



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.



Economic Research Service
U.S. DEPARTMENT OF AGRICULTURE

Economic
Research
Service

Technical
Bulletin
Number 1967

July 2024

The Poverty Area Measures Data Product

Tracey Farrigan and Austin Sanders





Economic Research Service

www.ers.usda.gov

Recommended citation format for this publication:

Farrigan, T., & Sanders, A. (2024). *The poverty area measures data product* (Report No. TB-1967). U.S. Department of Agriculture, Economic Research Service.



Cover photo from Getty Images.

Use of commercial and trade names does not imply approval or constitute endorsement by USDA.

To ensure the quality of its research reports and satisfy governmentwide standards, ERS requires that all research reports with substantively new material be reviewed by qualified technical research peers. This technical peer review process, coordinated by ERS' Peer Review Coordinating Council, allows experts who possess the technical background, perspective, and expertise to provide an objective and meaningful assessment of the output's substantive content and clarity of communication during the publication's review.

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotape, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at [How to File a Program Discrimination Complaint](#) and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: program.intake@usda.gov.

USDA is an equal opportunity provider, employer, and lender.



The Poverty Area Measures Data Product

Tracey Farrigan and Austin Sanders

Abstract

The U.S. Department of Agriculture's Poverty Area Measures (PAM) data product is designed to improve understanding of the geography of poverty in the United States. This report contains historical and technical documentation from the November 2022 version of PAM. Examples provided in this report are from 1960 through 2019, but the lessons will be applicable to PAM data in the future. PAM includes four measures of poverty: high, extreme, persistent, and the newly developed measure of enduring poverty. The methodology for the 2022 version of PAM incorporates reliability metrics to account for margin of error of the underlying data. The methodology also uniquely includes comparable U.S. county and census tract-level geography for all measures and data years (except for census tracts in 1960, given limited tract geography prior to 1970).

Keywords: poverty area measures, high poverty, persistent poverty, extreme poverty, enduring poverty, rural, nonmetropolitan

Acknowledgments

The authors extend a special thanks for the guidance provided by the USDA, Economic Research Service (ERS) Rural Economy Branch's persistent poverty working group, which included the authors, along with Kathy Kassel, Timothy Parker, John Pender, and David McGranahan, and management liaisons Robert Gibbs and Jessica Crowe. In addition, the authors appreciate technical reviews and input from Bruce Weber, Oregon State University; Mark Prell, ERS; and one anonymous reviewer. Their comments helped to improve the quality of this report. The authors also thank Christopher Whitney, Jeff Chaltas, Grant Wall, and Chris Sanguinett of USDA, ERS for editorial and design services.

About the Authors

Tracey Farrigan is a geographer and Austin Sanders is an agricultural economist with the USDA, ERS Resource and Rural Economics Division.

Contents

Summary	iii
Introduction	1
Background	2
Methodological Concepts	2
Poverty	2
Poverty Areas	3
Critical Incidence of Poverty	3
Measures Included in PAM	4
Data Selection	5
Decennial Census	5
American Community Survey (ACS)	5
Small Area Income and Poverty Estimates (SAIPE)	6
Census Bureau Data Sources and Years Used in Poverty Area Measures (PAM)	7
Methodological Considerations	9
Persistent Poverty Area Definition History	9
Contemporary Data Considerations	9
Frequency of Updates and Time Between Data Periods	10
Number of Time Periods and Timespan	10
Change in Geographic Boundaries Over Time	11
Incorporation of Data Reliability Metrics	13
Introduction of a New Long-Run Poverty Area Measure	13
Research Measures	14
Additional Technical Details	14
Comparing U.S. County-Level and Census Tract-Level Poverty Areas	14
Reliability Measures	19
Application of Margin-of-Error (MOE)-Based Reliability Metrics	19
Poverty Rate Derivation	19
Reliability Index Derivation	19
Conclusion	22
References	23
Appendix A: The Poverty Area Measures Variable Definitions and Codebook, 2022 Edition ..	26
Geographic Identifiers	26
Supplementary Geographic Codes	26
Poverty Area Measures	28
Appendix B: Chronology of USDA, Economic Research Service (ERS) Poverty Area Measures (PAM), 1960–2022	33



The Poverty Area Measures Data Product

Tracey Farrigan and Austin Sanders

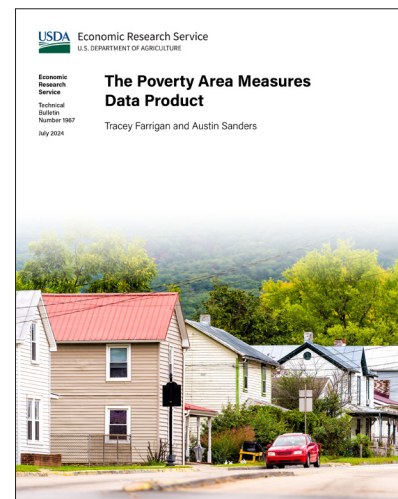
What Is the Issue?

Since at least the 1960s, poverty area measures generated by the U.S. Department of Agriculture's Economic Research Service (ERS) have been relied upon by policymakers to target, implement, and monitor Federal programs designed to support a range of initiatives. Contemporary Federal legislation (Exec. Order No. 13,985, 2021) advancing racial equity and support for underserved communities reinforced and expanded this demand. There is a need for a data product that includes measures of high and persistent poverty at multiple spatial scales and the ability to adjust the measures using different years of data and data sources, as well as the ability to merge the measures with complementary socioeconomic and demographic data.

What Did the Study Find?

The Poverty Area Measures (PAM) data product expands upon USDA, ERS's existing persistent poverty county classifications to include high, extreme, and enduring poverty area classifications. PAM also expands the number of geographic levels to include U.S. counties and census tracts for all measures and the frequency of poverty area measure updates.

- High and extreme poverty area measures for single time periods are produced to meet stakeholder demand for greater flexibility in defining poverty areas and updated annually to meet demand for the most current data.
- A new poverty area concept—enduring poverty—emerged after evaluating the existing USDA, ERS persistent poverty area measure and exploratory data analysis. The enduring poverty area measure expands the 30-year timeframe of the persistent poverty area measure to capture the entrenchment of poverty in an area as far back as available data allow.



ERS is a primary source of economic research and analysis from the U.S. Department of Agriculture, providing timely information on economic and policy issues related to agriculture, food, the environment, and rural America.

- County-level and census tract-level geographies are standardized over time to allow for temporal (1960 to present) and census-tract-within-county comparisons of all measures.
- Data reliability metrics are incorporated into each poverty area measure to account for the margin of error in the underlying American Community Survey (ACS) poverty rate data for counties and census tracts.
- Diverse geocoding is included to allow for linking to a wide range of supplemental data products and to shapefiles for mapping/geographic information system (GIS) applications.

How Was the Study Conducted?

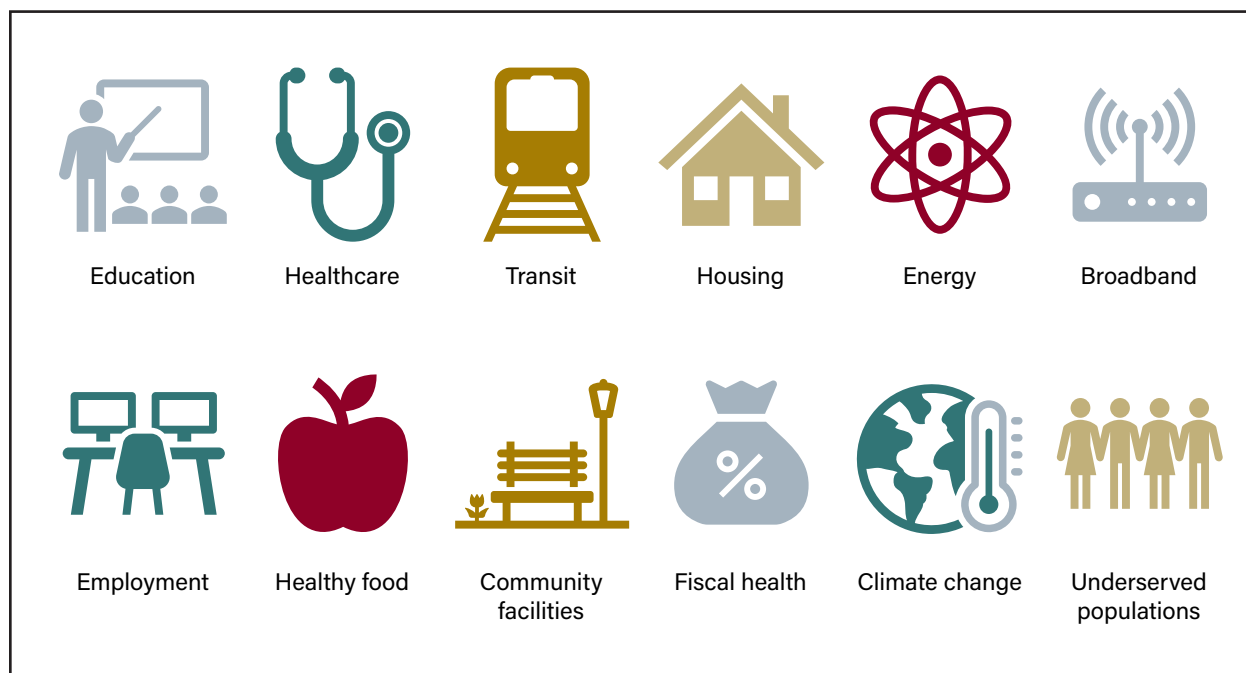
The PAM data product is built upon USDA, ERS's longstanding work in poverty area measurement and ongoing stakeholder engagement. The baseline methodology for high and persistent poverty areas is presented in an ERS report by Cook and Mizer (1994), which explains and provides justification for the derivation of county-level economic and policy typology codes, including persistent poverty counties. The persistent poverty county type is updated every decade. Over fiscal year 2022, an informal working group met to discuss methodological considerations for the next update. This group's work included, but was not limited to, considerations of expressed needs of Federal stakeholders, such as more current county measures and comparable census tract-level measures, and the incorporation of data reliability metrics into the existing methodologies. The PAM data product was born from this endeavor. The PAM web page was developed to serve as the access point for a publicly downloadable (CSV/Excel) data file, as well as to provide details about the data product and visualizations.

The Poverty Area Measures Data Product

Introduction

Since at least the 1960s, poverty-area measures developed by USDA’s Economic Research Service (ERS) have been relied upon to target, implement, and monitor Federal, State, and local government programs designed to support a broad range of initiatives (see figure 1) that provide resources to underserved communities. Contemporary Federal legislation has reinforced and expanded upon the demand for poverty area measures to meet similar needs (e.g., Consolidated Appropriations Act of 2021, Public Law 116–260).

Figure 1
Poverty area measures are used to inform a variety of initiatives



Source: USDA, Economic Research Service using icons from Microsoft and Getty Images.

Comparable measures of high and persistent poverty at multiple spatial scales (census tract, county, etc.) were of particular interest but not readily available. The USDA, ERS Poverty Area Measures (PAM) data product was designed to satisfy this interest. PAM provides the nontechnical user with a time series of well-established poverty area measures at comparable county and census tract geographies.

The PAM data consists of four poverty area measures (spanning 1960 to the present) and various geographic identifiers and supplementary codes for counties and census tracts, such as USDA, ERS’s Rural-Urban Continuum Codes and Rural-Urban Commuting Areas, which are useful for socioeconomic and demographic analysis. The measures are provided as downloadable Excel and CSV data files, which are available through the PAM web page (USDA, ERS, Poverty Area Measures, 2022). This report expands on the information included on the web page and related data files. The report includes a discussion of the background and impetus for creating the PAM data product, the poverty area measures included in PAM and data options for operationalizing them, related methodological concepts and considerations, and details about geographic comparisons and reliability metrics.

Background

USDA, ERS is the lead Federal statistical agency for research and statistics on the rural economy.¹ Since USDA, ERS's establishment in 1961, it has fulfilled this responsibility through statistical and research support for rural community prosperity and household economic well-being. The provision of poverty area measures has been an integral part of this work. Throughout the 1960s and 1970s, USDA, ERS researchers developed indices (see appendix B for more information) for low-income and low standard of living among people in agricultural and rural areas (e.g., Inman & Southern, 1960; Cowhig, 1965; Davis, 1979). In 1985, USDA, ERS introduced the persistent poverty county classification product to provide policymakers and program managers with a new tool to assist with meeting rural development and poverty alleviation goals (Ross & Green, 1985). The product made available for the first time a single summary measure to monitor long-run changes in spatial concentrations of poverty for nonmetropolitan (nonmetro) counties (Bender et al., 1985).

USDA, ERS has updated the persistent poverty classification every decade since the 1980s but with some changes in methodology and packaging. In the early 1990s (Hady & Ross, 1990; Cook & Hady, 1993; Cook & Mizer, 1994), USDA, ERS revised and expanded the persistent poverty county classification to include metropolitan counties and published the classifications as part of what would commonly become known as the USDA, ERS County Typology Codes. These codes contain a broad range of economic and policy types and are also updated every decade, with some exceptions. For instance, a persistent child poverty county classification was added to the 2000's edition postpublication (2009) to meet stakeholder demand for this information in a timely manner.

The 2010's iteration of the codes was accompanied by changes in the availability of poverty data for nationwide county-level analysis, which resulted in another methodological adjustment for the persistent poverty county classification. There has since been growth in Federal stakeholder demand for alternative persistent poverty county definitions and a broader range of poverty area classifications in general, particularly with respect to measures using subcounty geography. The PAM data product was developed with this demand in mind. PAM is not a replacement for the USDA, ERS County Typology Codes but rather serves as an extension of and complement to that data product.

Methodological Concepts

The PAM data product is based on the concept and measurement of poverty areas, as generally understood in Federal Government research and policy.

Poverty

Poverty is a term that is familiar to many as a measure of well-being in the United States, but it is a complicated concept. Poverty has a long history of changing discourse and definition. Yet, for most people, poverty implies some form of deprivation or lack of something that is necessary, such as food, housing, clothing, and the financial resources needed to obtain these basic needs. This perspective forms the basis of the Federal Government's Official Poverty Measure (OPM), which was established by the U.S. Office of Management and Budget in 1969.

¹ Details on the roles and responsibilities of statistical agencies can be found in Harris-Kojetin and Citro (2021), and a summary example is provided by the National Center for Health Statistics (2017).

A set of monetary income thresholds that vary by family size and composition are used to determine who is in poverty (Fisher, 1992). The thresholds represent the point below which a family of a given size has a cash income insufficient to meet basic needs. Poverty status is determined by first calculating family total income, which includes monetary income before taxes and does not include capital gains or cash benefits. If a family's total income is less than the family's threshold, then that family and every individual in it is considered as being in poverty. The incidence of poverty is reported as an areawide headcount or as a percentage of an area's population (Jolliffe, 2003), otherwise known as a poverty rate. This information typically serves as the metric for designating poverty areas.

Poverty Areas

There is no one definition of a poverty area, but the term generally refers to a geographic area that has a relatively high incidence of income-based poverty among the resident population. Researchers have found that for people residing in such areas, locational factors are linked to negative health and well-being outcomes. For instance, studies have demonstrated that various health problems, educational attainment, crime and delinquency, and psychological distress, among other issues, are affected by community characteristics (e.g., Ellen et al., 2001; Sampson et al., 2002; Leventhal & Brooks-Gunn, 2003; Eriksson et al., 2015; Levy et al., 2019). Further, it has been observed that the longer a high incidence of poverty exists in an area, the greater the likelihood that individual outcomes will be negatively impacted. Therefore, while poverty measurement occurs at the family and individual unit of analysis, it is understood that poverty can also be experienced in a collective manner (Misturelli & Heffernan, 2010). Poverty area measures are indicators of this collective experience and include single-time period measures (e.g., high poverty areas), as well as multi-time period measures (e.g., persistent poverty areas).

Critical Incidence of Poverty

A poverty rate cutoff of 20 percent or more is commonly used to define high incidence or, rather, a high poverty area (e.g., Bishaw et al., 2020). A poverty rate cutoff of 40 percent or more is commonly used to define an extreme poverty area (e.g., Ludwig et al., 2012; Farrigan, 2020). The critical incidence cutoffs originated with the establishment of the Official Poverty Measure (OPM). The use of these cutoffs has been widespread ever since, and their contemporary validity has been tested by USDA, ERS periodically over the decades (e.g., coinciding with decennial updates to the USDA, ERS County Typology Code data product, which includes persistent poverty area measures).

Former President Lyndon Johnson's Great Society initiatives during 1964–65 not only fueled the need for a family and individual poverty measure but also the need for spatial information on poverty conditions, which led to the commissioning of poverty area research (Farrigan & Crowe, 2023). The U.S. Department of Commerce's Bureau of the Census (Census Bureau) and the USDA's ERS were primary contributors to this body of work. Focusing separately on urban and rural areas, the agencies independently developed multi-factor indices of areawide economic well-being (e.g., Bird, 1964; U.S. Census Bureau, 1966). Each index contained a combination of income-based measures, demographic characteristics, and community capacity indicators. The indices were used to define poverty areas, which served as the basis for further research and targeting within a broad range of Federal policies and programs. After the OPM was developed, comparative research on the indices was conducted. This research led to the index approach to poverty area identification being replaced by a single-measure approach based on the OPM. Specifically, the Census Bureau compared the OPM to the multifactor index that the Census Bureau previously developed to identify metropolitan poverty areas and found that the poverty areas identified with the index corresponded with an OPM poverty rate of 20 percent or higher. This finding resulted in the Census Bureau's adoption of an OPM 20-percent

poverty rate cutoff in place of the index approach for identifying poverty areas. As the OPM recommendations became more widely adopted within the Federal Government, USDA, ERS made a similar transition (see the chronology in appendix B).

Testing the ongoing validity of the 20-percent cutoff has consistently been a part of USDA, ERS's persistent poverty county classification process. For instance, sensitivity analyses, which consist of a collection of tools and methods used for simulation modeling (Chattoe, 2000), have been conducted resulting in the cutoff being deemed appropriate for defining high poverty area status (as referenced in internal USDA, ERS technical documents). Further, as part of symposia to acknowledge the 50-year anniversary of rural poverty research conducted during the Great Society period, USDA, ERS's original 1960's index was recreated and updated using data current to 2016. Comparative analysis of the updated index to OPM poverty rates for the corresponding time period reaffirmed the 20-percent cutoff. Academic research suggests that areawide poverty rates of 20 and 40 percent serve as tipping points for the impact of community poverty on individual outcomes. For instance, Galster (2002, 2003) found that the negative externalities (imposition of a cost to poor and nonpoor residents) due to areawide poverty did not occur until the poverty rate reached 10 to 15 percent and were not substantial until the area's poverty rate reached 20 percent. Further, the negative externalities increased when moving from 20 to 40 percent, while poverty rates exceeding 40 percent appeared to add little to the negative externalities experienced at 20 to 40 percent.

Measures Included in PAM

The OPM-based critical poverty rate cutoffs serve as the building blocks for the four measures included in PAM. High poverty areas are defined by an areawide poverty rate of 20 percent or more based on the official poverty measure cutoffs. Extreme poverty areas are a subset of the high poverty classification, where the poverty rate is 40 percent or more. The measures represent the concentration of poverty in an area in a single-year or multiyear reference period (e.g., 5-year period average).

Figure 2
Definitions of the poverty area measures that are included in the Poverty Area Measures (PAM) data product

Poverty Area Measures Definitions
High poverty: Areas with a poverty rate of 20 percent or more in a single time period.
Extreme poverty: Areas with a poverty rate of 40 percent or more in a single time period.
High poverty area status over time is used to construct persistent and enduring poverty area measures for counties and census tracts.
Persistent poverty: Areas with a poverty rate of 20 percent or more for four consecutive time periods, about 10 years apart, spanning approximately 30 years (baseline time period plus three evaluation time periods).
Enduring poverty: Areas with a poverty rate of 20 percent or more for at least five consecutive time periods, about 10 years apart, spanning approximately 40 years or more (baseline time period plus four or more evaluation time periods).

Source: USDA, Economic Research Service.

Persistent poverty refers to long-standing geographic concentrations of the poor. Persistent poverty is defined by consistent high poverty area status over multiple decades. The USDA, ERS persistent poverty area definition uses four time periods (baseline plus three evaluation periods) spanning 30 years, rolling forward every decade. Enduring poverty extends the persistent poverty area timeframe as far back as comparable poverty area data are available, capturing cumulative high poverty area status for the earliest time period included in PAM to the most current. As such, enduring poverty areas are counties and census tracts that have consistently had high poverty rates for approximately 40 years or more.

Data Selection

Data sources with national coverage that meet the need for operationalizing the four poverty area measure definitions include the Decennial Census of Population and Housing, the American Community Survey (ACS) 5-year estimates, and the annual Small Area Income and Poverty Estimates (SAIPE). Only the Decennial Census and the ACS are used in the PAM data product, but SAIPE data can be appended by the user if desired.

Decennial Census

The Decennial Census of Population and Housing (Decennial Census) is a national survey that has existed since 1790 and is administered every 10 years by the Census Bureau. From 1970 (about the time that the OPM was established) through 2000, a subset of the population surveyed (about one in six households) was asked to complete a lengthier questionnaire. Commonly known as the long form, the questionnaire was used to collect more detailed information, including data on income, which was used to determine poverty status. The long form was eliminated following the 2000 Decennial Census with the advent of the ACS, which posed those questions and others on an ongoing basis instead of once each decade.

A benefit of the Decennial Census is that it has an extensive selection of geographies and the availability of corresponding demographic, socioeconomic, and housing characteristics. However, using the Decennial Census meant that county-level poverty estimates were only available every 10 years, from 1960 (OPM-based poverty measures were added post-Census) through 2000. Similar data at the census tract level are also available for the United States for 1990 and 2000, as well as for select geographies in the earlier decades.

American Community Survey (ACS)

In 2005, the ACS replaced the Decennial Census long form. The ACS is an annual, nationwide survey with a sample size of about 3.5 million addresses across the 50 U.S. States, Washington, DC, and Puerto Rico. The ACS includes a diverse set of social, economic, housing, and demographic characteristics. ACS includes a rich set of geographies: Nation, States, congressional districts, counties, places, census tracts, and other localities.

The ACS is used to obtain 1-year estimates for select geographies with populations of 65,000 or more, which the Census Bureau views as sufficiently large to support statistical estimates based on a single year of data. Five-year period estimates are published for all geographic areas, down to the census tract and block group levels. The estimates are produced by pooling the data across the 5 years to generate period averages. The Census Bureau recommends that a comparison of 5-year estimates over time for a given geographical unit be limited to 5-year periods that do not overlap. A comparison of overlapping 5-year periods would include 1 or more years of the same data, which would make interpretation of the comparison problematic.

Small Area Income and Poverty Estimates (SAIPE)

The Census Bureau’s SAIPE program offers annual estimates of income and poverty statistics for all States, counties, and school districts. The SAIPE’s main objective is to provide poverty and income estimates for the administration of Federal programs and the allocation of Federal funds to local jurisdictions. The estimates are available annually from 1995 to the present. The details of the SAIPE methodology differ from year to year. In general, income and poverty for States and counties are modeled estimates derived from a combination of census population data and poverty inputs from surveys, specifically the Current Population Survey (up until 2004), the ACS (beginning in 2005), and administrative records. Therefore, the estimates are not direct counts from enumerations or administrative records, nor are they direct estimates from sample surveys.

Census Bureau (2021) data user guidance notes that for counties and school districts, particularly those with populations below 65,000, SAIPE provides the most accurate subnational single-year estimates of poverty. Limitations of SAIPE include substantially fewer geographic scales than the Decennial Census or ACS and the lack of supplemental variable selection that exists with the other data sources.

Overall, direct comparisons of poverty statistics derived from the ACS, SAIPE, and Decennial Census programs should be made with caution due to their differing methodologies. However, with no consistent alternative spanning long periods of time (e.g., 1960 to present), comparisons are commonly made out of necessity.² The poverty rate cutoff method used for most poverty area measures, including those available in the PAM data product, reduces the critical nature of that comparison. That is, the absolute difference in poverty rates is not being compared but rather whether the poverty rates from each year per source meet the 20-percent threshold (table 1).

Table 1
Data year and source options for U.S. county and census tract poverty-area measures

Data source	Official Poverty Measure (OPM) data availability			
	Years	County	Census tract	Updates
Decennial Census	Every 10 years, 1960 through 2000	Nationwide	Limited geography, 1960–80; nationwide, 1990–2000	None, poverty data was no longer collected post-2000
American Community Survey (ACS) 1-year estimates	Every year, 2005 to present	Counties with populations of 65,000 or more	Not available	Annually, 1-year lag (e.g., 2022 estimates were released in 2023)
American Community Survey (ACS) 5-year estimates	Every year, 2009 (2005–09) to present	Nationwide	Nationwide	Annually (overlapping 5-year increments), 1-year lag (e.g., 2018–22 estimates were released in 2023)
Small Area Income and Poverty Estimates (SAIPE)	1989, 1993, and every year from 1995 to present	Nationwide	Not available	Annually, 1-year lag (e.g., 2022 estimates were released in 2023)

Source: USDA, Economic Research Service.

² Chapter 9 of the Census Bureau’s (2020) documentation offers a more detailed summary of the methodological differences and guidance about making comparisons between ACS and Decennial Census estimates for temporal analysis.

Census Bureau Data Sources and Years Used in Poverty Area Measures (PAM)

Poverty rate estimates from the Decennial Census are used to determine county-level high and extreme poverty areas for each decade, 1960 through 2000. The ACS 5-year period estimates are used for county-level high and extreme poverty area derivation post-2000. The original 2022 version of the PAM data product included the ACS periods 2007–11 and 2015–19. High and extreme poverty area measures based on other ACS 5-year periods are periodically added to the data product. Census tract-level high and extreme poverty area measures are based on the same data sources and are available for the same years, except for 1960 (given limited tract geography prior to 1970). In 1960, census tract geography only existed for a few urban areas. The number of defined census tracts increased substantially in the 1970s and 1980s, but the Census Bureau did not release census tract geography for the entire nation until 1990. Therefore, the geographic coverage for census tracts in the PAM data product is limited for the years prior to 1990 (table 2). Also, the poverty rate estimates used to determine census-tract level high and extreme poverty areas may differ from those published in the Census Bureau data products due to the process of standardizing census tract geography over time (see discussion in “Methodological Considerations”).

Table 2

Geographic coverage of high poverty areas in the Poverty Area Measures (PAM) data product (2022 edition)

Data period	Counties			Census tracts		
	High poverty	Poverty status determined	Total possible	High poverty	Poverty status determined	Total possible
1960	2,412	3,110	3,142	NA	NA	NA
1970	1,346	3,117	3,142	6,882	51,923	73,057
1980	723	3,127	3,142	8,384	58,608	73,057
1990	853	3,133	3,142	14,877	72,629	73,057
2000	494	3,136	3,142	14,118	72,840	73,057
2007–11	717	3,136	3,142	19,040	69,789	73,057
2015–19	585	3,135	3,142	17,580	71,066	73,057

NA = not available.

Note: High poverty areas are those with a poverty rate of 20 percent or more, as defined in the USDA, Economic Research Service Poverty Area Measures (PAM) data product. High (and extreme) poverty status is not determined if a poverty rate estimate is not available for an area in a given year or if an estimate is determined to have a low level of reliability and adding or subtracting the margin of error from the poverty rate estimate would change the poverty area status of an area (e.g., the high poverty status of an area with a poverty rate estimate of 21 percent and a margin of error of 17 percent would not be determined).

Source: USDA, Economic Research Service 2022 Poverty Area Measures.

The high poverty area measures are used to derive county-level and census tract-level persistent and enduring poverty area measures, according to the definitions provided in figure 2. For instance, the 1990 persistent poverty area measure is defined by an Official Poverty Measure (OPM) rate of 20 percent or more for each of the Decennial Census data years—1960, 1970, 1980, and 1990. Each subsequent measure rolls the definition forward by adding the latest time period and dropping the earliest time period. Therefore, the 2000 measure drops 1960 and adds 2000. Beginning with the 2010 measure, ACS 5-year period estimates are used for the current poverty rate period.

The enduring poverty area measure extends the persistent poverty area timeframe by at least one decade. That is, enduring poverty area status is defined by high poverty area status for a minimum of five consecutive time periods, spanning at least 40 years from the most current data period to the earliest. It is a continuous

measure that takes all data periods included in the PAM data product into account, increasing infinitely as newer years of data are added. In comparison, the persistent poverty measure is finite, given that the measure is based on four data periods only, regardless of how extensive a timeframe is covered by PAM.

The enduring poverty measure is coded to reflect the number of consecutive data periods that a county or census tract has consistently had high poverty, with the minimum number being five data periods and the maximum being dependent on the number of data periods available. For example, the 2022 edition of the PAM data product includes county high poverty area status for 2015–19, 2007–11, 2000, 1990, 1980, 1970, and 1960. As shown in table 3, a county is coded “1” if it is a high poverty county in each of the data periods from 2015–19 back to 1980 but is not defined as a high poverty county in 1970. A county is coded as “2” if it is a high poverty county from 2015–19 back to 1970 but is not high poverty in 1960. Lastly, a county is coded as “3” if it is a high poverty county in each data period from 2015–19 back to 1960. The enduring poverty area measure, as just described, is labeled to indicate that the most current data period used is 2015–19 (EndurePov1519). The PAM 2022 edition also includes a measure where the most current data period used to define enduring poverty is 2007–11 (EndurePov0711). Given that fewer data periods are used in its determination, the coding for this version of the measure only includes code “2” (defined by high poverty for all data periods from 2007–11 back to 1960) and code “1” (defined by high poverty for all data periods from 2007–11 back to 1970 and excluding those coded as “2”).

Table 3
Comparison of persistent and enduring poverty areas, data period ending 2015–19

		Number of consecutive measurement periods of high poverty	2015–19 example: High poverty measurement periods	Number of counties in 2015–19
Persistent poverty		≥ 4	1990, 2000, 2007–11, 2015–19	346
Enduring poverty	Code -1	≥ 4	1990, 2000, 2007–11, 2015–19 (missing or unreliable data in 1 or more years before 1990)	1
	Code 0	4	1990, 2000, 2007–11, 2015–19	35
	Code 1	5	1980, 1990, 2000, 2007–11, 2015–19	6
	Code 2	6	1970, 1980, 1990, 2000, 2007–11, 2015–19	0
	Code 3	7	1960, 1970, 1980, 1990, 2000, 2007–11, 2015–19	304

Note: An enduring poverty code of “0” indicates that an area is not classified as enduring poverty. An enduring poverty code of “-1” indicates that it could not be determined if an area was enduring poverty or not due to missing data or low data reliability. High poverty areas are those with a poverty rate of 20 percent or more, as defined in the USDA, Economic Research Service Poverty Area Measures (PAM) data product. High poverty status is not determined if a poverty rate estimate is not available for an area in a given year or if an estimate is determined to have a low level of reliability and adding or subtracting the margin of error from the poverty rate estimate would change the poverty area status of an area (e.g., the high poverty status of an area with a poverty rate estimate of 21 percent and a margin of error of 17 percent would not be determined).

Source: USDA, Economic Research Service 2022 Poverty Area Measures.

Methodological Considerations

Several methodological considerations went into developing the PAM data product, including using the ACS for the poverty area measures instead of SAIPE for post-Decennial Census data years. These considerations were informed by research and stakeholder engagement. The considerations center on updating and improving upon the persistent poverty area measure but impact all measures included in PAM.

Persistent Poverty Area Definition History

The methodology for the USDA, ERS persistent poverty county type that was published in the early 1990s serves as the basis for all subsequent years of USDA, ERS persistent poverty area measures. As previously discussed, the methodology uses poverty rates of 20 percent or more (derived from the OPM) as the indicator of well-being. Four data points are included, 10 years apart, spanning 30 years. The decision for this approach was driven by the availability of data and by the research context. Specifically, USDA, ERS researchers sought to examine spatial trends in poverty over as long a period as possible, with a particular interest in examining the distributional impacts of 1950's and 1960's antipoverty and rural development initiatives, migration and technological changes, and related issues of interest to USDA. More generally, there was an intention to provide researchers and Federal stakeholders with tools to inform and evaluate Federal policies and programs. In the early 1990's, the sole data source available for long-term analysis with sub-State geography was the Census Bureau's Decennial Census. Given that there is a 10-year gap between data years and that the OPM was only available in Decennial Census products beginning in 1960, the persistent poverty area measure could only include 1960 through 1990 decennial data years (four data points, 10 years apart, spanning 30 years).

Contemporary Data Considerations

A change in the persistent poverty county methodology for 2010's update was necessitated by the Census Bureau's transition from the Decennial Census to the ACS for sub-State income and poverty data collection. The ACS and the SAIPE were given consideration as the replacement for what would have been the most current Decennial Census when rolling the definition forward. Poverty rates are subject to significant change from year to year due to macroeconomic fluctuations, causing short-term economic difficulty or improvement (Iceland & Hernandez, 2017). This result can impact high and persistent poverty area status, making the decision to use a particular year for evaluation a critical one. The ACS 5-year period estimates, rather than single-year SAIPE, were chosen primarily because ACS estimates represent average conditions over a 5-year period. This decision was viewed as an enhancement, given prior dependence on single-year Decennial Census data points. The availability of comparable supplemental data in the ACS was also a factor that went into the decision to use ACS over SAIPE.

In order to best conform to the Decennial Census poverty rate estimation, which is based on income in the calendar year preceding data collection (e.g., 1989 income for the 1990 Decennial Census), the 5-year ACS period centering on the year that ends with nine was selected for use with updates to the official USDA, ERS persistent poverty area measure. This approach minimizes the squared difference between when data were actually collected and the target year. The approach also creates a consistent gap between measurement periods when transitioning from Decennial to ACS data. This meant the use of 2007–11 5-year period estimates for the 2010's measure (1980, 1990, 2000, and 2007–11) followed by the addition of 2017–21 estimates for the subsequent 2020's update (1990, 2000, 2007–11, and 2017–21).

Alternative persistent poverty area definitions used in the Federal Government that include ACS estimates may use a different approach to the 5-year period selection. For instance, a Census Bureau report (Benson et al., 2023) defined persistent poverty areas using ACS 5-year periods ending in nine (1990, 2000, 2005–09, and 2015–19). The authors state that the definition used was purely for the report, that it is one of several options, and the Census Bureau takes no official position on how persistent poverty should be defined. USDA, ERS’s definition using the 2007–11 5-year period appears in a table of alternative definitions provided in that report. The decision to continue to use the 5-year periods centering on the year that ends with nine moving forward was considered by a panel of USDA, ERS experts (along with other potential methodological changes) prior to the publication of the PAM data product in 2022. Stakeholder engagement was conducted as part of that process, which included discussions with the Census Bureau, the U.S. Office of Management and Budget (OMB), and other Federal stakeholders that use persistent poverty area measures for research, policy, or program applications. The USDA, ERS panel found no justification for changing the methodology and decided to continue using the existing approach.

Frequency of Updates and Time Between Data Periods

The ACS and the SAIPE present the opportunity to update the persistent poverty area measures more often than every decade, rolling the definition forward every 5 years using ACS or annually using SAIPE. Stakeholder engagement leading up to the development of the PAM data product indicated conflicting interests for more frequent updates to the persistent poverty county measure. For instance, some stakeholders expressed the desire to update the measure more often than every 10 years to better reflect current data. Other stakeholders advocated for maintaining the 10 years, given the implications of a shorter timeframe for programmatic purposes, and noted that 5–10 years was the typical time that it took for program application, funding, implementation, observed change, and evaluation.

From a research perspective, the time that it takes for lasting change to occur was considered. A review of the literature indicated that there is no definitive critical timeframe at which systemic poverty conditions are overcome or engrained in an area. Studies suggest that the process is context specific, generally over a long period, and often involves incremental improvement or deterioration. For example, community impact models indicate that structural change in the economic system alone takes about 5 years, on average. Further, research has shown that the characteristics most associated with persistent poverty are not especially prevalent in short-term or chronic (i.e., in and out of high poverty) concentrated poverty areas (Gans, 2010). Overall, the 10 years between data periods and updates was deemed reasonable for capturing change indicative of persistent poverty conditions; no justification was found for altering the existing persistent poverty area definition and update schedule.

Number of Time Periods and Timespan

The persistent poverty area definitions written into Federal legislation (as of the writing of this report) follow USDA, ERS’s methodology but typically use three data periods instead of four. A result of using fewer data periods is that more areas meet the persistent poverty criteria because an area does not have to exhibit high poverty for as many consecutive points in time. In this respect, decisions about the number of high poverty data periods (to include in a persistent poverty area measure) can be used to expand or contract inclusivity. For instance, broad policy objectives meant to reach a large contingency of areas in need might consider fewer data periods.

The timespan the data periods cover is less consistent in Federal definitions. Like USDA, ERS’s definition of persistent poverty, the timespans are typically described as spanning 30 years. Yet, some data periods use a shorter timespan, while others use a longer timespan. For instance, the rural development provisions defini-

tion that appears in the 10–20–30 rule³ of the American Recovery and Reinvestment Act (ARRA-2009) and the Consolidated Appropriations Act (CAA-2021) contains three data periods. The definition includes 1990 and 2000 (Decennial Census) and 2007–11 (ACS 5-year estimates). The data periods are approximately equally spaced apart by about 10 years, considering the transition from Decennial Census data to ACS 5-year estimates. The timespan between the first and the last data period is 20 years. In comparison, an alternative definition used for multiple provision areas of the CAA-2021 also uses three data periods, including 1990 and 2000. The third data period is stated as the most recent Small Area Income and Poverty Estimates (SAIPE). The most recent SAIPE at the time of this report was 2022, meaning that the definition uses three data periods, unequal distances apart, spanning more than 30 years between the first and last data period. Given that SAIPE is updated annually and there is no stipulated end date for this definition, updates could occur annually, and the timespan for this definition could increase annually.

The USDA, ERS persistent poverty area definition used in PAM maintains the original four data periods and 30-year timespan. The fact that the original definition was largely based on data availability, rather than empirical research, was taken into consideration. A review of the research literature was conducted to determine if there was sufficient evidence that a shorter (or longer) timespan is more appropriate, such as evidence of a generalizable critical length of time at which poverty becomes engrained in an area. Such evidence was not found to exist in the literature, and overall, there was no clear empirical evidence that would justify a change to the timespan (or number of data periods) used in the USDA, ERS definition. Therefore, PAM includes measures of persistent poverty based on the existing USDA, ERS definition. However, in consideration of the various legislative definitions, the data product was designed to allow for its use with alternative definitions. For example, the end-user can combine the 1990, 2000, and 2007–11 high poverty area measures to produce the persistent poverty county definition associated with the 10–20–30 rule. Similarly, SAIPE data or additional 5-year ACS period estimates can be merged with PAM (using the included geocode) to derive measures based on other county-level definitions.

Change in Geographic Boundaries Over Time

Poverty area measures can be produced using any spatial scale for which appropriate data are available. Demand for subcounty measures brought increased attention to census tracts, which are often used as proxies for neighborhoods. Census tracts are contained wholly within counties, whereas alternatives such as place-level geography can cross over county boundaries. As previously noted, census tract data have been available for the entire nation since 1990, initially based on the Decennial Census, followed by the ACS 5-year period estimates, while geographic coverage is more limited for earlier decades. Poverty area measures can be constructed from data readily available from the Census Bureau. However, the boundaries of census tracts are updated once per decade based on the Decennial Census, which can result in substantial changes due to revisions, splitting, or merging of tract geography.⁴ This result needs to be taken into consideration for long-run poverty areas measures and comparative temporal analysis.

Census tract geography for all measures and years included in PAM are standardized to a single time period. The 2022 edition of the data product uses 2010 census tract geography, while the next update will incorporate 2020 census tract geography. In order to maintain the greatest geographic coverage via standardization, the geographic normalization of the census tract data over time was also considered. Normalization is a procedure that allows data to accurately be compared over time for the exact same geographic boundaries (e.g., 2010 census tract geography) even when the boundaries were different at the time of data collection

³ The American Recovery and Reinvestment Act of 2009 contained what has become known as the 10–20–30 provision or rule. It required that at least 10 percent of funds from specific development programs go to persistently poor counties, defined as those that have had a poverty rate of 20 percent or more for at least 30 years.

⁴ The Census Bureau publishes Census Tract Relationship Files that show how census tract geography changed between Decennial Censuses.

and reporting (e.g., 2000 census tract geography and earlier). For example, the College Hill neighborhood in Providence, Rhode Island, had an assigned census tract number (coded as Tract in PAM) ending in 36 in 1990 geography. That census tract was split into 2 tracts in 2000 geography and assigned tract numbers ending in 36.01 and 36.02. Further, census tract 36.01 absorbed a portion of neighboring census tract 35. In order to compare the 2 data years directly, the tract geography and corresponding data would need to be edited to reflect 1 of the 2 years. If the choice is to use the 2000 census tract boundaries, the geography for census tracts 35 and 36 in 1990 would need to be changed (standardized) to reflect the boundaries of tracts 35, 36.01, and 36.02 in 2000. Further, the data for tracts 35 and 36 in 1990 would need to be appropriately distributed to the adjusted tract boundaries (35, 36.01, and 36.02), which is the process of data normalization.

There is no set methodology for normalizing data, but methodological guidance for doing so is available in the literature and online (see, for example, Thomas (2021)). There is also the option to purchase proprietary datasets of already normalized census tract data from private vendors or to use open access sources. Proprietary data from a longstanding publisher of census-based data products (Geolytics) was selected for the PAM data product. This decision was based on it being a widely recognized and well-vetted data product (Neighborhood Change Database), with updates available every decade following the Census Bureau release of new census tract geography. This decision would ensure the ability to complete decennial updates for census tract-level persistent and enduring poverty area measures in a timely manner, using the most current geography and a consistent methodology for data normalization.

County geography also changes periodically, sometimes with the addition of new counties or the splitting of old ones or the annexation of counties or county equivalents. While the change in county geography is less problematic than it is with the change in census tract geography, attention must be paid to this issue when constructing poverty area measures. The Census Bureau provides a list of these geographic changes by decade beginning with 1970, which can be used for identifying county-level updates. PAM county geography is standardized using this information if there is no change to county boundaries (e.g., if there is only a name and Federal Information Processing Standard (FIPS) code change).

In the instances where the boundaries (and, therefore, the data) are impacted, the poverty area measures are not reported. For example, in 2013, Petersburg Borough (county equivalent), Alaska, was created by taking portions of two different Alaskan census areas. Therefore, the high and extreme poverty area status for Petersburg Borough, Alaska, is reported for any post-2013 ACS data period included in PAM. For prior data periods, those measures are coded as not available. Given that the other measures require high poverty area status for earlier years, persistent and enduring poverty area measures for Petersburg Borough, Alaska, are also coded as not available.

The benefits of having the PAM measures for all data years and spatial scales in the same vintage of census geography are not limited to comparisons among those measures. It makes it easy for the user to merge additional years of Census Bureau poverty data or other supplemental data to PAM to do more indepth analysis or to construct persistent poverty area measures using alternative definitions. For instance, most census tract-level measures in use by Federal agencies (and all that appeared in legislation at the time of this report) consisted of single-time period high and extreme poverty area measures. Reliance on a single-time period measure can be problematic if the research, program, or policy goal is to address long-term difficulties. Fundamental structural differences exist between persistent poverty areas and their counterparts. Yet the complexity of working with census tract data over time can be a deterrent to constructing a census tract-level measure of persistent poverty. PAM addresses that issue by providing that measure using the USDA, ERS definition and by offering the flexibility to construct a measure using an alternative definition. Supplemental data that use 2010 census tract geography (available in the 2022 edition of PAM) or 2020 census tract geo-

raphy (subsequent PAM update) can easily be appended without having to worry about geographic standardization or data normalization.

Incorporation of Data Reliability Metrics

Another issue with census tracts (and to a lesser degree with counties) is the error of the poverty rate estimates, often measured in terms of margin of error (MOE) when using survey data. Poverty estimates for smaller geographies typically have higher margins of error, and this metric increases when subdividing the area's population into smaller groups. Data error estimation and interpretation for Decennial Census sample data (long form) requires some degree of statistical expertise. Conversely, the Census Bureau provides calculated margins of error for all ACS estimates (all geographies) and guidance on how to use them. The MOE communicates that the estimate is not an exact amount but rather a range of possible values, and the MOE provides the information needed to determine that range. The upper and lower bounds of the estimate can be calculated by subtracting and adding the MOE from/to the estimate (lower = estimate – MOE; upper = estimate + MOE). This is the potential range of the estimate within the MOE, otherwise referred to as the confidence interval: The Census Bureau is 90 percent confident that the true value of the ACS reported estimate is between those upper and lower values.

MOEs should be taken into consideration when available; however, there is no standard practice on how to use this information. When developing poverty area measures, one option is to use it to determine if the MOE impacts the high poverty status of a given area. For instance, if the lower bound (the estimate) and the upper bound yield different poverty status outcomes (e.g., using a 20.0-percent cutoff), then caution should be used when considering that estimate for poverty area analysis and when interpreting findings.

The most common practice found in Federal research and spatial applications is to develop a categorical index or scale of reliability from the MOEs, such as defining the poverty estimates as having low, moderate, and high reliability. This information can be used to inform decisions about whether poverty estimates for select geographies are reliable enough to report and analyze. There are several different versions of categorical reliability indices used in the Federal Government, but for spatial analysis, the most popular is that developed by Environmental Systems Research Institute, Inc. (Esri), an international geographic information systems (GIS) software and applications supplier. The Esri methodology was selected for use with the PAM data product. Specifically, the methodology is used to determine if ACS 5-year period estimates of poverty are at least moderately reliable. The methodology serves as one of two conditions used in PAM for determining if the poverty rate estimate (and, therefore, the derived poverty area status) is reportable. This result represents a change to the existing persistent poverty area methodology; the definition remained the same, but the output was improved upon by the incorporation of the reliability metrics.

Details on the derivation of the Esri reliability measure and its application to the poverty area measures are available in the additional technical details section of this report. If the PAM user wishes to construct a persistent poverty area measure using an alternative definition that contains ACS estimates, then the detailed explanation can be followed to apply reliability metrics to that definition as well. If the definition uses SAIPE, then a similar approach can be used because the Census Bureau publishes SAIPE confidence intervals. References that may be helpful on how to use the SAIPE confidence intervals are provided.

Introduction of a New Long-Run Poverty Area Measure

The PAM data product contains three well-established poverty area measures (high, extreme, and persistent) and a new long-run measure. The enduring poverty area measure introduced in the 2022 edition of PAM evolved from the official persistent poverty area update process. That is, in advance of the anticipated 2020's update to the persistent poverty county typology, exploratory research was conducted in association with the methodological considerations previously discussed. The research found that most persistent poverty

areas consistently had high poverty in each decennial data period as far back as comparable data are available, which is 1960 for counties and 1970 for census tracts. This finding reinforced the understanding that once high poverty becomes engrained in an area, it is likely to persist. The research suggested that a measure capturing a more expansive timeframe should be considered.

As explained in this report, the persistent poverty area measure was developed with the goal of examining spatial trends in poverty over as long a period as possible, which at the time was limited to four time periods spanning 30 years. Since poverty rate data are now available for a period spanning 60 years or more, it is possible to expand the persistent poverty area measure to cover all decades from 1960 to the most current. Rather than alter the persistent poverty area measure, which is embedded in Federal research and programs, the enduring poverty area measure was created. The enduring poverty area measure is different than the persistent poverty area measure in that the enduring measure is continuous rather than limited to a select number of data periods (see the appendix for technical details). Also, while both measures highlight the longevity of high poverty in an area and serve as indicators of the most critical cases, the enduring poverty area measure represents a subset of cases where overcoming barriers to reverse systemic poverty conditions can be the most challenging.

Research Measures

Under special circumstances, such as for research and staff analysis requests, USDA, ERS has used alternative definitions and data (sources and years) to produce unofficial tabulations of county-level and census tract-level persistent poverty areas. These tabulations have not been previously published as part of a publicly accessible data product. The original 2022 edition of the PAM data product included one such tabulation (1990, 2000, 2007–11, and 2015–19), which is referred to as a research measure. This decision was based on the demand for an updated persistent poverty area measure in advance of the official update. The decision was coupled with the uncertainty of the timing of the following official update, given potential data issues associated with Coronavirus (COVID-19) pandemic data collection. Additional research measures may be added in the future if there is a substantiated need, but there is no plan to add the measures as part of regular PAM data product updates.

Additional Technical Details

Comparing U.S. County-Level and Census Tract-Level Poverty Areas

Census tract-level and county-level poverty area measures included in the PAM data product can be used separately or in combination. It is important to recognize the implications of these different geographic units with respect to the spatial and demographic coverage of poverty areas. This issue is related in part to what is referred to as the modifiable areal unit problem (MAUP). MAUP means the shape and scale of the geographic areal unit used to report summary statistics may result in different interpretations of the same underlying data. In the context of poverty area measures, poverty rates reported at the county-level and census-tract level will suggest different geographic patterns of poverty despite being based on the same underlying Decennial Census and ACS survey responses.

Counties and county equivalents are governmental or administrative units that vary in size and population. A county's physical size is arbitrary, with boundary delineations often following natural geography (e.g., rivers) or are based on historical contexts. Counties tend to be generally smaller east of the Mississippi and bigger to the west. Visualizations of county-level poverty areas can falsely imply that poverty is worse in one county

than it is in another based on the relative size of the counties on the map. It is important to remember that the meaning of high poverty area status, for example, is the same (a county poverty rate of 20 percent or more) regardless of the physical size of the county or the number of people who reside there.

Census tracts are statistical units created by the Census Bureau. The tracts are intended to have population sizes of between 1,200 and 8,000 people, regardless of where they are located, and their boundaries fall wholly within county boundaries. Census tracts vary greatly in physical size, depending on the extent of population density (number of persons per square mile or some other spatial unit). Therefore, census tracts are prone to similar perceptual distortions as counties when visualized. The population size limitations of census tracts means that the tracts are typically smaller in physical area than are counties. However, if a county has a total population of less than 8,000 people and that population is not heavily concentrated in any particular area of the county, then it is likely that the county will contain just 1 or a few relatively large census tracts within it.

If a county's population is heavily concentrated in one region of the county, then the population may still have few census tracts, but given differences in population density, one tract may be significantly smaller in physical size than the others. It is also possible that the smaller, more densely populated census tract is where the county's poverty population is concentrated. As a result, that smaller sized census tract may be the only one that is defined as a high poverty area. The tract may contain enough of the county's total population, where in the aggregate, the county is also defined as a high poverty area. The poverty in that one census tract is the driver of the county's high poverty area status. Or the tract may contain a small enough share of the county's total population that it does not influence the county's poverty area status, resulting in a high poverty census tract within a nonhigh poverty county.

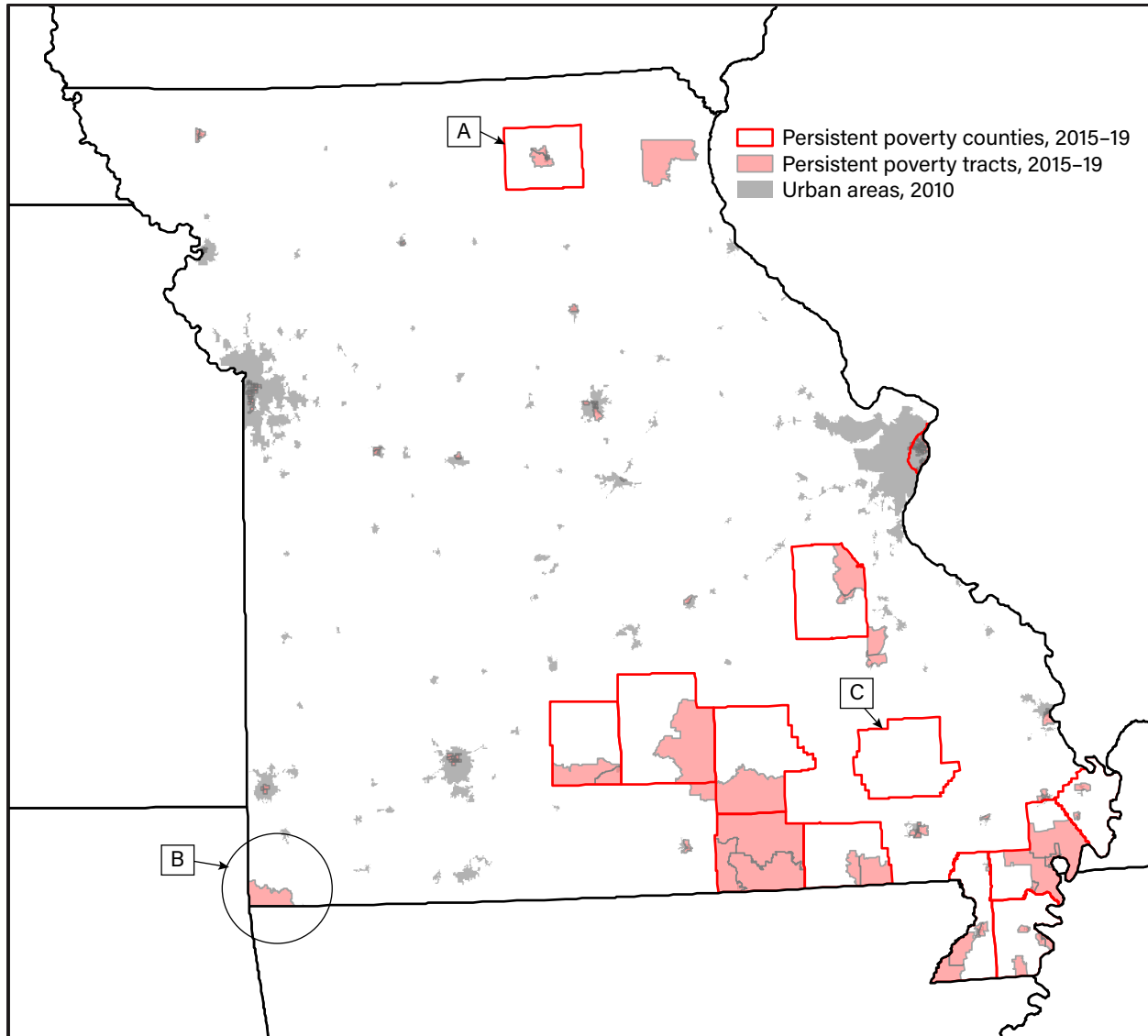
In other words, poverty area measures generated and interpreted independently at the county and census tract levels can yield different results. Tract-within-county analysis can be more challenging to interpret, but if understood correctly, the comparison can be insightful to policymakers and others seeking to identify the most impoverished areas within States and counties. For example, users can examine whether persistent poverty in a county is concentrated in one census tract or many and whether persistent poverty is highly localized or more widely dispersed. Users can also use the rural-urban commuting area (RUCA)⁵ codes to determine whether a census tract is more urban or rural and whether the tract has high commuting rates to more urban areas. (More information regarding RUCA codes can be found on the USDA, ERS topic page "Rural-Urban Commuting Area Codes.")

Using Missouri as an example, figure 3 shows that the relationship between persistent poverty at the county level and persistent poverty at the tract level varies within the State. Persistent poverty in some nonmetropolitan counties (such as example A) seems to be driven by the more urban tracts within the county (RUCA code 4), while persistent poverty in some of the counties in the southern part of the State seems to be driven by the more rural tracts (RUCA 5, 6, 8, 9, and 10). Many counties contain persistent poverty census tracts even if the counties themselves are not persistently poor, such as the area in example B of figure 3. This pattern seems especially common in counties with urban areas, where census tracts are more representative of neighborhoods and persistent poverty tracts are more representative of the poorer neighborhoods within the county. Some counties, such as the one in example C, may be classified as persistently poor even if the counties do not contain any persistently poor census tracts. In this case, poverty rates for the census tracts in the county were more than 20 percent in most measurement years used to define persistent poverty, which kept the county-level poverty rate at more than 20 percent in 4 consecutive measurement years, but no census tracts had poverty rates of more than 20 percent in all 4 measurement years.

⁵ USDA, ERS rural-urban commuting area (RUCA) codes classify census tracts based on their presence within or commuting levels to metropolitan area cores (codes 1–3), micropolitan area cores (codes 4–6), small town cores (7–9), or rural areas (code 10).

Figure 3

The census tract-level poverty area measure shows which tracts may be driving county-level poverty and where county-level poverty indicators overlook smaller persistent poverty areas



A = example of a nonmetropolitan persistently poor county where poverty is driven by urban census tracts;

B = example of a persistently poor census tract in a county that is not persistently poor;

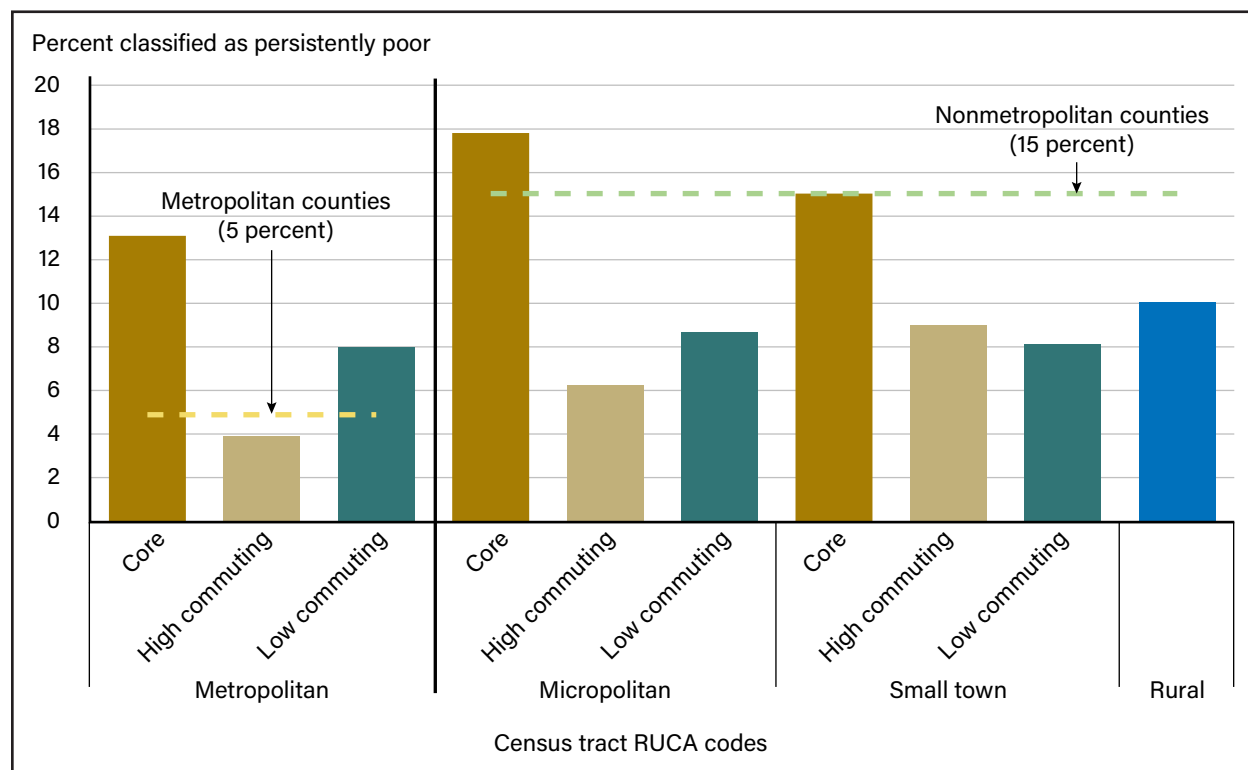
C = example of a persistently poor county that does not contain any persistently poor census tracts.

Note: Persistent poverty areas are those with a poverty rate of 20 percent or higher in 4 consecutive measurement periods (roughly 10 years apart) and spanning approximately 30 years, as defined in the USDA, Economic Research Service Poverty Area Measures data product. Urban areas refer to urbanized areas (territories of at least 50,000 people) and urban clusters (territories of 2,500 to 50,000 people) using the U.S. Department of Commerce, Bureau of the Census's 2010 definition.

Source: USDA, Economic Research Service (ERS) using data from the U.S. Department of Commerce, Bureau of the Census and USDA, ERS 2022 Poverty Area Measures.

The unit of geography used also influences the results of analyses that examine poverty along the urban-rural continuum, as is demonstrated by figure 4. Fifteen percent of nonmetropolitan counties were persistently poor in 2015–19, compared with 5 percent of metropolitan counties,⁶ suggesting that persistent poverty is more prevalent in rural areas. At the tract level, however, the core tracts found in metropolitan, micropolitan, and small-town urban areas⁷ are more likely to be persistently poor than their more rural neighboring tracts. This finding suggests that persistent poverty is more prevalent in more densely settled areas, even if the areas are in nonmetropolitan counties.

Figure 4
Percentage of U.S. census tracts classified as persistently poor in 2015–19, by the rural-urban commuting area (RUCA) code



Note: Persistent poverty areas are those with a poverty rate of 20 percent or higher in 4 consecutive measurement periods, roughly 10 years apart and spanning approximately 30 years, as defined in the USDA, Economic Research Service (ERS) Poverty Area Measures (PAM) data product. Metropolitan and nonmetropolitan designations for counties are based on the 2013 definition of metropolitan counties, as defined by the U.S. Office of Management and Budget. The USDA, ERS Rural-Urban Commuting Area (RUCA) codes define “core” tracts as those in which at least 30 percent of the tract’s population is in an urban area, “high commuting” tracts as those where the largest commuting flow is at least 30 percent to a core tract, and “low commuting” tracts as those where the largest commuting flow is at least 10 percent and less than 30 percent to a core tract.

Source: USDA, Economic Research Service 2022 Poverty Area Measures.

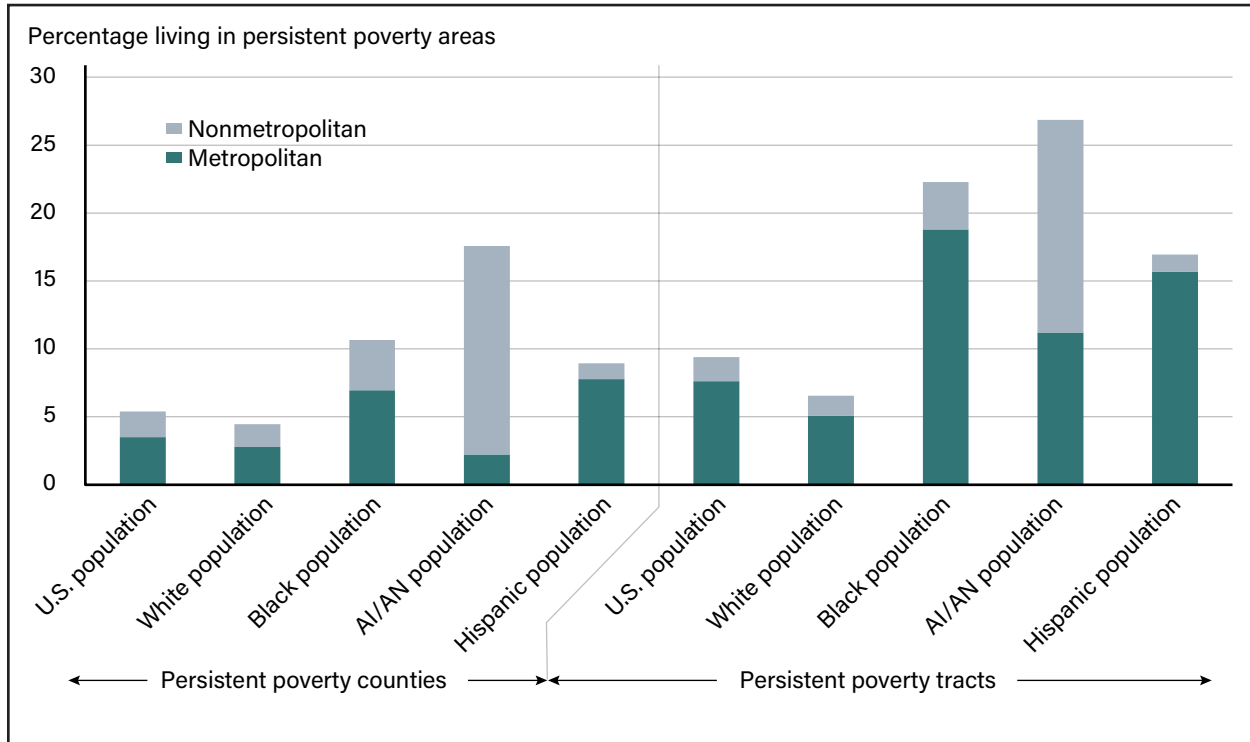
In addition to offering a finer level of geographic coverage, census tract analysis also results in more population residing in poverty areas than with county-level analysis. For example, figure 5 shows that about 5 percent of the U.S. population lives in persistent poverty counties, but about 9 percent lives in persistent poverty census tracts. This difference is particularly evident in metropolitan areas, where the percentage of

⁶ The designation of metropolitan and nonmetropolitan counties is based on the U.S. Office of Management and Budget’s (OMB) 2013 definition of metropolitan areas.

⁷ Metropolitan, micropolitan, and small-town core tracts are codes 1, 4, and 7 in the USDA, ERS’s rural-urban commuting area (RUCA) codes.

the total population living in metropolitan persistent poverty census tracts is double the population living in metropolitan persistent poverty counties. Using census tracts as the unit of geography also increases the share of African American/Black, American Indian and Alaska Native, and Hispanic populations residing in poverty areas more so than for White populations. Additional examples of analysis can be found on the Poverty Area Measures (PAM) web page. Further explanation of the RUCA codes can be found in appendix A, as well as on the USDA, ERS website.

Figure 5
Percentage of the U.S. population living in persistent poverty areas (2015–19), by race/ethnicity



AI/AN = American Indian/Alaska Native.

Note: Persistent poverty areas are those with a poverty rate of 20 percent or higher in 4 consecutive measurement periods, roughly 10 years apart and spanning approximately 30 years, as defined in the USDA, Economic Research Service (ERS) Poverty Area Measures (PAM) data product. Racial groups used are single-race non-Hispanic, and the Hispanic ethnic group may be of any race. Metropolitan and nonmetropolitan designations are based on the 2013 definition of metropolitan counties, as defined by the U.S. Office of Management and Budget.

Source: USDA, Economic Research Service (ERS) using data from the U.S. Department of Commerce, Bureau of the Census, 2015–19 American Community Survey 5-year estimates; and USDA, ERS 2022 Poverty Area Measures.

Reliability Measures

The margin of error (MOE) is a statistical measure that captures the amount of random sampling error in a survey's results. MOE can be used to evaluate the extent to which the reported estimates are representative of the whole population. MOEs are commonly used in research to determine the accuracy or reliability of survey data. Criteria derived from the MOEs are used to enhance the reliability of the poverty area measures.

MOEs provide the user with an understanding of how closely their result reflects reality. MOEs do so by presenting a “more or less” scenario. For example, consider a survey that was used to collect data on poverty for a region. The resulting poverty rate estimate indicates that 23 percent of the region's population is poor, with a plus or minus 8-percent MOE at a confidence level of 90 percent. In translation, the “true” poverty rate for the population in that region is somewhere between 31 percent (more) and 15 percent (less), 90 times out of 100, which is referred to as the confidence interval. This interval means that a poverty area measure that uses a 20-percent poverty rate cutoff would define that region as having high poverty, based on the 23-percent estimate. However, considering that the true poverty rate is likely (90 times out of 100) to be somewhere between 15 and 31 percent, the determination that the region is a high poverty area may be deemed unreliable.

The information that can be garnered from an MOE can be incorporated into the methodology for deriving a poverty area measure, resulting in greater confidence in the poverty area determination than there would be otherwise. This section of the report provides details on how this measure is achieved for the measures available in the PAM data product. The same steps can be applied when using supplemental data. For example, where there is a need to generate a poverty area measure using an alternative definition or to characterize poverty areas based on demographic, socioeconomic, or other survey-based estimates.

Application of Margin-of-Error (MOE)-Based Reliability Metrics

A new feature of the USDA, ERS persistent poverty area methodology, which is applied to all measures in the PAM data product, is the incorporation of data reliability metrics into the coding of poverty area variables. Due to the sample survey methodology of the ACS, poverty rate estimates in some areas (especially small counties and census tracts) may have relatively large MOEs. Large MOEs introduce more uncertainty into whether a county or census tract truly meets the criteria of a high or extreme poverty area and how far the county or tract could be from meeting the criteria. To address this uncertainty, the authors use a reliability index based on the coefficient of variation (CV) of ACS 5-year period poverty rate estimates and adjusted poverty rates using the bounds of the confidence interval.

Poverty Rate Derivation

Poverty rates were generated and used for internal calculations and explanatory purposes only. The rates are not included in the published PAM data file. The percentage of the population that is poor was calculated as the total poor population (determined by Census Bureau poverty thresholds), divided by the total population for whom poverty status was determined, multiplied by 100. The Census Bureau assigns poverty thresholds and uses sources of income to determine poverty status (U.S. Department of Commerce, Bureau of the Census, 2023).

Reliability Index Derivation

To calculate the coefficient of variation and construct the reliability index, the MOEs of the derived poverty rates for each county and census tract were calculated. The formula below is used to calculate the MOE of the derived poverty rate based on the poverty count estimate, poverty universe estimate, and the published

MOEs from the American Community Survey 5-year period estimates (U.S. Department of Commerce, Bureau of the Census, 2020).

Formula for generating the user-derived poverty rate margin of error:

$$MOE(\hat{Q}) = 100 \times \left[\frac{1}{\hat{Y}} \sqrt{[MOE(\hat{X})]^2 - (\hat{P}^2 \times [MOE(\hat{Y})]^2)} \right]$$

\hat{X} is the ACS estimate of the number of people with household income below the official poverty level. \hat{Y} is the ACS estimate of the number of people in the poverty universe for an area. \hat{P} is the ratio of the number of people with a household income below the poverty level to the number of people in the poverty universe in that area.

Formula for calculating the ratio of the poverty population with a household income below the poverty level:

$$\hat{P} = \hat{X} / \hat{Y}$$

\hat{Q} is the estimate of the percentage of the poverty population universe that has a household income below the official poverty level.

Formula for calculating the percentage of the poverty population that has a household income below the poverty level:

$$\hat{Q} = 100 \times \hat{P}$$

The derived margin of error is then used to calculate the coefficient of variation (CV) for the poverty rate estimate.

Formula for calculating the coefficient of variation from the derived poverty rate margin of error (MOE) (example is based on a 90-percent confidence interval):

$$CV = \frac{\left[\frac{MOE(\hat{Q})}{1.645} \right]}{\hat{Q}} \times 100$$

The coefficient of variation (CV) measures the amount of sampling error relative to the size of the poverty rate estimate itself. The larger the MOE is relative to the estimate, the less reliable the estimate. Based on the thresholds established by Esri (2017), a poverty rate estimate is considered to have high reliability if the CV is less than or equal to 12 percent, medium reliability if the CV is greater than 12 percent and less than or equal to 40 percent, and low reliability if the CV is greater than 40 percent.

Coding of the Poverty Area Measures

In the PAM data product, high and extreme poverty statuses are considered “not determined” and are coded with “-1” if an area’s poverty rate estimate is deemed to have “low reliability” based on the criteria above and if the estimate is within its MOE of the relevant poverty rate threshold. For example, if a county’s poverty

rate estimate is 21 percent and its MOE is 17 percent, then its CV is about 49 percent. This county would be given a high poverty code of “-1” because the CV is above the 40-percent threshold and subtracting the MOE from the poverty rate estimate (the lower limit of the 90-percent confidence interval) yields a result that is below the “high poverty” threshold of 20 percent. This finding applies to estimates that are both above and below the 20-(40-) percent poverty rate threshold for high (extreme) poverty.

If an area’s high poverty status cannot be determined due to low reliability or missing data in any of the data years used to define a given persistent or enduring poverty code, then the area’s persistent and enduring poverty status is also considered “not determined” and coded with a “-1.”

Table 4 shows the impact that the inclusion of the reliability metrics has on the number of counties and census tracts classified as persistent poverty. In 2015–19, the same number of counties would have been classified as persistently poor with or without the inclusion of reliability metrics, but there would have been 113 more census tracts classified as persistently poor if the reliability metrics were not used. This result demonstrates how poverty rate estimates tend to be more reliable for county-level geographies than for census tract-level geographies.

Table 4
Tabulation of persistently poor counties and census tracts in 2015–19, with and without applying the reliability metrics

	Counties		Tracts	
	With applying reliability metrics	Without applying reliability metrics	With applying reliability metrics	Without applying reliability metrics
Persistent poverty status not determined	21	13	4,431	1,133
Not persistently poor	2,776	2,784	60,326	63,511
Persistently poor	346	346	8,299	8,412

Note: Persistent (and enduring) poverty status is not determined if the high poverty status of an area is not determined in any of the data periods used to define persistent (enduring) poverty status. High poverty status is not determined if a poverty rate estimate is not available for an area or if an estimate is determined to have a low level of reliability and if adding or subtracting the margin of error from a poverty rate estimate would change the poverty area status of an area (e.g., the high poverty status of an area with a poverty rate estimate of 21 percent and a margin of error of 17 percent would not be determined).

Source: USDA, Economic Research Service using data from the U.S. Department of Commerce, Bureau of the Census, 1990 and 2000 Decennial Censuses, and 2007–11 and 2015–19 5-year American Community Survey Estimates.

Another future consideration is that, as more Decennial Census data years are replaced with ACS 5-year data periods, the number of areas whose persistent or enduring poverty area status cannot be determined is likely to increase. This result is because each additional year of ACS data used to define the measures is an additional opportunity for one of an area’s high poverty statuses to be left undetermined due to the low reliability of the poverty rate estimate.

For instance, the persistent poverty area measure ending in 2000 does not include any ACS data periods and, as such, is not subject to meeting the criteria of the reliability metrics (unrestrictive). The Decennial Census is used to derive poverty rate estimates for all four of the data periods, which typically have lower margins of error than ACS estimates because of higher sampling rates. The persistent poverty area measure ending in 2007–11 includes one ACS 5-year period, meaning that the measure is subject to meeting the criteria of the reliability metrics for one of the four data periods used for its determination (restrictive). The same measure ending in 2017–21 includes two ACS 5-year periods, requiring the measure to meet the criteria for two of the four data periods (more restrictive). This result will likely increase the number of areas with undetermined persistent or enduring poverty area status until all four data periods used to define the measures come from

the ACS. However, the reliability of the estimates for counties is relatively stable over time (when considering errors in Decennial Census, ACS, and SAIPE data products); therefore, the impact is most likely to be observed with census tracts rather than counties.

More information on the reliability index used for the PAM reliability metrics can be found in Esri (2017). For more information on calculating margins of error for estimates derived from ACS data, see chapter 8 in the Census Bureau publication, *Understanding and Using American Community Survey Data: What All Data Users Need to Know*.

Conclusion

The Poverty Area Measures (PAM) data product is an online resource created and routinely updated by USDA, ERS. PAM contains four measures of areawide poverty (high, extreme, persistent, and enduring) that can be used to better understand the geography of poverty in the United States from 1960 onward. PAM allows users to investigate poverty areas at the county and census tract levels, individually or in combination, and provides the geocoding necessary to merge the measures with other relevant indicators from most Federal data sources.

This technical bulletin serves two primary purposes:

1. To provide details about the methodological considerations that went into the development of each of the poverty area measures. This result includes a detailed description of how reliability metrics are used by USDA, ERS to ensure the most accurate results.
2. To fill a gap in the literature by providing a summary background of USDA, ERS's history of work in poverty area measurement and its contemporary relevance.

This technical bulletin is also intended to provide transparency concerning how the measures can and can't be used. For instance, guidance on census tract within county analysis is provided along with examples. The main limitations are that the PAM data product contains a select set of data years and all of the measures except for enduring poverty are in binary code. The poverty rates and underlying count data are not provided in order to maintain quality control and to adhere to proprietary data sharing restrictions (census tract-level only). However, the geocode included is standardized to geographies available in most national data products. Therefore, the user can easily merge the poverty area measures with supplemental data to enhance useability.

References

- Bender, L., Green, B., Hady, T., Kuehn, J., Nelson, M., Perkinson, L., & Ross, P. (1985). *The diverse social and economic structure of nonmetropolitan America* (Report No. RDRR-49), U.S. Department of Agriculture, Economic Research Service.
- Benson, C., Bishaw, A., & Glassman, B. (2023). *Persistent poverty in counties and census tracts* (Report No. ACS-51). U.S. Department of Commerce, Bureau of the Census.
- Bird, A. (1964). *Poverty in rural areas of the United States* (Report No. AER-63). U.S. Department of Agriculture, Economic Research Service.
- Bishaw, A., Benson, C., Shrider, E., & Glassman, B. (2020). *Changes in poverty rates and poverty areas over time: 2005–19* (Report No. ACSBR/20-8). U.S. Department of Commerce, Bureau of the Census.
- Chattoe, E., Saam, N., & Mohring, M. (2000). Sensitivity analysis in the social sciences: Problems and prospects. In: Suleiman, R., Troitzsch, K., & Gilbert, N. (eds) *Tools and techniques for social science simulation*. Physica, Heidelberg.
- Cook, P., & Hady, T. (1993). *Updating the ERS county typology: A view from the 1980s* (Report No. AGES 93-27). U.S. Department of Agriculture, Economic Research Service.
- Cook, P., & Mizer, K. (1994). *The revised ERS county typology: An overview* (Report No. RDRR-89). U.S. Department of Agriculture, Economic Research Service.
- Cowhig, J. (1965). *Urban and rural levels of living: 1960* (Report No. AER-79). U.S. Department of Agriculture, Economic Research Service.
- Cromartie, J., & Parker, T. (2014). Population shifts across U.S. nonmetropolitan regions. In Bailey, C., Jensen, L., & Ranson, E. (Eds.), *Rural America in a globalizing world: Problems and prospects for the 2010s*. Morgantown, WV: West Virginia University Press.
- Davis, T. (1979). *Persistent low-income counties in nonmetro America* (Report No. 12). U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service.
- Ellen, I. G., Mijanovich, T., & Dillman, K.-N. (2001). Neighborhood effects on health: Exploring the links and assessing the evidence. *Journal of Urban Affairs*, 23(3–4), 391–408.
- Eriksson, K. L., Hjalmarsson, R., Lindquist, M. J., & Sandberg, A. (2015). The importance of family background and neighborhood effects as determinants of crime. *Journal of Population Economics*, 29(1), 219–262.
- Esri. (2017). *The American Community Survey: An Esri White Paper*.
- Exec. Order No. 13,985, 86 C.F.R. 7009. (2021).
- Farrigan, T. (2020, May 4). Extreme poverty counties found solely in rural areas in 2018. *Amber Waves*, U.S. Department of Agriculture, Economic Research Service.

- Farrigan, T., & Crowe, J. (2023). *Analyzing persistent poverty areas using federal data*. Federal Committee on Statistical Methodology (FCSM) Equitable Data Toolkit: A Toolkit for Strengthening Federal Data To Analyze Historically Underserved Populations.
- Fisher, G. (1992). The development and history of the poverty thresholds. *Social Security Bulletin*, 55(4), 3–14.
- Fuguitt, G. V., & Beale, C. L. (1978). Population trends of nonmetropolitan cities and villages in subregions of the United States. *Demography*, 15(4), 605–620.
- Galster, G. (2002). An economic efficiency analysis of deconcentrating poverty populations. *Journal of Housing Economics*, 11(4), 303–329.
- Galster, G. (2003). Investigating behavioral impacts of poor neighborhoods: Towards new data and analytic strategies. *Housing Studies*, 18(3), 893–914.
- Gans, H. (2010). *Concentrated poverty: A critical analysis*. *Challenge*, 53(3), pp. 82–96.
- Hady, T., & Ross, P. J. (1990). *An update: The diverse social and economic structure of nonmetropolitan America* (Report No. AGES9036). U.S. Department of Agriculture, Economic Research Service.
- Hines, F. K., Brown, D. L., & Zimmer, J. M. (1975). *Social and economic characteristics of the population in metro and nonmetro counties: 1970*. U.S. Department of Agriculture, Economic Research Service.
- Iceland, J., & Hernandez, E. (2017). Understanding trends in concentrated poverty 1980–2014. *Social Science Research*, 62, 75–95.
- Inman, B., & Southern, J. (1960). *Opportunities for economic development in low-production farm areas: A study of incomes, employment, and resources* (Report No. AIB-234). U.S. Department of Agriculture, Agricultural Research Service.
- Jolliffe, D. (2003). *Comparisons of metropolitan-nonmetropolitan poverty during the 1990s* (Report No. RDRR-96). U.S. Department of Agriculture, Economic Research Service.
- Leventhal, T., & Brooks-Gunn, J. (2003). Moving to opportunity: An experimental study of neighborhood effects on mental health. *American Journal of Public Health*, 93(9), 1576–1582.
- Levy, B., Owens, A., & Sampson, R. J. (2019). The varying effects of neighborhood disadvantage on college graduation: Moderating and mediating mechanisms. *Sociology of Education*, 92(3), 269–292.
- Ludwig, J., Duncan, G., Gennetian, L., Katz, L., Kessler, R., Kling, J., & Sanbonmatsu, L. (2012). Neighborhood effects on the long-term well-being of low-income adults. *Science*, 337, 1505–1510.
- Misturelli, F., & Heffernan, C. (2010). The concept of poverty: A synchronic perspective. *Progress in Development Studies*, 10(1), 35–58.
- Morrill, R., Cromartie, J., & Hart, G. (1999). Metropolitan, urban, and rural commuting areas: Toward a better picture of the United States' settlement system. *Urban Geography* 20(8), 727–748.
- National Advisory Commission on Rural Poverty. (1967). *The people left behind: A report by the President's National Advisory Commission*. U.S. Government Printing Office.

- National Center for Health Statistics. (2017). *What is a Federal statistical agency?* NCHS Fact Sheet, June. Centers for Disease Control and Prevention.
- Ross, P., & Green, B. (1985). *Procedures for developing a policy-oriented classification of nonmetropolitan counties* (Report No. AGES850308). U.S. Department of Agriculture, Economic Research Service.
- Sampson, R. J., Morenoff, J. D., & Gannon-Rowley, T. (2002). Assessing “Neighborhood Effects”: Social processes and new directions in research. *Annual Review of Sociology*, 28(1), 443–478.
- Thomas, M. (2021). *Standardizing the U.S. Census*. The Center for Data and Visualization Sciences, Duke University.
- U.S. Department of Agriculture, Economic Research Service. (n.d.). *USDA ERS - Poverty Area Measures*.
- U.S. Department of Agriculture, Economic Research Service. (2023, March 22). *Rural-Urban Commuting Area Codes*.
- U.S. Department of Agriculture, Economic Research Service. (2020, December 10). *Rural-Urban Continuum Codes*.
- U.S. Department of Commerce, Bureau of the Census. (1966). *Characteristics of families residing in poverty areas* (Current Population Reports, Series P-23, No. 19). U.S. Government Printing Office.
- U.S. Department of Commerce, Bureau of the Census. (1967). *Poverty areas in the 100 largest metropolitan areas* (1960 Census of Population, Supplementary Reports, PC(S1)-54). U.S. Government Printing Office.
- U.S. Department of Commerce, Bureau of the Census. (1970). *Trends in social and economic conditions in metropolitan and nonmetropolitan areas* (Current Populations Survey, Series P-23, No. 33). U.S. Government Printing Office.
- U.S. Department of Commerce, Bureau of the Census. (2020). *Understanding and using American Community Survey data: What all data users need to know*.
- U.S. Department of Commerce, Bureau of the Census. (2021, October 8). *Understanding and using geographic identifiers (GEOIDs)*.
- U.S. Department of Commerce, Bureau of the Census. (2021, November 22). *Metropolitan and micropolitan: About*.
- U.S. Department of Commerce, Bureau of the Census. (2021, November 22). *Which data source to use for poverty*.
- U.S. Department of Commerce, Bureau of the Census. (2023, January 30). *How the Census Bureau measures poverty*.

Appendix A: The Poverty Area Measures Variable Definitions and Codebook, 2022 Edition

Geographic Identifiers

The geographic identifier codes are administrative codes used to uniquely identify geographic areas in the United States. The codes (summarized in table A.1) can be used to join the Poverty Area Measures (PAM) data to USDA, Economic Research Service (ERS) datasets (such as the Atlas of Rural and Small Town America or Food Access Research Atlas) and other datasets (such as the U.S. Department of Commerce, Bureau of the Census' American Community Survey and the U.S. Department of Labor, Bureau of Labor Statistics' Local Area Unemployment Statistics dataset). Visit the Census Bureau's website for more information on geographic identifiers.

FIPS. The Federal Information Processing Standard (FIPS) codes are commonly used geographic identifiers for U.S. county-level data. FIPS codes are five digits long when in text format, with the first two digits identifying the U.S. State and the last three digits identifying the county in the State.

GEO_ID_CT. The GEOID is a 14-digit code used by the Census Bureau. The first three digits represent the summary level of the data, and the last five digits represent the county FIPS code. All GEOIDs listed in the PAM data product are county-level (summary level "050"). This code can be used to join with other county-level Census Bureau data.

Tract. The census tract number is a six-digit number that uniquely identifies a census tract within a county. Concatenating the census tract number to the end of the FIPS number creates a unique identifier for each census tract in the United States, which can be used to join the PAM tract-level data to other datasets.

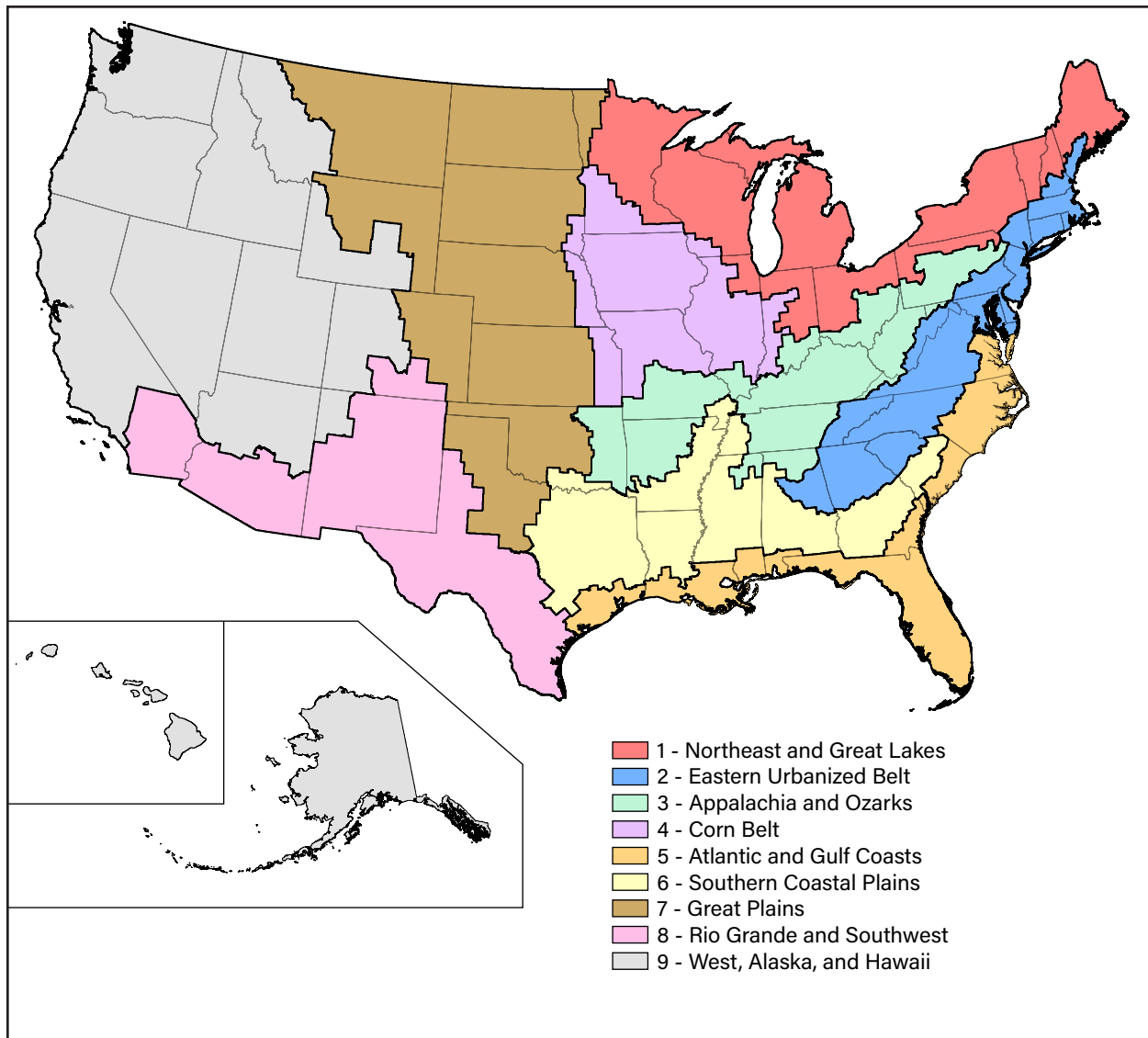
Supplementary Geographic Codes

The supplemental geographic codes included in PAM allow policymakers, practitioners, and public policy researchers to compare the prevalence of poverty areas by region and by location on the rural-urban continuum. The codes include U.S. Census Regions (Region), USDA, ERS subregions (subreg3), metropolitan areas (MetNonmet2013), Rural-Urban Continuum Codes (Beale2013), and Rural-Urban Commuting Areas (RUCA_2010).

Region. The Census Bureau groups States into four census regions: Northeast, Midwest, South, and West.

Subreg3. USDA, ERS subregions group counties into areas with "reasonably similar climatic, physiographic, economic, historic, socio-cultural, and/or urban-rural characteristics" (Cromartie & Parker, 2014; Fuguitt & Beale, 1978). The subregions do not conform to State boundaries or census regions. The nine subregions include: (1) Northeast and Great Lakes, (2) Eastern Urbanized Belt, (3) Appalachia and Ozarks, (4) Corn Belt, (5) Atlantic and Gulf Coasts, (6) Southern Coastal Plains, (7) Great Plains, (8) Rio Grande and Southwest, and (9) West, Alaska, and Hawaii (figure A.1).

Figure A.1
USDA, Economic Research Service (ERS) subregions



Source: USDA, Economic Research Service using data from Cromartie & Parker, 2014.

MetNonmet2013. The U.S. Office of Management and Budget’s (OMB) 2010 metropolitan statistical areas standards classify counties as metropolitan (metro) if they contain at least 1 urbanized area of 50,000 people or more or if they are adjacent counties with strong commuting ties to a metropolitan core county. All other counties are referred to as nonmetropolitan (nonmetro). The MetNonmet2013 code included in the PAM data product indicates the set of counties defined as metropolitan in the 2013 release of the metropolitan and micropolitan statistical areas. Comparing the prevalence of high poverty areas in metropolitan and nonmetropolitan areas may indicate if the differing economic conditions of large cities and more rural areas are related to high poverty rates. For more information, visit the Census Bureau’s website.

Beale2013. USDA, ERS Rural-Urban Continuum Codes, originally developed by Hines et al. (1975), expand on the metropolitan area codes by classifying metropolitan counties based on the population size of the metropolitan area (codes 1 through 3) and classifying nonmetropolitan counties by the degree of urbanization and adjacency to metropolitan areas (codes 4 through 9). The Rural-Urban Continuum Codes

(Beale2013) included in the PAM data product were based on the 2013 definition. Visit the USDA, ERS (2023) website for more information on the Rural-Urban Continuum Codes.

RUCA_2010. USDA, ERS Rural-Urban Commuting Area (RUCA) codes, originally developed by Morrill et al. (1999), classify census tracts based on their location in a metropolitan area (codes 1 through 3), metropolitan area (codes 4 through 6), small town (codes 7 through 9), or completely rural area (code 10), and their commuting ties to the cores of urban areas. The PAM data product includes only the primary RUCA codes. These codes allow users to examine the relationship between poverty areas and urbanicity/rurality at the subcounty level. Visit the USDA, ERS website for more information on the RUCA codes.

Poverty Area Measures

USDA, ERS poverty area measures (PAM) classify counties and census tracts based on the level and duration of poverty in those areas. For each classification, a code of “0” indicates that an area did not meet the classification criteria, a code of “1” (1 or higher in the case of enduring poverty) indicates that an area did meet the classification criteria, and a code of “-1” indicates that it could not be determined if an area met the classification criteria. A determination may not be made if data are unavailable or if the poverty rate estimate is determined to have low reliability and is within its margin of error of the poverty rate cutoff (a 20-percent poverty rate for high poverty or a 40-percent rate for extreme poverty).

Each classification incorporates data for different time periods and for different durations. The digits at the end of each poverty area measure variable name indicates the last (or only) data year used to define that measure and the data source. If there are two digits at the end of the variable name, the last year of data came from the Decennial Census. Decennial Census data from 1960, 1970, 1980, 1990, and 2000 are used in the PAM data product. If there are four digits at the end of the variable name, the last year of data came from the Census Bureau’s American Community Survey (ACS) 5-year estimates. For example, HiPov1519 uses poverty rate data from 2015–19 ACS 5-year estimates.

HiPov1519. Counties and census tracts are classified as “high poverty” areas if the poverty rate in the area is 20 percent or higher in a single measurement period.

ExtPov1519. Counties and census tracts are classified as “extreme poverty” areas if the poverty rate in the area is 40 percent or higher in a single measurement period.

PerPov1519. Counties and census tracts are classified as “persistent poverty” areas if the area was determined to have high poverty in four nonoverlapping measurement periods, roughly 10 years apart and spanning approximately 30 years. For example, a county with a PerPov1519 code of “1” was determined to have high poverty in 1990, 2000, 2007–11, and 2015–19.

EndurePov1519. Counties and census tracts are classified as “enduring poverty” areas if the area was determined to have high poverty in more than four consecutive measurement periods, roughly 10 years apart and spanning approximately 40 or more years. Enduring poverty counties are a subset of persistent poverty counties, where the “EndurePov” code number indicates the number of additional consecutive measurement periods where the area had high poverty beyond the four periods used to determine persistent poverty. For example, a county with an EndurePov1519 code of “3” had three additional measurement periods of high poverty beyond what is used for PerPov1519 (e.g., it was determined to have high poverty in 1960, 1970, and 1980 in addition to the data years 1990, 2000, 2007–11, and 2015–19).

Table A.1

Variable Codebook

Variable names	Variable labels and values
Geographic variables	
GEO_ID_CT	Census download GEOID when downloading county and tract data together
STUSAB	State postal abbreviation
fips	County Federal Information Processing Standard (FIPS) code, numeric, no leading zeros
fips_txt	County Federal Information Processing Standard (FIPS) code, text with leading zeros
CountyName	Area name (county, State)
TractName	Area name (tract, county, State)
Tract	Census tract number
Region	Census region numeric code 1 = Northeast 2 = Midwest 3 = South 4 = West
subreg3	USDA, Economic Research Service (ERS) subregions 1 = Northeast and Great Lakes 2 = Eastern Urbanized Belt 3 = Appalachia and Ozarks 4 = Corn Belt 5 = Atlantic and Gulf Coasts 6 = Southern Coastal Plains 7 = Great Plains 8 = Rio Grande and Southwest 9 = West, Alaska and Hawaii
MetNonmet2013	Metropolitan (metro) and nonmetropolitan (nonmetro) county code 0 = nonmetropolitan county 1 = metropolitan county
Beale2013	USDA, ERS Rural-Urban Continuum Code 2013 (counties) 1 = counties in metro area of 1 million population or more 2 = counties in metro area of 250,000 to 1 million population 3 = counties in metro area of fewer than 250,000 population 4 = urban population of 20,000 or more, adjacent to a metro area 5 = urban population of 20,000 or more, not adjacent to a metro area 6 = urban population of 2,500 to 19,999, adjacent to a metro area 7 = urban population of 2,500 to 19,999, not adjacent to a metro area 8 = completely rural or less than 2,500, adjacent to a metro area 9 = completely rural or less than 2,500, not adjacent to a metro area

continued on next page ►

Variable names	Variable labels and values
RUCA_2010	<p>Rural-Urban Commuting Areas 2010, primary code (census tracts)</p> <p>1 = Metropolitan area core: primary flow within an urbanized area (UA)</p> <p>2 = Metropolitan area high commuting: primary flow 30 percent or more to a UA</p> <p>3 = Metropolitan area low commuting: primary flow 10 percent to 30 percent to a UA</p> <p>4 = Micropolitan area core: primary flow within an urban cluster (UC) of 10,000 to 49,999 (large UC)</p> <p>5 = Micropolitan high commuting: primary flow 30 percent or more to a large UC</p> <p>6 = Micropolitan low commuting: primary flow 10 percent to 30 percent to a large UC</p> <p>7 = Small town core: primary flow within an urban cluster of 2,500 to 9,999 (small UC)</p> <p>8 = Small town high commuting: primary flow 30 percent or more to a small UC</p> <p>9 = Small town low commuting: primary flow 10 percent to 30 percent to a small UC</p> <p>10 = Rural areas: primary flow to a tract outside a UA or UC</p> <p>99 = Not coded: Census tract has zero population and no rural-urban identifier information</p>
BNA01	<p>Census tract represents block numbering areas (BNAs); BNAs are small statistical subdivisions of a county for numbering and grouping blocks in nonmetropolitan counties where local committees have not established tracts. BNAs are comparable to census tracts and have assigned census tract numbers (Tract), but they can have distinct characteristics such as primarily consisting of water or Federal land with few residents. This coding is provided to allow the user to easily identify and evaluate these areas relative to their interests.</p> <p>0 = not a BNA tract</p> <p>1 = BNA tract</p>
Poverty Area Measures (PAM)	
HiPov60	<p>Poverty rate is greater than or equal to 20.0 percent, 1960 (counties only)</p> <p>-1 = Not available (N/A)</p> <p>0 = PctPoor60 < 20.0 percent</p> <p>1 = PctPoor60 >= 20.0 percent</p>
HiPov70	<p>Poverty rate is greater than or equal to 20.0 percent, 1970</p> <p>-1 = N/A</p> <p>0 = PctPoor70 < 20.0 percent</p> <p>1 = PctPoor70 >= 20.0 percent</p>
HiPov80	<p>Poverty rate is greater than or equal to 20.0 percent, 1980</p> <p>-1 = N/A</p> <p>0 = PctPoor80 < 20.0 percent</p> <p>1 = PctPoor80 >= 20.0 percent</p>
HiPov90	<p>Poverty rate is greater than or equal to 20.0 percent, 1990</p> <p>-1 = N/A</p> <p>0 = PctPoor90 < 20.0 percent</p> <p>1 = PctPoor90 >= 20.0 percent</p>
HiPov00	<p>Poverty rate is greater than or equal to 20.0 percent, 2000</p> <p>-1 = N/A</p> <p>0 = PctPoor00 < 20.0 percent</p> <p>1 = PctPoor00 >= 20.0 percent</p>

continued on next page ►

Variable names	Variable labels and values
HiPov0711	Poverty rate is greater than or equal to 20.0 percent, 2007–11 ACS -1 = N/A 0 = PctPoor0711 < 20.0 percent 1 = PctPoor0711 >= 20.0 percent
HiPov1519	Poverty rate is greater than or equal to 20.0 percent, 2015–19 ACS -1 = N/A 0 = PctPoor1519 < 20.0 percent 1 = PctPoor1519 >= 20.0 percent
ExtPov60	Poverty rate is greater than or equal to 40.0 percent, 1960 (counties only) -1 = N/A 0 = PctPoor60 < 40.0 percent 1 = PctPoor60 >= 40.0 percent
ExtPov70	Poverty rate is greater than or equal to 40.0 percent, 1970 -1 = N/A 0 = PctPoor70 < 40.0 percent 1 = PctPoor70 >= 40.0 percent
ExtPov80	Poverty rate is greater than or equal to 40.0 percent, 1980 -1 = N/A 0 = PctPoor80 < 40.0 percent 1 = PctPoor80 >= 40.0 percent
ExtPov90	Poverty rate is greater than or equal to 40.0 percent, 1990 -1 = N/A 0 = PctPoor90 < 40.0 percent 1 = PctPoor90 >= 40.0 percent
ExtPov00	Poverty rate is greater than or equal to 40.0 percent, 2000 -1 = N/A 0 = PctPoor00 < 40.0 percent 1 = PctPoor00 >= 40.0 percent
ExtPov0711	Poverty rate is greater than or equal to 40.0 percent, 2007–11 ACS -1 = N/A 0 = PctPoor0711 < 40.0 percent 1 = PctPoor0711 >= 40.0 percent
ExtPov1519	Poverty rate is greater than or equal to 40.0 percent, 2015–19 ACS -1 = N/A 0 = PctPoor1519 < 40.0 percent 1 = PctPoor1519 >= 40.0 percent
PerPov90	Official USDA, ERS Measure: Persistent Poverty, 1990: poverty rate >= 20.0 percent in 1960, 1970, 1980, and 1990 (counties only). May not match previously published versions due to changes in geographic normalization procedures. -1 = N/A 0 = poverty rate not >= 20.0 percent in 1960, 1970, 1980, and 1990 1 = poverty rate >= 20.0 percent in 1960, 1970, 1980, and 1990

continued on next page ►

◀ continued from previous page

Variable names	Variable labels and values
PerPov00	<p>Official USDA, ERS Measure: Persistent Poverty, 2000: poverty rate \geq 20.0 percent in 1970, 1980, 1990, and 2000. May not match previously published versions due to changes in geographic normalization procedures.</p> <p>-1 = N/A</p> <p>0 = poverty rate not \geq 20.0 percent in 1970, 1980, 1990, and 2000</p> <p>1 = poverty rate \geq 20.0 percent in 1970, 1980, 1990, and 2000</p>
PerPov0711	<p>Official USDA, ERS Measure: Persistent Poverty, 2007–11: poverty rate \geq 20.0 percent in 1980, 1990, 2000, and 2007–11. May not match previously published versions due to changes in geographic normalization procedures and application of reliability criteria.</p> <p>-1 = N/A</p> <p>0 = poverty rate not \geq 20.0 percent in 1980, 1990, 2000, and 2007–11</p> <p>1 = poverty rate \geq 20.0 percent in 1980, 1990, 2000, and 2007–11</p>
PerPov1519	<p>Research Measure Only: Persistent Poverty, 2015–19: poverty rate \geq 20.0 percent in 1990, 2000, 2007–11, and 2015–19. May not match previously published versions due to changes in geographic normalization procedures and application of reliability criteria.</p> <p>-1 = N/A</p> <p>0 = poverty rate not \geq 20.0 percent in 1990, 2000, 2007–11, and 2015–19</p> <p>1 = poverty rate \geq 20.0 percent in 1990, 2000, 2007–11, and 2015–19</p>
EndurePov0711	<p>Official USDA, ERS Measure: Enduring Poverty, 2007–11: poverty rate \geq 20.0 percent for at least 5 consecutive time periods up-to and including 2007–11.</p> <p>-1 = N/A</p> <p>0 = poverty rate not \geq 20.0 percent in 1970, 1980, 1990, 2000, and 2007–11</p> <p>1 = poverty rate \geq 20.0 percent in 1970, 1980, 1990, 2000, and 2007–11; not \geq 20.0 percent in 1960 (counties only, no 1960 census tract data)</p> <p>2 = poverty rate \geq 20.0 percent in 1960, 1970, 1980, 1990, 2000, and 2007–11 (counties only, no 1960 census tract data)</p>
EndurePov1519	<p>Research Measure Only: Enduring Poverty, 2015–19: poverty rate \geq 20.0 percent for at least 5 consecutive time periods, up-to and including 2015–19.</p> <p>-1 = N/A</p> <p>0 = poverty rate not \geq 20.0 percent in 1980, 1990, 2000, 2007–11, and 2015–19</p> <p>1 = poverty rate \geq 20.0 percent in 1980, 1990, 2000, 2007–11, and 2015–19; not \geq 20.0 percent in 1970</p> <p>2 = poverty rate \geq 20.0 percent in 1970, 1980, 1990, 2000, 2007–11, and 2015–19; not \geq 20.0 percent in 1960 (counties only, no 1960 census tract data)</p> <p>3 = poverty rate \geq 20.0 percent in 1960, 1970, 1980, 1990, 2000, 2007–11, and 2015–19 (counties only, no 1960 census tract data)</p>

GEOID = geographic identifier; ACS = American Community Survey.

Note: In the “Combined (county & tract)” data tab, each poverty variable ends with a “c” for county and/or a “t” for tract.

Source: USDA, Economic Research Service using U.S. Department of Commerce, Bureau of the Census, 1960, 1970, 1980, 1990, and 2000 Decennial Census U.S. county data; U.S. Department of Commerce, Bureau of the Census, 2007–11, 2015–19, and 2017–21 American Community Survey (ACS) 5-year period estimates for counties and census tracts; and Census Bureau, 1960, 1970, 1980, 1990, and 2000 Decennial Census data for census tracts were normalized to 2010 census tract geography using Geolytics’ Neighborhood Change Database (NCDB).

Appendix B: Chronology of USDA, Economic Research Service (ERS) Poverty Area Measures (PAM), 1960–2022

Composite measures era

- ✓ Multidimensional approach (e.g., multifactor indices)—the interest is in the broader concept of well-being rather than poverty status or income level alone.
- ✓ Relative measures (e.g., lowest quintile) used rather than an absolute measure (e.g., 20-percent poverty rate cutoff); all measures are relative to nonmetropolitan counties or sub-county rural areas only.
- ✓ Single point-in-time measures, persistence is assumed—dimensions/components are viewed as being indicative of persistent critical problems.

1960	U.S. counties were ranked according to a five-factor index of the relative poverty status of their rural population, unpublished data (USDA, ERS internal records).
	Low-income and level of living (e.g., due to chronic underemployment of rural families) in agricultural areas (Inman & Southern, 1960).
1964	Poverty in rural areas of the United States (Bird, 1964).
1965	Urban and rural levels of living (Cowhig, 1965).
1966	The Census Bureau created a five-factor index to identify concentrations of poverty, “Poverty Areas,” within large metropolitan areas (U.S. Department of Commerce, Bureau of the Census, 1966).
1967	Economic status of rural population by counties, which is based on a composite index including measures of income, housing, population dependency, and education (National Advisory Commission on Rural Poverty, 1967).

Beginning of the transition to Official Poverty Measure

The Census Bureau published a series of Current Population Reports on metropolitan poverty areas, which began as a five-factor index, then transitioned (in approximately 1970) to the use of a single measure based on a 20-percent critical cutoff, given the correlation of index findings with the Orshansky-based (Official Poverty Measure (OPM)) poverty rate. (see, for example, U.S. Department of Commerce, Bureau of the Census 1967 and 1970).

Persistent poverty measures era

- ✓ Unidimensional and multiyear approach—indicators of areawide income level or poverty status over time, which are viewed as being indicative of broad, often systemic (economic, social, institutional, infrastructure, environmental, and political) capacity challenges.
- ✓ Beginning with relative measures (e.g., lowest income quintile) and transitioning to absolute, OPM-based (e.g., 20-percent poverty rate cutoff) measures.
- ✓ Beginning with nonmetropolitan county measures only, then expanded to nationwide county coverage.

- 1979** | Persistent low-income counties in nonmetropolitan America, defined by relatively low-income using three data periods (1950, 1959, and 1969) spanning 20 years, with comparison to income levels in 1975 (Davis, 1979).
- 1985** | Publications (e.g., Ross & Green, 1985; Bender et al., 1985) defining persistent poverty counties by per capita family income in the lowest quintile among all nonmetropolitan counties using four data periods (spanning 30 years), including 1950, 1959, 1969, and 1979. The measure is part of a set of county classifications, which are the seminal publication of what is also known as the USDA, ERS County Typology Codes.
- 1994** | Methodological and data update to the prior persistent poverty county type. Persistent poverty is defined by an Official Poverty Measure poverty rate of 20 percent or more in each of the years 1960, 1970, 1980, and 1990 (Cook & Hady, 1993; Cook & Mizer, 1994)
- 2004** | Using the 1994 methodology, the persistent poverty county type is updated using Decennial Census data for 1970, 1980, 1990, and 2000.
- 2009** | A persistent child poverty county classification was added to the County Typology Codes. The classification is defined by poverty rates of 20 percent or more for related children in each year 1970, 1980, 1990, and 2000.
- 2015** | The persistent poverty and persistent child poverty classifications are updated, continuing to use the 1994 methodology but with a change in data source for the most current year: 1980, 1990, and 2000 Decennial Census data and 2007–11 American Community Survey 5-year estimates.

Contemporary poverty measures era

- ✓ Expansion of the persistent-poverty measures era approach to include additional poverty area measures and geographic scales.
 - ✓ Change in persistent-poverty area methodology to include data reliability metrics.
- 2022** | The Poverty Area Measures (PAM) data product seminal publication includes four measures (high, extreme, persistent, and enduring) at two comparable geographic scales (county and census tract) spanning decennial data years (approximately) from 1960 to 2019.