RTC: RURAL

Disability Patterns in Rural Areas

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Introduction

Data about rural people with disabilities have been unavailable for 13 years. This is a result of the shift from the Census *Long Form* to the American Community Survey (ACS). This lack of information and resulting knowledge gap has hindered researchers' and policy makers' ability to analyze and respond to needs of people with disabilities in rural areas. Recently released data offer insight into the distribution of disability across America and will improve our understanding of the diverse and complex nature of rural disability. This renewed understanding has major implications for planning and implementing local, state and federal policies, and programs that address issues of disability in rural America.

The Data: The American Community Survey (ACS)

The ACS replaced the U.S. Census's detailed *Long Form* sample in 2005. The *Long Form* sample collected data on 17% of the population once per decade. The ACS samples 2.5% of the population each year. This arrangement produces data for larger areas annually, but it takes up to five years to accumulate a sample sufficiently large to conduct analyses for smaller, more rural areas (e.g., counties with populations below 20,000). The five-year estimates for the smaller, rural areas have been published annually since 2010. However, because the disability indicator questions were not asked before 2008, disability data covering the entire United States were collected through 2012 and became available in late 2013.

Disability Measures

Disability is a complex phenomenon and can be challenging to define. The World Health Organization's International Classification of Functioning, Disability and Health (2001) defines disability as "an umbrella term for impairments, activity limitations or participation restrictions (p. 3)." Impairments are problems in body function or structure, activity limitations are difficulties an individual may have in executing activities and participation restrictions are problems an individual may experience in involvement in a life situation (WHO, 2001). More simply, disability can be understood as an interaction between an individual's functional abilities and limitations and their environment.

This analysis of disability is based on six ACS questions which are indicative of impairments and activity limitations. Four questions are on functional limitation and ask if a respondent has:

1) Serious difficulty hearing (or is deaf; HEAR)
2) Serious difficulty seeing (or is blind; SEE)
3) Difficulty concentrating, remembering, or making decisions because of a physical, mental, or emotional problems (COGNITIVE)
4) Serious difficulty walking or climbing stairs (WALK).

Two additional questions inquire about selected difficulties with Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL). These questions ask if a respondent has:

5) Difficulty bathing or dressing (SELF)
6) Difficulty doing errands on one's own because of a physical, mental, or emotional problem (independent living; IL).

A total impairment estimate is derived by counting any person who self-identified as having one or more of these six impairments or limitations.

Defining Rural

Defining "rural" is also not without challenges. Our analysis of rural disability draws on the Office of Management and Budget (OMB, 2013) definitions of non-metropolitan and metropolitan statistical areas, with non-metropolitan counties considered to capture "rural." Two types of non-metropolitan county classifications are used by OMB: micropolitan, made up of counties with one or more urban clusters of 10,000 to 49,999 persons, and non-core counties, with towns under 10,000.

	Counties		Population		Persons with Impairments		
County Type	Number	Percent	Number (in mill)	Percent	Number (in mill)	Percent of US	Percent in County
United States	3146	100	303.97	100	36.55	100	12.0
Metropolitan	1167	37.1	259.00	85.2	29.31	80.2	11.3
Micropolitan	641	20.4	26.44	8.7	4.02	11.0	15.2
Non-Core	1338	42.5	18.52	6.1	3.22	8.8	17.4

Table 1: Population and Persons with Impairments, U.S. total and by County Type (derived from ACS 2008-2012)

Overview: Impairment in America

Of over 300 million Americans, 36 million report experiencing at least one type of impairment. Most people with impairments, like most Americans, live in metropolitan counties. 85% of the total population, and 80% of people with impairments reside in metropolitan areas.

Micropolitan counties house 8.7% of the total population and 11% of all people with impairments. Non-core counties contain only 6.1% of the total population but nearly 9% of all people with impairments. Combined, these rural counties encompass nearly 15% of the total U.S. population and nearly 20% of all people with impairments. While the national impairment rate stands at 12% (1 in 8), rates of impairment are higher in micropolitan counties (15%) and non-core counties (17%). As evidenced above, disability is over-represented in micropolitan areas and even more so in non-core counties (Table 1).

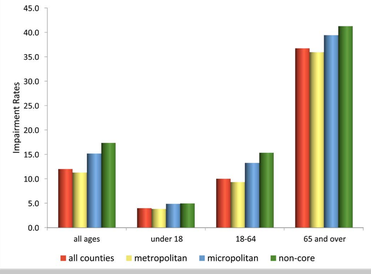

Figure 2. Impairment Rates: Total and by Age Group, and by County Type (derived from ACS 2008-2012)

Impairment in Metropolitan, Micropolitan and Non-core Counties by Age

Impairment rates are lower for young people (under 18, with only 4%) and higher for older people (65 and over, with nearly 37%). As micropolitan and non-core counties have higher shares of elderly than metro areas, one might expect that impairment is over-represented in these areas because of their relatively high shares of elderly. However, micro and non-core impairment rates are higher across all age groups. The most rural (non-core) counties, followed by micropolitan counties, have above average impairment rates for all age groups, for young people under 18, persons of working age between 18 and 64, and elderly age 65 and older. Comparatively high rates of impairment in rural America prevail, after taking the size of age groups into account.

NIDRR NATIONAL INSTITUTE ON DISABILITY AND REHABILITATION RESEARCH

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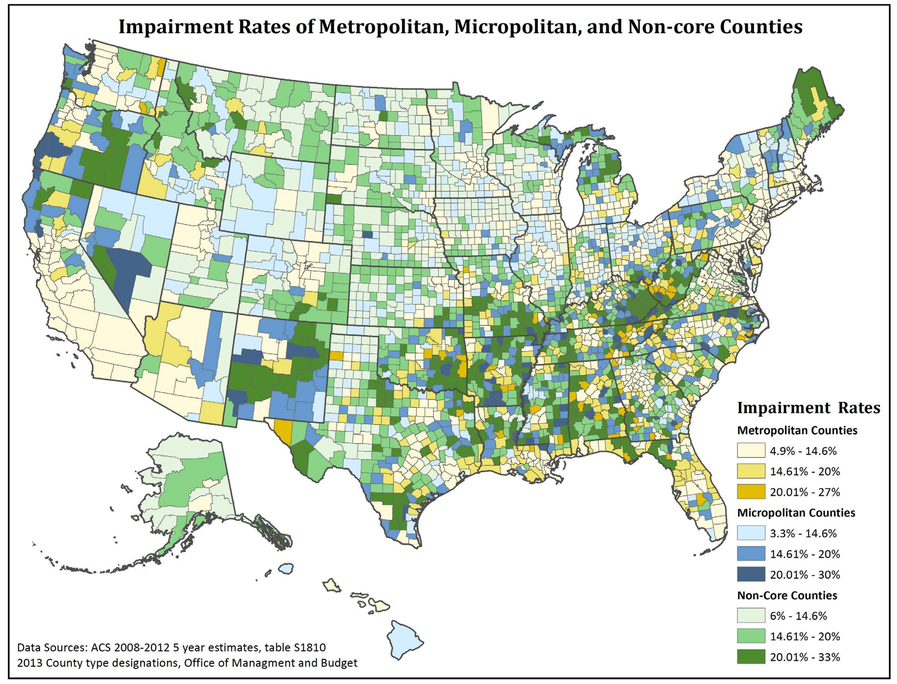

Figure 1. Spatial Patterns of Impairment Rates

Spatial Distribution of Impairment by Metropolitan – Micropolitan – Non-core Counties

Figure 1 shows county impairment rates for metropolitan, micropolitan, and non-core counties. Counties shaded in yellow are metropolitan counties, those shaded in blue are micropolitan counties, and those shaded in green are non-core counties.

From the map it is clear that there are high concentrations of high rates of impairment across the rural South and in patches throughout the Northwest. The map is dominated by green and blue through the Great Plains and into the South revealing that a majority of counties in the US, 62.9%, are non-metropolitan (micropolitan or non-core) counties. These non-metropolitan counties have higher rates of disability than their metropolitan neighbors. The average rate of persons with impairments in micropolitan and non-core counties is 15.2% and 17.4% respectively. The rate of persons with impairments in metropolitan counties is only 11.3%, making for 12.2% nationally.

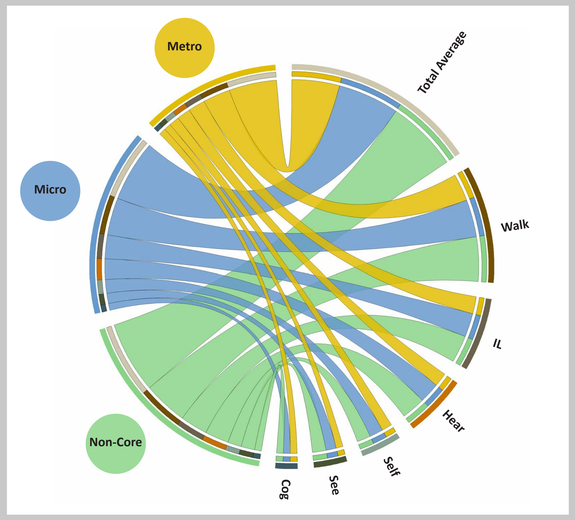

Figure 3. Impairment Types by Metropolitan, Micropolitan, and Non-Core

Circos Graph by Impairment Types

This graph depicts the rates of impairment of people living in metropolitan, micropolitan and non-core counties across the United States. Rates of total impairment as well as rates for different impairment types are shown. Color-coded ribbons connect county types on the left to impairment types on the right. The width of the ribbons at each end reflects the proportion of impairment. From this graph, it is clear that rates for every type of impairment are higher in micropolitan and highest in non-core counties.

Hot Spot – Cold Spot Analysis

Figure 1, on the left, of impairment rates for metropolitan, micropolitan, and non-core counties suggests that disability is not randomly distributed. Figure 4a, below, displays the very same data but in a different color scheme highlighting counties with above or below average rates of impairment. This same data is also used as input in a Hot Spot - Cold Spot Analysis, a systematic method of identifying spatial clusters of counties with above- or below-average impairment rates.

This analysis can help to detect the presence of spatial clusters, which may point towards underlying geographic phenomena. We use the Getis Ord Gi* measure (Getis and Ord, 1992), which takes the value of a county and values of neighboring counties into account. For this analysis, neighbors were defined by a queen contingency, counties sharing either an edge or a corner. Values at the extreme end of the spectrum (high disability rates or low disability rates), if adjacent to counties with similar values, are at the core of forming spatial clusters (hot spots or cold spots), while single and isolated high or low value counties do not form a cluster and are visually suppressed. Hot spot - cold spot maps consequently reveal and accentuate patterns of spatial clustering.

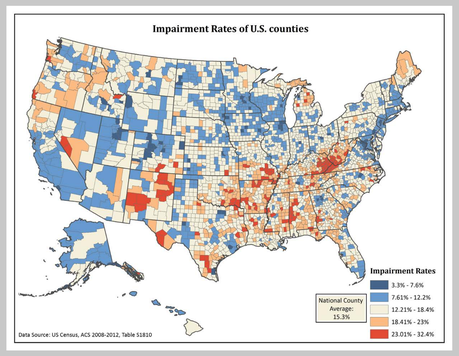

Figure 4a. Impairment Rates of U.S. Counties

We ran the Hot Spot - Cold Spot Analysis for two variables: disability rates for individuals 65 years or older (Figure 4b), and total rate of disability across all ages (Figure 4c) to take into account differences in disability by age. Both maps are quite similar. However, clusters with sizeable youthful populations (such as the Kansas-Oklahoma-Texas Panhandle region with a young, ethnic labor force in the meat processing industry, or Southern California) vanish when showing spatial clusters of person 65 and older.

Both maps highlight how cold spots of counties with relatively low rates of disability tend to cluster around larger urban areas. In fact, of the 20 urban areas with the largest populations, all but three are found at the center of significant cold spots across the country. A majority of these urban areas are found in the northern half of the country, following the cold spot trend seen in the map. The hot spot clusters on the map are dominated by rural non-core and micropolitan counties. This particular method also reveals that hot spots are more prevalent in the south than the north. However, it is valuable to note that counties with high rates of impairment are found in the North and conversely counties with low rates of impairment are found in the South (as illustrated in Figure 4a above). These counties are suppressed in the Hot Spot - Cold Spot Analysis because there is limited spatial clustering around these counties. Figure 4d further shows that micropolitan and non-core counties, in aggregate, dominate in hot spot clusters and metropolitan counties prevail in cold spot clusters.

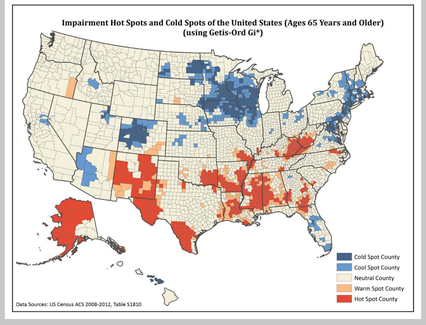

Figure 4b. Impairment Hot Spots and Cold Spots for Individuals 65 Years and Older

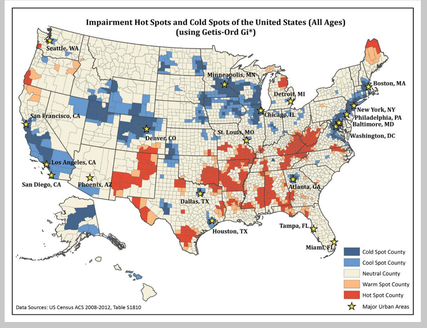

Figure 4c. Impairment Hot Spots and Cold Spots for All Ages with Large Urban Areas

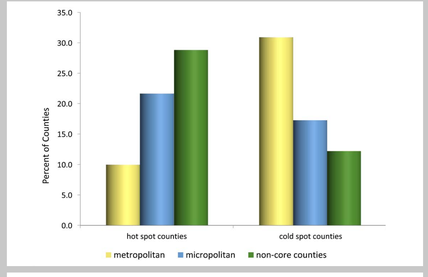

Figure 4d. Hot Spot and Cold Spot Counties by County Type

Summary and Conclusions

While most persons with impairments live in metropolitan areas, impairment rates are above average in non-metropolitan America. Additionally, within non-metropolitan counties, these rates are higher in the more rural non-core counties than micropolitan counties. Although impairment is only one aspect of disability, the impairment data clearly suggest rural dimensions of disability. This analysis focused on descriptive measures and general spatial patterns. Further analysis is needed to explore correlates of disability. Other socio-demographic and environmental factors, such as employment or poverty may contribute to disability. No matter the details, rural policy and decision makers need to be cognizant of the rural dimensions of disability.

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