

**The Influence of Different Social Factors on Transportation Barriers to Healthcare
Services in Rural Region of the United States**

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On my honor as a University Student, I have neither given nor received unauthorized aid on this
assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

Transportation is a significant social determinant of health and plays a large role in promoting a healthy life. The social determinants of health (SDOH) are non-medical factors that influence health outcomes. They are the conditions that shape everyday life and affect a wide range of quality of life outcomes and risks. The availability and reliability of transportation impacts a person's access to appropriate health care. In 2017, approximately 5.8 million Americans reported that transportation barriers prevented them from seeking proper medical care (Oluyede, et al., 2022). Transportation barriers to health care include lack of access to a vehicle or public transportation, inability to operate a transportation vehicle, long travel distances and times, and poor transportation infrastructures. These barriers interrupt one's ability to attend medical appointments and can lead to some not seeking health care at all.

While transportation barriers are a widespread issue across the entire United States, 40% of the United States population in rural areas have no public transportation services available and 25% have insufficient transportation (Glasgow, 2000a). Transportation is one of the most frequently stated concerns by rural residents when addressing limitations to their access to healthcare. Compared to their urban counterparts, rural regions face longer travel distances to healthcare facilities that oftentimes attributes to more delays in clinical interventions, chronic disease exacerbations, and unmet healthcare needs. Furthermore, rural regions frequently lack the public transportation system that are more commonly found in urbanized regions, placing a larger need on residents to rely on personal transportation, which is not always readily available.

It is crucial to examine the factors that are potentially contributing to these transportation barriers because it can lead to increased healthcare costs and impact the quality of life for individuals who are in need of medical support. This paper will focus on the different social

factors that influence transportation barriers to healthcare services in rural regions of the United States and the role it plays in achieving equitable healthcare. This research will be conducted through various literature reviews and syntheses to compile research and examine potential overlaps and gaps with each factor that affect transportation to healthcare. The Politics of Artifacts STS theory will be used to examine whether existing transportation systems favor a certain ethical value or promote a particular political order to further investigate the root causes of these barriers. Through this lens, we can analyze the social and political implications of transportation systems as a technology. The theory will be used to unveil the embedded political values of the current transportation systems and how they shape power dynamics. Additionally, Langdon Winner's theory reveals how artifacts are not neutral, but they are socially constructed. This STS theory will be utilized to move beyond seeing transportation as a neutral tool, but rather a tool that shapes social and political realities, particularly regarding healthcare access in rural regions of the United States.

Background

Transportation inequities have been long instilled within the United States. From the mid-1800s to mid-1900s, there were hundreds of state laws and constitutional amendments passed that legalized segregation and discrimination (*Transportation Inequity in the United States*, n.d.). The full extension of segregation affected many aspects of day to day life, including public transportation. These transportation inequities eventually led to inequities within the interstate highway system. The development of the interstate highway system from the Federal-Aid Highway Act of 1956 brought more than 40,000 highways (Fernandez, 2023). However, the creation of highways destroyed many under-resourced Black neighborhoods. Many

of the interstate systems today continue to disadvantage certain social groups, by either limiting their access to the interstate or not making them readily accessible (Brenman, 2007).

Many of the transportation barriers to healthcare today are rooted from past transportation inequities and have been fueled by urbanization. The shift of Americans from rural regions to more urban and suburban areas has shifted the dynamics of healthcare provision and accessibility. The increase in population in these urbanized areas has also greatly increased the amount of healthcare facilities and workers significantly. Rural Health Information Hub indicated that there were twice as many practicing dentists in urban and suburban areas than in rural areas (Roberts, n.d.). The centralization of healthcare services and workforce migration to urban areas has negatively impacted rural regions, thus resulting in many rural residents traveling further distances to meet their health care needs. According to a data analysis done by Hannah Friedman, rural Virginians must travel an average of two and a half to five times more than Virginians in metropolitan areas to seek essential hospital based healthcare services (*Rural Virginians Must Travel Long Distances to Hospital-Based Health Care Services*, n.d.).

Addressing transportation barriers is essential for ensuring that health care is accessible and equitable for all individuals. A lack of transportation can lead to further exacerbating existing medical concerns or delaying a potential diagnosis and treatment. An analysis done by the National Health Interview Study (NHIS) revealed a much higher prevalence of conditions for those who missed care because of transportation problems (Wallace et al., 2005). For example, the prevalence of frequent headaches in children was found to be twice as high in those who frequently missed care due to transportation problems compared to those who did not. A study done in Washington state found that for every 100-mile increase in driving distance to a primary care physician, the time to treat colorectal cancer increased to 14.6 days (Wercholuk, 2022),

emphasizing the importance of having proper transportation to prevent increased need of care. Additionally, missing or delaying care can lead to more treatments in the future (Syed et al., 2013), leading to more financial burdens on the patients to not only pay for the treatment, but to allocate more money for transporting to the health care center. Access to proper transportation can also increase access to healthier food options and vital services which in turn promotes a healthier lifestyle and thus reduces the chances of developing chronic illnesses (Abrahamson, and Skillen, 2021).

Research Question and Methods

To delve more about the issues with transportation barriers to healthcare, I will ask the following research question: How do different social factors influence transportation barriers to healthcare in rural regions of the United States? By evaluating what factors play a large role in this barrier, results could drive new policies and systems that can help transportation become more equitable for all individuals. To develop an answer to this question, I will be performing a literature review on several different articles and case studies. These articles will help compile research and examine the potential overlaps, gaps, and intersections with transportation barriers. The literature review will also serve to help guide new research directions and inform practice on what can be done to minimize the transportation barriers individuals encounter. Additionally, I will utilize the Politics of Artifacts STS theory to examine whether existing transportation systems favor a certain ethical value or promote a particular political order to further investigate the root causes of these transportation barriers to health care (Winner, 1980). Both the literature review and Politics of Artifacts STS theory will work to answer the research question at hand. By combining the findings from both methods, this research will aim to provide a comprehensive

understanding of how social factors interact to create transportation barriers to healthcare in rural America. This knowledge will be instrumental in developing solutions and policies to minimize healthcare inequality.

Results and Discussion

Low Income

Low income of residents in rural communities is a critical factor influencing transportation barriers to healthcare in rural regions. Many low income individuals struggle to own or maintain a personal vehicle, making it difficult to have a reliable transportation vehicle to use for attending healthcare services. As a result, they may forgo medical appointments due to the costs associated with transportation. The lack of public transportation options in rural regions also place a larger significance on owning a personal vehicle. In a qualitative study done on rural older adults, it was found that only 12% of communities who have populations of less than 2,500 have public transportation systems (Goins, et al., 2005). The lack of public transportation brings forth more complications with infrequent transit services, inconvenient public transportation schedules, and the need to ensure transit matches with medical schedules. Furthermore, the lack of nearby healthcare facilities cause many rural residents to travel farther distances to the appropriate healthcare facilities. According to findings from the 2017 National Household Travel Survey, rural residents traveled more than twice the distance as urban residents for medical care (17.8 miles compared to 8.1 miles respectively). Additionally, the time spent traveling was nearly 9 minutes longer for rural residents compared to urban residents (*Transportation to Support Rural Healthcare Overview - Rural Health Information Hub*, n.d.). The longer travel distance required deters many rural residents from making the travel in order to save costs on

transportation and potential overnight stays for other essential expenditures. The costs associated with vehicle ownership such as maintenance, fuel, and insurance can be prohibitive for low-income residents, effectively limiting their access to necessary healthcare services. More indirectly, rural residents who must travel farther distances for their healthcare will oftentimes sacrifice work to dedicate time to travel for the appointment. This can lead to a negative impact on their financial situation and will influence some to hold off on these appointments in an effort to save costs and missing work. Additionally, high costs of non-emergency medical services can deter low-income individuals from utilizing these services due to higher costs. Due to rural regions having fewer service providers and longer travel distances, costs for such services can be higher than their urban counterparts (“Understanding the Cost of Non-Emergency Medical Transportation (NEMT),” 2023), consequently preventing these residents from accessing the necessary healthcare services and facilities.

The lack of transportation systems in rural areas serve as not only physical artifacts, but political artifacts that are influenced with political decisions. The lack of public transportation systems made readily available in rural regions reflect and reinforce the prioritization of urbanization investment. This leaves many of the low-income residents in these rural regions with fewer healthcare access options due to the lacking transportation systems that do not cater to their specific needs. The poor transportation system not only reflects economic differences, but the political choices that shape and design the technological systems, in this case public transportation for low-income residents. These decisions ultimately determine who has access to healthcare and who does not, thus highlighting the influence low-income has on transportation barriers in rural areas.

Age

Age is another social factor that significantly influences transportation barriers to healthcare in rural regions of the United States. In a study by Nina Glasgow, it was found that a large majority of older rural residents relied on private vehicle usage as their main source of transportation (Glasgow, 2000). Each age bracket (65-74, 75-84, and 85+) displayed a percentage of 80 or higher for how many people relied on private vehicles, emphasizing how many older adults rely on their private vehicle. However, as adults age, many of them experience an increase in health problems such as visual or cognitive impairment and decline in mobility. This in turn affects their ability to operate a vehicle and travel for their healthcare needs. As a result, many of these adults have to turn to other avenues for transportation to healthcare services such as shared ride services and close social groups. While ride share services like paratransit and dial-a-ride are available to both urban and rural regions, it is still quite limited in rural regions. In states like Oregon, it was found that 69% of services were located in metropolitan areas, 19% in micropolitan areas, 12% in small towns, and 0% in rural areas (Freund et al., 2020). The absence of these rideshare services in rural regions cause many of the older adults to lose a reliable form of transportation, thus missing healthcare appointments and services. As a result, many older adults rely on close social groups such as family members and friends for providing transportation to meet their needs (*Older Adults & Transportation*, n.d.). Although many of the children and friends of these older adults will meet their transportation needs, several complications arise either from conflicting schedules or long distances between the family member and friend and the older adult. Moreover, not all older adults have access to a social group that can support and meet their transportation needs, leading them to rely on public transportation systems. Public transportation systems are sparse and not as readily accessible in

rural regions of the United States. In addition to the lack of public transportation in these areas, many of these transportation systems do not provide adequate infrastructure to older adults who may have disabilities (*Older Adults and People with Disabilities – RHHub Transportation Toolkit*, n.d.). This may include limited access to elevators, ramps, and supportive sidewalks and paved roads which can be a challenge for accessibility. It was found that older individuals who use wheelchairs were 65% less likely to use public transit than those who didn't due to public transit not having the accommodations for such medical equipment (PatientEngagementHIT, 2022), therefore blocking access to older individuals in rural regions to healthcare services.

Langdon Winner's, "The Politics of Artifacts" theory presents a framework for understanding how certain technological designs and systems, such as transportation services, embody specific forms of power and authority that prioritize certain demographics over others. Winner asserts that "in the technical realm, we repeatedly enter into a series of social contracts, the terms of which are revealed only after the signing" (Winner, 1980), sheds light on the implicit agreements within society about who may benefit from certain technological advancements. In this case of transportation accessibility to healthcare in rural regions, the social contract was designed without consideration of the older population's needs and their abilities. By not designing accessible and readily available public transportation options for older individuals, it is evident that these technological systems are not merely built for technological advancement, but rather have political properties and embody forms of power.

Race

Race is yet another social factor that largely impacts transportation in rural regions of the United States. In rural regions, minorities are more likely to use public transportation for all

non-work related trips (Probst et al., 2007). In a 2017 National Household Travel Survey, it was found that Black and Hispanic populations were 3 times and 2 times more likely to use public transportation compared with White populations respectively, which also align with lack of a private vehicle (Labban et al., 2023). In conjunction with the higher reliance on public transportation from minority groups, there is also an increase in rural diversity. According to a U.S. census measuring population change from 2000-2010, Non-Hispanic whites were about 80% of rural dwellers in 2010 (*Health Disparities Affect Millions in Rural U.S. Communities*, n.d.). The increased need and demand of public transportation from minority groups however is unmet in these rural regions of the United States, therefore affecting these minority populations from transporting to healthcare services. Furthermore, the history of race-based zoning laws such as redlining has caused many minority residents to live in rural areas that are oftentimes further away from healthcare services and facilities. These areas typically receive less funding and disinvestment in their transit networks ultimately affecting the way many minorities travel (Swistara, 2021). The Rural and Minority Health Research Center found that rural ZIP code areas with higher proportions of minority residents were more likely to be further away from healthcare services compared to rural ZIP codes with less minorities (Carey, 2023). The increased distance of travel coupled with minority groups often lacking private transportation cause many minorities to forgo medical care because of transportation availability and travel distances. Many of the minority groups living in these rural areas also face difficulty in understanding the very system itself. Language barriers between rural minority residents and public transportation also compound to race affecting transportation to healthcare services. It was revealed that public transit ridership by rural Hispanics is lower than that of rural non-Hispanics, suggesting that they may face language barriers in navigating and learning about these public

transportation systems (Matsuo & University of Iowa. School of Urban and Regional Planning, 2014). In these rural regions with significant populations of non-English speakers, the absence of multilingual resources related to transportation can hinder these individuals from navigating and utilizing these transportation systems.

The “Politics of Artifacts” theory by Winner can be applied to further understand the potential root causes of why and how race influences transportation to healthcare services in rural regions of the United States. Winner suggests that these artifacts, “can be seen as political instruments, as ways of shaping power relations within a society” (Winner, 1980). The lack of rural public transportation systems reflect a system that prioritizes the mobility of those who can typically afford private vehicles. Rural public transportation, when available, often operates on limited schedules and routes, neglecting the needs of geographically dispersed minority communities within these rural regions. Additionally, the large reliance on public transportation from Black and Hispanic populations in rural regions is not a matter of individual choice, but rather a consequence of the political design of the system itself. Utilizing Winner’s Politics of Artifacts theory, it can be seen that race not only has an influence on transportation in rural regions, but that these transportation systems are political artifacts that contribute to the impact race has.

Conclusion

The lack of accessible transportation in rural America presents a significant barrier to healthcare for residents, particularly those facing a confluence of social factors. This paper has explored how low income, age-related limitations, and racial disparities in particular act to exacerbate and influence transportation to healthcare services and facilities. Through different

literature reviews, it was revealed how these three social factors impact access and utilization of transportation to healthcare in rural regions. In conjunction with a literature review, Langdon Winner's, "Politics of Artifacts" theory was utilized to shed light on how seemingly neutral transportation systems can embody deep rooted political values and social relations. The existing system, designed without equitable access in mind, prioritizes the mobility needs of certain groups over others. Rural residents with limited financial resources, older adults facing mobility challenges, and minority communities often found themselves left behind. This lack of access not only creates logistical challenges, but contributes to the delayed diagnoses, exacerbated chronic conditions, and ultimately, poorer health outcomes. This theoretical STS framework underpinned the call for a reevaluation of transportation policies and practices, aiming for a system that aligns with equitable access to healthcare for all rural residents.

Moving forward, it is crucial to dismantle these deep rooted barriers with a multi-pronged approach that aims to prioritize equity and remove the historical biases embedded with the transportation system in rural communities. Solutions to these barriers should not only focus on enhancing transportation infrastructure, but also on fostering community-based initiatives and leveraging technology to create more inclusive and adaptable transportation systems towards healthcare for rural America. Increased funding for rural public transportation is critical, enabling the expansion of transit routes to reach the geographically isolated communities. Furthermore, more frequent services should be added to accommodate the diverse work and appointment schedules of rural residents, as well as infrastructure improvements. This may include creating more accessible sidewalks, ramps, and dedicated drop-off points near healthcare facilities.

Community engagement is also critical to minimizing the gap between rural residents achieving equitable healthcare. By directly involving the rural residents of these regions in the design process ensures that transportation solutions address their specific needs. Healthcare providers could partner with transportation companies to offer subsidized or free transport services to and from medical appointments, to aid those rural residents who may not have access to public or private transportation due to low-income and mobility issues. Beyond the immediate solutions of increasing accessibility to transportation, a shift in perspective is also critical in ensuring equitable access to healthcare for all individuals. Transportation systems should not only be viewed as an infrastructure for getting from one point to another, but rather a social determinant of health. It is an essential tool for promoting health and well-being and should be made accessible to all individuals so that patients can attend their appointments, follow treatment plans, and access preventative care.

By dismantling the political biases embedded in the transportation system and prioritizing equitable access, we can create a path towards better health outcomes for rural residents in the United States. This will ensure that one's geographic location, as well as their income, age, and race, does not dictate their ability to access transportation in order to reach the healthcare they need. Ultimately, an innovative rural transportation system, coupled with readily available healthcare resources, can empower rural communities to take control of their health, thus fostering good health and well-being. Recognizing transportation as a fundamental right rather than a privilege will catalyze the development of inclusive policies that reflect the needs of all citizens, bridging the gap between rural and urban healthcare access. This transformation requires a concerted effort from policymakers, community leaders, and healthcare providers to

reimagine and rebuild a system that values and upholds the health of every individual, irrespective of their rural or urban residency.

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