and in Appalachia. This gap was even wider for Appalachian counties than for the remainder of the U.S., with 27.3 percent of children ages 0-4 in poverty, compared to 19.5 percent for children ages 5-17 in 1995.

The ARC has used the distressed county designation for almost twenty years to identify counties with the most structurally disadvantaged economies. Each year the ARC updates the distressed status of counties based on more current information on unemployment and per capita market income. However, reliable county-level poverty rates have, until recently, only been available from the decennial census at the beginning of each decade. The Census Bureau SAIPE program has produced county-level poverty estimates for 1989, 1993 and 1995, giving the ARC the option of using more recent poverty data to classify counties. We evaluate the influence of post-censal estimates of poverty on the traditional distressed county classification, which uses only the estimates of poverty from the most recent census, during both the 1980s and the early 1990s. Of the 399 Appalachian counties, the number designated as distressed increased between 1980 and 1990 by 50 percent.² This increase reversed a two-decade decline in the number of distressed counties. Changing relative poverty levels were a factor in 10 of the 12 transitions out of distressed status during the 1980s. Poverty did not contribute quite as greatly to the much larger number of counties that became distressed in the 1980s.

Principally, we use two analyses to evaluate the viability of the SAIPE for the ARC designation of distressed counties. We first evaluate the accuracy of the distressed status designation at the end of a decade, comparing the 1980 census with the 1989 SAIPE (using the 1990 census as the standard of accuracy). With certain caveats, the results from the 1980s demonstrate that as a decade progresses, the SAIP point estimates more accurately predict the status of both distressed and non-distressed counties than the poverty estimates from the previous census. Then we examine the causes of status transitions that would occur in the early 1990s incorporating the SAIPE into the distressed county designation. The number of counties that have been affected

² The number of distressed counties in 1990 does not correspond to the number of counties officially designated distressed by ARC because distress levels were frozen during the 1988-1992 period awaiting the release of 1990 census poverty data (Wood and Bischak 2000). The distressed designation uses three year averages of unemployment and per capita market income. Numbers in Table 4.1a are based on a formula for defining distressed counties that incorporates poverty estimates from the last census, not the Census Bureau's post-censal SAIPE estimates.

by economic change in the 1990s can be better evaluated and joint changes in unemployment, income, and/or poverty can be distinguished from changes in poverty alone. Between 1990 and 1994 the number of distressed counties in Appalachia declined sharply (38 percent), due more to overall economic improvement in Appalachia relative to the U.S. as a whole than by substitution of the SAIPE for the 1990 census poverty estimates. Moreover, relative shifts in unemployment played a more important role as an independent cause of these transitions out of distressed status than did shifts in poverty.

The distressed status accuracy results from the end of the 1980s suggest that the SAIPE would provide a better determinant of distressed status than the poverty estimates derived from a decade old census. The magnitude and causes of distressed status transitions in the first half of the 1990s indicate that using the SAIP estimates would alter the counties that would be designated distressed by the ARC but not to a radical degree. However, both of these analyses demonstrate that a simple substitution of the SAIP point estimates for census poverty estimates may unjustifiably deny some counties distressed status recognition. As an antidote to this situation it might be more defensible to combine the SAIP point estimate and the SAIP upper bound estimate in the future determination of distressed status. This would accomplish the objective of utilizing more current estimates of poverty while reducing the negative consequences of utilizing an estimate of poverty with greater statistical variation than decennial census derived estimates.

Overall, the analysis of the 1990s indicates that the number of distressed counties has declined in Appalachia during the decade. The *Small Area Income and Poverty Estimates* indicate a decline in poverty in Appalachia relative to the U.S. as a whole, which reflects a concomitant relative decline in unemployment and a relative increase in per capita market income. Determination of distressed status using the 2000 Census of Population and Housing poverty rates should confirm this decline. During the next decade, the accuracy of the SAIPE program should improve significantly as new sources of income and poverty data, especially the American Community Survey (ACS), become available, making them an even more viable option for the determination of distressed status by the Appalachian Regional Commission.

research. The analysis examine the Census Bureau's *Small Area Income and Poverty Estimates* (abbreviated as SAIPE, which will also be referred to as "SAIP estimates" to focus on the numerical estimates themselves rather than the overall statistical estimates program) and their effects on the ARC *distressed county* designation. We begin with a discussion of the SAIP estimates. This is followed by an examination of the changes in total poverty in Appalachia between 1979 and the mid-1990s, with particular emphasis paid to the post-1990 period, including a discussion of the geographical distribution of poverty. While our analysis covers the total population (all ages), we focus in greater detail on child poverty. We conclude with an evaluation of the impact of using the SAIPE estimates for the years 1989, 1993 and 1995 to assign the economically distressed status designation used by the ARC.³

Small Area Income and Poverty Estimates Program

Detailed poverty and income levels for states and sub-state geographic areas, especially counties, are among the most important products of the decennial census of population and housing. However, the ten-year interval between the census enumerations leaves a relatively long time span without more current data on the changes in poverty levels and rates in sub-state areas. Measuring poverty at ten-year intervals does not capture fluctuations within the period and is seldom coincident with the timing of major economic shifts. Moreover, national poverty trends do not uniformly affect all states and sub-state areas, nor do these national trends consistently affect all age groups within the population. This ten-year gap between censuses undermines the ability of many federal, state, and local programs designed to alleviate poverty to effectively identify and reach their target populations.

The Census Bureau's *Small Area Income and Poverty Estimates Program* was initiated to remedy this deficiency by providing post-censal county estimates of income and poverty. We provide a brief summary of this program in this report; more detailed information on the *Small Area Income and Poverty Estimates Program* can be found at the Census Bureau's website (<http://www.census.gov/hhes/www/saipe/saipe93/origins.html>), and in reports from the

³ We have used the 1990 Census estimates for poverty when referring to poverty change since 1990. See appendix A for a further discussion of the Census Small Area Income and Poverty Estimates.

National Research Council (1998 and 2000). The primary reason for developing post-censal estimates of income and poverty for small areas is that the national levels and spatial distributions of these characteristics are not stable over time. If decennial census data are used to benchmark poverty relief programs for an entire decade, the programs remain fixed on the decennial targets even when income and poverty levels rise or fall nationally, or the relative levels of poverty for population groups, states, or local areas change. The Census Bureau (under authorization from Congress) prepares poverty estimates for children ages 5-17. These statistics are for use by the U.S. Department of Education in allocating federal funds under Title I of the Elementary and Secondary Education Act for education programs to aid disadvantaged school-age children. In this report we examine levels and changes in poverty among the entire population, among children ages 0-4, and among children ages 0-17, while recognizing that the poverty estimates for children 5-17 and the models that generate them have been subjected to greater scrutiny and more thorough evaluation (National Research Council, 1998).

The principal aim of the Census Bureau's SAIPE program has been to produce post-censal estimates of median income and poverty for states, counties, and school districts in the absence of actual measures collected in a large-scale survey or a census. To accomplish this goal, the Census Bureau uses multiple regression statistical modeling to generate updated county-level estimates of income and poverty. Multiple regression is a statistical technique that attempts to explain or predict the level of a single dependent variable based on the levels of a set of independent variables (Vogt 1993). In the absence of a single source of reliable estimates for income and poverty, regression modeling leverages several data sources and time periods in order to optimize precision (National Research Council 1997).

The SAIPE multiple regression models have produced biennial estimates of income and poverty beginning in 1993. The SAIPE model uses several county-level independent (predictor) variables, the number of personal exemptions claimed on federal income tax returns by families with incomes at or below the poverty level, the number of people receiving food stamps, the 1990 census of population, and the Census Bureau population estimates. The statistical model incorporates county-level data on income and poverty from the Demographic Supplement of the Current Population Survey (CPS) conducted in March each year, as the dependent variable. The

SAIPE model combines three years of CPS data to improve the precision of the estimates. This technique is similar to ARC's use of three-year averages for unemployment and per capita market income in the designation of distressed counties. Because the CPS sample does not include all counties, the relationship between the predictor variables and the dependent variable is estimated for the subset of counties included in the CPS sample, and then applied to all counties.

In 1994, Congress authorized a study by the National Research Council (NRC) to assess the production, appropriateness, and the reliability of the updated poverty estimates for children ages 5-17. Upon evaluation of the original model and poverty estimates for 1993, the NRC Panel concluded that the 1993 estimates represented a substantial step toward the production of post-censal poverty estimates. The panel further recommended the use of these estimates (together with poverty estimates from the 1990 Census) for allocations for school year 1997-98 under the terms of Title I of the Elementary and Secondary Education Act allocations (National Research Council, 1997). Subsequent revisions of the 1993 estimates were evaluated by the NRC Panel and recommended for use in Title I allocations for school year 1998-99 (National Research Council, 1998). The Panel concluded that the estimates, although containing strengths and weaknesses, were superior to continued use of child poverty rate data from the outdated 1990 Census for allocations under Title I. Poverty estimates for counties and school districts for 1995 were also evaluated by the NRC Panel. The 1995 estimates for children ages 5-17, released in 1999, were recommended for Title I allocations for school year 1999-2000 (National Research Council, 1999).

The decision to use the Census Bureau's post-censal poverty estimates for funding allocations is a tradeoff between precision obtained in the decennial census and more current (if less precise) post-censal estimates. The 1990 census estimates of poverty are more precise in a statistical sense because they are based on a very large sample (approximately one-sixth of all households). However, they describe the income and poverty situation only as of 1989. The 1993 and 1995 estimates are considerably less precise, but because of their relative currency, they provide a better description of poverty and economic conditions in the post-1990 period. The Census Bureau plans to continue research and development efforts to improve the estimation models and potentially reduce the time lag between the reference year of the estimates and their release date.

National income and poverty patterns changed between 1989 and the 1993 and 1995 SAIP