Each year, the U.S. Census Bureau releases a number of public reports on the level of poverty in the previous year and trends in the level and composition of the poor from year to year. To make their annual assessment, Bureau analysts use the official poverty measure that was created around the time when President Lyndon Johnson launched the War on Poverty in 1964. The measure was devised to define and quantify poverty in America and thereby provide a yardstick for progress, or regress, and in that sense has served the nation well. However, since the measure’s inception, criticisms of it have abounded, as have suggestions for alternative approaches. While continuing to use the official measure, the Census Bureau also has pursued ancillary measures, most recently the Supplemental Poverty Measure, whose first results were released in November 2011. In addition, the Census Bureau and many state and local entities have devised their own, place-specific measures, in an attempt to better understand the level and trend of poverty in their region and to gauge the effectiveness of antipoverty efforts. This issue of Fast Focus seeks to make sense of these various measures at the federal, state, and local levels.

May 2012

A consumer’s guide to interpreting various U.S. poverty measures

David S. Johnson and Timothy M. Smeeding

Those who follow poverty in the United States anticipate the Census Bureau’s annual late summer release of the “poverty report,” which uses the longstanding official poverty measure to determine the national level of poverty in the previous year and trends in the level and composition of the poor from year to year.¹ In the fall of 2011, poverty rates based on a variety of new poverty measures and data sources (including the American Community Survey) were released by the Census Bureau and other sources. Each release elicited responses from the press and from advocate and public information sources on blogs, in press releases, and in special reports.²

The problem this media coverage demonstrates is that different data sources and different poverty measures produced differences in both the level and trend in poverty. Also evident were differential levels and trends by many characteristics of the poor, especially by age.³ Adding to the complexity, a recent series of articles has focused on multiples of poverty—that is, those living below 150 percent of a poverty line or those between 100 and 200 percent of poverty, comparing these data across different poverty and income measurement domains.⁴

Differentiating these measures and putting them in context for understanding and using the various poverty estimates is the purpose of this Fast Focus.

Alternative poverty measures

The Census Bureau releases a variety of poverty estimates using different data sources and measures.⁵ We will discuss four such estimates: (1) the official measure using the Current Population Survey Annual Social and Economic Supplement (CPS ASEC); (2) the official measure using the American Community Survey (ACS); (3) experimental National Academy of Sciences measures (NAS-type measures); and (4) the Supplemental Poverty Measure (SPM), which builds on the NAS concepts to produce one alternative poverty measure for the nation.⁶ In addition, we will provide a few estimates of an NAS-type measure using the ACS and local area data that are not produced by the Census Bureau but rather by researchers in the localities where the estimates originate (i.e., New York City and Wisconsin). The text box below highlights the differences between the measures discussed here.
Best known are the official national poverty estimates released annually in September and based on the Current Population Survey Annual Social and Economic Supplement (CPS ASEC), which computes incomes for the previous calendar year. The official poverty rates use thresholds that are anchored in nature and based on a poverty line created in the early 1960s. The thresholds are priced up each year according to various consumer price indices, but not adjusted for changes in the standard of living. The income measure used is before-tax money income including cash income support benefits.

The Census Bureau also produces state and local poverty estimates using the ACS, which has a large enough sample to produce reliable annual poverty estimates for geographic areas with a population of 65,000 or more, including all metropolitan areas. With its repeated five-year samples, the ACS provides poverty measures at school district and census tract levels every year.\(^9\)

The NAS/SPM-type poverty measures arose over the past two decades from researchers concerned that the official poverty measure had become obsolete (except for its ability to present very long-term trends). These measures follow various formulations, mostly those suggested in the path-breaking 1995 NAS report on poverty measurement\(^10\) and a 2005 updated report on progress since the 1995 report, including various reports on an NAS-type measure released by the Census Bureau and the Bureau of Labor Statistics (BLS).\(^11\) The first report creating the new SPM, which will supplement, not replace, the official measure, was released in November 2011.\(^12\) The SPM combines the best and most agreed upon elements of the research based on expert opinion and on the experimental series, as determined by a federal Interagency Technical Working Group (ITWG) comprising representatives from several major federal agencies and departments.\(^13\)

The SPM is designed to provide a more modern, comprehensive, and meaningful measure of national poverty. The ITWG\(^14\) charge to the Census Bureau and BLS is to “continually work to improve upon the SPM measure,” and hence, the SPM will always be based on the most recent data and methods, which means that creating a historical SPM series is problematic. As a result, currently there are two basic series, the NAS experimental series (from 1999 to 2010) and the new SPM first produced in 2011, with poverty estimates for 2009 and 2010.

Each of the NAS-type and SPM methods produces poverty measures based on thresholds that are determined annually by consumer spending behavior and that increase in a “quasi-relative” nature with changes in spending levels. The term quasi-relative means that the threshold changes in the same direction as does relative income but not by as much as does relative income.\(^15\) They use after-tax incomes with allowances for the cost of work and out-of-pocket medical expenses, and include major refundable tax credits (like the Earned Income Tax Credit or EITC) and in-kind benefits for food (such as Supplemental Nutrition Assistance Program or SNAP benefits), housing, and energy costs (see text box).

### State-level poverty rates

Although it is possible to provide multi-year estimates of the SPM at the state level, the Census Bureau recommends using three years of CPS data, which are not yet available, to obtain more reliable numbers. In addition, the CPS is primarily used for national estimates, and the Census Bureau recommends using the ACS for local area estimates. Currently, however, the Census Bureau has not produced NAS/SPM-type poverty estimates using the ACS.\(^16\) To obtain more meaningful statistics for their region, various localities and states have produced NAS/SPM-type measures following measurement nuances based on their own policy concerns.\(^17\)

| Poverty Measure Concepts: Official, Supplemental (SPM), and National Academy of Sciences (NAS) |
|---------------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| **Official Poverty Measure** | **Supplemental Poverty Measure** | **NAS-Type Poverty Measure** |
| **Measurement units** | Families and unrelated individuals | All related individuals who live at the same address, including any coresident unrelated children who are cared for by the family (such as foster children) and any cohabitators and their children | Families and unrelated individuals |
| **Poverty threshold** | Three times the cost of minimum food diet in 1963 | The 33rd percentile of expenditures on food, clothing, shelter, and utilities (FCSU) of consumer units with exactly two children multiplied by 1.2 to add 20 percent for all other necessary expenses | Percentage of the median expenditures on FCSU for consumer units with two adults and two children (including an amount for all other necessary expenses) |
| **Threshold adjustments** | Vary by family size, composition, and age of householder | Vary by housing status: owners with mortgages, owners without mortgages, and renters. Geographic adjustments for differences in housing costs (using ACS) and a three-parameter equivalence scale for family size and composition | Geographic adjustments for differences in housing costs (using Fair Market Rents) and a three-parameter equivalence scale |
| **Updating thresholds** | Consumer Price Index: all items | Five-year moving average of expenditures on FCSU | Three-year moving average of expenditures on FCSU |
| **Resource measure** | Gross before-tax cash income | Sum of cash income, plus in-kind benefits that families can use to meet their FCSU needs, minus taxes (or plus tax credits), minus work expenses, minus out-of-pocket medical expenses (reported) | Sum of cash income, plus in-kind benefits that families can use to meet their FCSU needs, minus taxes (or plus tax credits), minus work expenses, minus out-of-pocket medical expenses (imputed) |
As a result, there is a need to simultaneously evaluate a variety of poverty estimates.

Telling measures apart

The easiest way to summarize these measures is to consider the matrix below showing six basic boxes, defined by type of poverty measure (i.e., official, NAS, SPM) and by different data sources (i.e., CPS, ACS) used to produce these estimates. Each poverty measure contains two key parameters: the poverty threshold and the measure of income or resources used to compute poverty. As the SPM was only recently developed, much previous work has been done producing NAS-type poverty measures that are similar in concept to the SPM, but differ in particular aspects. Until one SPM measure is produced over time and across areas, researchers will need to rely on a variety of estimates.

<table>
<thead>
<tr>
<th>Poverty Measure Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>CPS</td>
</tr>
<tr>
<td>ASEC</td>
</tr>
<tr>
<td>Official</td>
</tr>
<tr>
<td>National Estimates</td>
</tr>
<tr>
<td>NAS-Type</td>
</tr>
<tr>
<td>SPM</td>
</tr>
<tr>
<td>ACS</td>
</tr>
<tr>
<td>State/Local Estimates</td>
</tr>
<tr>
<td>For some areas, combinations of NAS/SPM-type measures (e.g., NYC, WI)</td>
</tr>
</tbody>
</table>

Comparing trends in poverty

We begin with Figure 1 taken from the CPS and showing different levels and trends in national poverty according to the measure of resources and poverty lines coming from official and NAS/SPM perspectives. The official poverty measure can be roughly interpreted as a poverty line set in the early 1960s and “anchored” there in real terms, with only price adjustments since the original line was constructed. The figure shows that the quasi-relative measure increases much more rapidly over the last decade up to 2008, while a different anchored NAS measure has risen by less. This is because the NAS anchored measure uses the 1999 NAS-type poverty threshold and the Consumer Price Index (CPI) to update this by inflation up to 2010, rather than re-calculating the threshold each year as does the NAS quasi-relative measure. The NAS anchored measure can be used to examine changes in the resources available to the poor against a fixed (1999) market basket, or living standard, as compared to changes in the quasi-relative living standards reflected in the measures whose poverty line needs standard is updated yearly. Hence, Figure 1 demonstrates that during the last recession poverty did not increase as much using the NAS measure anchored to the 1999 NAS level as it did with the NAS quasi-relative measure. These estimates reflect the utility of both anchored and relative poverty measures.

Updating thresholds

One of the most controversial aspects of the SPM is the quasi-relative method of updating the threshold. As shown in the text box, the thresholds for the SPM measure (and similarly for the NAS measures) are updated over time using the change in expenditures for food, clothing, shelter, and utilities (FCSU) at the 33rd percentile of the consumption expenditure distribution. This means that the SPM (and NAS) thresholds will move with changes in expenditures on necessities instead of changing only with prices. As a result, the thresholds could fall in recessions and rise more than inflation in expansions. But they will not change as much as do median incomes, which are a fully relative measure used in Europe and by several international bodies. This quasi-relative updat-
ing method was supported by the ITWG as a conservative approach to updating the thresholds with changes in the standard of living. As the NAS report stated:

“Hence, tying the poverty thresholds to spending levels for these three necessary commodities [food, clothing, and shelter] is a conservative way of updating; it adjusts the thresholds for real increases in consumption of basic goods and services, rather than for all goods and services. Supporting the reasonableness of this degree of updating is the evidence that subjective poverty thresholds have an elasticity in the range of 0.65 to 0.80 with respect to median income: when people are asked in successive years to set a value for a minimum income, their answers reflect changes in living standards but on less than a one-for-one basis.”

The goal of the NAS panel (and ITWG) in using the expenditures on FCSU to update the thresholds was to tie the poverty thresholds to changes in the relative standard of living instead of the fixed or anchored standard of living from the 1960s used in the official measure (and adjusted by changes in the CPI) over a 50-year or longer term. Until a time series of the SPM poverty rates is available, one can use the NAS-type measures to provide a framework to examine changes during the past decade (and especially during the Great Recession).21

Estimates in the 1995 NAS panel report showed that analysts expected the thresholds to increase more than inflation, but less than median income over the longer term.22

As shown in Figure 1, there are short-run implications of using the changes in expenditures, and hence, as suggested by the 1995 NAS panel, it would also be useful to have an “anchored” measure using the CPI adjustment in order to compare it to the SPM measure. The panel stated:

“Nonetheless, for evaluation purposes, we believe it would be useful to produce a second set of poverty rates from the proposed measure in which the thresholds are updated only for price changes. This second set of rates will permit evaluating changes in the official rates, based on updating the thresholds according to our recommended procedure, relative to changes in the business cycle.”

As Table 1 shows, the thresholds for the quasi-relative NAS measure increased until 2008 and then fell. In particular, they fell 1.0 percent between 2009 and 2010, while the SPM thresholds increased 2.0 percent. This difference in the change in poverty thresholds can account for almost the entire difference in the change in poverty rates between 2009 and 2010. As shown in Figure 1, the NAS-type poverty measure fell from 15.8 to 15.6 percent between 2009 and 2010, while the SPM increased from 15.2 to 16.0 percent. If the SPM threshold levels were used in the NAS-type measure, the poverty rates would have been 14.9 and 15.6 percent, respectively. This effect can also be seen in comparing the anchored measure (using the CPI to adjust the thresholds) to the NAS (quasi-relative) measure. It is not surprising that a small increase in the threshold has a substantial increase in the poverty rate given a large fraction of families with incomes in that range of the income distribution. As a result, some of the increase in the SPM poverty rate is due to the larger increase in the SPM threshold, which rose 2.0 percent between 2009 and 2010, compared to the 1.6 percent increase in the official threshold.

The main reason for the difference between the trends in the NAS and SPM thresholds is the variation in the number of years used in pooling the data. The NAS panel was concerned about having the current thresholds based only on current expenditure (CE) data. They stated:

“A concern with an updating procedure that adjusts for real increases in consumption is that the poverty thresholds will be too closely tied to changes in the business cycle. Our proposed updating procedure should moderate such fluctuations, both because of the use of three years’ worth of expenditure data to calculate the reference family threshold each year and because the updating is tied to the basic necessities of food, clothing, and shelter.”

---

**Table 1**

<table>
<thead>
<tr>
<th>Year</th>
<th>Official Poverty Threshold</th>
<th>Official SPM 5-Year Average</th>
<th>NAS-Type Quasi-Relative 3-Year Average</th>
<th>NAS-Type Anchored 1999 FCSU Inflated by Prices Only</th>
<th>Annual Median FCSU</th>
<th>SPM-Based 3-Year Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>$19,806</td>
<td>$20,492</td>
<td>$20,708</td>
<td>$19,971</td>
<td>$22,906</td>
<td>$20,479</td>
</tr>
<tr>
<td>2006</td>
<td>20,444</td>
<td>21,320</td>
<td>21,818</td>
<td>20,614</td>
<td>24,402</td>
<td>21,582</td>
</tr>
<tr>
<td>2007</td>
<td>21,027</td>
<td>22,317</td>
<td>23,465</td>
<td>21,202</td>
<td>26,544</td>
<td>22,942</td>
</tr>
<tr>
<td>2008</td>
<td>21,834</td>
<td>23,608</td>
<td>24,755</td>
<td>22,016</td>
<td>26,396</td>
<td>24,336</td>
</tr>
<tr>
<td>2009</td>
<td>21,756</td>
<td>23,854</td>
<td>24,522</td>
<td>21,937</td>
<td>25,952</td>
<td>24,424</td>
</tr>
<tr>
<td>2010</td>
<td>22,113</td>
<td>24,343</td>
<td>24,267</td>
<td>22,297</td>
<td>25,916</td>
<td>24,250</td>
</tr>
</tbody>
</table>

**Percent change (2009–2010) | 1.6% | 2.0% | -1.0% | 1.6% | -0.1% | -0.7%**

**Percent change (2008–2010) | 1.3% | 1.3% | -2.0% | 1.3% | -1.9% | -0.3%**

**Source:** Authors’ calculations using Census Bureau and Bureau of Labor Statistics data.

**Note:** Thresholds are for family units comprising two adults and two children.
As such, they recommended using three years’ worth of CE data, while the ITWG extended this to five years, stating: “The larger sample that is provided by five years of data will increase the stability of the thresholds and ensure that they move more slowly from year-to-year.” In addition, the NAS panel thought “…that it is appropriate for a poverty measure to reflect such changes with a lag.” As shown in Table 1, if the SPM thresholds were calculated using three years of data, there would be a similar fall in the thresholds between 2009 and 2010 (a 0.7 percent decrease compared to a 1 percent decrease).

This occurs because the expenditures on FCSU are hump-shaped over the 2005 to 2010 period (see Table 1). Mathematically, the SPM threshold will increase between 2009 and 2010 if the 2005 FCSU is less than the 2010 FCSU. A threshold using three years of data (e.g., NAS) will fall between 2009 and 2010 if the 2010 FCSU is lower than 2007, as will an SPM threshold calculated using three years of CE data. And a threshold using five years of data will rise (or fall) if the FCSU is higher (lower) in 2010 than in 2005, as shown in Table 1.

The impact that these threshold changes have on poverty can be seen in Figure 1. If we used the SPM thresholds in 2009 and 2010 with the NAS-type measure, this would lead to an increase in poverty between 2009 and 2010, and a lower poverty level in 2009 due to the lower thresholds. As the elasticity of the poverty rate to the threshold is fairly large, a simple 1 percent change in the threshold yields a change in the poverty rate of around three-tenths of a percentage point.

State and local poverty levels and trends

Finally, if one is interested in state and local poverty, the ACS series dominates the CPS series because it can give much greater geographic detail within the state. But the ACS produces NAS/SPM-like measures at present in only the few states and localities that have developed NAS/SPM-like measures. In these states, care must be taken in comparing the official poverty rates with the ones developed by independent researchers (like the IRP measure for Wisconsin and the Center for Economic Opportunity measure for New York City).23

Table 2 illustrates the poverty rate estimates for the official and NAS- or SPM-type measures from 2008 to 2010 in Wisconsin and New York City. Both illustrate a smaller change in their poverty rate from year to year than the increase in the ACS-based official measure for each site. The NYC SPM-type measure increased 1.4 percentage points compared to a 2.0 percentage point increase in the official NYC poverty rate, and a 0.9 percentage point decrease in Wisconsin’s NAS-type measure compared to a 2.8 percentage point increase in the official poverty rate in Wisconsin. However, as in the discussion about the national measures, at the state and local levels the changes in thresholds and other adjustments for cost of living and medical care also affect the poverty rates in these two areas. The three-year NAS-type threshold in Wisconsin decreased by 3.2 percent between 2008 and 2010, reflecting the full downward effect of the recession on spending, while the five-year SPM-type threshold rose by 4.3 percent in New York City across these two years.

In order to understand how much the poverty line matters, we undertook an experimental simulation for New York City and Wisconsin. If an anchored threshold is used (as in Figure 1) such that the thresholds in both New York City and Wisconsin increase between 2008 and 2010 by the change in the CPI (as in the official thresholds) and do not decline because of recession-induced expenditure declines as in Wisconsin, or rise by a higher amount because of higher five-year average expenses in New York City, the change in both thresholds would be 1.3 percent, as shown in the bottom line of Table 1. If we also maintain the 2008 cost of living index adjustments for the poverty threshold for both New York City and Wisconsin relative to the United States and across areas within Wisconsin, then the change in the poverty lines and poverty rates in Wisconsin and New York City are more comparable. Poverty rises by 0.9 percent (not 1.4 percent) in New York City, but poverty falls by 0.2 percent (not by 0.9 percent) in Wisconsin under this simulation. These increases are both less than the respective increases in the official poverty rates. These comparisons again highlight the care that must be taken in comparing alternative poverty measures across areas and methods.

Summary and conclusions

The moral of our story is that one must be careful about how poverty rates are determined and how they can and cannot be compared. If one wants national poverty estimates, there are three series: the long running official series; the NAS experimental series (2001 to 2010); and the new SPM series (but for only 2009 and 2010). The latter two differ between themselves mainly in the way the thresholds are constructed. And both the NAS and SPM measures differ from the official measure as they include the impact of taxes, refundable tax credits (like the EITC), and near-cash benefits like food assistance (such as SNAP).
Since there is not a consistent historical SPM series for the nation or for state or local areas, there is a need to evaluate a variety of poverty estimates simultaneously. Until there is a historical series for the SPM, we recommend caution in using both the historical NAS-type measures along with the SPM measure. We also recommend that researchers clarify the particular components of their poverty estimate, and relate it to the Census Bureau’s SPM. Finally, we think that both anchored and quasi-relative NAS-type measures provide useful information for analyzing poverty levels and trends.

The authors gratefully acknowledge helpful comments from Donald Oelrich and Mark Levitan.


We do not address these measures below, but note that they are subject to most of the same decisions about needs standard and resource measure as in the poverty calculations themselves.

See the Census Bureau website’s Poverty section at http://www.census.gov/hhes/www/poverty/index.html.


The Census Bureau recommends using the ACS for any state or local level poverty estimates as the size and design of the survey are tailored to producing local area estimates. In addition, the ACS and CPS surveys differ along many dimensions, including sample size, question design, reference period, residence rule, etc. See C. Nelson, “What Do We Know about Differences between CPS and ACS Income and Poverty Estimates?”, Census Bureau background paper, 2006, available at www.census.gov/hhes/www/poverty/about/datasources/nelson_082906.pdf.


The ITWG was charged with developing a set of initial starting points to permit the Census Bureau, in cooperation with the Bureau of Labor Statistics (BLS), to produce the SPM that would be released along with the official measure each year.

The European Union and several international bodies like the Organization for Economic Cooperation and Development (OECD) and the Luxembourg Income Study use poverty rates that are fully relative, meaning the poverty threshold is a fixed percentage of median incomes. The SPM and NAS are quasi-relative because they change with the expenses of the specified family types in the text box. Because expenditures vary less than do incomes, the quasi-relative lines move less than the fully relative ones. But both types of lines may fall in recessions as incomes and expenditures fall. In contrast, the official and anchored poverty measures discussed below change only with consumer prices, and so they may rise in recessions if prices rise, even if incomes fall.

See T. Renwick, K. Short, A. Bishaw, and C. Hokayen. “Using the American Community Survey (ACS) to Implement a Supplemental Poverty Measure (SPM),” paper presented at the Population Association of America annual meetings for an SPM at the national level using the ACS.


See also DeParle and colleagues, “Older, Suburban and Struggling, ‘Near Poor’ Startle the Census.”

See Virgin, Creating the CEO Poverty Unit, report for a discussion of how to separately examine changes in the thresholds with changes in the resources; see also T. Smeeding. “Poor People in Rich Nations: The United States in Comparative Perspective,” Journal of Economic Perspectives, 20(1): 69–90.

The European Union sets its poverty line at 60 percent of annual median income within each nation state. The OECD and LIS amongst others set their poverty line at 50 percent (half) of the annual median income in each nation.

Using this comparison between an anchored measure and the quasi-rela-tive measure, we can also examine the impact on children and the elderly. Another major result of the SPM is the change in the poverty rates for children and the elderly. Child poverty under the SPM is lower than the official, while elderly poverty almost doubles. While the actual poverty rates differ between the NAS-type and SPM measures (similar to the results in Figure 1), the trends using the NAS-type measures are similar for these groups.


Chung and colleagues, Wisconsin Poverty Report; and Virgin, Creating the CEO Poverty Unit.
Fast Focus is a single-topic brief put out several times a year and distributed electronically (only) by the

Institute for Research on Poverty
1180 Observatory Drive
3412 Social Science Building
University of Wisconsin
Madison, Wisconsin 53706
(608) 262-6358
Fax (608) 265-3119

The Institute is a nonprofit, nonpartisan, university-based research center. As such, it takes no stand on public policy issues. Any opinions expressed in its publications are those of the authors and not of the Institute.

The purpose of Fast Focus is to provide supplemental coverage of poverty-related research, events, and issues between issues of Focus, and to acquaint a large audience with the work of the Institute by means of short essays. Full texts of Fast Focus, Focus, IRP Discussion Papers, and Special Reports are available on the IRP Web site at www.irp.wisc.edu.

Fast Focus is free of charge, although contributions to the UW Foundation–IRP General Fund sent to the above address in support of Fast Focus are encouraged.

Edited by Deborah Johnson.

This publication was supported by Grant Number AE00102 from the U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation (ASPE), and awarded by the Substance Abuse and Mental Health Services Administration (SAMHSA). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of ASPE or SAMHSA.

Copyright © 2012 by the Regents of the University of Wisconsin System on behalf of the Institute for Research on Poverty. All rights reserved.

If you received this issue from someone else and would like to receive e-mail notification and an abstract of future issues of Fast Focus, send a message to irpfocalert-request@ssc.wisc.edu with the subject line “Subscribe.”