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DOI: 10.1377/hlthaff.2019.00910
HEALTH AFFAIRS 38,
NO. 12 (2019): 1985–1992
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POLICY INSIGHT

What Is Rural? Challenges And Implications Of Definitions That Inadequately Encompass Rural People And Places

ABSTRACT Monitoring and improving rural health is challenging because of varied and conflicting concepts of just what *rural* means. Federal, state, and local agencies and data resources use different definitions, which may lead to confusion and inequity in the distribution of resources depending on the definition used. This article highlights how inconsistent definitions of *rural* may lead to measurement bias in research, the interpretation of research outcomes, and differential eligibility for rural-focused grants and other funding. We conclude by making specific recommendations on how policy makers and researchers could use these definitions more appropriately, along with definitions we propose, to better serve rural residents. We also describe concepts that may improve the definition of and frame the concept of rurality.

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Awareness of the issues facing rural America has increased over the past few years. These issues have, unfortunately, focused on negative experiences, such as the opioid crisis, failing economies, and population declines. With this awareness has come renewed energy to better understand rural areas, particularly their health issues. This is evident in the numerous articles and editorials in major newspapers—such as the *New York Times*, *Washington Post*, and *Wall Street Journal*—that have outlined the plight of health care in rural America.[1–4]

Research that focuses on rural areas and the health of rural residents is not new. In 1912, more than a hundred years ago, the *American Journal of Public Health* published a report on typhoid in rural Virginia.[5] Other early scholarship described the need for a different approach to health in rural environments because of resource limitations, physician supply, and effectiveness of the delivery system.[6–9] Even then, a challenge to the field was defining rurality. A 1938 article wrestled with the definition of *rural* as a continuum, fostering the notion that what is rural depends upon context, agency, or area of work being studied.[10]

In 1987 Congress formed the Federal Office of Rural Health Policy (FORHP) within the Health Resources and Services Administration (HRSA) to advise the secretary of the Department of Health and Human Services about rural health issues within federal policy. This was followed by rural health research and programs in other agencies, such as the Veterans Health Administration. Since then, FORHP and other agencies have worked to provide support to rural communities, providers, and state offices of rural health, as well as extensive funding for policy-relevant rural health research. The field of rural health research has since expanded, producing evidence about rural disparities in such areas as access to care, outcomes of care, disease prevalence, and mortality rates. Federal programs and policies require formal eligibility criteria that define rurality, yet those criteria might not align

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with a more nuanced local reality. In addition, not all federal programs use the same definition, which leads to confusion among communities that may be eligible for some programs but not others.

Thus, the purpose of this article is to describe various definitions of *rural* that are used in federal policy and other contexts and the implications of that usage. Additionally, we discuss other methods for identifying rural places and offer recommendations for research and policy changes to better serve rural residents.

Common Definitions

Some definitions of *rural* depend upon administratively determined boundaries such as counties, ZIP Code Tabulation Areas, and census tracts.[11] While these can be useful, they do not always capture cohesive areas. Communities often span these areas, census tracts, counties, and even states but are considered separate because of these administrative boundaries. Moreover, common measures of rurality mask the diversity of culture, demographics, resources, and needs present in these areas.

Many definitions of *rural* start with those used by the Census Bureau. Urbanized areas are any combinations of census tracts or blocks that contain 50,000 or more residents, while urban clusters are clusters of census tracts or blocks containing 2,500–50,000 residents. Because the Census Bureau does not define *rural* per se, any tract or block outside of these two urban categories is often considered rural.[12,13]

The Office of Management and Budget (OMB) uses these census designations to define Metropolitan and Micropolitan Statistical Areas at the county level. Generally speaking, the OMB forms core-based statistical areas using a combination of the census definition and commuting patterns by residents of adjacent counties. These units are then classified as metropolitan or micropolitan, depending on whether they are centered on an urbanized area (metropolitan) or an urbanized cluster of more than 10,000 residents (micropolitan).[14]

Of note, the core-based statistical area designations are not intended to define rurality, a practice explicitly warned against in the OMB guidance: "The Metropolitan and Micropolitan Statistical Area Standards do not produce an urban-rural classification, and confusion of these concepts can lead to difficulties in program implementation. Counties included in Metropolitan and Micropolitan Statistical Areas and many other counties may contain both urban and rural territory and population."[14]

Despite this warning, many government agencies and federal research programs use Metropolitan Statistical Area and non–Metropolitan Statistical Area as urban and rural designations, respectively. For example, the public-use data in the Behavioral Risk Factor Surveillance System survey,[15] as well as data in many of the products of the National Center for Health Statistics,[16] include this designation as a rural-urban indicator. This leads to a large body of literature that depends upon an arguably poor measure of rurality.

The Department of Agriculture's Economic Research Service has created two additional county schemes. Urban Influence Codes divide counties into groups based on their size and adjacency to other county types. Rural-Urban Continuum Codes provide a designation that is also based upon the OMB county designations.[17] Similar to the Urban Influence Codes, these codes are categorized by population size and adjacency to metropolitan areas. Both sets of codes were last updated in 2013.

Using a smaller level of geography, rural-urban commuting area codes are based on census tract rather than county.[18] Like the OMB designation, these codes consider population density, commuting patterns, and adjacency. The use of census tracts provides a more precise and nuanced range of categories. These codes are updated with each decennial census. A ZIP code–based approximation is also commonly used.

Recognizing that areas on the rural continuum vary in size, population density, and distance to urban resources, the Economic Research Service has also developed Frontier and Remote Area Codes. These codes are ZIP code based and specific to rural places, unlike many classifications that begin with urban areas and leave rural ones to be defined as a residual. The codes provide four options for categorizing a ZIP code, based on the size of the biggest city or town in that ZIP code and the travel distance to a larger city or town. The most restrictive definition considers a place to be in a frontier or remote area if it is at least fifteen minutes away from a city or town of 2,500–9,999 people and an hour or more away from a city or town of 50,000 or more people.[19] The least restrictive definition categorizes a place as a frontier or remote area if it has fewer than 50,000 people, the majority of whom live an hour or more from urban areas of 50,000 or more people. The Economic Research Service created this four-tier indicator in recognition of the fact that researchers and policy makers may need different thresholds, depending on the nature of their question or the types of goods and services to which they are measuring access.

These are not the only rural definitions or designations in use. Other classifications include

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It is not unusual for a location to meet the rurality criteria for one program (such as CMS) but not another (such as HRSA).

the Economic Research Service's natural amenities scale[20] and County Typology Codes;[21] the Department of Veterans Affairs' unique rurality definitions, at least before 2015;[22] and the Index of Relative Rurality.[23] One could easily tabulate fifteen different definitions used at the federal level,[24] and adding program-specific and nonfederal definitions would further expand this list.

These various definitions make determining the rurality of an area difficult. To aid in this, the Rural Health Information Hub has developed a tool called "Am I Rural?" that provides the status for a specific address or location, based on various rural definitions and eligibility for Centers for Medicare and Medicaid Services (CMS) or HRSA programs.[25] It is not unusual for a location to meet the rurality criteria for one program (such as CMS) but not another (such as HRSA). These discrepancies make program planning, community development, and providing health care resources difficult for areas caught in the middle.

A natural tension exists between the need for an official definition and the more subjective notion of what it means to be rural. The perception of a community as rural may be driven by factors beyond geographic proximity to urbanized areas. A 2017 study that compared this perception to actual designations clearly indicates this disconnect.[26] In that study 15 percent of respondents who lived in metropolitan areas considered themselves rural, as did 26 percent of respondents residing in an urban cluster. There was also regional variation: 42 percent of urbanized area residents in the Middle Atlantic region considered themselves urban, compared to only 25 percent in the South Atlantic region. Nine percent of residents of metropolitan counties with a population of at least one million considered themselves rural, representing 23 percent of all rural respondents.

This suggests that self-reported rurality may differ from that defined strictly by geographic measures; it also suggests that people living in the same area may have different senses of their rurality. For example, someone who commutes thirty minutes to the central city may have a different sense of connectedness to the urbanized area than a retiree who rarely leaves home. This is further bolstered by work that indicates that rural health disparities are a function not just of geographic location, but also of culture and economic opportunity.[27]

Beyond Geography

Regardless of the definition, researchers, policy makers, media, and residents frequently ascribe particular attributes to rural and urban areas that might not be representative, inclusive, or even accurate. For example, there are different perceptions of demographic composition (such as composition by age, sex, and race/ethnicity), social factors (marital status, education, and political views), and economic structures (farming, logging, or mineral-dependent economies). It is not uncommon for the popular media to equate *rural* with white farmers, despite the large nonwhite farming contingent and the many rural areas that are not dependent on farming.[28,29]

Some perceptions are accurate, however, when rurality is associated with variations in some population characteristics. For example, residents of nonmetropolitan counties are generally older and in poorer health, compared to residents of metropolitan counties.[30] Recognizing that rurality reflects a breadth of demographic, social, economic, and health system characteristics, it may be useful, if not more practical, to measure those underlying characteristics directly instead of using a strictly geographic definition of rurality—that is, whether or not a place is rural, and how rural it is determined to be.[31] Some rural advocates have argued that researchers and policy makers should move past comparisons of rural and urban areas alone and focus on these underlying factors.[32] A better understanding of how these underlying characteristics influence health care access, quality, and outcomes could inform more effective and equitable health policies.

Case Study: Closures Of Obstetric Units

Two recent studies of rural maternity care illustrate how conducting research and interpreting the findings' implications for rural residents, hospitals, and communities are complicated by various definitions of *rural* and by the limitations of available data.

The first study examined whether pregnant

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rural residents gave birth locally or traveled to urban hospitals.[33] A subsequent analysis studied women with complicated pregnancies, including women with opioid use disorder.[34] In these analyses rurality was based upon whether the patient's address on the hospital discharge form was in a "rural" county.

This simple measure was confounded by the fact that the variable was not consistently measured over time. For the subanalysis of rural residents with complicated pregnancies, trends over time were important because of the opioid epidemic's becoming a crucial public health issue. Unfortunately, the data set changed its gradient measure of county rurality in 2007, requiring the analysis to focus only on a dichotomous rural-urban measure.[35] It is likely that there were differences over time among rural residents that were not identified, owing to these data limitations.

The second study examined research documenting the extent of recent rural hospital obstetric unit closures and their consequences.[36,37] The data for this research came from three different sources, and the only common unit of measurement across these was the county. Thus, rural counties were defined as nonmetropolitan based on the OMB definition. Further possible distinctions included by population density (noncore versus micropolitan) and by adjacency to urban counties. After consulting with rural community leaders and clinicians and reviewing prior literature, the researchers conducted analyses for loss of services using the population density measure, and the consequences of the loss of services were determined based on adjacency.[38] In both cases, there were important differences in service loss and the consequences across types of rural counties, but the interpretation was still limited by the fact that the analysis was conducted at the county level—which masked any variability within the county by rurality.

The town of Winnsboro, South Carolina, is a real-life example of how these definitions might not work as expected. Winnsboro is within an urban cluster but is located in a county that is 78 percent rural (according to the Census Bureau). According to CMS, this area is eligible for a rural health clinic, as it is not in an urbanized area. This is helpful, because it is also a Health Professional Shortage Area for primary, dental, and mental health care. Unfortunately, because of its proximity to Columbia, this area and its entire county are not eligible for any FORHP funding (the county is designated as part of the Columbia core-based statistical area). This limits the funding it can obtain for needed services and programs. The community is certainly not unique in having this discrepancy.

It is incumbent upon the researcher to clearly define how rurality is operationalized in their work.

Furthermore, if one examines the list of closed rural hospitals[39] tracked by the University of North Carolina, at the time of publication, 39 of the 160 hospitals that closed since 2005 (nearly 25 percent) were located in metropolitan core-based statistical areas, although many of them were designated as critical access or Medicare-dependent hospitals.

County Heterogeneity

Counties vary tremendously in size and population. County sizes range from just 13.2 square miles to more than 20,000 square miles (and up to 147,805 square miles if Alaska boroughs are included), while populations range from eighty-eight to more than ten million residents. Given these differences, treating counties as a single unit can mask important heterogeneity within a given county and affect research and policy outcomes. For example, Maine and Indiana are roughly the same in terms of area, but Maine has sixteen counties while Indiana has ninety-two. As a result, even Maine's urban counties are large enough to contain numerous rural spaces that are far (up to 100 to miles or more) from counties' urban centers. Using a county-level definition of *rural*, hospital discharge data for Maine indicate that 39 percent of deliveries in 2017 were rural. Using rural-urban commuting area codes, this rate increases to 57 percent—a difference that is large and meaningful for policy.

This concern is also illustrated by the obstetric unit closures case study described above, where some of the magnitude of services loss was not captured in the maternity analyses. For example, St. Louis County, Minnesota, is the largest county east of the Mississippi River, stretching from the Canadian border to the southernmost port on Lake Superior. It contains Duluth—Minnesota's fourth-largest city, with a population of 86,293—making the county metropolitan

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by the OMB definition. However, it also contains Voyageurs National Park and the million-acre Boundary Waters Canoe Area Wilderness. In 2015 the hospital in the town of Ely (population: 3,460) stopped providing obstetric care, dramatically reshaping local access to maternity services. Had this closure occurred a year earlier, it would not have shown up in the rural obstetric closure analysis[36] because of the use of the county as a unit of analysis (and its county being deemed metropolitan).

Choosing The Best Definition

Given the variety of definitions of *rural*, determining which to use may be difficult. However, the decision can be guided by practical considerations, such as the purpose of the analysis, the intended audience for the research, funding sources, history, and data collection methods (exhibit 1). These considerations can help guide decisions on which definition of *rural* to use for any particular analysis. Regardless, the wide variety of definitions means that it is incumbent upon the researcher to include the specific definition and clearly define how rurality is operationalized in their work.

Moving Toward A Better Understanding

While we recommend using the above approach to choosing the proper definition of *rural*, given the current environment, we acknowledge that more work should be done toward improving the process of choosing such definitions. Current definitions of *rural* focus on the absence of an element—for example, an area has few people or is far from larger cities. What if definitions of rurality instead included both deficits and assets? Such a shift in thinking could go a long way toward addressing the multiple health disparities visible in rural America. With such a framework, a better definition of *rural* might be possible—one that includes the concepts that measure assets.

From a rural health standpoint, these assets could include the primary care supply, distance to the nearest trauma center, and availability of resources such as healthy food outlets and public transit. However, many other factors might be just as important. For example, being within a relatively short distance of an urban or higher-resource area may suggest positive access, but only if the rural population has access to resources that would enable them to travel (for example, access to a vehicle). And how would one take into account barriers to travel such as natural barriers (mountains, rivers, and lakes), state lines, and so on? Rural residents may also face economic and workplace barriers such as being un- or underinsured and having limited paid leave for medical care. Given these factors, should a definition of *rural* also include socioeconomic measures, such as household income or employment status?

What other factors would lead to a more comprehensive definition of *rural*? What if the natural environment—such as the percentage of tree coverage, natural amenities (rivers, lakes, and so on), and weather—were included (as the natural amenities scale does)?[20] Many areas across the US are defined as being urban or metropolitan but are visually rural—that is, there are large open spaces and a low density of population or buildings. Classic examples include Ely, Minnesota (mentioned above), the Grand Canyon (in the same county as Flagstaff, Arizona),

EXHIBIT 1

Practical considerations for defining rurality

Consideration	Question	Application
Purpose of analysis	What unit of geographic analysis best corresponds to the purpose?	Is rurality capturing highly localized resources, access to relatively diffuse resources (for example, primary care), or proximity to scarce resources (such as a Level I trauma center)? Population density, RUCA, and FAR, respectively, might be the best choices.
Intended audience	Does the definition of rurality produce findings that are understandable and useful to the target audience?	Will the language be understood by a broader audience? Terms such as *noncore*, *adjacency*, and even *micropolitan* may be difficult for lay audiences to understand and could lead to misunderstood results.
Funding source	Is the study financially supported by a funding body?	Does the funder have specific needs or requirements for how rurality is assessed?
History	How has prior research defined rurality?	Does maintaining consistency with prior research help clarify definitions of rurality or create further confusion?
Data collection	How will the analysis be conducted in a practical sense?	Is the appropriate level of analysis the county, ZIP code, or census tract? Should rurality account for community behaviors, population density, or adjacency to urban areas?

SOURCE Authors' analysis. **NOTES** RUCA is rural-urban commuting area code. FAR is Frontier and Remote Area Code.

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and Winnsboro, South Carolina (as noted above, in close proximity to the Columbia metropolitan area).

Relatedly, it is important to consider local residents' perceptions. If a majority of the people living in an area believe that they are rural, a definition of *rural* should reflect that as well.

Taking these considerations into account would require a more nuanced and detailed method for defining rurality. This could also mean moving away from categorical or dichotomous definitions (urban versus rural) to a continuous definition, similar to the concept proposed in 1938 by William Meserole.[10] One measure, the Index of Relative Rurality, does take this approach, using counties as the unit of assessment.[23] The index is based on four factors—population size, population density, remoteness, and built-up area—and results in a continuous index of values that range from 0 (a very low level of rurality) to 100 (a very high level). This numerical approach offers the flexibility and scalability that are missing from other definitions of *rural* and could also be applied broadly to any geographic area for which data are available. This measure is not as widely known as others, but the Henry J. Kaiser Family Foundation has been using it as its rurality indicator.[40]

We suggest that a definition of *rural* could be operationalized as an index and incorporate measures from a variety of areas, such as population density, travel or distance, geographic isolation, resources, socioeconomic characteristics, local perceptions or culture, and amenities (For a visual representation of what such an index would include, see online appendix exhibit A1.)[41] Each component would include several submeasures to contribute to the category. For example, resource submeasures could include numbers of providers per 1,000 population, hospitals, or home health agencies. Each category could also be weighted, essentially granting some categories more influence than others. In this example, population density would have the highest weight, while amenities would have the lowest. The components of each category, how they were indexed, and how the weights were assigned could all be adjusted to create an overall rural index that would indicate an area's rurality on a continuous scale.

An index would also lend utility to a definition of *rural* by providing information on the factors that drive a particular area's rurality. For example, two areas might have very similar index values, but one's value would be driven by a low population density while the other's value would driven by socioeconomic characteristics. Recognizing these differences in resources would help local, state, and federal policy makers better target and adjust interventions and identify the service needs of each area, instead of using a one-size-fits-all approach.

An index would lend utility to a definition by providing information on the factors that drive a particular area's rurality.

Any movement toward new, expanded, or refined ways of defining rurality must take into account the use of existing definitions. With federal and state agencies using varying definitions for eligibility determinations and planning purposes, it would be challenging to overhaul the entire system so that it used a single commonly used measure. It might be wise, in both the short and long terms, to use some sort of combined approach, similar to those of FORHP and HRSA more broadly. A county is eligible for the rural programs of these agencies if it is "rural"—or, if the county is metropolitan, if it is in a rural census tract. Using such a combined approach, and replacing the second criterion with the use of the rural index score, might be a more comprehensive approach than the population density–based census tract that is currently used.

Policy attention and additional resources are needed in rural communities, yet current definitions of rurality might not accurately and fully represent the concept. These current definitions also render a location rural by one definition and urban in another. Regardless of how definitions of *rural* do or do not evolve in the future, a more consistent and appropriate usage of the methodologies would benefit policy makers, researchers, and communities. This would include a definitive statement of what measures (or methods) were used to classify the area and a recognition of the sensitivity (and limitations) of those methods. We also encourage all who report rural findings to present data at the smallest possible unit (ZIP Code Tabulation Areas, census tracts, and the like). Finally, having a facilitated conversation about the move toward a refined or more inclusive definition of *rural* would

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be fruitful, particularly if facilitated by a federal stakeholder, such as HRSA. If this occurred, it would be vital for representative members of rural communities—such as community leaders, scholars, advocates, and residents—to be included in such a process so that their perspectives are fully appreciated and captured.

A concerted effort to explore these options, particularly on the part of rural health researchers, would lend credibility to alternative approaches and aid in the move toward better-informed policy. ■

An earlier version of this article was presented at the National Rural Health Association Annual Meeting in Atlanta, Georgia, May 9, 2019. Tyrone Borders is the editor of the *Journal of Rural Health*.

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41 To access the appendix, click on the Details tab of the article online.

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