

Unique Health Care Delivery Considerations in Rural America

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ABSTRACT

Rural regions face significant health care disparities, including decreased access to insurance, increased access barriers to specialty care, worse medical outcomes, and increased mortality rates. People with multiple sclerosis (MS) residing in rural regions in the United States, as well as globally, face similar barriers to accessing MS care and experience poorer disease outcomes. Barriers to health care access include cultural and financial constraints, scarcity of services, a lack of trained physicians, insufficient public transport, and poor availability of broadband internet service. The Appalachian region, which contains a high degree of rurality, experiences increased disparities compared with the rest of the nation and can be used to highlight the unique challenges rural populations face. Appalachian residents can identify as private, and mistrust is a major factor in providing health care. Increasing the quantity and retention of Appalachian providers is essential to building trust. Still, it has proved difficult due to issues with compensation, taxes, malpractice fees, adverse actions against physicians, and high turnover rates. Telehealth interventions such as Project ECHO (Extension for Community Healthcare Outcomes) have improved rural outcomes in multiple diseases, including MS, but limited technology and technological literacy in rural areas impede the implementation of these interventions. Given the increasing rural population and ongoing disparities these communities face, there is a need to develop targeted interventions to improve access and outcomes in rural populations.

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According to the 2020 US Census, the rural population increased from 19.3% in 2010 to 20.0% in 2020.¹ Rural regions are associated with increased barriers to health care,^{2,3} worse medical outcomes,^{4,5} and increased mortality rates.⁶ The Appalachian region, which contains a high proportion of rural areas, can be used to highlight these challenges, as health disparities are often worse in both rural and urban parts of this region.⁷ People with multiple sclerosis (MS) residing in rural areas face similar challenges in accessing care⁸⁻¹³ and poorer outcomes,¹⁴⁻¹⁶ although this is not as well studied. Given the significant disparities these communities face, there is a need to develop targeted interventions to improve access and outcomes in rural populations.

HEALTH CARE DISPARITIES IN RURAL REGIONS

Although the definition of *rural* varies, the definition used by the 2020 Census states that rural populations are those outside of urban areas, which are defined as a densely settled core of census blocks with a minimum population of 5000 or a minimum housing unit threshold of 2000 units.¹ Over the past decade, diversity has increased in rural areas, but 76% of this population still identifies as non-Hispanic White.¹ Rural residents are also more likely to lack health insurance,¹⁷ complete lower levels of education,¹⁸ have a lower income, and face housing and food insecurity.¹⁹ However, these gaps have narrowed in recent years.

Significant differences in health care access exist between rural and urban areas. A retrospective study analyzing 474,674 patients from a large midwestern academic health center from June 2018 to March 2019 determined that patients in rural clinics had lower health care utilization, including primary care and specialty care visits, and overall worse health status than patients in urban clinics.² A 2023 study using census block groups to evaluate access to intensive care unit beds within a 60-minute drive time across the US found that rural areas had a higher percentage of no or below-average access than urban block groups.³ Multiple barriers to access issues have been identified, including cultural and financial constraints, scarcity of services, a lack of

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trained physicians, insufficient public transport, and poor availability of broadband internet services.²⁰

Lack of access is likely related to the elevated morbidity and mortality seen in rural areas. Prior studies showed that rural patients with acute myocardial ischemia were less likely to undergo cardiac catheterization,⁴ and patients with acute ischemic stroke were less likely to be seen by a neurologist and receive thrombolysis or thrombectomy.⁵ A study evaluating mortality in rural compared with urban areas found that mortality rates are higher in rural areas for conditions including cerebrovascular disease, heart disease, and diabetes.⁶ From 1999 to 2017, the rural-urban age-adjusted mortality rate ratio for cerebrovascular disease remained stable at 1.13 in 1999 and 1.09 in 2017. However, the ratios for heart disease increased from 1.06 to 1.21 and from 1.09 to 1.30 for diabetes.⁶ The lack of improvement in rural-urban morbidity and mortality over the past 2 decades emphasizes the ongoing disparities faced by rural populations despite attempted interventions.

APPALACHIA'S UNIQUE DISPARITIES

The Appalachian region includes 420 counties in 13 states, including all of West Virginia. The region roughly follows the Appalachian mountain range and covers 205,000 square miles, stretching from Mississippi to New York.⁷ Despite demographic and socioeconomic status similar to that of rural areas across the US, rural Appalachia continues to have even worse access to care and health outcomes; this region can be used to further highlight disparities faced by rural areas nationwide and explore unique patient perspectives.⁷ Appalachia experiences worse mortality from many conditions (eg, heart disease, cancer, chronic obstructive pulmonary disease, injury, stroke, and diabetes), a higher number of physically and mentally unhealthy days, increased prevalence of diabetes and obesity, increased suicide rate, and increased poisoning mortality rate compared with the US as a whole.⁷ These outcomes are even worse in rural compared with metro Appalachian regions.⁷

Health care in rural areas such as Appalachia is defined by multifaceted perspectives that affect access and outcomes. Appalachian residents can define themselves as private, self-reliant, and resistant to charity.²¹ Trust and mistrust are major factors in a patient's health care in rural areas,²¹ and Appalachian residents are less satisfied with convenience, information, quality, and courtesy of health care provided.²² Lack of access is also a possible etiology behind poorer health outcomes. Compared with the US as a whole, the Appalachian region has 12% fewer primary care physicians, 35% fewer mental health providers, 28% fewer specialists, and 26% fewer dentists, and these percentages are all worse in rural compared with metro Appalachian regions.⁷ Regarding neurologic care, a recent 2022 study found that Appalachian counties have between 25% and 35% less access to neurologic care within 60 miles compared with their non-Appalachian counterparts; this difference persisted even when stratified by urban and rural status.²³

Increasing the quantity and retention of providers in Appalachia has proven difficult. In West Virginia, the

number of specialty physicians per 100,000 is 24% lower than the national average,²⁴ and health care providers have named West Virginia the third-worst state in which physicians can practice.²⁵ Causative factors are related to compensation, taxes, malpractice fees, adverse actions against physicians, and high turnover rates. Workforce shortages and lack of necessary diagnostic equipment add to the state's characteristics.^{25,26}

Finally, rural providers have reported discrimination within these communities.²⁷ Providers can be drawn to rural communities in part due to the closeness of the people in the area, but providers in minority groups have reported micro-aggressions, insults, harassment, and exclusion in their community, office, and the wider medical community.²⁷ When providers are unable to establish positive relationships or find acceptance in their community, this can lead to relocation resulting in failed retention.²⁷ Recruiting and retaining health care providers is imperative to improve access and build patient trust.

DISPARITIES IN RURAL MS CARE

Although there is an abundance of literature describing rural health care disparities, few data are evaluating the unique challenges people with MS face in rural areas. Like other rural medical populations in the US, they may have difficulty accessing medical care. A 2007 observational study of 14,723 people with MS from the Veterans Affairs Multiple Sclerosis National Data Repository showed that veterans residing in rural areas and places farther from a medical center were less likely to have a specialty care visit.⁹ A study of 1518 people with MS residing in all 50 states found that those in rural areas reported greater difficulty in accessing MS-related and mental health care. Rural residents also reported more barriers, such as a lack of nearby or convenient facilities, money, or health insurance coverage, as well as an increased level of impairment compared with people with MS in urban areas.^{10,12} Most recently, a study computed geospatial access to a neurologist within 60 miles using 2022 Centers for Medicare & Medicaid Services Care Compare physician data for all US census tracts. Of 70,858 census tracts, 388 had no access to a neurologist within 60 miles, and rural regions had an 80% lower spatial access to a neurologist than urban areas.⁸ Access to an MS specialty center was even more limited, with 25% (17,837) of census tracts in the US not having access within 60 miles, and rural regions with 37% lower odds of having an MS center within 60 miles compared with urban areas. In addition, rural areas with higher percentages of Hispanic and Black individuals had lower access than rural communities with higher percentages of White individuals. These findings highlight the significant access needs in rural communities and the potential disparities of other important at-risk populations.

Given the lack of access to neurologists and MS specialists, it is not surprising that other studies have shown people with MS in rural areas were significantly more likely to receive their MS care at a family or general practice and reported less



PRACTICE POINTS

People who reside in rural areas, including individuals with multiple sclerosis, face significant health care disparities, including decreased access to insurance, increased access barriers to specialty care, worse medical outcomes, and increased mortality rates.

Appalachia, with its large, rural population, has even worse outcomes than other rural areas and highlights some of the unique challenges faced when treating rural populations, including mistrust of the health care system.

Telehealth can be used to improve rural outcomes, but its implementation is impeded by limited access to technology and decreased digital literacy, emphasizing the need to develop targeted interventions to improve outcomes and access for those in rural areas. ■

satisfaction with the quality of care received.^{10,11} They have also been shown to have restricted access to services separate from their MS-specific care. A study analyzing nursing home residents from June 1998 to December 2000 found that those who had previously lived in rural areas averaged significantly fewer minutes of physical, occupational, and psychological therapy and were less likely to have seen a licensed mental health specialist,¹³ suggesting there are undisclosed factors related to obtaining all facets of health care.

In addition to poor access to care, people with MS living in rural areas have been shown to have worse health outcomes. A study of 1518 people with MS living in all 50 states found that those in rural areas reported lower physical health-related quality of life,¹⁶ received less of the recommended combined medication and psychotherapy treatment for depression, and perceived their care was of lower quality.¹² In another study, rural veterans with MS were less likely to attend specialty visits; however, veterans attending specialty visits were more likely to have an active prescription for a disease-modifying therapy (DMT).⁹ These studies suggest that lack of appropriate access to care leads to suboptimal management and worse outcomes.

Rural disparities in health care for people with MS persist in international populations as well. A 2024 Canadian study found that people with MS residing in rural areas had fewer visits with neurologists, non-neurologist specialists,

ambulatory care clinicians, and MS tertiary clinic visits, along with fewer DMT dispensations compared with those residing in urban areas.²⁸ A study of people with MS in Iran from 1990 to 2016 found that people with MS experience delays of over 18 months from symptom onset to diagnosis and treatment, with worse delays observed for rural residents. The Expanded Disability Status Scale mean at presentation was also significantly greater for rural compared with urban people with MS.¹⁴ In Norway, between 1993 and 2019, the prevalence of MS was greater in rural compared with urban areas, which was unlikely to be explained by risk factors such as latitude, exposure to sunlight, and diet.²⁹ A 2014 observational study conducted in 2 rural counties and 1 urban county in Ireland found that people with MS in rural areas had higher overall unmet needs, particularly in the areas of financial needs related to MS and occupational therapy.¹⁵ Although rural disparities are likely influenced by local culture, patient perspectives, and insurance regulations, there is a global issue in access to MS care, suggesting common themes among all these populations.

POTENTIAL SOLUTIONS

Telehealth has been a proposed solution for many rural health-related disparities and has been shown to be useful in MS care. Telehealth interventions take a variety of formats, including direct synchronous patient and clinician videoconferencing visits and synchronous peer-to-peer consultations. In 2016, the ECHO (Expanding Capacity for Health Outcomes) Act was passed to support health care delivery models that utilize technology to connect specialists with primary care providers. The most widely implemented model is Project ECHO (Extension for Community Healthcare Outcomes), which pairs frontline clinicians in underserved areas with specialists in academic “hubs” using videoconferencing for case-based education. This program was piloted for hepatitis C treatment in the rural Southwest but has now been used for other disease states and locations. Studies suggest that these programs are effective at improving outcomes for patients with hepatitis C, chronic pain, dementia, and type 2 diabetes.³⁰

In MS, a pilot Project ECHO was tested. For 41 weeks, MS specialists and clinicians who worked outside of the specialty care setting connected on a weekly 60-minute videoconference. In exit interviews, participants reported improved confidence in treatment decisions, direct changes in patient care, changed practice habits for all of the participants' patients with MS, and increased perception that patients had confidence in the participant as an MS care provider.³¹ In addition to peer-to-peer telehealth programs, direct synchronous telehealth visits between patients and neurologists have also been shown to increase access for underserved populations. The aim of the VA National Teleneurology Program, funded by the Office of Rural Health, was to utilize telehealth to expand access to initial neurology consults for veterans. This program resulted in neurology consults being scheduled and completed faster compared with in-person consultations, and 51.5% of the participants resided in rural

locations.³² Although both of these interventions are promising for the MS community, barriers to widespread implementation should be considered, including lack of broadband capability and lower digital literacy, which have been described for rural populations.^{33,34}

Outside of MS and neurology care, other strategies have been evaluated to reduce barriers for rural-residing individuals with diabetes. Interventions that have resulted in improved disease management include encouraging self-management, community-based initiatives at farmer's markets, exercise classes, and group education sessions.³⁵ However, given the need for specialist care, imaging, and infusion management in MS, these types of interventions will need to be adapted to the unique needs of people with MS.

Most of the research on the barriers to care for people with MS in rural areas was done before the current diagnostic criteria were implemented and before the approval of many of the high-efficacy treatments. An updated understanding of contemporary barriers will be needed to develop and implement interventions.

CONCLUSIONS

Rural regions continue to face significant disparities in accessing health care and have poorer outcomes compared with urban populations.²⁻⁶ Appalachia, which has a large rural population, experiences worse health care disparities compared with the nation as a whole.^{7,23} Rural cultural perspectives, including characteristics such as being private, self-reliant, resistant to charity, and mistrusting of the health care system overall, play a role in the observed disparities,²¹ but there are also multiple systemic issues, including lack of access and workforce shortages.²⁴⁻²⁷ People with MS residing in rural areas face similar challenges accessing MS specialty care and experience worse outcomes compared with their urban counterparts, but this is understudied.^{8-13,16} Further studies are needed to characterize the contemporary barriers they face accessing care in relation to the current diagnostic criteria and availability of high-efficacy DMTs. Although telehealth is an effective strategy for reducing health care disparities in rural regions,^{30,31} it should be viewed as part of a multifaceted approach, as decreased technology availability and technological literacy limit its implementation in rural areas. Nationwide, more targeted interventions are needed to decrease rural health care disparities as rural populations grow. ■

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