

## ORIGINAL ARTICLE

## Defining “Rural” for Veterans’ Health Care Planning

Alan N. West, PhD;<sup>1</sup> Richard E. Lee, MPH;<sup>1</sup> Michael D. Shambaugh-Miller, PhD;<sup>2</sup> Byron D. Bair, MD;<sup>3</sup>  
Keith J. Mueller, PhD;<sup>2</sup> Ryan S. Lilly, MPA;<sup>1</sup> Peter J. Kaboli, MD;<sup>4</sup> & Kara Hawthorne, MSW<sup>5</sup>

1 Veterans Rural Health Resource Center – Eastern Region, Department of Veterans Affairs, White River Junction, Vermont, and Togus, Maine

2 Department of Health Services Research and Administration, College of Public Health, University of Nebraska Medical Center, Omaha, Nebraska

3 Veterans Rural Health Resource Center – Western Region, Department of Veterans Affairs, Salt Lake City, Utah

4 Veterans Rural Health Resource Center – Central Region, Department of Veterans Affairs, Iowa City, Iowa

5 Office of Rural Health, Department of Veterans Affairs, Washington, DC

### Abstract

**Purpose:** The Veterans Health Administration (VHA) devised an algorithm to classify veterans as Urban, Rural, or Highly Rural residents. To understand the policy implications of the VHA scheme, we compared its categories to 3 Office of Management and Budget (OMB) and 4 Rural-Urban Commuting Area (RUCA) geographical categories.

**Method:** Using residence information for VHA health care enrollees, we compared urban-rural classifications under the VHA, OMB, and RUCA schemes; the distributions of rural enrollees across VHA health care networks (Veterans Integrated Service Networks [VISNs]); and how each scheme indicates whether VHA standards for travel time to care are met for the most rural veterans.

**Results:** VHA’s Highly Rural and Urban categories are much smaller than the most rural or most urban categories in the other schemes, while its Rural category is much larger than their intermediate categories. Most Highly Rural veterans live in VISNs serving the Rocky Mountains and Alaska. Veterans defined as the most rural by RUCA or OMB are distributed more evenly across most VISNs. Nearly all urban enrollees live within VHA standards for travel time to access VHA care; so do most enrollees defined by RUCA or OMB as the most rural. Only half of Highly Rural enrollees, however, live within an hour of primary care, and 70% must travel more than 2 hours to acute care or 4 hours to tertiary care.

**Conclusions:** VHA’s Rural category is very large and broadly dispersed; policy makers should supplement analyses of Rural veterans’ health care needs with more detailed breakdowns. Most of VHA’s Highly Rural enrollees live in the western United States where distances to care are great and alternative delivery systems may be needed.

**Key words** health care policy, rural definitions, veterans.

The views expressed in this article do not necessarily represent the views of the Department of Veterans Affairs or of the United States government. Dr. West had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. The authors have no conflicts of interest to report. For further information, contact: Alan N. West, PhD, VAMC (11Q), White River Junction, VT 05009; e-mail alan.west@va.gov.

doi: 10.1111/j.1748-0361.2010.00298.x

The Veterans Health Administration (VHA), which provides medical care to United States military veterans throughout the nation, is the largest integrated health care system in America. Re-organized in the 1990s into 21 regional administrative health care networks (Veterans Integrated Service Networks, or VISNs), VHA has

striven to improve health care access and quality for its 5 million+ active patients, who tend to be poorer, older, and sicker than those in other systems.<sup>1</sup> Recently, VHA established an Office of Rural Health to concentrate access and quality improvement efforts on the particular needs of rural veterans, as rural residents in general must

travel considerably longer to access health care, particularly for certain conditions or treatments.<sup>2,3</sup> To better understand the issues confronting rural veterans, VHA has developed a 3-category classification scheme that designates locations throughout the United States as *Urban*, *Rural*, or *Highly Rural*. Of veterans who are enrolled in VHA health care, roughly 5 in 8 are Urban residents, whereas 1 in 60 is a Highly Rural resident. VHA's classification scheme differs considerably from those used by other federal agencies and programs, so its policy implications may also be unique.

If policy makers seek to target the special circumstances involved in securing health care services in rural areas, their solutions will be shaped by the definition of "rural" used, affecting provider services and program costs. Medicare, for example, makes higher payments to physicians practicing in rural underserved areas and reimburses rural hospitals differently under 4 special designations (ie, critical access hospitals, sole community hospitals, rural referral center hospitals, and Medicare-dependent hospitals). The classification scheme an agency uses will guide its decisions to deploy resources such as primary care, emergency services, public health, general surgery, telemedicine, and mobile health clinics, and to concentrate other services in more densely populated areas. It is important, therefore, to understand how a classification scheme such as VHA's may yield a different appreciation of veterans' health care needs than other commonly used schemes.

Urban-rural classification schemes have been based on counties, ZIP codes, census blocks, or combinations of these geographical units.<sup>4-6</sup> There are advantages and disadvantages to using each of these different building blocks: County information is readily available and easy to understand, but counties often span large and diverse regions that only loosely reflect actual health care service areas. ZIP codes are smaller geographical units and therefore more precise, but they are defined by postal delivery routes, not governmental jurisdiction (some even cross county lines), and they are subject to change annually. The even smaller geographical units defined by the Census Bureau (census blocks, block groups, and tracts) do not change any more frequently than every decade and can be aggregated to county boundaries, but they typically are not available in most health care-related datasets.

The most commonly used county-based scheme is that of the federal Office of Management and Budget (OMB),<sup>7</sup> which defines 3 categories: A *Metropolitan* area includes 1 or more central counties with Urbanized Areas (areas identified by the Census Bureau as having populations of at least 50,000), as well as adjacent counties that are

economically and socially integrated with that core. *Metropolitan* areas are based on counties with Urban Clusters of between 10,000 and 49,999 residents. The remaining counties are designated as *NonCore*, and include the most rural areas. Other county-based schemes include the United States Department of Agriculture (USDA)'s Rural-Urban Continuum Codes and Urban Influence Codes, which further subdivide the basic OMB categories.

The most commonly used scheme based on census tracts is the system of Rural-Urban Commuting Areas (RUCAs) developed by the University of Washington and the USDA's Economic Research Service.<sup>8</sup> RUCA takes into account primary and secondary commuting patterns to Urbanized Areas, Urban Clusters, or smaller population centers to classify census tracts into 33 distinct categories, which typically are combined into fewer and larger categories for data analyses. Most health-related studies have used 4 higher-level categories, most often RUCA's categorization A (available at: <http://depts.washington.edu/uwruca/ruca-uses.php>), which defines them as follows: *Urban* areas have Metropolitan cores (as in the OMB definition) and substantial primary or secondary commuting flow patterns to Urbanized Areas. *Large Rural Towns* have Metropolitan cores and substantial commuting patterns to Urban Clusters. *Small Rural Towns* have primary commuting flows to or within population centers of between 2,500 and 9,999 residents. *Isolated Rural Towns* are less populated rural areas with no primary commuting flows to Urbanized Areas or Urban Clusters. Because census tract information is rarely available in health care data, a ZIP code crosswalk to the RUCA categories has been developed (and can be downloaded from the website provided above).

VHA's Urban/Rural/Highly Rural (U/R/HR) classification scheme is a hybrid in that it is based partly on census tracts and partly on counties. Census tracts that belong to Urbanized Areas are designated as *Urban* locations; all other locations are considered *Rural*, except for those in counties with average population density of less than 7 residents per square mile, which are designated as *Highly Rural*. VHA has "geo-coded" the home addresses of all veterans currently enrolled in its health care system, and has used these codes to assign enrollees to U/R/HR categories and to estimate their travel times to VHA care facilities. Since ZIP and county codes also are available, we could assign enrollees to OMB and RUCA categories as well, and thereby compare the 3 classification schemes with respect to the overlap of categories, their implications for understanding whether VHA travel time standards are being met, and their capacities for revealing regional variations.

### Method

VHA's Planning Systems Support Group (PSSG, a field unit under the Assistant Deputy Under Secretary for Health Policy & Planning) has "geo-coded" the home street addresses of all veterans who were enrolled in VHA health care, though not necessarily active users, at the end of September 2007. PSSG combined latitudes and longitudes with sophisticated travel time and road condition data to assign each enrollee to "travel time bands" surrounding the nearest VHA primary care, acute care, and tertiary care facilities. From VHA's Austin Information Technology Center, we obtained an SAS (SAS Institute Inc., Cary, North Carolina) file containing these geo-codes, ZIP codes, Federal Information Processing Standard (FIPS) county codes, travel time bands, and VHA Urban/Rural/Highly Rural designations for all enrollees. This data file includes 8,503,395 unique individuals (including some who were denied enrollment). Because we sought to compare VHA categories with the RUCA and OMB schemes, we included enrollees only and eliminated any individuals for which geo-codes, ZIPs matching RUCA

codes, or county codes matching OMB codes were missing, which left 8,334,939 unique enrollees (98%) for analysis. OMB categories were assigned by linking county codes using a Census Bureau crosswalk (available at: [www.census.gov/population/www/metroareas/metrodef.html](http://www.census.gov/population/www/metroareas/metrodef.html)). RUCA categories were assigned by linking ZIP codes to a crosswalk produced by the University of Washington ("ruca\_2\_national," available at: <http://depts.washington.edu/uwruca/ruca-uses.php>).

Data analyses were descriptive, yielding tables representing the numbers (and percentages) of enrollees in each combination of categories across classification schemes, numbers (and percentages) in each travel time range away from VHA primary, acute, or tertiary care, and numbers (and percentages) in each category for each VISN.

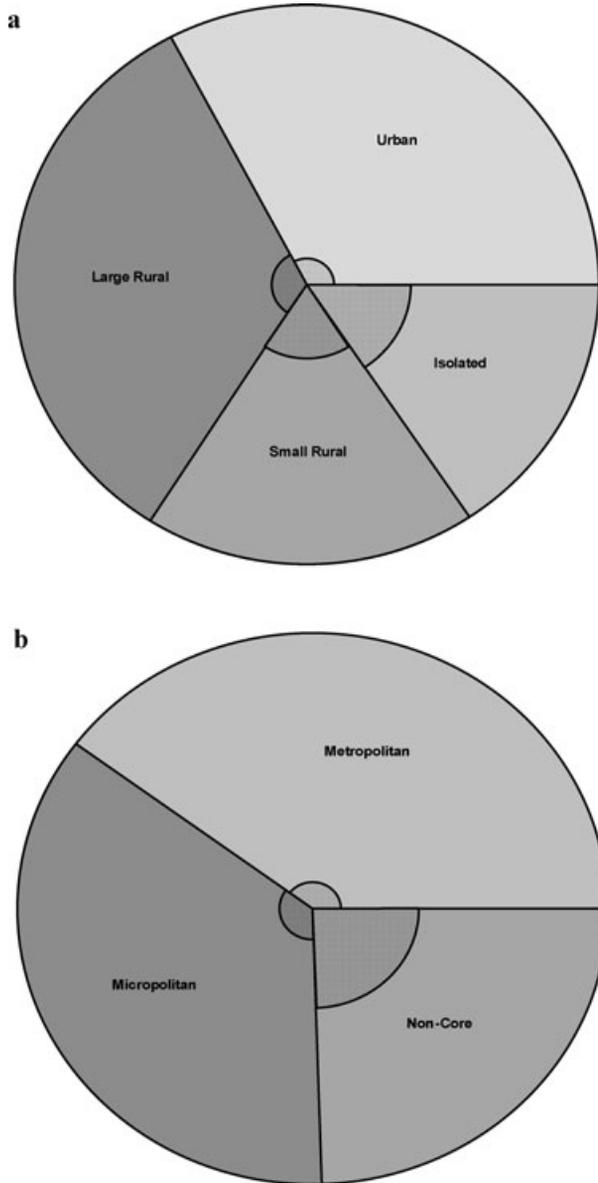
### Results

Table 1 shows the counts and percentages of enrollees in (1) each category of the VHA's U/R/HR classification scheme (upper rows); (2) each category of the RUCA and

**Table 1** Agreement Between VHA's Urban-Rural Designations and RUCA or OMB Designations

	Enrollees Classified by VHA as:			Row Total
	Urban	Rural	Highly Rural	
Total Enrollees:	5,177,994	3,031,357	125,588	8,334,939
Percentage of All Enrollees:	62.1%	36.4%	1.5%	100%
Number of Enrollees (& Percent in Column) Classified by RUCA as:				
<i>Urban</i>	5,176,560 (99.9%)	1,025,385 (33.8%)	7,661 (6.1%)	6,209,606 (74.5%)
<i>Large Rural Town</i>	792 (0.0%)	1,034,559 (34.1%)	15,519 (12.4%)	1,050,870 (12.6%)
<i>Small Rural Town</i>	467 (0.0%)	540,789 (17.8%)	40,228 (32.0%)	581,484 (7.0%)
<i>Isolated Rural Town</i>	175 (0.0%)	430,624 (14.2%)	62,180 (49.5%)	492,979 (5.9%)
Number of Enrollees (& Percent in Column) Classified by OMB as:				
<i>Metropolitan</i>	5,163,758 (99.7%)	1,244,703 (41.1%)	12,186 (9.7%)	6,420,647 (77.0%)
<i>Micropolitan</i>	13,238 (0.3%)	1,106,245 (36.5%)	19,781 (15.7%)	1,139,264 (13.7%)
<i>NonCore</i>	998 (0.0%)	680,409 (22.4%)	93,621 (74.6%)	775,028 (9.3%)
	Enrollees Classified by OMB as:			
	<i>Metropolitan</i>	<i>Micropolitan</i>	<i>NonCore</i>	
Number of Enrollees Classified by RUCA as:				
<i>Urban</i>	6,103,522	68,419	37,665	
<i>Large Rural Town</i>	164,570	866,185	20,115	
<i>Small Rural Town</i>	92,775	106,321	382,388	
<i>Isolated Rural Town</i>	59,780	98,339	334,860	

**Figure 1** Comparisons of the VHA Classification Scheme to the Other Schemes. Area of Each Circle Represents All Rural and Highly Rural Enrollees (As Defined by the VHA Scheme). Hash-marked Areas Near the Center of Each Circle Contain the Highly Rural Enrollees. Different Sectors of Each Circle Represent the Divisions Defined by the Other Scheme. (a) Comparison of the VHA Scheme to the RUCA Scheme. (b) Comparison of the VHA Scheme to the OMB Scheme.



OMB schemes (rightmost column); and (3) each VHA category broken down into RUCA or OMB categories (middle columns). Comparisons of VHA's classification scheme with the RUCA and OMB schemes also are represented graphically in Figure 1. Each circle in the figure represents all the Rural and Highly Rural enrollees as defined by the VHA scheme, with the area of each seg-

ment reflecting the number of enrollees belonging to it; the interior hash-marked sections represent Highly Rural veterans while the outer areas represent Rural veterans. Figure 1a shows the correspondence of VHA and RUCA categories; Figure 1b shows the relationships between VHA and OMB categories. Since very few enrollees that the VHA scheme classifies as Urban are classified by the other schemes as non-urban, for simplicity they are not represented in the figures.

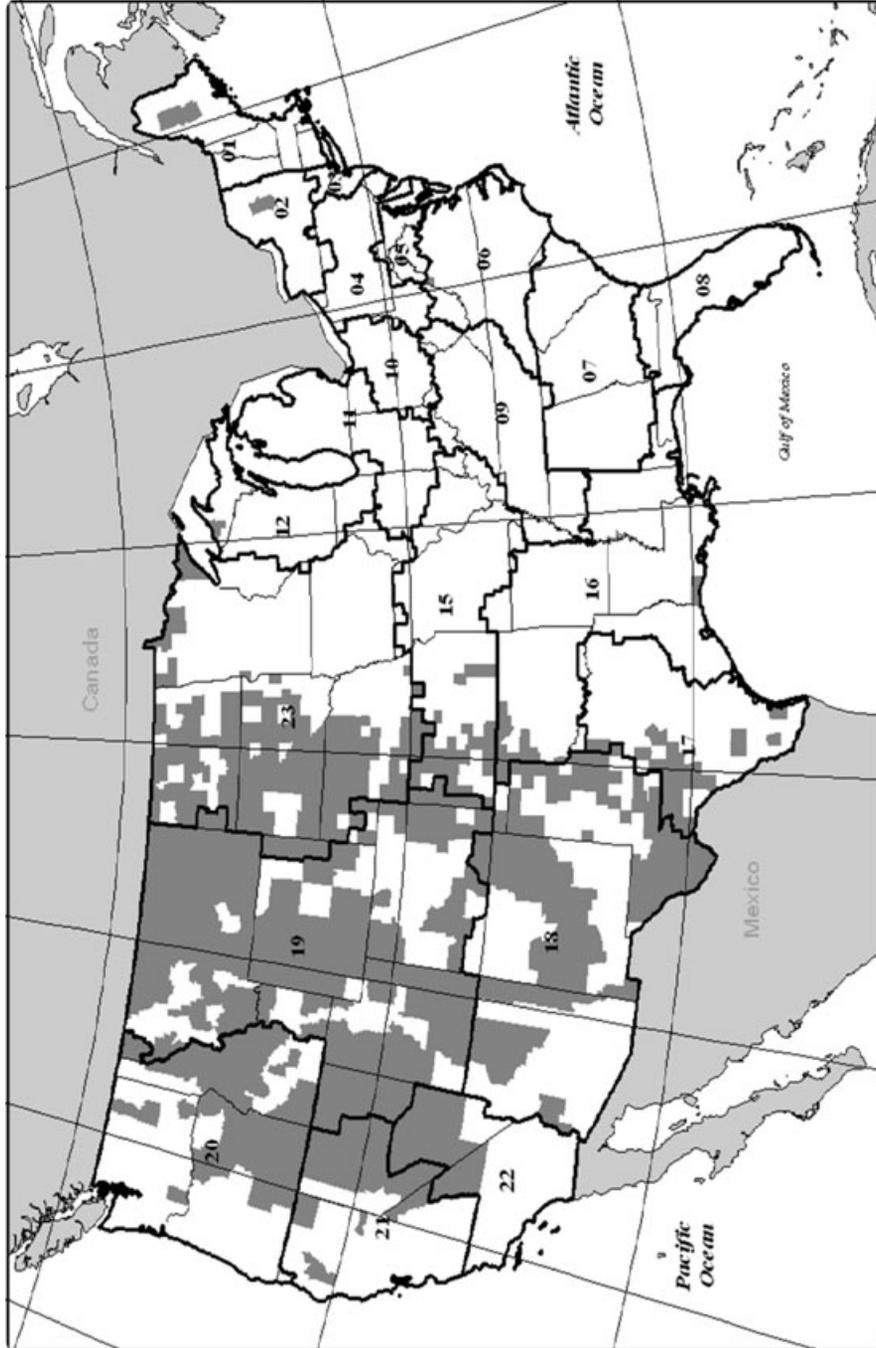
The VHA scheme designates 62% of enrollees as Urban residents, and nearly all of these individuals are in the RUCA Urban and OMB Metropolitan categories, as well. But these latter categories are about 20% larger, and include more than a million veterans that the VHA scheme designates as rural. VHA's Urban category, therefore, appears to be "more urban" than those in the other schemes, as it is limited to census tracts in Urbanized Areas.

VHA's Highly Rural category is quite small, representing only 1.5% of all enrollees, while RUCA's Isolated Rural category is 4 times larger, and OMB's NonCore is 6 times larger. About 4 out of 5 Highly Rural enrollees live in either Isolated or Small Rural Towns under RUCA, and 3 of every 4 are NonCore under OMB. The remaining Highly Rural enrollees, however, include residents in the other RUCA or OMB categories, even the most urban.

VHA's Rural category, which accounts for 36% of enrollees, also is distributed across RUCA and OMB categories, reflecting differences in definition and geographical unit (ie, county, ZIP, or geo-code) across schemes. Because VHA's most urban and most rural categories are considerably smaller than those in the other schemes, its Rural category includes 3 to 5 times as many enrollees as are in the middle RUCA or OMB categories. More than one-third of VHA Rural enrollees are Urban under RUCA and Metro under OMB. In effect, both the most urban and the most rural categories are defined more narrowly in the VHA scheme than they are in the other schemes, while VHA's Rural designation is much broader than their middle categories.

A map of US counties, with Highly Rural counties in blue (Figure 2), shows that most are in the mid- or intermountain West (as well as Alaska, which is not shown). It also shows that many are very large geographically. Though the East has many rural areas, it has only 2 Highly Rural counties, in upstate New York and northern Maine.

Table 2 shows the percentages of VHA enrollees in the different VHA, OMB, or RUCA categories for each VISN separately, sorted from least to most with respect to the proportion of enrollees living in urban settings. Only 4 VISNs (18, 19, 20, and 23, which together span



**Figure 2** Highly Rural Counties (Dark) in the Veterans Integrated Service Networks Spanning the 48 Contiguous States.

**Table 2** Percentage of Enrollees in Each VHA, RUCA, or OMB Category, by Veterans Integrated Service Network (VISN)

	VHA Categories			RUCA Categories				OMB Categories		
	Urban	Rural	Highly Rural	Urban	Large Rural	Small Rural	Isolated Rural	Metro-politan	Micro-politan	NonCore
National N	5,177,994	3,031,357	125,588	6,209,606	1,050,870	581,484	492,979	6,420,647	1,139,264	775,028
National%	62.1	36.4	1.5	74.5	12.6	7.0	5.9	77.0	13.7	9.3
VISN	%	%	%	%	%	%	%	%	%	%
23	36.4	56.9	6.7	47.3	18.9	13.7	20.1	50.7	22.3	27.1
15	41.3	57.6	1.1	52.1	21.9	13.9	12.1	56.6	23.0	20.4
9	44.8	55.2	0.0	59.1	18.3	14.1	8.6	64.4	18.5	17.1
2	49.8	50.1	0.1	66.3	17.2	7.6	8.9	71.8	19.8	8.4
16	49.9	50.0	0.1	66.7	15.7	10.3	7.3	69.6	17.0	13.4
6	50.4	49.6	0.0	66.4	17.4	8.3	7.9	68.2	20.0	11.8
7	55.3	44.7	0.0	74.8	13.1	7.0	5.1	77.3	13.8	8.9
20	57.6	36.4	6.0	71.7	14.9	7.0	6.4	73.3	18.2	8.4
19	58.0	26.7	15.3	68.0	12.4	10.6	9.0	68.5	15.2	16.3
11	58.4	41.6	0.0	72.7	12.9	9.6	4.8	74.7	14.5	10.9
18	62.5	32.0	5.6	74.1	14.8	6.8	4.4	77.3	16.3	6.4
4	62.9	37.1	0.0	75.5	15.7	4.3	4.5	78.6	16.7	4.7
17	63.3	36.1	0.6	80.2	9.6	6.0	4.2	82.9	8.2	8.9
10	66.0	34.0	0.0	79.1	15.0	4.6	1.3	80.7	14.9	4.3
1	68.9	30.8	0.3	78.1	9.6	4.7	7.5	80.0	12.4	7.6
12	69.4	30.4	0.2	77.8	9.0	7.2	6.0	79.0	11.7	9.4
21	72.8	25.9	1.3	80.6	11.8	4.2	3.4	85.9	10.2	3.9
5	75.7	24.3	0.0	86.7	8.2	2.7	2.5	91.4	5.1	3.5
8	78.4	21.6	0.0	89.7	6.5	2.6	1.2	88.7	8.3	3.0
22	90.5	8.6	1.0	95.5	3.2	0.8	0.5	99.0	0.9	0.0
3	94.8	5.2	0.0	98.7	0.3	0.7	0.4	99.2	0.0	0.8

the Rocky Mountains, Northern Plains, Pacific Northwest, and Alaska) have substantially more than 1% of their enrollees living in Highly Rural settings. Under the RUCA scheme, on the other hand, more than half the VISNs across the country have at least 5% of their enrollees living in Isolated Rural settings, and under the OMB scheme more than half have at least 8% of their enrollees living in NonCore settings. Given the expanses involved, travel distance is likely to be a much greater issue in Highly Rural veterans' access to health care. To assess this likelihood, we counted the enrollees who live within various ranges of travel times to the closest VHA primary care facility, acute care hospital, or tertiary care hospital.

VHA access standards<sup>9</sup> specify that (1) 70% of veterans should have to travel no more than 30 minutes to VHA primary care if they are Urban or Rural residents, or more than 1 hour if they are Highly Rural; (2) 65% should travel no more than 1 hour to access a VHA acute care hospital if they are Urban, 90 minutes if Rural, and 2 hours if Highly Rural; and (3) 65% should travel no more than 2 hours to VHA tertiary care if they are Urban or Rural residents, or beyond VISN boundaries if they are

Highly Rural. Table 3 shows the numbers and percentages of enrollees whose travel times fall into various ranges. Under any of the 3 classification schemes, more than 70% of enrollees in its most urban category live within a half-hour of VHA primary care, within 60 minutes of VHA acute care, and within 2 hours of VHA tertiary care, well surpassing the access standards for urban enrollees. About two-thirds of enrollees in the most rural RUCA or OMB categories live within an hour of VHA primary care and within 2 hours of VHA acute care, and 4 out of 5 live within 4 hours of VHA tertiary care, surpassing the access standards for the most rural enrollees, as well. Under the VHA classification scheme, however, only half of Highly Rural enrollees live within an hour of primary care, and about 70% must travel more than 2 hours to get to acute care and more than 4 hours to get to tertiary care (it is noteworthy, however, that the percentage of Highly Rural enrollees who used VHA health care in the past 3 years was about the same as for other enrollees—Highly Rural: 72%; Rural: 71%; Urban: 69%). In short, all 3 schemes indicate that VHA access standards are well met for urban veterans, but while the OMB and RUCA schemes suggest that the standards also are met for the most

**Table 3** Travel Times to the Closest VHA Primary, Acute, and Tertiary Care, by VA, RUCA, and OMB Classifications

Minutes to Travel to VHA Care:	Numbers of Enrollees, by Residence and Time to Care (Percentages Are for Each Column and Care Type)											
	VHA Categories				RUCA Categories				OMB Categories			
	Urban N = 5,177,994	Rural N = 3,031,357	Highly Rural N = 125,588	Urban N = 6,209,606	Large Rural N = 1,050,870	Small Rural N = 581,484	Isolated Rural N = 492,979	Metropolitan N = 6,420,647	Micropolitan N = 1,139,264	NonCore N = 775,028		
<b>Primary Care</b>												
1-15	2,851,780 55%	432,171 14%	16,972 14%	2,938,694 47%	292,219 28%	51,618 9%	18,392 4%	2,968,107 46%	280,955 25%	51,861 7%		
16-30	1,854,723 36%	715,371 24%	10,507 8%	2,252,833 36%	188,751 18%	76,914 13%	62,103 13%	2,282,770 36%	213,631 19%	84,200 11%		
31-60	437,377 8%	1,384,149 46%	33,655 27%	934,720 15%	399,661 38%	283,163 49%	237,637 48%	1,053,528 16%	437,120 38%	364,533 47%		
61-90	31,874 1%	427,530 14%	29,986 24%	77,885 1%	145,887 14%	135,491 23%	130,127 26%	105,135 2%	174,845 15%	209,410 27%		
91-120	1,507 0%	61,287 2%	17,612 14%	4,015 0%	18,999 2%	25,863 4%	31,529 6%	8,856 0%	24,494 2%	47,056 6%		
>120	733 0%	10,849 0%	16,856 13%	1,459 0%	5,353 0%	8,435 1%	13,191 3%	2,251 0%	8,219 1%	17,968 2%		
<b>Acute Care Hospital</b>												
1-15	1,195,944 23%	78,015 3%	2,675 2%	1,207,597 19%	60,813 6%	7,477 1%	747 0%	1,213,215 19%	59,583 5%	3,836 0%		
16-30	1,454,778 28%	180,628 6%	958 1%	1,581,505 25%	35,949 3%	12,780 2%	6,130 1%	1,585,277 25%	38,670 3%	12,417 2%		
31-60	1,303,138 25%	726,818 24%	6,947 6%	1,678,002 27%	186,140 18%	104,629 18%	68,132 14%	1,742,146 27%	183,220 16%	111,537 14%		
61-90	567,284 11%	829,737 27%	12,304 10%	836,821 13%	288,970 28%	156,705 27%	126,829 26%	909,329 14%	302,992 27%	197,004 25%		
91-120	301,905 6%	602,097 20%	15,398 12%	431,233 7%	227,548 22%	134,731 23%	125,888 26%	463,557 7%	261,477 23%	194,386 25%		
>120	354,945 7%	614,062 20%	87,306 70%	474,448 8%	251,450 24%	165,162 28%	165,253 34%	507,143 8%	293,322 26%	255,848 33%		
<b>Tertiary Care Hospital</b>												
1-15	830,927 16%	3,203 0%	0 0%	834,099 13%	0 0%	0 0%	31 0%	834,130 13%	0 0%	0 0%		
16-30	1,164,243 22%	62,436 2%	13 0%	1,222,831 20%	2,449 0%	1,173 0%	239 0%	1,223,975 19%	1,295 0%	1,422 0%		
31-60	1,131,950 22%	394,228 13%	2,062 2%	1,382,353 22%	90,789 9%	35,438 6%	19,660 4%	1,422,382 22%	76,892 7%	28,966 4%		
61-90	629,845 12%	561,745 19%	2,070 2%	870,321 14%	178,843 17%	86,533 15%	57,963 12%	922,217 14%	176,997 16%	94,446 12%		
91-120	476,536 9%	605,952 20%	2,401 2%	642,947 10%	229,348 22%	120,993 21%	91,601 19%	674,957 11%	260,270 23%	149,662 19%		
121-240	677,849 13%	1,137,076 38%	32,923 26%	929,118 15%	428,625 41%	263,840 45%	226,265 46%	1,010,578 16%	472,933 42%	364,337 47%		
>240	266,644 5%	266,717 9%	86,119 69%	327,937 5%	120,816 12%	73,507 13%	97,220 20%	332,408 5%	150,877 13%	136,195 18%		

rural veterans, the VHA scheme indicates that they are not.

## Discussion

Although the 3 classification schemes differ considerably in the numbers of VHA health care enrollees that they designate as rural residents, they all show that the proportions of rural veterans among enrollees are substantial and warrant attention. VHA's Rural category, in particular, is defined quite broadly and includes 3 to 5 times the enrollees that the middle RUCA or OMB categories have. On the other hand, RUCA's Isolated Rural Towns and OMB's NonCore locales include about 4 and 6 times more enrollees, respectively, than the VHA's Highly Rural category. Most Highly Rural veterans also belong to these RUCA and OMB categories, indicating that they live in places that all schemes agree are the most rural. The most urban RUCA and OMB categories each include more than 6 million enrollees, at least 1 million more than belong to VHA's Urban category. In effect, both the most urban and the most rural categories are defined more narrowly in the VHA scheme than they are in the other schemes, suggesting that the VHA categories may better reflect specifically urban or remotely rural populations.

These comparisons, however, are only to the highest-level OMB or RUCA categorizations; that is, to 3 or 4 major categories, respectively. Using RUCA's 10-category breakdown, or the 10 Rural-Urban Continuum Codes or 12 Urban Influence Codes derived from the OMB categories, would no doubt provide greater refinements, particularly in distinguishing different rural settings. The 33 smallest RUCA categories, in particular, can be combined in multiple ways to reflect different levels of population density or commuter travel to urban centers. VHA's broad Rural definition includes many areas that RUCA or OMB consider urban, so its policy implications may be unclear. The potentially detrimental impact of defining rural too broadly was illustrated by Mueller and associates,<sup>10</sup> who described how the TRICARE rural definition, which excludes only central cities, was applied to Medicare Part D: To ensure rural access to care, policy makers mandated that pharmacies must be available within 15 miles of at least 70% of rural residents. But the broad TRICARE definition includes many areas that most people would consider suburban; as a result, the access standard could be met without including any areas that other schemes would define as rural. Applied to a 7-state region, for example, the access standard could have been met even if services to sparsely populated North Dakota were omitted entirely. In effect, a policy intended to benefit rural residents might have helped few. Consequently, VHA policy

makers may benefit from supplementing their analyses of the health care needs of Rural enrollees by including classifications from other schemes that use more narrowly defined categories. Actionable rural health policy implications may be more likely to emerge from these narrower classifications.

Though VHA's Rural enrollees are distributed widely throughout its VISNs nationwide, in more than half of the VISNs, Highly Rural veterans account for less than 1% of all enrollees. Aside from 2 counties in upstate New York and northern Maine, the Highly Rural category is generally not relevant to the eastern half of the United States, and would not directly impact rural health policy there. Most Highly Rural enrollees live in the western half of the United States, where travel distances tend to be much greater. Yet several Highly Rural veterans live in places that the other schemes classify as more heavily populated. This seemingly contradictory situation can occur if a veteran lives in or near an Urban Cluster (but not an Urbanized Area) census tract in a physically large county having a low population overall, as appears to be the case for several Western counties. Because VHA's Highly Rural definition is based on whole counties being sparsely populated, distance is likely to present a greater challenge to accessing health care in these areas. An example of a possible implication is that mobile health clinics to deliver primary care may in fact turn out to be less cost-effective in Highly Rural than Rural areas because of the great distances that a clinic must travel to provide services to a few veterans in each locale. Mobile clinics may well have to set up in the few population centers in Highly Rural counties, with veterans still needing to travel substantial distances to get to them. In many situations, it may prove more cost-effective to increase veterans' mileage reimbursement.

If policy makers were to rely solely on either the RUCA or OMB scheme, they would conclude that access standards for any of the 3 levels of care have been met for the great majority of enrollees, regardless of whether they live in the most urban or most rural settings. If, however, they used VHA's classification scheme, they would see that the standards are far from fully met for Highly Rural veterans. On the other hand, the larger RUCA or OMB categories reveal that there are many more veterans for whom access standards are not met (eg, about 175,000 Isolated Rural enrollees or 275,000 NonCore enrollees live further than 1 hour from VHA primary care) than the entire Highly Rural population. Policy formulation, therefore, should supplement conclusions based on VHA's classification scheme with additional information from the more detailed breakdowns available in other schemes.

## References

1. Oliver A. Public-sector health-care reforms that work? A case study of the US Veterans Health Administration. *Lancet*. 2008;371:1211-1213.
2. Chan L, Hart LG, Goodman DC. Geographic access to health care for rural Medicare beneficiaries. *J Rural Health*. 2006;22:140-146.
3. West AN, Weeks WB, Wallace AE. Rural veterans and access to high-quality care for high-risk surgeries. *Health Serv Res*. 2008;43:1737-1751.
4. Coburn AF, MacKinney AC, McBride TD, Mueller KJ, Slifkin RT, Wakefield MK. *Choosing Rural Definitions: Implications for Health Policy*. Omaha, NE: Rural Policy Research Institute Health Panel; 2007. Available at: <http://www.rupri.org/Forms/RuralDefinitionsBrief.pdf>. Accessed July 27, 2009.
5. Ricketts TC, Johnson-Webb KD, Taylor P. *Definitions of Rural: A Handbook for Health Policy Makers and Researchers*. North Carolina Rural Health Research and Policy Analysis Center; 1998. Available at: [http://www.shepscenter.unc.edu/research\\_programs/rural\\_program/pubs/report/ruralit.pdf](http://www.shepscenter.unc.edu/research_programs/rural_program/pubs/report/ruralit.pdf). Accessed July 27, 2009.
6. Miller K, Fluharty CW. *RUPRI Farm Bill Policy Brief # 1: Targeting Rural Populations Based on Urbanized Area Geographies*. RUPRI Policy Research Institute; 2006. Available at: [http://www.rupri.org/Forms/RUPRI\\_Farm\\_Bill\\_Policy\\_Brief\\_3\\_.pdf](http://www.rupri.org/Forms/RUPRI_Farm_Bill_Policy_Brief_3_.pdf). Accessed July 27, 2009.
7. US Census Bureau. *Metropolitan and Micropolitan Statistical Areas*. Available at: <http://www.census.gov/population/www/metroareas/metroarea.html>. Accessed July 27, 2009.
8. US Department of Agriculture. *Rural-Urban Commuting Area Codes*. Available at: <http://www.ers.usda.gov/Data/RuralUrbanCommuntingAreaCodes/>. Accessed July 27, 2009.
9. Planning Systems Support Group & Healthcare Analysis and Information Group. *FY 2006 Geographic Access to Veterans Health Administration*. Available at: [http://vawww.pssg.med.va.gov/PSSG/geo\\_access/FY2006/Geocoding\\_FY06\\_April\\_08-2.pdf](http://vawww.pssg.med.va.gov/PSSG/geo_access/FY2006/Geocoding_FY06_April_08-2.pdf). Accessed September 12, 2009.
10. Mueller KJ, Slifkin RT, Shambaugh-Miller MD, Randolph RK. Definition of rural in the context of MMA access standards for prescription drug plans. A Joint Publication of the RUPRI Center for Rural Health Policy Analysis (Policy Paper P2004-7) and the North Carolina Rural Health Research and Policy Analysis Center (Working Paper No. 79). Available at: <http://www.unmc.edu/ruprihealth/Pubs/p2004-7.pdf>. Accessed October 6, 2009.