Poverty rates by state in the mid-1980s: An update

by Robert D. Plotnick and Sheldon Danziger

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In the Fall 1987 issue of *Focus* (10:3), Christine Ross and Danziger presented state poverty rates for 1979 and 1985. The rates were constructed from data from the March 1980 and 1986 Current Population Survey (CPS) computer tapes. The 1985 rates have attracted considerable interest, since the U.S. Bureau of the Census has not published any state poverty rates for the 1980s.

The CPS samples on which state poverty rates are based are relatively small, consisting of fewer than 1,000 households interviewed in most states. As a result, the estimated rates for any single year may be subject to significant sampling error. The standard errors of the 1985 rates ranged from 0.75 to 2.38 percentage points. By way of contrast, the standard errors for poverty rates by region, which the Census Bureau does publish, range from 0.4 to 0.5 points.

This article reports, for the mid-1980s, new state poverty rates which have smaller standard errors than those previously reported. We pooled data from the March CPS tapes for 1985, 1986, and 1987, which provide income data for calendar years 1984, 1985, and 1986. Pooling doubled the effective sample size.[1] This reduced the standard error of each estimate by about 30 percent.[2] The disadvantage of pooling is that instead of having a separate poverty rate for each of the three years, we obtain the average level of poverty during the three middle years of the decade.

During these years the nation's economy steadily expanded, per capita income grew, the unemployment rate declined, and inflation moderated. The national poverty rate smoothly declined from 14.4 percent in 1984 to 14.0 in 1985 and to 13.6 in 1986. It was 13.5 percent in 1987. It is likely, then, that for most states year-to-year changes in poverty were also gradual and moderate. On balance we believe the improvement in precision from the larger sample more than compensates for the lack of year-specific poverty rates. Further, we believe that the large standard errors for each state in every year make year-to-year comparisons by state quite problematic, even in those cases where state economic trends diverged from the national ones.

The poverty lines used here are the official lines that the U.S. Bureau of the Census updates and maintains. They vary by family size, the number of related children, and the age of the household head. For example, in 1985 the poverty lines ranged from $5,156 for an elderly person living alone to $22,083 for a family of nine or more with at least one child under 18. The poverty line for a family of four was $10,989. The lines increase each year to match the rate of inflation as measured by the Consumer Price Index.

Poverty rates are estimated by comparing the money income of a family (or unrelated individual, a one-person family) to its corresponding poverty line.[3] If income is below the poverty line, then all the *persons* in that family are counted as poor.

State poverty rates in the mid-1980s

Table 1 contains the new estimates of the percentage of persons in each state who lived in households with incomes below the poverty line. The national poverty rate for the 1984–86 period was 14.0 percent (the same as the 1985 rate). During this three-year period some states had much higher poverty rates. The point estimates show six states with rates at least five percentage points above the national rate: Alabama (21.5 percent), Arkansas (22.4 percent), Louisiana (20.8 percent), Mississippi (25.6 percent), New Mexico (20.7 percent), and West Virginia (22.8 percent). The District of Columbia (19.2 percent) was also in this group. At the other end, four states had poverty rates five or more points below the national average: Connecticut (7.2 percent), Maryland (8.5 percent), Massachusetts (8.8 percent), and New Hampshire (5.6 percent).

The poverty rates in Table 1 are very similar to those published in *Focus* 10:3 for 1985. The simple correlation between the two sets of estimates is 0.96.

Were any of the differences between the two sets of rates statistically different from zero? Using the formula to compute the standard error of a difference, we find that only one difference (for Pennsylvania) exceeded twice its standard error and, hence, was significant at the 5 percent level. Because the new point estimates have smaller standard errors, we believe that this new series is more reliable.

Standard errors of estimated state poverty rates

The state poverty rates in Table 1 are subject to error from two sources: first, because a sample is taken to represent all persons; and second, because of nonsampling errors in

Table 1

Poverty Rates for Persons by State, Mid-1980s

New England		
Maine	11.1	(1.30)
New Hampshire	5.6	(1.05)
Vermont	10.2	(1.31)
Massachusetts	8.8	(0.58)
Rhode Island	11.2	(1.42)
Connecticut	7.2	(0.97)
Mid-Atlantic		
New York	15.2	(0.53)
New Jersey	9.5	(0.58)
Pennsylvania	12.4	(0.63)
East North Central		
Ohio	12.4	(0.66)
Indiana	12.2	(1.06)
Illinois	15.0	(0.73)
Michigan	14.4	(0.72)
Wisconsin	11.8	(1.22)
West North Central		
Minnesota	11.5	(1.25)
Iowa	16.5	(1.43)
Missouri	14.3	(1.20)
North Dakota	14.9	(1.37)
South Dakota	16.2	(1.38)
Nebraska	14.6	(1.38)
Kansas	11.2	(1.19)
South Atlantic		
Delaware	11.3	(1.27)
Maryland	8.5	(0.94)
District of Columbia	19.2	(1.53)
Virginia	10.6	(1.13)
West Virginia	22.8	(1.61)
North Carolina	14.0	(0.70)
South Carolina	17.6	(1.42)
Georgia	15.6	(1.36)
Florida	13.3	(0.71)
East South Central		
Kentucky	18.5	(1.54)
Tennessee	17.8	(1.52)
Alabama	21.5	(1.83)
Mississippi	25.6	(1.71)
West South Central		
Arkansas	22.4	(1.60)
Louisiana	20.8	(1.57)
Oklahoma	15.5	(1.37)
Texas	16.2	(0.77)
Mountain		
Montana	16.3	(1.29)
Idaho	16.4	(1.43)
Wyoming	12.3	(1.49)
Colorado	10.8	(1.33)
New Mexico	20.7	(1.56)
Arizona	13.4	(1.50)
Utah	11.9	(1.31)
Nevada	12.4	(1.62)
Pacific		
Washington	11.7	(1.34)
Oregon	12.6	(1.42)
California	13.4	(0.55)
Alaska	10.4	(1.49)
Hawaii	9.9	(1.15)
United States	14.0	(0.16)

Source: Computations by authors from March 1985, 1986, and 1987 Current Population Survey data tapes.
Note: Standard errors are in parentheses.

response, processing, and systematic bias in the data. The extent of nonsampling error is not known, but the standard errors shown in Table 1 indicate the extent of sampling error and the effect of some response and processing errors. One should exercise caution in the interpretation of small differences between states.

The formula for computing standard errors of state estimates from the usual one-year CPS sample is

$$\sigma_{x,p} = \sqrt{f(b/x) \cdot p(100 - p)}$$

where x=estimated number of persons in the state, taken from the CPS data, p=estimated percentage of persons who are poor in the state, f=the state-specific factor given by the Census Bureau for 1985, and b=a parameter given by the Census Bureau to be used in computing standard errors of percentages. Since the sample in this work is double the usual one-year size, we doubled x in calculating the standard errors in Table 1.[4]

If one were to compute the standard error of the difference between two of the estimated state poverty rates, one would use the following formula:

$$\sigma_{x-y} = \sqrt{(\sigma_x)^2 + (\sigma_y)^2 - 2\rho(\sigma_x\sigma_y)}$$

where σ_x and σ_y= standard errors of the poverty rates of the two states and ρ, the correlation coefficient,=0 because poverty rates for two different areas are being compared. ■

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[1] We do not triple the sample because of the nature of the CPS sample frame. Each sample household is interviewed for four consecutive months, omitted from interviews for the next eight months, again interviewed for four months, then dropped from the sample. Thus, half of the households interviewed in March 1985 would be in their first four months and would again be interviewed in March 1986, during their last four months. Similarly, half of the households in the March 1987 CPS would have also been interviewed in the March 1986 CPS.

To obtain a data set in which all observations are independent of one another, we dropped from the March 1985 data all households that were also interviewed in March 1986. We also dropped from the March 1987 data households that already appeared in the March 1986 CPS. As a result the March 1985 and 1987 CPSs each added half of their samples to the complete middle-year CPS.

[2] The formula for computing standard errors of poverty rates from the CPS shows that doubling the sample size reduces its standard error by a factor equal to the inverse of the square root of 2, or by 29 percent. The formula is the first that appears at the end of this article.

[3] "Money income" includes all cash income from labor market earnings, dividends, interest, rent, pensions, government income support programs, and any other periodic income source. Taxes are not deducted. Noncash forms of income such as fringe benefits or government benefits from food stamps or Medicare are not counted.

[4] The formula was provided by the Bureau of the Census. It differs from the one published in the appendix to the Bureau's series P-60 reports by inclusion of the state-specific factor. For discussion on how to use the standard errors to construct confidence intervals around each point estimate, see the fall 1987 *Focus* article.

Institute for Research on Poverty: New Funding and Small Grants

The Office of Assistant Secretary for Planning and Evaluation in the U.S. Department of Health and Human Services will support research at the Institute during the two-year period from mid-1989 to mid-1991.

These funds, authorized by recent congressional action, will make it possible to initiate a number of new projects for which planning is now under way. They will also permit continuation of the Institute's Small Grants program. Guidelines for the eighth competition under this program will be available after November 1, 1988, and the application deadline will be February 17, 1989.

Four small grants of up to $12,500 each will be offered for research on poverty-related topics during the summer of 1989. These grants do not require residence in Madison. Two grants of up to $25,000 each are planned for visitors in residence at Madison or at the Department of Health and Human Services during the academic year 1989–90.

IRP Executive Committee

The Dean of the College of Letters and Science at the University of Wisconsin–Madison has appointed the following faculty members to serve on the Institute's Executive Committee during the 1989–90 academic year. The committee provides internal advice on research priorities and related institutional topics.

Irwin Garfinkel, Social Work

Arthur Goldberger, Economics

Linda Gordon, History

Robert Haveman, Economics and La Follette Institute of Public Affairs

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