Focus

Poverty rates by state, 1979 and 1985: A research note

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The official poverty rate in the United States increased from 11.6 percent of all persons in 1979 to 15.2 percent in 1983 and then declined to 14.0 percent in 1985. The poverty rates for all persons and for various demographic groups are published annually by the U.S. Bureau of the Census. Poverty rates for states, however, are not published annually. As a result, users of statistics have relied on the state rates for 1979, derived from the 1980 Census of Population. Because of the great number of requests that the Institute has received for more recent state poverty estimates, Ross and Danziger have prepared this research note.

The poverty rates for 1979 and 1985 shown in Table 1 give the percentage of persons in families with money income below the official poverty line in each state.[1] The table also shows the differences between the poverty rates in 1979 and 1985 by state.

"Money income" includes all cash income after government transfers but before payments of federal, state, local, or social security (FICA) taxes, and before any other deductions from earnings, such as union dues. Money income is the sum of earnings from wages, salary, or self-employment; social security and public assistance; dividends, interest, and rent; unemployment insurance and workers' compensation; pensions from public and private employment; and other periodic income. Income in the form of noncash benefits, such as food stamps, subsidized housing, and health benefits, is not included in the measure. Other forms of noncash income that are not included are the value of goods produced and consumed on farms and the value of fringe benefits.

The poverty lines used here to define the poverty population are the official lines that are updated and maintained by the Census Bureau. In a given year, they vary by the size of the family, the number of related children, and the age of the household head. For example, in 1985 the poverty lines varied from $5,156 for an elderly person living alone to $23,926 for a family of nine or more with at least one child under eighteen. The poverty line for a family of four was $10,989.

The original poverty index was developed in 1964 by the Social Security Administration, based on the Department of Agriculture's 1955 Economy Food Plan and the determination that families of three or more persons spend approximately one-third of their income on food. The poverty lines for these families were therefore set at three times the cost of the plan. The poverty index developed by the Social Security Administration was revised by federal interagency committees in 1969 and again in 1980. One of the modifications of the original SSA lines was to adjust the poverty levels each year based on changes in the Consumer Price Index. The 1980 modifications, implemented in the March 1982 Current Population Survey (CPS) and the 1980 Census, eliminated separate thresholds for farm families and for male- and female-headed households, and extended the thresholds from seven to nine family members. The poverty lines for 1979 and 1985 are, therefore, not completely comparable.

The poverty rates in Table 1 are constructed by comparing the income of the family or unrelated individual (a single-person family) to the poverty line corresponding to that unit. If the family's income is below the poverty line, then all of the *persons* in that family are counted as poor. The base for the poverty rate is the total number of *persons*—not family units—in the population.

The data used to construct the state poverty rates are taken from the computer tapes of the annual March Supplement to

Table 1

Poverty Rates for Persons by State, 1979 and 1985

	1979	1985	Percentage-Point Difference
New England			
Maine	12.0	11.9	−0.1
	(2.82)	(1.89)	(3.39)
New Hampshire	7.0	6.0	−1.0
	(2.45)	(1.48)	(2.86)
Vermont	13.2	9.2	−4.0
	(4.26)	(1.75)	(4.61)
Massachusetts	8.9	9.3	0.4
	(1.06)	(0.83)	(1.35)
Rhode Island	7.5	9.0	1.5
	(2.48)	(1.84)	(3.09)
Connecticut	5.9	7.6	1.7
	(1.21)	(1.40)	(1.85)
Mid-Atlantic			
New York	12.5	15.8	3.3
	(0.71)	(0.76)	(1.04)
New Jersey	10.8	8.3	−2.5
	(1.03)	(0.76)	(1.28)
Pennsylvania	9.0	10.5	1.5
	(0.75)	(0.84)	(1.13)
East North Central			
Ohio	9.8	12.8	3.0
	(0.81)	(0.95)	(1.25)
Indiana	9.8	12.0	2.2
	(1.14)	(1.52)	(1.90)
Illinois	11.8	15.6	3.8
	(0.86)	(1.04)	(1.35)
Michigan	8.9	14.5	5.6
	(0.84)	(1.03)	(1.33)
Wisconsin	7.1	11.6	4.5
	(1.06)	(1.72)	(2.02)
West North Central			
Minnesota	7.4	12.6	5.2
	(1.17)	(1.83)	(2.17)
Iowa	7.9	18.0	10.1
	(1.43)	(2.13)	(2.57)
Missouri	11.2	13.7	2.5
	(1.28)	(1.65)	(2.09)
North Dakota	13.1	15.9	2.8
	(3.71)	(1.94)	(4.19)
South Dakota	14.5	17.3	2.8
	(3.75)	(2.00)	(4.25)
Nebraska	9.8	14.8	5.0
	(2.13)	(1.96)	(2.89)
Kansas	8.3	13.8	5.5
	(1.62)	(1.83)	(2.44)

	1979	1985	Percentage-Point Difference
South Atlantic			
Delaware	9.0 (3.38)	11.4 (1.77)	2.4 (3.82)
Maryland	6.4 (1.08)	8.7 (1.35)	2.3 (1.73)
District of Columbia	16.1 (4.20)	20.4 (2.28)	4.3 (4.78)
Virginia	11.0 (1.24)	10.0 (1.53)	−1.0 (1.97)
West Virginia	14.3 (2.29)	22.3 (2.30)	8.0 (3.25)
North Carolina	13.6 (1.28)	14.2 (0.98)	0.6 (1.61)
South Carolina	20.2 (2.10)	15.2 (1.86)	−5.0 (2.81)
Georgia	15.0 (1.42)	17.7 (1.95)	2.7 (2.41)
Florida	14.6 (1.05)	13.4 (0.93)	−1.2 (1.40)
East South Central			
Kentucky	12.0 (1.56)	19.4 (2.23)	7.4 (2.72)
Tennessee	16.2 (1.58)	18.1 (2.15)	1.9 (2.67)
Alabama	22.0 (1.91)	20.6 (2.52)	−1.4 (3.16)
Mississippi	19.9 (2.34)	25.1 (2.38)	5.2 (3.34)
West South Central			
Arkansas	21.1 (2.45)	22.9 (2.24)	1.8 (3.32)
Louisiana	18.5 (1.73)	18.1 (2.07)	−0.4 (2.70)
Oklahoma	12.8 (1.77)	16.1 (1.89)	3.3 (2.59)
Texas	15.1 (0.88)	15.9 (1.02)	0.8 (1.39)
Mountain			
Montana	14.2 (3.54)	16.1 (1.76)	1.9 (3.95)
Idaho	11.3 (2.95)	16.0 (1.97)	4.7 (3.55)
Wyoming	6.4 (3.29)	12.0 (2.01)	5.6 (3.86)
Colorado	7.2 (1.40)	10.3 (1.75)	3.1 (2.24)
New Mexico	18.5 (3.08)	18.5 (2.00)	0.0 (3.67)
Arizona	10.0 (1.70)	10.7 (1.77)	0.7 (2.45)

	1979	1985	Percentage-Point Difference
Utah	8.1 (2.08)	11.1 (1.69)	3.0 (2.68)
Nevada	7.0 (2.76)	14.4 (2.21)	7.4 (3.54)
Pacific			
Washington	9.6 (1.31)	12.0 (1.87)	2.4 (2.28)
Oregon	9.0 (1.61)	11.9 (1.94)	2.9 (2.52)
California	10.2 (0.57)	13.6 (0.75)	3.4 (0.94)
Alaska	10.8 (4.46)	8.8 (1.74)	−2.0 (4.79)
Hawaii	9.1 (2.75)	10.7 (1.65)	1.6 (3.21)
United States	11.6 (0.19)	14.0 (0.22)	2.4 (0.29)

Source: Computations by authors from March 1980 and March 1986 Current Population Survey computer tapes.
Note: Standard errors are in parentheses.

the CPS. The March CPS contains income information from the previous year, and therefore the data for income years 1979 and 1985 reported here are from the March 1980 and March 1986 CPS. Below the estimated poverty rates in the accompanying table, we report the standard errors. In general, the larger is the standard error shown in our table, the less reliable is our estimate.

The CPS sample is continually updated to produce more reliable estimates of characteristics of the U.S. population. The March 1980 sample reflects a design that was based on the 1970 Census, with coverage in all 50 states and the District of Columbia. The sample was weighted to reflect independent estimates of the total civilian noninstitutional population by age, race, and sex from the 1970 decennial census, modified by statistics on births, deaths, immigration, emigration, and the size of the Armed Forces. The 1986 CPS reflects a new sample design based on the 1980 Census and drawn to better represent individual states. Under the new state-based sample design, the clusters of counties from which the sample is drawn are defined within state boundaries, and the overall sample is allocated among states to produce more reliable state and national estimates. State-specific estimates prior to 1985 are not as reliable.

Because the sample on which each state poverty rate is based is relatively small, we cannot compute with any reliability the state poverty rates for demographic groups such as the aged, blacks, Hispanics, or female-headed households. Poverty rates by county are impossible to compute because an individual's county of residence is not reported in the data.

The poverty rate for all persons in the United States in 1985 was 14 percent. Some states had poverty rates in 1985 which were much higher than this, including the District of Columbia (20.4 percent), Alabama (20.6 percent), West Virginia (22.3 percent), Arkansas (22.9 percent), and Mississippi (25.1 percent).[2] Other states had much lower poverty rates, including New Hampshire (6.0 percent), Connecticut (7.6 percent), New Jersey (8.3 percent), Maryland (8.7 percent), and Alaska (8.8 percent).[3]

The poverty rate for the United States in 1979 was 11.6 percent. The state poverty rates computed from the CPS will in general be different from the published rates from the 1980 Census for two reasons. First, the 1980 Census uses a much larger sample, and it includes some types of group living quarters not represented in the CPS. Second, the poverty lines used in publications from the 1980 Census are the ones revised in 1982, while the 1980 CPS uses the previous thresholds. The Census Bureau found that the revision changed the overall poverty rate slightly (for 1981, the new poverty matrix raised the percentage poor from 13.0 to 13.2 percent). Finally, the sample from the 1980 Census is representative of the state, while the sample from the 1980 CPS may not be.

Standard errors of estimated state poverty rates

The state poverty rates reported in the accompanying table are subject to error from two sources: first, because a sample is taken to represent all persons, and second, because of nonsampling errors in response, enumeration, and systematic bias in the data. The extent of nonsampling error is not known, but the standard errors provided in Table 1 indicate the extent of sampling error, and the effect of some nonsampling errors in response and enumeration. Caution should be exercised in the interpretation of small differences in estimated poverty rates either within a year or between years.

The standard errors for the poverty rates for 1979 and 1985 reported in Table 1 are computed using the formula for the standard error of a percentage shown in the Appendix to the Census Bureau P-60 reports (see box). In addition, the standard errors for 1985 were adjusted by state-specific factors provided by the Census Bureau, which reflect the greater reliability of some of the state estimates than is true of others.

The formula used to compute the standard errors of the poverty rates is the following:

$$\sigma_{x,p} = \sqrt{f \left[\frac{b}{x} \cdot p(100 - p) \right]}$$

where x = the estimated number of persons in the state, taken from the CPS data; p = the estimated percentage of poor individuals in the state; f = the state-specific factor given by the Census Bureau for income year 1985 (in 1979, $f=1.0$ for all states); and b = the parameter given by the Census Bureau to be used in computing standard errors of percentages.

For further discussion of official poverty rates
see the following publications of the
Bureau of the Census

Characteristics of the Population below the Poverty Level 1979, Series P-60, No. 130 (December 1981).

Money Income of Households, Families, and Persons in the United States: 1984, Series P-60, No. 151 (April 1986).

Characteristics of the Population below the Poverty Level: 1984, Series P-60, No. 152 (June 1986).

Receipt of Selected Noncash Benefits: 1985, Series P-60, No. 155 (January 1987).

Money Income and Poverty Status of Families and Persons in the United States: 1986, Series P-60, No. 157 (August 1987).

The standard errors and poverty rate estimates may be used to construct confidence intervals. The confidence interval is a range of values which include the unknown true state poverty rate with a known probability. For example, the interval from one standard error above and below the estimated poverty rate would contain the true state poverty rate with a 68 percent probability. Similarly, the confidence interval constructed using twice the standard error on either side of the estimated poverty rate would contain the true state poverty rate with 95 percent probability.

As an example, we can construct the 95 percent confidence interval for the estimated poverty rate for Wisconsin in 1985. The poverty rate is 11.6, with a standard error of 1.72. Twice the standard error above and below the estimated poverty rate gives an interval from 8.2 to 15.0. Therefore, we can conclude that there is a 95 percent probability that the actual poverty rate for Wisconsin in 1985 was within the interval 8.2 to 15.

To evaluate whether the change in poverty rates between 1979 and 1985 is statistically larger than zero, the standard error of the difference in estimates must be computed. Using the formula given in the Appendix to the Census Bureau P-60 reports, the standard error may be computed from the individual standard errors of the percentage poor:

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

where σ_x and σ_y = standard errors of estimates of x and y; and ρ = correlation coefficient.

Since the samples for 1979 and 1985 are different, ρ is zero. The formula then uses the sum of squared standard errors. The standard error of the difference in poverty rates is shown in the third column of Table 1, below the difference for each state.

Taking Wisconsin as an example once more, we note that the difference between the poverty rates in 1979 and 1985 is 4.5 percentage points. The standard error is computed as the square root of the sum of squared standard errors, or the square root of $(1.06^2 + 1.72^2)$. Thus, the standard error of the difference in poverty rates is 2.02. A 95 percent confidence interval around the difference in poverty rates is 4.04 percentage points added to and subtracted from 4.5 percentage points, or an interval of 0.5 to 8.5 percent. Because the interval does not include zero, we may conclude that the 1985 poverty rate for Wisconsin is significantly higher than the 1979 rate.

On the other hand, the increase in poverty in Indiana from 9.8 percent in 1979 to 12.0 percent in 1985 was not statistically significant at the 5 percent level. The difference in poverty rates was 2.2. The standard error of the difference in rates was 1.90. Twice the standard error on either side of the difference in poverty rates gives the interval $(-1.6, 6.0)$, which includes zero. Therefore, it cannot be concluded that there is a difference between the poverty rates for Indiana in 1979 and 1985. In general, estimated state poverty rates that are fairly similar in 1979 and 1985, and which have larger standard errors, are more likely not to be statistically different from one another. ■

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[1] A "family" in this article refers to a group of people living together and related by blood, marriage, or adoption. Unrelated individuals are considered to be family units of one person. The Census Bureau definition of families does not include unrelated individuals.

[2] Although the estimates in this list vary from 20.4 to 25.1 percent, they are not statistically different from one another at the 5 percent level of significance.

[3] Although the estimates in this list vary from 6 to 8.8 percent, they are not statistically different from one another at the 5 percent level of significance.

Small Grants: New Competition

The Institute and the U.S. Department of Health and Human Services will sponsor the seventh competition under the Small Grants program for research on poverty-related topics during the period July 1988 through June 1989. Four grants of up to $12,500 each are available for work during the summer of 1988; these grants do not require residence in Madison. One or 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 1988–89 academic year. Guidelines will be available from the Institute after November 1, 1987. Application deadline will be February 5, 1988.