Differential Access to Quality Rural Health Care: Professional and Policy

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Abstract:

Using a national dataset, the influence of the community and individual provider characteristics on the availability of healthcare resources in rural areas was evaluated. Disparities continue to exist in the availability of providers including organizational types of providers such as Community Health Centers and Community Mental Health Centers. A lower percentage of nonmetropolitan counties have such centers, and more rural counties within the general grouping of nonmetropolitan counties have fewer of these organizational resources. A case study on the Southwestern region of Virginia is presented to highlight the impact on health outcomes and an innovative community response to the lack of availability of needed healthcare services.

Keywords: access | community health center | community mental health center | rural | shortage

Article:

Improving the quality of healthcare provided to individuals who live in rural areas is a formidable task. The quality of healthcare services in rural areas affects both residents of rural areas and those who travel through rural areas and who may unexpectedly need emergency care. Lower financial resources available to support healthcare combined with barriers posed by the lack of public transportation, compounded with long distances to providers, interfere with access to rural healthcare. The lack of availability of health science libraries and tertiary care facilities challenges providers who seek to keep up with ever-changing knowledge bases in their field. These barriers combine to threaten the health status of rural people. They also threaten the ideal goal of having quality healthcare available in all communities.

In this study the differential effects of community resources available in rural (nonmetropolitan) and nonrural areas are determined for the country. Then, the impact of community characteristics of rurality, poverty, median age of the community upon the availability of health services facilitative of rural healthcare provision, such as community health centers (CHCs) and community mental health centers (CMHCs), which are approved as Medicare providers, are

evaluated. Finally, the impact of the lack of availability of formal health services on a specific local area is demonstrated, followed by a description of a successful community response.

This article identifies barriers to quality rural healthcare and provides examples of how these barriers interfere with the availability of the most up-to-date healthcare practices. These barriers combined with differential access to care are postulated to be related to different patterns of health utilization and worse health outcomes. Finally, one rural region of Virginia is used as a case example of the need to examine the unique characteristics of local communities to guide the development of healthcare solutions. Within this community an innovative community health fair provided through the Remote Area Medical Volunteer Corps[1] provides a concrete example of the level of unmet healthcare need and the creative response of this organization and a large number of professional and nonprofessional volunteers. This organization provides services in needy areas, and in 2003 it provided care in India, Nepal, Honduras, and South America, in addition to Virginia, Georgia, Florida, and Kentucky.[2] Challenges to the public, to the professions, to policy makers, and to researchers are identified.

BACKGROUND AND SIGNIFICANCE

The US Department of Health and Human Services recognized the inferior health status of rural individuals in its publication, "Healthy People 2010: Understanding and Improving Health." According to the report, the rate of injury-related deaths in rural areas is 40% higher than that in urban areas. Lower use of preventative medicine, lack of insurance, difficulty in obtaining emergency or specialty care, and lower likelihood of using seat belts or exercising combine with higher rates of heart disease, cancer, and diabetes to create a significant health disparity between rural residents and urban residents. The report also found rural adults to be approximately 36% more likely than urban adults to report "fair" or "poor" health status.[3] Because rural cultures often place value on traits such as self-sufficiency and independence, rural residents may be less likely to seek professional care for health problems.[4] For both transportation and cultural reasons, many people living in rural areas prefer to receive care locally, but affording and recruiting healthcare professionals can be extremely difficult and requires unique strategies.[4]

Commonly cited barriers to rural healthcare in America include lack of financial resources to obtain care, distance to care, lack of transportation, and a shortage of healthcare professionals that varies by profession, region, and state. Consistently, rural areas are noted to have lower rates of all types of healthcare professionals, with rates declining in the most rural areas.[5] As Van Dis noted, 20% of Americans live in rural areas, and the same is true of only 9% of physicians.[6] This geographic disparity results in shortages in the availability of needed providers. It also influences different supply trends and poses different challenges for specific provider groups serving rural communities.

Care-seeking behaviors also vary by urban/rural categorization. One study found that residents of the most rural counties and counties of fewer than 10,000 adjacent to large suburban areas were more likely to have a usual source of care than were metropolitan residents. Nevertheless, rural residents had fewer ambulatory visits.[7] Residents of communities with no more than 2,500 residents were almost twice as likely to have regular sources of care as those in large metropolitan areas.[7]

Merwin et al[5] provide a conceptual framework for examining the impact of community characteristics such as rurality and poverty on the availability of general and mental healthcare providers in the community that will guide an evaluation of the importance of these factors in facilitating access to care. This model is based on supply and demand theory, which describes the interactive relationships between a community's choices to purchase healthcare and the supply of providers in the community. The characteristics of the community, together with the ability to purchase healthcare services and therefore demand healthcare services from providers, affect the supply of providers. Ultimately these factors affect the services received by community members and the outcomes of healthcare. This study compares the availability of resources in metropolitan and nonmetropolitan areas and determines the influence of the type of rural community, its regional location, and the availability of specific types of providers on the availability of 2 types of organizational providers: the federally funded CHC and CMHCs approved for Medicare funding. Consideration of the impact of the lack of healthcare resources on the unmet need will be examined through a targeted examination of Southwest Virginia.

RESEARCH DESIGN

A correlational design using all of the counties in the country was conducted. The dataset used was the Area Resources File, 2004.[8] This dataset includes a collection of variables obtained from other data sources, aggregated to the county level. It was constructed by the Bureau of Health Professions of the Health Resources and Services Administration to support health planning and policy making. Variables are defined in tables that follow. The dataset contained 3,2 records. Records for Alaska, the Virgin Islands, Guam, and 1 county in Colorado established after much of the data was collected were deleted. All other counties and independent cities in the United States and Puerto Rico were included and are referred to as counties in this study. Therefore, 3,114 records were used in this analysis. Since the county is the unit of analysis, the study results represent information about counties versus information about individuals residing in the counties. A limitation of this study is that there is no geographic measure to describe the distance between each rural county and the nearest CHC or CMHC as well as service availability in nearby communities. The Center for Medicare and Medicaid Services' 2002 provider of service file was the original source of data for the presence of CHCs or CMHCs, reflecting only centers that are Medicare-approved providers. Other types of organizations and satellite clinics also exist in communities. A comprehensive evaluation of whether or not a particular community is in need of a CHC or CMHC based on the availability of all types of organizations delivering services is a relevant evaluation but is beyond what is covered in this article. These limitations will be partially overcome in an ongoing study.

This study determines differences in community characteristics, provider availability, and the presence of publicly funded community health and mental health centers between counties located in metropolitan and nonmetropolitan areas. The study then evaluates the impact of community characteristics including regional location, classification of rurality, rates of availability of different types of practitioners on the presence of 1 of more CHCs, and/or CMHS's in a county. Next, a case study regarding the response of one local community to the lack of availability of health resources is presented.

FINDINGS

Table 1 demonstrates statistically significant differences in community characteristics between metropolitan and nonmetropolitan counties in the United States. Nonmetropolitan areas are much smaller, have an older population, have a lower percentage of non-White individuals in their population, and have about $5,000 lower per capita income on average and a 3.7% higher percentage of the population living in poverty in comparison with metropolitan areas. There are consistently fewer providers in nonmetropolitan areas. There are almost twice as many physicians per capita in metropolitan areas versus nonmetropolitan areas. Physician specialty groups reflect even greater disparity that differs in amount by type of specialty. For example, there are 3.8 surgeons per 10,000 census in metropolitan areas in comparison with 1.7 surgeons per 10,000 census in nonmetropolitan areas. But there are only 0.3 psychiatrists and 0.03 child psychiatrists per 10,000 census in nonmetropolitan areas in comparison with 0.8 psychiatrists and 0.15 child psychiatrists per 10,000 in metropolitan areas. The differences are not as large, but are still statistically significant, for doctors of osteopathy. Nurse practitioners also have higher rates of availability in metropolitan areas versus nonmetropolitan areas while there is no difference for physician assistants.

Table 1. Comparison of community characteristics, health professional resources, and publicly funded community health and mental health centers in nonmetropolitan counties versus metropolitan counties

		Metropolitan (*n* = 1,086)		**Nonmetropolitan (*n* = 2,028)**	
Variable	**Definition**	**Mean**	**SD**	**Mean**	**SD**
Census*	Census population in 2000	213,791	472,117	23,973	22,921
Medage*	Median age in 2000	35.8	3.37	38.2	4
Pctnw*	Percent non-White in population, 2000	17.4	15.2	14.2	16.6
Pci*	Per capita income, 2001, in dollars	26,132	7,893	21,428	4,514
Pctpov*	Percent poverty, 2000	10.9	4.5	14.6	5.7
Mdnfcen*	Nonfederal MDs in 2001 per 10,000 census	20.1	19.4	10.6	9.9
Drostcen*	Total doctors of osteopathy, nonfederal & federal, 2001	1.3	1.6	1.2	2.1
Surgcen*	Nonfederal surgical specialists (MDs) in 2001	3.8	4	1.7	2.4
Npcen*	Nurse practitioners in 2001 per 10,000 census	2.2	2.2	1.8	2
Pacen	Physician assistance in 2003 per 10,000 census	1.8	1.6	1.8	2.1
Psychcen*	Nonfederal psychiatrists in 2001 per 10,000 census	0.8	1.3	0.3	0.6
Chpsycen*	Nonfederal child psychiatrists in 2001, per 10,000 census	0.15	0.2	0.03	0.13

$*P < 0.05$.

Differences on the availability of resources in metropolitan and nonmetropolitan areas have been long recognized, and 2 types of publicly funded organizations have been developed as part of the solution to meet healthcare needs of populations throughout our country. The extent to which different types of rural areas that make up the general classification of nonmetropolitan areas have benefited from the placement of CHCs or CMHCs in their communities is shown in Table 2. To determine factors that explain the presence of 1 or more CHCs and/or CMHCs in a county, background information on the classifications of the Department of Agriculture's 2003 Rural/Urban Continuum Codes and the region of the country was compared for metropolitan and nonmetropolitan areas. The influence of rural classification, region of the country, community demographic characteristics, and the availability of providers was determined (Table 3). In these

analyses, classifications of rural areas within the nonmetropolitan area are contrasted with metropolitan areas that serve as the reference category for these analyses. For regions of the country the South serves as the reference category. The logistic regression results show that 956 counties have 1 or more CHCs. The only type of rural classification that did not have a lower probability of having a CHC was the category 5 areas, those with an urban population greater than 20,000 and not adjacent to a Metro area. In general, the more severe the definition of *rural* the lower likelihood of the county having a CHC. Specifically, the completely rural areas with fewer than 2,500 urban population and not adjacent to a Metro area had the lowest likelihood of having a CHC. There were also differences based on the regional location of the county. After controlling for the rural classification of the county, counties located in the Northeast were 3.7 times more likely to have a CHC in their county, the West was 3.1 times more likely to have a CHC, and there was no difference in the Midwest in comparison with the South. Therefore, the South and the Midwest were the least likely regions to have a CHC in their counties after the type of rural classification (based on the size of urban population and adjacency to metro area) was controlled for. Counties with higher median age, higher percentages of minority populations, higher availability of physicians, and nurse practitioners were more likely to have a CHC in their county. When the specific census of the population is added to the model, the rate of availability of physicians becomes nonsignificant as does the R4 rural classification.

Table 2. Frequencies of community health and mental health centers and counties by rural–urban and regional classification

		Metropolitan (*n* = 1,086), %	**Nonmetropolitan (*n* = 2,028), %**
CHC1	Presence of 1 or more federally qualified health centers, 2002	41	25
CMHC1	Presence of 1 of more community mental health centers, 2002	24	7
Rural*	Category 1–3 = Metropolitan; Category 4–9	35	65
Nonmetropolitan classifications			
R1	Counties of metro areas of 1 million population or more	13	0
R2	Counties in metro areas of 250,000–1,000,000 population	10	0
R3	Counties in metro areas of fewer than 250,000 population	11	0
R4	Urban population of 20,000 or more, adjacent to a metro area	0	7
R5	Urban population of 20,000 or more, not adjacent to a metro area	0	3
R6	Urban population of 2,500–19,999 adjacent to a metro area	0	20
R7	Urban population of 2,500–19,999, not adjacent to a metro area	0	14
R8	Completely rural or less than 2,500 urban population, adjacent to a metro area	0	7
R9	Completely rural or less than 2,500 urban population, not adjacent to a metro area	0	14
Region			
Reg1	Northeast	57	43
Reg2	Midwest	27	61
Reg3	South	39	61
Reg4	West	30	70

*The 2003 Rural/Urban Continuum Codes are quoted definitions from National Center for Health Workforce Analysis.[8(pp11–12)] All variables are from reference 8.

Table 3. Impact of rural classification, region, community characteristics, and provider availability on publicly funded community health and mental health centers in rural counties

	Community health center		Community mental health center	
Parameter	**Estimate**	**Odds ratio**	**Estimate**	**Odds ratio**
Intercept	–3.71*		–1.78*	
R4	–0.57*	0.56	–0.3	0.73
R5	–0.43	0.64	–0.08	0.91
R6	–1.26*	0.28	–1.26*	0.28
R7	–1.11*	0.32	–1.53*	0.21
R8	–1.10*	0.33	–2.27*	0.1
R9	–1.47*	0.22	–2.81*	0.06
NorthEast (1)	1.31*	3.7	0.32	1.38
Midwest (2)	0.19	1.21	0.00	1.0
West (4)	1.14*	3.15	0.63*	1.88
Medage	0.02*	1.03	–0.00	0.99
Pctnw	0.02*	1.02	0.01*	1.01
Pctpov	0.10*	1.11	0.00	1.00
Mdnfcen	0.01*	1.01		
Drostcen	0.03	1.03		
Npcen	0.05*	1.05		
Pacen	–0.00	0.99		
Chpsycen	…		0.48	1.62
Psychcen	…		0.13*	1.14

The impact of these factors on the availability of a CMHC in the county was also evaluated. There was no difference for rural classifications with urban populations of 20,000 or more in their likelihood of having a CMHC. The more rural areas were much less likely to have a CMHC. However, as each rural classification had lower numbers of urban population and if the classification category indicated that the area was not adjacent to a metro area, there were progressively lower likelihoods of having a CMHC. Classifications R6–R9 had low odds ratios starting with 0.28 declining to 0.06 for the most rural classification (R9). The West had an odds ratio of 1.8, indicating a higher likelihood of having a CMHC than counties in the other regions. However, this reflects the inability of the Rural/Urban Classification scale to fully capture the influence of the size of the populations in the counties in the West. Counties with a higher percentage of non-White individuals were more likely to have a CMHC. When census of the county is added to the model, the odds ratio for the West is no longer significant and the median age of the county is also no longer significant. Because size of the population is a component of the Rural/Urban Classification, the models not controlling for census are reported.

LOCAL SOLUTIONS: A CASE EXAMPLE FROM SOUTHWEST VIRGINIA

Rural healthcare policy making often occurs at the federal or state level. Changes in health insurance plans or the availability of healthcare resources for health often have a major impact on healthcare in local communities. The lack of availability of providers in nonmetropolitan areas is demonstrated through the results presented above. These types of results can influence policy. However, the numbers above do not adequately describe the impact of a lack of providers on local communities. One approach to improving rural healthcare is focusing on the specific needs of a particular underserved community. Southwest Virginia is a rural area of Virginia that

will serve as an example of the specific needs for rural healthcare and an innovative approach to substitute intermittent volunteer healthcare for the lack of formal, ongoing needed healthcare services.

Previous researchers have been intrigued that despite a provider-to-patient ratio above the threshold for health profession shortage areas, residents of southwest Virginia have higher rates of morbidity and mortality.[9] The healthcare needs of the community are described as the researchers sought to determine the reason for this apparent paradox by conducting a survey, which revealed that southwestern Virginians had higher rates of chronic disease such as heart disease, hypertension, and diabetes, in comparison with the average Virginian. Although most respondents were covered by Medicaid or Medicare, many other members of their households lacked health insurance, and others could not afford to pay annual deductibles. Many did not receive regular care from a health provider, and lack of dental care was especially pronounced, with 5% of respondents having never been to a dentist.[9] Nineteen percent of those surveyed reported only seeking healthcare as a last resort. Medical expenses not covered by insurance, such as prescriptions, vision care, dental care, and preventative care, were especially difficult for southwestern Virginians to afford. Respondents reported sharing medications with family members without prescriptions.

OUTREACH RESPONSE TO NEEDS IN SOUTHWEST VIRGINIA

The necessity of meeting the immediate healthcare needs of the Southwest Virginia area and creating a healthcare system that can provide a sustained level of care for these residents persists. A response to this need has been the provision of a Remote Area Medical (RAM) Clinic in Wise, Va. The first clinic was held in 2000, and it has been a yearly 2½-day summer event since its inception. In 2005, this outreach event provided more than 6,400 patient encounters in a 3-day weekend clinic.[1,10] One of the authors (Snyder) served as a volunteer staff and shares her experience gained while serving as a volunteer.

This event provides extensive healthcare to overcome unmet healthcare needs in the community. Table 4 shows that the 2005 RAM Clinic in Wise, Va, provided $1,382,914 worth of free health services through the efforts of 980 volunteers. More than 2,000 individual patients were served including 992 who received general medical services and 328 who received laboratory work. Many patients received multiple services. There were 6,397 patient encounters for different services. There were 3,799 general medical encounters reflecting the need for multiple medical services for individuals who were seen. Specialty medical services were received including 75 dermatology, 23 ear, nose, and throat (ENT), 43 digestive health (GI), and 179 gynecology (GYN) encounters. Pharmacy, dental, eye, and audiology services were provided resulting in 958 prescriptions, 3,476 extractions, 1,023 fillings, and 710 pairs of prescription eye glasses received. Many procedures were conducted including 1,076 laboratory tests, 86 mammograms, 69 retinoscopies, and 59 ultrasounds. In addition, telemedicine was used for 2 clients to facilitate involvement of medical providers from distant sites, and 3 clients were sent by emergency transport to healthcare facilities. These services were provided because of the leadership of the local community, the RAM USA organization, and numerous volunteers. The process that evolved and resulted in this successful clinic is described as a model for other local initiatives.

Table 4. Health care services, 2005 Remote Area Medical (RAM) Clinic, Wise, Va*

	Total
Value of all services	$1,382,914
Volunteers	
Total	980
Patients served	2,376
General medical	992
Laboratory work	328
Services provided	
Patient encounters, any service	6,397
General medicine encounters	3,799
Special medical services	
Dermatology	75
ENT	23
GI	43
GYN	179
Pharmacy	
Prescriptions	958
Dental (51 chairs)	
Extractions	3,476
Fillings	1,023
Eye examinations (12 lanes of facilities)	
Prescription eye glasses	710
Audiology	200
Procedures	
Laboratory test performed	1,076
Mammograms	86
Retinosopies	69
Ultrasound	59
Linkage to health facilities	
Telemedicine consults	2
Emergency transports to emergency room	3

*Table constructed from raw data provided by RAM, USA, from S. Brock and C. Dalton (personal communication, October 2005) to A. Snyder.

Access to care provided by this project was initiated by local leadership, which sought the involvement of a national organization. A large tertiary care health system (the University of Virginia) located 6 hours away but with ties to the local community was engaged in addition to many other organizations and volunteers. The development of a massive response to community need is an organizational challenge. Additional information including a rich description of the origins of this clinic and of its functioning is provided at http://www.nursing.virginia.edu/centers/rhcrc/CommOut.asp. This offers direction for other communities seeking to develop local initiatives to meet the community healthcare needs.

CONCLUSIONS

The unmet need in the southwestern part of Virginia is part of an overall policy problem of lack of access to care and resultant poor health outcomes in rural areas in our country. While the

RAM clinic addressed unmet needs through volunteer efforts, the volume of participants willing to stand in long lines to receive needed health services and the presence of individuals who are using the annual RAM clinic as their only source of healthcare attests to the need for longer term policy solutions to unmet healthcare needs for many rural communities. The disparities in resources between metropolitan and nonmetropolitan areas are large. Longer term policy solutions are necessary to improve the ongoing, available formal infrastructure for healthcare in rural areas. Specifically, additional publicly funded health and mental health clinics need to be available in the most underserved areas, particularly in the communities that are in small, isolated communities. While these centers have been located in the types of rural areas within the rural–urban classification with 20,000 or more urban population, more attention needs to be given to increasing the placement of these organizations within rural areas with lower numbers of urban population. Although there will not be economy of scale returns by placing organizations in areas with small populations, the lack of availability of services may result in severe levels of unmet healthcare need, poor healthcare outcomes, and limited local healthcare services. Although the number of people living in these less densely populated areas may be small, the difficulties incurred by both the lack of transportation and too often low financial resources combine to make it difficult to seek healthcare outside of home communities. The differential availability of resources combined with poorer health outcomes and unmet health needs suggests that there needs to be systematic evaluation of the unmet needs of communities with this information being used to guide the development of the formal healthcare system in communities with high healthcare needs. This evaluation can guide the development of specific nursing and other clinical interventions as well as policy responses targeted to needy communities.

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