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Spatial Variations in US Poverty: Beyond Metropolitan and Non-metropolitan

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Abstract

Because poverty in rural and urban areas of the US often has different causes, correlates and solutions, effective anti-poverty policies depend on a thorough understanding of the ruralness or urbanness of specific places. This paper compares several widely used classification schemes and the varying magnitudes of poverty that they reveal in the US. The commonly used 'metropolitan/non-metropolitan' distinction obscures important socioeconomic differences among metropolitan areas, making our understanding of the geography of poverty imprecise. Given the number and concentration of poor people living in mixed-rural and rural counties in metropolitan regions, researchers and policy-makers need to pay more nuanced attention to the opportunities and constraints such individuals face. A cross-classification of the Office of Management and Budget's metro system with a nuanced RUDC scheme is the most effective for revealing the geographical complexities of poverty within metropolitan areas.

1. Introduction

The terms city, urban and metropolitan are often used interchangeably in research and policy. Within one month of taking office, the Obama administration established a White House Office of Urban Affairs whose charge is to

> develop a strategy for *metropolitan* America, and to ensure that all federal dollars targeted to *urban* areas are effectively spent on the highest-impact programmes (The White House, 2009; emphasis added).

Thus, even at the highest levels of government, the terms urban and metropolitan are conflated. While investments in metropolitan areas are vital to the US' long-term

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economic well-being (Katz *et al.*, 2009), such a metropolitan emphasis can cloud a nuanced understanding of the socioeconomic diversity of places within metropolitan areas.

For how many places is such conflation a problem? One place is Skamania County, Washington, which is a "rural county located in the heart of the Columbia River Gorge" (Skamania County, 2009). In 2000, it had a population of 9872, all of whom the US Census Bureau classifies as rural and a population density of six people per square mile. However, the Office of Management and Budget (OMB) classifies Skamania County as metropolitan and researchers and policy-makers using metropolitan and urban interchangeably would treat it as urban. Across the US, 95 other counties with a total population of 1.2 million have the same metropolitan–rural cross-classification. Residents have probably never regarded themselves as urban dwellers.

These examples demonstrate a frequent confusion in urban analyses–metropolitan and urban are not synonymous, which can cause us to view urban and rural places and populations in very different lights. Urban areas, as defined by the US census using population size and density, contain 80 per cent of US population but only 3 per cent of the national land mass (US Census Bureau, 2000). However, metropolitan (metro) and non-metropolitan (non-metro) areas are OMB definitions that not only consider population size and density but also commuting patterns. US metro areas contain 83 per cent of the population and 26 per cent of the land mass. About 41 per cent of the people in non-metro areas, which many researchers and policy-makers consider rural, are urban residents under the census definition.

Another challenge in urban and rural studies is the dichotomous treatment of urban and rural or metro and non-metro areas. Whether defined based on spatial form or functions, urban–rural or metro–non-metro areas are social constructs based on subjective criteria. They are always portrayed in opposition to each other, geographically, socio-culturally and economically. Geographically, urban places are larger in population size and have a higher density; economically, a distinction exists between agriculture and other activities; socio-culturally, urban and rural people share different ways of life, values and beliefs (Pumain, 2004). The urban–rural dichotomy may have been appropriate in the era of industrialisation, but it fails to capture contemporary urban–rural structure.

With rapid urbanisation and suburbanisation, boundaries become blurred between urban and rural places and between metro and non-metro areas, and there are greater distinctions within metro and non-metro areas. Over the last three decades of the 20th century, metropolitan areas became more diverse and stratified in demographic composition, industry structure and socioeconomic status. Previously rural places became integrated into metro areas and economic activity within metro areas has deconcentrated into the suburbs (Brown and Cromartie, 2004). Terms like edge city, inner and outer suburbs, exurbia, peri-metropolitan area, and extended metropolitan areas appear frequently in scholars' lexicon, demonstrating new forms of settlement—mostly zones around urban centres where urban and rural functions mix together (Champion and Hugo, 2004).

This increasing diversity within metropolitan areas challenges theories conceptualising poverty predominantly as a central-city phenomenon (Frey, 2004; Holliday and Dwyer, 2005). Notions of social disorganisation and concerns about the impact of neighbourhood on the life chances of individuals made the urban underclass and concentrated poverty the focus of a generation of scholars (Jargowsky and Yang, 2006; Jencks and Mayer, 1990; Ricketts and Sawhill, 1988; Wilson, 1987). Some characterise the suburbs, in contrast, as places of relative prosperity and

suggest that migration to the suburbs has exacerbated inner-city poverty (Jargowsky, 2002; Jargowsky and Park, 2009). Yet, as suburbs have grown in size, both the poor and working poor have also come to live in them (Kneebone and Berube, 2008) and a debate has waged about the extent to which poverty is a phenomenon of the inner-ring suburbs or the outer-ring suburbs (Berube and Frey, 2002; Cooke, 2010; Kingsley and Petit, 2003). Dichotomising urban and rural as metro and non-metro, these nuances are lost.

This paper draws attention to misunderstandings of location, concentration and the urban or rural nature of poverty within the broad metropolitan area designation. By comparing and combining definitions currently in use, and one that is still an academic construct, this paper explores how definitions affect understanding of urban people and places—and urban poverty in particular—both conceptually and empirically. It is not just how we define urban–rural and metro–non-metro that matters, but the very meaning of these concepts and whether they continue to have relevance (Jones, 2004). Our analysis focuses on counties where urban and rural functions mix because this is where variations among typologies lead to inconsistent classification. Inconsistent classification schemes point to a potential deficit in awareness of the particular forms that poverty may take in mixed rural and rural metro counties. The commonly used 'metropolitan–non-metropolitan' distinction obscures important socioeconomic differences among metropolitan areas, making our understanding of the geography of poverty imprecise. Given the number and concentration of poor people living in mixed rural and rural counties in metropolitan regions, researchers and policymakers need to pay more nuanced attention to the opportunities and constraints such individuals face. A cross-classification of the OMB's metro system with a nuanced Rural Urban Density Code (Isserman, 2005) scheme is the most effective for revealing the geographical complexities of poverty within metropolitan areas.

2. A Review of Rural Urban Definitions and Classification Schemes

In general, the most commonly used urban–rural definitions are based on three dimensions: landscape and spatial form (an ecological approach), economic and social characteristics (a functional approach) and administrative boundaries (Champion and Hugo, 2004). Each definition is designed for and serves different purposes. Almost every country employs the traditional ecological approach that is based on population size and density to define urban and rural areas. In the US, the most commonly used are federal systems, such as the Census Bureau's urban–rural definitions, the OMB's metropolitan and non-metropolitan classification system and the Rural Urban Continuum Code (RUCC) developed by the USDA's Economic Research Service (ERS). Most definitions are based on major criteria the Census and OMB's definitions employ. The Census Bureau defines 'urban' based on population size and the population density of census blocks and block groups, while the OMB defines 'metropolitan' based on population size and commuting patterns at the county level. Both definitions delimit rural by exclusion—areas that are not urban are rural and those that are not metro are non-metro. Since these definitions apply to different geographies (blocks and block groups vs counties) and were designed for different purposes, they identify different places as rural and urban. These dichotomies also hide variations and complexities within urban/metro and rural/non-metro areas. Agencies and researchers have designed variations of the Census Bureau and OMB definitions to overcome the limitations of these dichotomous definition systems and

to target more accurately programmes and funds. The ERS Rural Urban Continuum Code (RUCC) classifies OMB's metro and non-metro areas into nine more finely defined categories. As a critique to federal definitions, we describe the Rural Urban Density Code (RUDC) (Isserman, 2005), which offers a more nuanced rural and urban classification scheme.

2.1 Urban and Rural: US Census Bureau Definition

Traditional urban–rural definitions typically employ the ecological approach—defining places on the basis of population size and density—which has an arbitrary quality and lacks a strong theoretical basis. A census urban area contains core census block groups, or blocks that have a population density of at least 1000 people per square mile, and surrounding census blocks with a population density of at least 500 people per square mile. On this basis, the Census Bureau defines two major geographies: urbanised areas and urban clusters. An urbanised area has a population of 50 000, whereas urban clusters have a population of at least 2500 but less than 50 000. All territory outside urban areas is defined as rural (US Census Bureau, 2005), reflecting popular perceptions of rural and urban and consistent with the geographical patterns we see from an airplane (Isserman, 2005). This taxonomy is used by the Federal Rural Health Clinic programme for determining eligibility requirements.

Under the Census Bureau's definition, the majority of the US landscape is rural, with 20 per cent of the nation's population living in 97 per cent of the nation's land. Isserman characterises the census definition as a spatial separation approach because it distinguishes urban and rural areas but treats rural areas as homogeneous (Isserman, 2005). Since major socioeconomic data are not available annually for census block groups and blocks, rural and urban areas defined by the census are not directly used for most analyses. However, the population size and density thresholds used by the Census Bureau to define rural and urban serve as the foundation for almost all urban–rural classification systems.

2.2 Metropolitan and Non-metropolitan: The OMB Classification

'Metropolitan' is a functionally based definition that combines city and adjacent suburbs into regional labour and housing markets. The defining criteria are population size and density and commuting patterns. The building block is usually the entire city or county; thus, a metro area can cover extensive areas. The concept of metro does not imply that the entire area is urban in its spatial form (it is often assumed to be fully urban in popular discourse). Rather, these are "daily activity spaces" in which urban, suburban and rural areas are associated with urban centres through a set of functional activities as measured by commuting flows (Fitzsimmons and Ratcliffe, 2004, p. 354; Hugo and Champion, 2004, p. 373). Proximity leads to interactions between urban centres and outlying areas. However, it does not necessarily mean that the land use and functions of these areas are the same as urban centres.

While many researchers use the OMB's metro–non-metro designation in the interests of simplicity, the official typology in use by federal statistical agencies defines three groups (metropolitan, micropolitan and non-core) based on Core Based Statistical Area (CBSA) standards applied to year 2000 census data. A CBSA has one or more central counties in which at least 50 per cent of the population live in an urban area with a population of 10 000 or more. Outlying counties are added to the CBSA if they have strong commuting ties with the central county—at least 25 per cent of the employed population commute to and from core counties on a daily basis (OMB, 2000). CBSAs are either metropolitan (at least 50 000 in an urban area) or micropolitan (between 10 000 and 50 000 in an urban area), while non-core

counties are neither metro nor micro. An example of a programme that employs this definition for the distribution of funds is the Medicare Reimbursement Program. Although the purpose of introducing the category of micropolitan area was to detail the complexities of non-metro America, researchers and policy-makers still tend to group micropolitan and non-core counties together on the basis of their non-metro designation and use the classification interchangeably with rural for research projects and programmes, despite OMB's explicit caution against it (OMB, 2000; Jolliffe, 2004; CMS, 2006a).

OMB metro areas cover a much larger land mass (25.5 per cent of the US land mass, comprising 1089 counties) than census urban areas. Of particular note are many Western counties, where OMB classifies the majority of land as metro but the Census Bureau classifies only a small portion as urban. The urban areas in these counties are quite small relative to the land mass of the county, meaning that great expanses of area are very distant from the urban core. Non-metro areas cover 74.5 per cent of the land mass.

The metro approach introduces an upward bias into the urban population count and an outward bias into urban boundaries (Brown and Cromartie, 2004; Champion, 2004). The expansive boundaries of metropolitan areas mask the heterogeneity of people and places within metro areas. Derived from central place theory (Berry, 1960; Christaller, 1933/1966), another major flaw of the metro–non-metro approach is it presumes an urban focus and ignores the fact that population flow is multidimensional—no longer do individuals simply commute between suburbs and central cities but rather among suburbs or from city to city within the metro area(Coombes, 2004; Mikelbank, 2004). Although counties vary greatly in size, several characteristics make them a preferred unit of analysis: counties are the smallest geographical unit for which annual statistical data have been available nationally, they have relatively stable boundaries and are important administrative units for various programmes (Brown and Cromartie, 2004; Fitzsimmons and Ratcliffe, 2004). Because of all these factors, metro–non-metro areas have replaced urban and rural areas as the *de facto* definitions of urban and rural for most research and policy-making purposes, despite OMB's explicit statement that metro–non-metro should only be used for statistical purposes (OMB, 2000).

2.3. The Rural Urban Continuum Code (RUCC)

The USDA ERS, which has the most extensive set of US-based rural definitions, has worked with county- and sub-county-level data systems and developed several variants. The RUCC classification scheme augments OMB's metro–non-metro system by considering population size and adjacency to metro areas. It classifies counties into nine categories: levels one through three classify metro counties of varying population size and levels four through nine classify non-metro counties distinguished by the size of their urban population and adjacency to metro areas (ERS, 2004c). Its intent is to disentangle the complexity of rural America and it has been widely used in rural research and programmes (for example, the Rural Housing and Economic Development Program) and for poverty analysis.

Although the RUCC classification provides more detailed information for specific location and policy implementation, it also creates problematic results for research and data analysis. Research based on the 1990 RUCC has shown that using all nine levels[1] creates instability of model specification, while using collapsed categories masks important variations among counties (Cossman *et al.*, 2008). To make meaningful comparisons with other definitions, while not losing all the fine detail of RUCC codes, we collapse the nine RUCC levels into five categories: we retain levels one to three to examine variations within metro

areas—called large metro, medium metro and small metro in the rest of the paper. We group levels four through seven into a single non-metro urban category based on their similar poverty levels in 1999 (ERS, 2004b) and consider levels eight and nine to be a single rural category. Under this collapsed RUCC classification, 7.6 per cent of the land area is large metro (413 counties), 8.8 per cent is medium metro (325 counties), 9.2 per cent is small metro (351 counties), 48.6 per cent is non-metro urban (1382 counties) and the remaining 25.9 per cent is rural (670 counties). While these finely tuned categories are useful for analysis of rurality in non-metro areas, the scheme does not allow distinction *within* metro areas based on the percentage of the population that is rural or urban.

2.4 The Rural Urban Density Code (RUDC)

Isserman's (2005) Rural Urban Density Code (RUDC) is a nuanced approach that provides a clear picture of the variety of rural and urban places within the OMB's metro and non-metro categories.[2] The RUDC classifies each county as rural, mixed rural, mixed urban or urban. This approach uses the percentage of the county's population that is urban or rural, the presence or absence of urbanised areas of 50 000 or more and urban areas of 10 000 or more and the population density of the county, all based on 2000 census data.

Under this classification scheme, a rural county has a population density less than 500 people per square mile and 90 per cent of the county population is rural or the county has no urban area with a population of 10 000 or more. Urban counties have a minimum population density of 500 people per square mile, 90 per cent of the county population is in urban areas and the county's population in urbanised areas is at least 50 000 or 90 per cent of the county population. Mixed rural counties are those that meet neither the urban nor the rural county criteria and have a population density less than 320 people per square mile. Mixed urban counties meet neither the urban nor the rural county criteria and have a population density equal to or greater than 320 people per square mile (Isserman, 2005). As is the case for all definitions based on population size and density, the threshold approach creates arbitrary similarities and separations. Isserman also does not explain clearly the rationale of using 320 as a 'reasonable' estimate of the population density threshold for mixed urban and mixed rural areas. Despite drawbacks, RUDC provides a more refined urban–rural classification at the county level, which can be easily combined with metro–non-metro definitions for exploring complexity within urban and rural places.

The RUDC indicates a much more rural America than do the Census and OMB definitions—1790 counties (61.3 per cent of US land area) are classified as rural and 1022 counties are classified as mixed rural. This classification scheme expands the meaning of rural by acknowledging that the presence of commuters to an adjacent city does not make a place less rural—just more connected (Isserman, 2005, 2007). This reduces the apparent size of many urban areas, tightening their borders while acknowledging that the perimeter of a major urban area is distinct from its surrounding. This tightening effect is striking on the west coast because large counties, extending east from coastal cities, massively increase the apparent extent of the urbanised area in OMB's characterisation.

2.5 Variation in Population Composition and County Distribution across Definitions

To illustrate the contradictions between varied definitions in portraying urban or rural people and places, we take a brief look at population composition and county distribution in the US (Table 1). Each federal classification schemes portrays a very urban America: the Census Bureau's urban definition characterises

79.9 per cent of the total population (about 222 million people) and the metro definition characterises 82.6 per cent of the total population (about 232 million people). The RUDC designations, however, suggest that a smaller portion of the population is urban (45 per cent, 126.5 million people) or mixed urban (14 per cent, 40.5 million people). The difference in the share of population that is urban between the Census Bureau and the OMB definitions and the RUDC is nearly 40 percentage points (approximately 100 million people or 37 per cent of the total population). At the rural end of the scale, the difference in the share of population defined as rural between the low end (RUCC, 1.9 per cent, 5.2 million) and the high end (Census Bureau, 21.1 per cent, 59 million) is almost 20 percentage points (about 19 per cent of the total population). Although the Census Bureau urban and the OMB metro definitions roughly concur on the size of the urban population, these two groups of 'urban' people do not necessarily live in the same places. The reality is that about 41 per cent of urban population live in non-metro areas. In contrast, the more fine-grained definition of the RUDC demonstrates considerable consistency: about 98 per cent of the RUDC urban population is also so-defined by the Census Bureau.

Like the population distributions already described, cross-classifying counties across various schemes is also revealing. A metro area is not uniform in geography; it includes counties that vary in their urban and rural character (Figure 1). Among the 1089 OMB metro counties, the RUDC classifies 172 counties (16 per cent) as urban and another 13 per cent as mixed urban, leaving the majority of OMB metro counties classified under RUDC as either rural (27.9 per cent) or mixed rural (42.9 per cent). The classification of many metro areas as having a more rural character pinpoints an issue—the diversity of metro areas—that has not drawn enough attention from researchers and policy-makers.

Table 1. Population composition across definitions (percentages)

	Total population	*Rural population*	*Urban population*
Census			
Urban	79.9	100	0
Rural	21.1	0	100
OMB			
Metro	82.6	13.0	87.0
Non-metro	17.4	59.1	40.9
RUCC			
Large Metro	53.0	7.5	92.5
Medium Metro	19.7	19.0	81.0
Small Metro	9.9	30.3	69.7
Non-metro Urban	15.5	54.3	45.7
Non-metro Rural	1.9	99.4	0.7
RUDC			
Urban	45.0	2.4	97.6
Mixed Urban	14.4	14.9	85.1
Mixed Rural	30.7	33.2	66.8
Rural	9.9	76.1	23.9

S*ource*: US Census Bureau (2000, 2003); ERS (2004c); Isserman (2005).

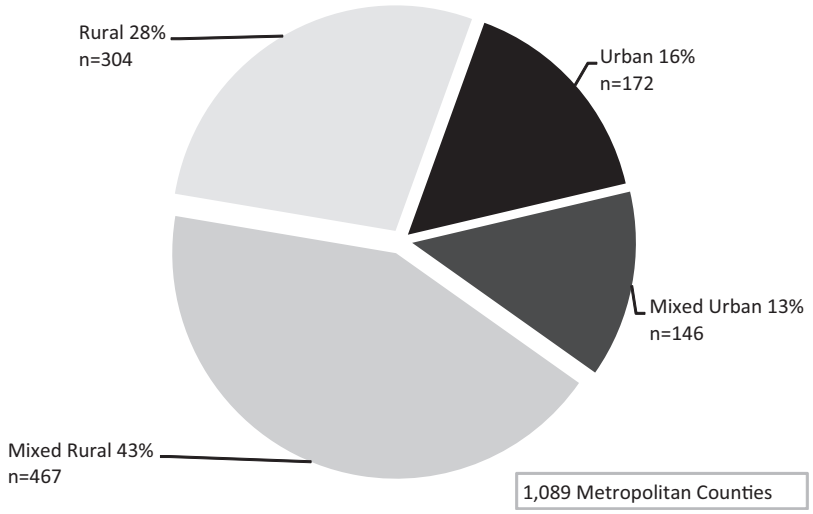

Figure 1. Consistency of categories between OMB metro and RUDC (Isserman, 2005).
Source: US Census Bureau (2003); Isserman (2005).

3. Data and Method

To understand how these varied definitions influence our understanding of the geographical distribution of poverty, we use GIS mapping and descriptive statistics. To depict variations in poverty, we analyse a number of major socioeconomic indicators: poverty rates (100 per cent below the federal poverty level (FPL)), poverty rates by race, lack of health insurance (percentage uninsured for total population and for children), Earned-Income Tax Credit usage rates (percentage receiving the EITC), food stamp usage (in dollars per capita), educational attainment (percentage high school or less and percentage college or more), median household income in dollars and unemployment rate. All the indictors are for the year 2000. We calculate the averages[3] of these measures for each of the urban–rural categorisation schemes, paying special attention to those counties that are what we call 'inconsistently categorised across definitions'—considered urban (or metro) in one scheme, but rural in another.[4]

4. Variations in the Representation of Urban and Rural Poverty

We begin our analysis with a close look at the extent of the divergence between OMB designations, ERS RUCC definitions and Isserman's RUDC classification on the spatial distribution of poverty and inequality. In general, poverty measures for non-core and non-metro places correspond well across rural definitions—these categories of ruralness reflect the diversity of rural places. Isserman provides a detailed analysis of rural poverty by combining RUDC codes and Urban Influence Codes (Isserman, 2005). However, a similar fine-grained understanding of poverty within metro places is lacking. Therefore, the remaining analysis primarily focuses on findings and implications for metro counties.

How we classify urban and rural places shapes our understanding of who is poor and where they live. Changing the definitions necessitates shuffling counties, and

the number of counties shifted is not negligible. Approximately 23 per cent of poor Americans live in RUDC rural and mixed rural counties within metro areas. Such a substantial number requires researchers and policy-makers to pay more attention to the opportunities and constraints these individuals face and how those opportunities and constraints may be shaped by the more rural character of their surroundings. The conventional wisdom in poverty studies is to use metro and non-metro geographies to examine the discrepancy in poverty between urban and rural areas (Durham and Smith, 2008; ERS, 2004a; Fisher, 2007; Gundersen, 2006; Jolliffe, 2004; Lichter and Johnson, 2007; Rupasingha and Goetz, 2007). However, the focus on metro versus non-metro conceals variations in poverty within them. In the following sub-sections, we examine poverty rates in both consistently and inconsistently classified counties as a means of drawing attention to poor populations that do not fit neatly into the prevailing taxonomy.

4.1 Variations in Poverty across Definitions

Depending on the classification scheme, the calculated rate of poverty in rural and urban areas varies (Table 2). Poverty rates for urban areas are consistent across all the definitions, with values of around 12 per cent. Yet, when we disaggregate poverty rates for the three RUCC metro categories, a different picture emerges. While the poverty rates for RUCC large metro counties (11.5 per cent) and medium metro counties (12.1 per cent) are similar to that of the Census Bureau's urban, OMB metro and RUDC urban counties, RUCC small metro counties have relatively higher poverty rates (13.5 per cent).[5] Poverty differences among these disaggregated categories of metro areas suggest that metropolitan geography matters for understanding concentrations of poverty. Crucial poverty differences also emerge in comparisons of the mixed urban category from RUDC with its OMB and RUCC counterparts. RUDC mixed urban counties have the lowest poverty rate of all categories (10.3 per cent).

With respect to rural poverty, OMB non-metro counties and RUDC rural counties are virtually identical (14.8 per cent vs 14.9 per cent). OMB non-core and RUCC non-metro rural counties, two classifications that represent 'complete' ruralness, have the highest poverty among all categories (15.9 per cent and 16.2 per cent). Within these rural counties, other indicators of socioeconomic status demonstrate patterns similar to those for the poverty level (Table 2). RUDC mixed rural counties have a poverty rate (12.8 per cent) between that of urban and rural places, lower than all the rural categories but higher than the urban ones. The finding of similarity across these rural counties suggests, in contrast to metro counties, that the rural definitions are sufficiently nuanced to express the characteristics of the populations they represent.

The conventional wisdom is that non-metro areas are poorer than metro counties—and rural areas are poorer than urban areas. However, the results based on the Census Bureau's definitions depict the opposite. Census urban areas have a higher poverty rate than census rural areas by 1.7 percentage points.[6] The same pattern is also found in other major poverty and socioeconomic indicators. One likely explanation is a scale effect. Because the census urban definition is based on blocks and block groups, the urban and rural poverty statistics are compiled on the basis of block and block group characteristics, not the county in its entirety. The distribution of median household income for census rural and urban areas (not shown) suggests that census rural areas contain more places with incomes at the high end of the distribution.

Table 2. Poverty and major socioeconomic indicators by classification system

			Poverty by race/ethnicity					*Median household*		*Food*	*Percentage uninsured*[c]			*Percentage education*	
	Percentage poor	*Poor population*	*White*	*Black*	*Asian*	*Native American*	*Hispanic*	*income ($)*	*Percentage EITC*[a]	*stamp*[b] *($/person)*	*All*	*<18*	*Percentage unemployed*	*HS or less*	*College or above*
Census															
Urban	12.74	27 506 713	9.3	23.0	13.3	20.4	21.2	44 282	NA	NA	NA	NA	6.1	45.7	26.5
Rural	11.01	6 393 099	9.5	20.7	10.6	18.7	19.8	41 539	NA	NA	NA	NA	5.0	57.4	16.3
OMB1															
Metro	11.9	26 944 850	8.7	22.4	12.9	19.4	20.5	45 606	14.7	52.9	14.1	11.4	5.8	45.8	26.3
Non-metro	14.8	6 954 962	12.2	27.9	14.3	24.1	25.1	33 632	18.7	60.7	14.7	12.1	6.3	59.3	15.2
OMB2															
Metro	11.9	26 944 850	8.7	22.4	12.9	19.4	20.5	45 606	14.7	52.9	14.1	11.4	5.8	45.8	26.3
Micro	14.1	3 974 896	11.6	27.5	14.2	22.7	24.6	35 023	17.9	57.7	14.2	11.6	6.3	57.3	16.5
Non-core	15.9	2 980 066	13.2	28.6	14.5	26.3	25.8	31 526	20.0	65.2	15.4	12.8	6.4	62.5	13.2
RUCC															
Large metro[d]	11.5	16 822 802	8.2	20.5	11.9	18.5	19.3	48 414	14.2	53.9	44.4	28.2	14.3	11.7	5.8
Medium metro[d]	12.1	6 528 792	9.2	24.7	13.8	20.2	22.5	42 068	15.1	51.5	47.4	23.9	13.7	11.0	5.8
Small metro[d]	13.5	3 593 256	10.8	28.0	16.4	22.9	23.2	37 607	16.7	50.7	50.8	20.9	14.1	11.5	6.1
Non-metro U	14.6	6 132 095	12.0	28.0	14.5	23.8	25.0	34 009	18.6	60.3	14.6	12.0	6.3	58.9	15.4
Non-metro R	16.2	822 867	13.7	27.1	13.3	26.9	25.9	30 483	19.8	63.8	15.6	13.0	6.2	62.6	13.0

Table 2. *(Continued)*

	Percentage poor	*Poor population*	*Poverty by race/ethnicity*					*Median household income ($)*	*Percentage EITC*[a]	*Food stamp*[b] *($/person)*	*Percentage uninsured*[c]		*Percentage unemployed*	*Percentage education*	
			White	*Black*	*Asian*	*Native American*	*Hispanic*				*All*	*<18*		*HS or less*	*College or above*
RUDC															
Urban	12.0	15 118 178	8.3	20.9	12.5	19.4	20.2	47 967	14.5	59.5	14.5	11.7	6.0	43.6	29.6
Mixed urban	10.3	4 082 778	8.0	22.9	11.6	18.0	20.6	46 288	13.0	41.8	12.6	10.2	5.1	45.4	25.8
Mixed rural	12.8	10 662 253	10.3	25.5	14.5	21.2	22.2	39 370	16.5	50.0	14.3	11.7	6.1	51.5	19.8
Rural	14.9	4 036 603	12.4	27.6	14.0	24.3	24.9	33 076	19.4	61.4	14.8	12.2	6.0	62.3	13.2

Note: The following measures are derived from the 2000 Census Summary File 3: poverty rate (%100 FPL), number of people who are below federal poverty level (poor population), poverty by race, median household income (median household income), unemployment rate (percentage unemployed) and education.

[a] Percentage EITC is the percentage of people who received Earned Income Tax Credit returns in 2000 based on IRS data.

[b] Food stamp usage is in 2000, based on data from Census Consolidated Federal Funds.

[c] Percentage uninsured is the percentage of population who do not have health insurance in 2000, and is from Census Small Area Health Insurance Estimates (SAIHE). "All" is for total population and "<18" is for people who are age 18 or younger.

[d] Large metro, medium metro and small metro refer to RUCC codes 1 to 3 respectively.

4.2 Poverty Variation in Inconsistently Classified Counties

Counties that are classified inconsistently by OMB, RUDC and RUCC are of interest because they represent places where the experience of poverty may not be well represented by a metro–non-metro designation. While poverty rates for metro urban, metro mixed rural and metro rural counties are comparable (about 12 per cent), the poverty rate in metro mixed urban counties is lower than their metro counterparts by about two percentage points (Table 3). Similar patterns are also observed for poverty across major ethnic groups. A high poverty rate in metro urban counties may reflect the traditional wisdom about the concentration of poverty in central cities. However, equally high poverty rates in metro counties that have a somewhat rural character suggest the suburbanisation of poverty. This population is at particular risk of being overlooked under the existing metro–non-metro distinction.

A number of other socioeconomic indicators reflect patterns of greater disadvantage in metros with a more rural character, relative to consistently classified metro urban counties (Table 3). Metro rural and mixed rural counties have a higher percentage of people who depend on the Earned Income Tax Credit (17.5 per cent and 15.9 per cent respectively) relative to metro urban counties (14.5 per cent). Median household income is substantially lower in more rural metro counties, by about $10 000 compared with metro urban counties. Metro mixed rural counties also have a high percentage of people (14.3 per cent) not covered by health insurance, relative to metro mixed urban or metro rural (12.6 per cent and 13.0 per cent respectively), although with a rate comparable to metro urban areas (14.6 per cent).

The other notable pattern in metro counties is that metro mixed urban places appear to be somewhat better-off, particularly in relation to more rural metro counties, but also in comparison with metro urban counties. This pattern of advantage in metro mixed urban places emerges for the overall poverty rate, White poverty, Asian poverty, Native American poverty, EITC dependence, food stamps take-up and health (un)insurance (Table 3). Both mixed urban metro counties and metro rural counties have relatively low unemployment.

A more complex picture emerges when examining the differences between urban, mixed urban, mixed rural and rural counties in metro areas disaggregated by size (following the RUCC classification scheme) (Table 3). First, the higher poverty rate in RUCC small metros (13.5 per cent, from Table 2) appears to be driven by a small number of dense urban counties with unusually high poverty (16.6 per cent). In comparison, urban large metro counties and urban medium metro counties have poverty rates of 12.3 per cent and 11.4 per cent respectively (Table 3). Secondly, the mixed urban advantage relative to urban and rural metro counties is evident in both large and small metros (but not in medium metros), across almost all indicators (poverty rate, White, Black and Asian poverty, median household income, EITC take-up, uninsurance rates and unemployment). Conversely and particularly in comparison with the mixed urban metros, places with a more rural character are more disadvantaged.

The combination of the RUCC with Isserman's designation helps to illuminate variation in poverty within metro areas. First, those metro counties whose population density is low enough to characterise them as mixed rural and rural vary substantially in socioeconomic status from those with a slightly higher population density; and, secondly, the size of the metropolitan area matters for urban, rural and mixed rural counties within metro areas. That is, counties with a more rural character in large metro areas have lower poverty rates than do their counterparts in medium and small metro

Table 3. Poverty and major socioeconomic indicators by cross-tabulated classifcations systems

					Poverty by race/ethnicity								*Percentage uninsured*			*Percentage education*	
		Number of Counties	*Percentage poor*	*Poor population*	*White*	*Black*	*Asian*	*Native American*	*Hispanic*	*Median household income ($)*	*Percentage EITC*	*Food stamp ($/person)*	*All*	*<18*	*Percentage unemployed*	*HS or less*	*College or above*
OMB1	*RUDC*																
Metro	Urban	172	12.2	15 118 178	8.4	21.0	12.6	19.5	20.2	47 781	14.5	60.0	14.6	11.8	6.0	43.8	29.5
	Mixed urban	146	10.3	4 063 172	8.0	22.9	11.6	18.0	20.7	46 327	13.0	41.8	12.6	10.2	5.1	45.4	25.8
	Mixed rural	467	12.2	6 995 307	9.7	24.5	14.5	20.5	21.0	41 318	15.9	46.6	14.3	11.8	5.9	49.1	21.3
	Rural	304	12.0	768 193	9.8	25.2	13.4	18.5	22.3	37 893	17.5	49.8	13.0	10.5	5.0	61.5	13.5
Non-metro	Mixed rural	555	14.0	3 666 946	11.5	27.6	14.5	22.7	24.7	35 210	17.8	57.4	14.2	11.6	6.3	57.0	16.7
	Rural	1486	15.8	3 268 410	13.2	28.4	14.1	26.1	25.7	31 591	20.0	65.0	15.4	12.7	6.4	62.5	13.2
OMB2	*RUDC*																
Non-core	Rural	1355	15.9	2 973 138	13.2	28.5	14.5	26.4	25.8	31 529	20.0	65.2	15.4	12.8	6.4	62.5	13.1
RUCC	*RUDC*																
Large metro	Urban	132	12.3	13 670 439	8.4	20.7	12.6	19.4	19.9	48 194	14.7	60.2	14.8	12.1	6.1	43.7	29.7
	Mixed urban	60	8.1	1 294 595	6.3	19.1	9.4	15.8	17.6	51 927	10.6	31.9	11.6	9.7	4.3	42.3	27.7
	Mixed rural	119	9.7	1 596 678	8.0	19.4	10.0	15.2	16.5	47 696	14.1	36.6	13.7	11.4	5.2	48.8	20.6
	Rural	102	11.0	261 090	9.2	24.2	12.5	16.1	20.6	40 265	16.4	45.9	12.7	10.3	4.9	61.5	13.5

(Continued)

Table 3. *(Continued)*

					Poverty by race/ethnicity								Percentage uninsured			Percentage education	
		Number of Counties	*Percentage poor*	*Poor population*	*White*	*Black*	*Asian*	*Native American*	*Hispanic*	*Median household income ($)*	*Percentage EITC*	*Food stamp ($/person)*	*All*	*<18*	*Percentage unemployed*	*HS or less*	*College or above*
Medium metro	Urban	32	11.4	1 361 974	8.1	23.6	12.2	19.3	22.2	44 501	13.2	58.9	12.9	10.0	5.6	44.6	27.3
	Mixed urban	64	11.9	2 465 324	9.2	25.4	13.1	20.0	23.0	42 760	14.7	48.9	13.4	10.8	5.6	46.9	25.1
	Mixed rural	138	12.7	2 432 720	9.8	24.6	15.2	21.3	22.2	40 317	16.3	49.8	14.7	11.9	6.2	48.3	21.7
	Rural	91	12.5	268 774	10.0	23.6	15.9	17.3	21.6	37 482	17.9	50.4	13.2	10.6	5.0	60.5	14.0
Small metro	Urban	8	16.6	85 765	14.4	26.1	20.0	26.1	22.6	36 162	13.6	40.0	12.5	10.7	6.9	42.9	31.5
	Mixed urban	22	11.2	303 253	8.5	25.3	12.3	15.5	20.6	40 824	14.8	45.5	12.3	9.1	5.5	51.8	20.2
	Mixed rural	210	13.7	2 965 909	11.0	28.3	17.2	23.7	23.3	37 440	16.9	51.4	14.5	11.9	6.2	49.9	21.3
	Rural	111	12.4	238 329	9.3	23.3	13.2	20.2	21.3	43 584	15.4	54.3	14.2	11.6	5.9	48.1	24.4
Non-metro urban	Rural	816	15.7	2 445 543	13.0	28.7	14.4	25.9	25.7	31 949	20.0	65.4	15.3	12.6	6.4	62.4	13.2
Non-metro rural	Rural	670	16.2	822 867	13.7	27.1	13.3	26.9	25.9	30 483	19.8	63.8	15.6	13.0	6.2	62.6	13.0

Note: Data sources for this table are the same as for Table 2.

areas. The fact that these three county types are treated as identical within the OMB classification system points to the difficulties of using that system when making policy decisions pertaining to poverty. Nearly 8 million poor people—about 29 per cent of the poor in metropolitan areas—live in metro rural and mixed rural areas; these areas and populations deserve particular attention from poverty alleviation programmes.

4.3 Regional Variations in the Impact of Urban–rural Definitions

A closer look at US census regions illustrates how inconsistent definitions influence our understanding of the geography of poverty in metro regions (Figure 2). Poverty rates are generally higher in the South than in the Northeast, Midwest and West, despite decreasing rates of poverty in the South in the past two decades (Mather, 2007). Nationally, poverty in metro urban counties is on a par with poverty in metro mixed rural and metro rural counties, at a rate of around 12 per cent. However, in the Northeast and Midwest, metro urban poverty stands out as significantly higher than in the other metro categories. In contrast, the pattern in the South is reversed, with higher metro rural poverty relative to metro urban areas (14.5 per cent vs 12.8 per cent). In the West, poverty in metro mixed rural counties is more prominent (13.7 per cent), while metro rural poverty is comparatively low (9.2 per cent). These findings suggest that distinctions among urban, rural and mixed counties matter for understanding the geography of poverty within metro areas among regions as well as among counties.

A closer look at maps of poverty for metro counties reveals regionally specific issues and characteristics. For the Northeast (Figure 3), it appears that most metro urban counties

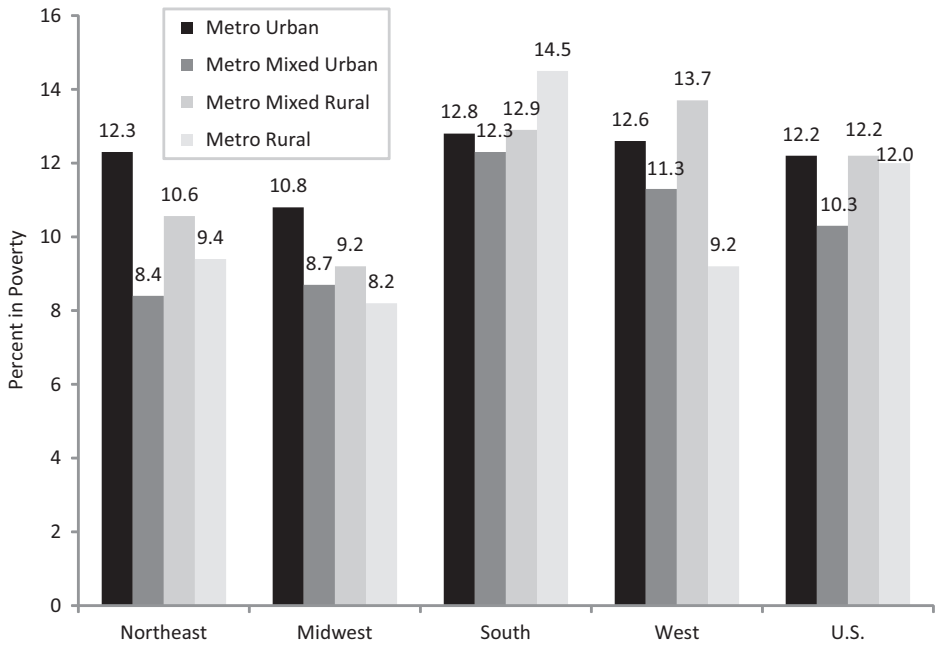

Figure 2. Poverty rates for RUDC urban, mixed urban, mixed rural and rural counties in metropolitan areas for the US and census regions.
Source: US Census Bureau (2000, 2003); Isserman (2005).

have relatively low poverty rates while most metro mixed rural counties have higher poverty rates. However, the five counties with the highest poverty rates are all metro urban (three in New York State—Bronx, Kings and New York), one in Philadelphia (Philadelphia) and one in Massachusetts (Suffolk) (Figure 3, inset). While small in area, these counties are large in population size; mathematically, they have a big impact on the (population-weighted) mean poverty rate for metro urban areas. The other counties with high poverty rates are metro mixed rural counties, located mostly in up-state New York, the metro areas of Buffalo, Rochester, Syracuse and Utica-Rome.

Poverty rates in metro counties in the Midwest are generally lower than their counterparts in other regions. About 70 per cent of the Midwest counties have poverty rates below 10 per cent (Figure 4). There are only three counties with poverty rates of over 20 per cent, all of them in Missouri—St Louis City (metro urban), Washington County (metro rural) and McDonald County (metro rural). Large metro urban counties along the rust belt, including Milwaukee (Milwaukee County), Detroit (Wayne County) and Chicago (Cook County), also have high poverty rates, primarily due to high unemployment. As in the Northeast, the relatively large population in metro urban counties drives up the overall poverty rate. Although a greater number of rural and mixed rural metro counties have higher poverty rates in the Midwest, the large population size in urban counties makes the population-weighted mean poverty rate higher for metro urban areas.

Figure 3. Poverty rates and RUDC designations for metropolitan counties in the Northeast Region.
Source: US Census Bureau (2000, 2003); Isserman (2005).

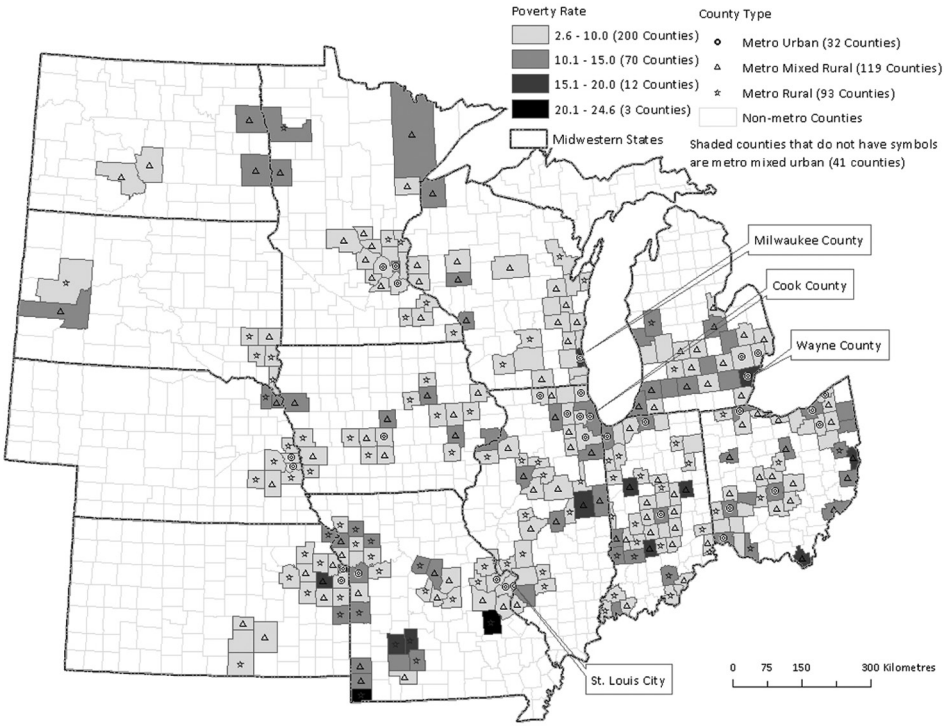

Figure 4. Poverty rates and RUDC designations for metropolitan counties in the Midwest region.
Source: US Census Bureau (2000, 2003); Isserman (2005).

In the South, small pockets of poverty distribute unevenly across the region, particularly in the lower Mississippi Delta and Appalachia (Figure 5). Most high-poverty counties are metro rural or metro mixed rural counties that have had persistent slow economic growth with a heavy reliance on low-wage agriculture. We can also see pockets of poverty along the southern auto corridor, where foreign auto plants are located (for example, Birmingham, Tuscaloosa and Montgomery metro areas in Alabama, Jackson metro in Mississippi and San Antonio metro in Texas). Due to low rates of unionisation, area workers typically have relatively low wages. In addition, for metro rural and metro mixed rural counties, especially those in Texas, whether integration into metro areas reduces hardship is largely dependent on the size of the metro areas. For example, rural and mixed rural counties in the large metros of Dallas and Houston have lower poverty rates than their counterparts in small and medium metro areas.

In the West, there is a clear concentration of high-poverty counties in the Central Valley region of California (Figure 6), a major agricultural centre. All these counties are classified as mixed rural by the RUDC. Low-wage agricultural jobs, an increasing number of immigrants seeking jobs and a high cost of living in California collectively contribute to high poverty in these counties. Dona Ana and San Juan counties in New Mexico also have high poverty rates. The Navajo reservation comprises about 60 per cent of San Juan County. Dona Ana, situated on the Mexico–US border, has the highest poverty rate among all metro counties in the West.

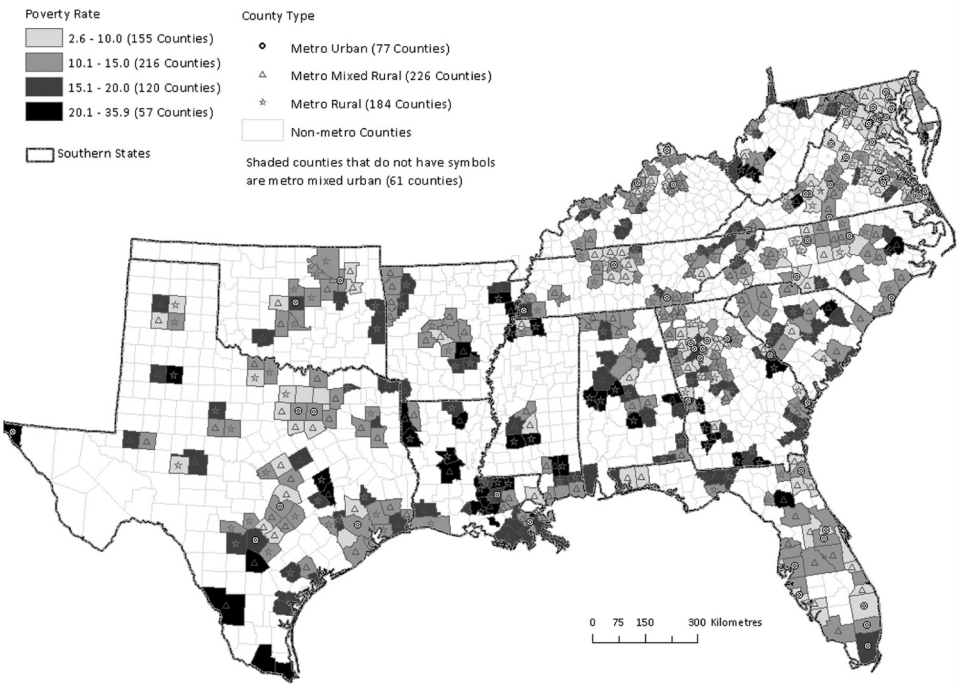

Figure 5. Poverty rates and RUDC designations for metropolitan counties in the South region. *Source*: US Census Bureau (2000, 2003); Isserman (2005).

5. Conclusion and Discussion

Depending on the definition employed, the US can be depicted as largely urban or more rural. The rural population ranges from about 2 per cent of total population (RUCC definition) to more than 20 per cent (Census Bureau definition). The urban population can be as low as 45 per cent (RUDC definition) or as high as 83 per cent (OMB definition). These differences translate into differences in estimation of the urban and rural context for poverty. Under the Census Bureau urban definition, about 28 million urban residents are poor, while the RUDC classification suggests that only around 15 million urban residents are poor.

Dichotomising rural and urban masks the complexity and diversity of rural and urban places. Most metro counties (71 per cent) are rural and mixed rural places. While our findings are consistent with the conventional wisdom that metro or urban areas fare better than non-metro or rural areas in terms of major poverty and socioeconomic indicators, there is considerable complexity and diversity within rural and urban places. In non-metro areas, mixed rural counties are less poor than rural counties. Within metro areas, mixed rural, urban and rural counties are quite different from mixed urban counties with respect to poverty and other major socioeconomic indicators. Mixed urban counties fare the best relative to either the more rural or more urban counties. These nuances capture the geography of metropolitan poverty that increasing sprawl and the mixing of urban and rural functions have spawned.

Figure 6. Poverty rates and RUDC designations for metropolitan counties in the West region. *Source*: US Census Bureau (2000, 2003); Isserman (2005).

The findings in this study have five major implications. First, a simplistic metro–non-metro or urban–rural dichotomy does not adequately describe the rural or urban character of a county. Since 'urban' and 'rural' are multidimensional concepts, one way of gauging these dimensions is to cross-tabulate ecologically defined (urban–rural) with functionally defined definitions (metro–non-metro). As early as 1973, the United Nations suggested this approach in the hope of eventually serving "most practical purposes best" (UN, 1973, p. 12; as quoted in Champion and Hugo, 2004, p. 17). However, rarely has any work been done along these lines due to methodological, technical and political reasons (Champion, 2004).

Secondly, focusing on metro versus non-metro conceals the variations in poverty within metro areas that differ in size, and these variations play an important role in understanding the geography of metropolitan poverty. Large metro areas not only have lower poverty rates than medium and small metro areas, but also mixed rural and rural counties in large metro areas are less poor than their counterparts in medium and small metro areas. Of the 100 metro counties with the highest poverty rates, 50 are small metro counties, 43 of which are rural and mixed rural counties; the allocation of resources should reflect these distinctions by population size and urban–rural character.

Thirdly, whether a metro county is urban, mixed urban, mixed rural or rural has very different implications for its poverty rate across regions. Nationally, metro urban counties have the same average level of poverty as

metro rural counties, but in the Northeast and Midwest metro urban poverty stands out as higher than all other county types across the urban–rural spectrum. In contrast, the South is distinguished by higher poverty rates in metro rural and metro mixed rural counties, as well as the highest metro poverty rates for each of the RUDC categories across all regions. In the West, poverty in metro mixed rural counties is more prominent than in other types of metro counties.

Fourthly, dichotomising urban and rural may influence the types of fund targeted towards a place. Take two programmes targeted to rural areas and offered by the Center for Medicare and Medicaid Services (CMS): the Rural Health Clinics programme (RHC) and the Medicare Telemedicine Reimbursement programme (MTR).[7] To qualify for the RHC programme, a location has to be outside an urbanised area as defined by the Census Bureau. The MTR programme, however, uses the OMB's metropolitan status to determine whether a location qualifies as rural. Therefore, a location can qualify as rural for RHC but not MTR. Residents in the upper Snoqualmie Valley (for example, North Bend) in King County, WA, can enjoy the benefits of RHC because their location is not within an urbanised area, yet are not able to receive MTR because the location is part of the Seattle–Tacoma–Bellevue metropolitan area. It may be that the RHC programme better targets resources to rural places because it employs a finer level of geographical distinction.

Fifthly, it is likely that the trend of increasing suburban diversity and the shift of poverty out of cities and into suburbs over the 20th century (Berube and Frey, 2002; Farley, 1964; Frey, 2001; Holliday and Dwyer, 2005; Mikelbank, 2004) explains the pattern of poverty within mixed rural, rural and mixed urban counties in metro areas. With the long-run decentralisation of populations and jobs in the US, suburbs have grown rapidly, opening up new housing and employment opportunities and becoming more racially and economically diverse than traditional suburbs (Berube and Frey, 2002; Frey, 2001; Holliday and Dwyer, 2005; Lang *et al.*, 2005). Those suburbs that grew the most quickly over the last 30 years of the 20th century are "neither urban nor suburban both in terms of form and character" Lang *et al.*, 2005, p. 381). The 50 fast-growing suburban counties (from 1970 to 2000) overlap with inconsistently classified counties, with 15 suburban counties defined as metro mixed rural, 16 as metro mixed urban and 19 as metro urban. The transformation of suburbs into racially and economically diverse geographies has produced uneven development and spatial inequality in metropolitan areas. Among the 100 metro counties with the highest poverty rates, 40 are rural counties and 38 are mixed rural counties. Metro counties with a more rural character deserve particular attention in terms of the allocation of resources.

While the OMB's metro and non-metro scheme is a convenient short-hand, US metro areas contain diverse mixes of rural and urban places that belie a simplistic dichotomy. Ignoring this diversity within metro areas creates a skewed picture of both urban and rural poverty and, with appropriate definitions, these short-cuts are not necessary at the county level. Such confusion may also contribute to the debates over the targeting resources meant to reduce poverty and associated social problems. Over $2.7 billion in federal economic stimulus money for rural areas has gone to large metro areas (Heath, 2010). The ensuing debate over the appropriateness of these expenditures highlights this confusion regarding the geographical diversity within metropolitan areas. A US Congressman's comments typify the confusion: "Ask Nebraskans to define rural and they'll have different ideas", he says, "but clearly Phoenix and Atlanta are not rural at all" (Heath, 2010), yet rural and mixed rural places are located within these

metro areas. To clarify these nuances, a cross-tabulation of the OMB and RUCC's metro systems with a nuanced RUDC scheme is best for revealing the geographical complexities of poverty within US metro areas.[8] Poverty in metro but mixed rural and rural counties has the potential to be distinct from that facing the populations of the central city and remote rural places. As the Obama administration seeks to redefine urban investment (Shulman, 2009), a nuanced picture of how that investment will influence poverty in the diverse geographies of metropolitan areas is vital.

Notes

1. The 1990 RUCC classification included 10 categories.
2. The authors would like to thank Andrew Isserman for sharing the codes.
3. Means are weighted by the county population.
4. Our analyses focus on the contiguous 48 states. It is a fairly common practice in poverty literature to exclude Alaska and Hawaii at the county level because they are functionally different from the contiguous 48 states. Our sensitivity analysis shows that including them produces almost identical results.
5. All differences within each definition are statistically significant at the 0.001 level. However, significance testing is not appropriate when dealing with population data, especially for comparisons across various definitions because these are not independent samples, but recategorisations of the population. Nevertheless, whether or not these represent meaningful differences is a valid concern. It is, however, a subjective assessment. In the context of a poverty rate that was fairly stable over the last three decades of the 20th century, even modest differences deserve attention from academia and policy-makers, particularly when differences in poverty are echoed in patterns for other socioeconomic measures.
6. Jolliffe (2004) found that poverty rates in non-metro areas have been consistently lower than metro areas from 1991 to 2002 by using the fair market rent index to adjust for cost-of-living difference.
7. For detailed information on RHC and MTR, please refer to CMS's website at http://www.cms.hhs.gov/CertificationandComplianc/18_RHCs.asp (CMS, 2006a) and http://www.cms.hhs.gov/Telemedicine (CMS, 2006b).
8. For access to a dataset with a cross-classification of OMB and RUDC by US county, link to: http://cvp.evans.washington.edu/data-explorer/data-explorer-tool.

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