

System- and Individual-Level Barriers to Accessing Medical Care Services Across the Rural-Urban Spectrum, Washington State

Health Services Insights
Volume 15: 1–11
© The Author(s) 2022
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/11786329221104667



Janessa M Graves¹, Demetrius A Abshire²
and Art G Alejandro¹

¹College of Nursing, Washington State University, Spokane, WA, USA. ²College of Nursing, University of South Carolina, Columbia, SC, USA.

ABSTRACT

BACKGROUND: Residents of rural areas face barriers beyond geography and distance when accessing medical care services. The purpose of this study was to characterize medical care access barriers across several commonly used classifications of rurality.

METHODS: Washington State household residents completed a mixed-mode (paper/online) health care access survey between June 2018 and December 2019 administered to a stratified random sample of ZIP codes classified as urban, suburban, large rural, and small rural (4-tier scheme). For analyses, rurality was also classified into 2-tier schemes (rural/urban) based on ZIP code and county. Respondents reported availability of medical care services and system- and individual-level barriers to accessing services. Logistic regression models estimated the odds of reporting system- or individual-level barriers in accessing medical care services across rurality (4- and 2-tier schemes), adjusting for respondent characteristics, and weighted to account for survey design.

RESULTS: About 617 households completed the survey (25.7% response rate). Compared to urban residents (across all 3 schemes), more rural residents reported traveling to a distant city or town for medical care ($P < .001$). Rurality was significantly associated with increased odds of facing system-level barriers. Respondents from small rural areas had greater odds access barriers for primary care (OR 7.31, 95% CI 1.84–29.09) and having no primary care provider (OR 11.37, 95% CI 3.03–42.75) compared to urban respondents. Individual-level barriers were not associated with rurality.

CONCLUSIONS: To improve healthcare access across the rural-urban spectrum, policymakers must consider system-level barriers facing rural populations.

KEYWORDS: Health care quality, access, and evaluation, rural health services, health care surveys, healthcare disparities, rural population

RECEIVED: January 20, 2022. **ACCEPTED:** May 8, 2022.

TYPE: Original Research

FUNDING: The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This project was funded by the Washington State University New Faculty Seed Grant Program. D. A. Abshire was supported by the National Institute on Minority Health and Health Disparities of the National Institutes of Health (NIH)

under award number K23MD013899. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

DECLARATION OF CONFLICTING INTERESTS: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

CORRESPONDING AUTHOR: Janessa M Graves, WSU College of Nursing, 412 East Spokane Falls Boulevard, Spokane, WA 99202, USA. Email: janessa.graves@wsu.edu

Introduction

Access to quality health care is one of the top health priorities for rural America.¹ Compared to urban residents, rural residents are less likely to receive certain preventive health services,^{2,3} utilize healthcare services less frequently,⁴ and tend to be disproportionately affected by chronic conditions that warrant regular medical management.^{5–7} Greater distance to care in rural areas is one factor associated with fewer visits for routine follow-up care,⁸ and many rural residents often have to travel 2 to 3 times farther for medical care due to provider shortages and other health care-related shortcomings.^{9–11} The growing number of rural hospital closures further threatens rural residents ability to access healthcare services.^{12,13}

Even in areas where health care is readily available, the extent to which services accommodate patients' needs and preferences, such as hours of operation, are important access considerations.¹⁴ For rural patients who travel long distances for care, evening and weekend hours could potentially facilitate

their access to medical services. However, there is mixed evidence on rural-urban differences in hours of operation being a barrier to accessing care. Some evidence suggests that rural patients are less likely to have access to providers outside regular business hours compared to their urban counterparts¹⁵ while other evidence suggests there are no statistically significant rural-urban differences that inconvenient clinic hours is a healthcare access barrier.³

While availability and accommodation are 2 critical aspects of healthcare access, additional factors affecting access to care and health care inequities across the rural-urban spectrum include approachability, appropriateness, acceptability, and affordability.^{3,16} To address *approachability*, health care systems must have the capacity to assess a community's needs and ensure that local populations are informed and can identify and access appropriate and effective medical services. This includes providing access to timely health information, which is often delivered through online sources, such as websites, social media,



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (<https://us.sagepub.com/en-us/nam/open-access-at-sage>).

and other online platforms.¹⁷ In rural communities where the necessary infrastructure for high-speed broadband Internet services and digital communications is weak or wholly lacking, residents are not afforded equitable access as their urban counterparts.¹⁸ To ensure *appropriateness*, health care must be physically or technologically accessible and patients should be provided sufficient information to obtain medical services that suit their preferences for technical care, continuity of care, interpersonal relationships, and comfort.¹⁹ The growing literature on patient preferences for primary care services cite the importance of quality of care, waiting times, and interpersonal interaction with the provider.¹⁹⁻²¹ When considering *acceptability*, it is important to note that rural residents may prefer services based on factors other than physical distance, such as specialization, availability of specific services, and patient-centeredness.¹⁶ Finally, *affordability* and health care costs may also play a significant role in patient's preferences for, and access to, health care services.²²

Meeting the health care needs of geographically diverse populations requires an understanding of the environmental context and multidimensional aspects of access to care, as well as patient preferences. Variability in designations for "what is rural" and nuances among the many definitions of "rural"²³ are particularly relevant for understanding the diverse environmental contexts that may influence multiple dimensions of health care access in rural areas. An especially applicable situation might involve a specific location meeting the criteria for one rural definition, but not for another.²³ For this reason, challenges and issues with defining rural could have important implications for research and policies that are designed to understand and address the needs of rural communities.

Challenges and issues in defining rural have been recognized by various federal entities that have recently sought input or made changes regarding rural classifications. For example, in the Federal Communications Commission (FCC) requested comments as of March 2022 on proposed revisions to the Rural Health Care Telecommunications Program that would have funding implications for broadband and telecommunications services in rural areas.²⁴ The FCC raises important questions in the request regarding the appropriateness of rural definitions for determining eligibility for the FCC's Rural Health Care Program. The United States Census Bureau also published a notice in March 2022 regarding final criteria changes for defining rural and urban areas.²⁵ These recent examples highlight the importance of ongoing research to understand the implications of rural classification schemes to inform public health policy aimed at improving health outcomes in rural areas.

The purpose of this study was to examine individual- and system-level barriers to medical care access using both a rural-urban dichotomy and a 4-tiered scheme that accounts for the diversity of rural areas. Use of both approaches may provide a better understanding of the ways in which rural should be conceptualized and operationalized when evaluating the different types of barriers to accessing medical care.

Methods

Sampling and administration

This study is a secondary analysis of a larger project examining psychosocial determinants of health, built environmental characteristics, and obesity among adults living in rural and urban areas. A cross-sectional survey was administered to a stratified random sample of 2325 residential households in small rural, large town, suburban, and urban core areas of Washington State in June 2018 to December 2019. Household addresses were obtained from address-based samples from Marketing Systems Group, based on the United States Postal Service Delivery Sequence File for Washington State. The sample excluded vacant units, vacation homes, or dormitories.

Postal invitations included a \$1 pre-incentive and asked the adult in the household with the most recent birthday to complete the survey online (effectively selecting 1 adult from the household at random). Three follow-up letters were mailed to respondents over 6 weeks, 2 of which included a paper version of the survey and a postage-paid return envelope. The web-based survey was available in English and Spanish. Each household was assigned a unique identification number for tracking purposes and survey responses were anonymous. The Washington State University Office of Research Assurances determined that the project was exempt from Institutional Review Board consideration.

The study sample was stratified by rurality, which was defined at the ZIP code-level using the Rural-Urban Commuting Area (RUCA) 3.10 coding framework and classification scheme 2 developed by the Office of Rural Health, Washington State Department of Health. This classification scheme integrates daily commuting patterns and population density to classify ZIP codes into 4 tiers: urban core (RUCA 1), suburban (RUCA 2-3 and >100 residents/square mile), large rural (RUCA 4-6 and >100 residents/square mile), and small town/rural (RUCA 7-10 or not urban core with population density <100 residents/square mile).

Sample population

The study sample consisted of participants from Washington State, located in northwestern United States. Approximately 20% of Washington's 7.7 million residents are dispersed throughout rural areas of the state.²⁶ The urban centers surround Puget Sound and several smaller cities in the central and eastern regions of the state. Most Washingtonians are insured (93.4%), with the majority covered by employment-based insurance (58.4%) and public insurance (Medicaid, 20.2%; Medicare, 17.4%).²⁷

Health care access and barriers

Respondents were asked to report their usual source of medical care (hospital emergency room, personal primary care provider [PCP], walk-in clinic [ie, no appointment necessary], or other) and distance usually traveled to obtain medical care (within

their postal address city or town, in another city or town more than 30 miles away, or in a distant city or town more than 30 miles away). Respondents rated their community regarding “availability of good, affordable health care” on a 5-point Likert-type scale from “very good” to “very poor.”

To assess barriers to health care access, respondents were asked if they were unable to see a PCP in the past year due to any of the following reasons: (1) no appointment times that fit your schedule, (2) no PCP in your local area, (3) PCP was not accepting new patients, (4) inability to pay for services, (5) inability to take time off work, (6) lack of insurance, or (7) PCP was not accepting new patients with your insurance plan. These reasons align with system-level barriers (1-3) and individual-level barriers (4-7) per the Andersen-Newman model of health services utilization. Respondents also indicated whether any of the following health situations were a problem in the last year: lacked access to preventive care, accessed non-emergency care in the emergency room because they were unable to see a PCP, needed medical care was too far away to access, and delayed or canceled a surgical procedure due to lack of ability to pay. The first three situations corresponded to system-level barriers; the last was considered an individual-level barrier.

Rurality classification

To examine the influence of rurality classification on access and barriers to health care, we used 3 common measures of rurality. Household ZIP codes were classified using the RUCA scheme 2 classification from the Washington State Department of Health, which incorporates population density, urbanization, and daily commuting data into 4 tiers of rurality: urban, suburban, large rural, small rural. In addition to this 4-tier RUCA scheme, we also used a 2-tier RUCA scheme (urban/suburban and large/small rural). We used a third indicator of rurality by linking household counties to rural-urban continuum codes (RUCC) from the U.S. Department of Agriculture’s 2013 classification scheme. RUCC codes classify counties on a 9-level rural continuum ranging from most urban (1) to most rural (9). We subsequently dichotomized RUCC codes into the standardly used groups: metropolitan (RUCC 1-3) and non-metropolitan (RUCC 4-9).²⁸

Analysis

Post-stratification weights were implemented in all analyses to account for differential response due to sampling and to generate a representative sample of Washington State residential households. Access and barriers to health care were compared bivariately across the 3 rurality classifications using design-based Pearson chi-square tests. Multivariable logistic regression models were employed to examine the association between access and barriers to health care rurality, adjusting for respondent demographics that could influence access to care (age, sex, race, employment status, and health insurance coverage). Two-sided significance tests were used for all analyses with statistical

significance set at $P < .05$. Analyses were conducted using Stata/MP, version 15 (StataCorp).

Results

A total of 617 respondents completed the survey (25.7% response rate), representing an estimated population of 3 243 667 million residential addresses in Washington State. Most respondents were female, aged 40 to 79 years, white, and non-Hispanic (Table 1). On average, respondents were 56.5 years old (95% confidence interval [CI] 53.9-59.0).

Overall, respondents represented 4.4% small rural, 7.6% large rural, 10.0% suburban, and 77.9% urban households, following the 4-tier RUCA classification. Based on the dichotomized RUCA classification scheme, 12.0% were rural and 88.0% were urban; the RUCC scheme classified 10.0% of respondents as nonmetropolitan and 90.0% as metropolitan. Employment status varied significantly across respondents in the 2-tier RUCA and RUCC schemes ($P = .04$ and $P = .01$, respectively) and age groups varied between metropolitan and non-metropolitan respondents using the RUCC scheme ($P = .03$). When considering age as a continuous variable, respondents in rural and non-metropolitan communities were significantly older than urban and metropolitan communities across all classification schemes ($P < .01$). However, the distributions observed for these demographic variables are consistent across all classification schemes, despite the significant differences (Table 1).

Medical care experience

The majority of respondents listed a personal PCP as their usual source of medical care (85.8% overall), and this did not vary significantly across 4-tier RUCA categories ($P = .06$). However, proportionately more rural residents reported using a hospital emergency room and proportionately more urban residents reported an “other” source of usual medical care across both 2-tier RUCA and RUCC categories (Table 2; $P < .01$ for both). Overall, 5.9% of respondents reported that they usually travel to a distant city or town to access medical care (Table 2). Distance traveled to access care varied significantly across all 3 classification schemes, with proportionately more respondents from rural and nonmetropolitan areas usually traveling more than 30 miles for medical care (Table 2). Based on the 4-tier RUCA scheme, nearly 28% of residents in small rural areas reported traveling more than 30 miles for medical care compared to 11%, 8%, and 4% among residents in large rural, suburban, and urban areas.

Nearly half of respondents (48.5%) rated the availability of good, affordable health care in their community as “good” or “excellent.” For both the 2-tier RUCA and RUCC classification schemes, significantly fewer rural/non-metropolitan respondents rated the health care availability in their community as “good” or “excellent” compared to urban/metropolitan (Table 2). Differences in perceived quality and affordability of healthcare in the community were not statistically different across the

Table 1. Demographics of Washington State household respondents, by 3 rurality classification schemes, 2018 to 2019.

	RUCA 4-TIER			RUCA 2-TIER			RUCC 2-TIER		TOTAL
	URBAN	SUBURBAN	LARGE RURAL	SMALL RURAL	URBAN	RURAL	METRO	NON-METRO	
Sex									
Female	68.6	54.0	61.4	64.2	66.9	62.5	66.8	62.3	66.4
Male	31.5	46.0	38.6	35.8	33.1	37.5	33.2	37.7	33.7
Age (y)^a									
18-24	3.6	0.9	3.4	1.7	3.3	2.8	3.2	3.1	3.2
25-39	16.4	11.3	9.9	8.8	15.9	9.5	15.9	7.8	15.1
40-64	35.0	38.7	29.5	33.2	35.4	30.8	35.6	28.2	34.9
65-79	26.4	25.4	35.2	38.7	26.3	36.5	26.3	38.5	27.5
80+	7.1	8.3	7.7	7.7	7.3	7.7	7.3	7.3	7.3
Missing	11.4	15.4	14.4	9.9	11.9	12.8	11.6	15.2	12.0
Ethnicity									
Non-Hispanic	95.1	95.6	95.9	97.5	95.2	96.5	95.1	97.8	95.3
Hispanic	4.9	4.4	4.1	2.5	4.8	3.5	4.9	2.2	4.7
Race									
White	72.9	75.4	74.3	83.4	73.2	77.6	73.6	74.8	73.7
Other race	15.0	10.4	8.3	6.6	14.5	7.7	14.2	8.8	13.7
Missing	12.1	14.3	17.5	9.9	12.4	14.7	12.2	16.5	12.7
Married/cohabitating									
No	50.0	37.1	50.4	39.5	48.5	46.3	48.0	51.1	48.3
Yes	50.0	62.9	49.6	60.5	51.5	53.7	52.0	48.9	51.7
Employment status^{a,b}									
Employed	47.3	52.5	42.6	36.7	47.9	40.4	47.8	39.4	47.0
Not employed	13.7	7.3	6.5	11.2	13.0	8.2	13.0	7.1	12.4
Retired	35.9	38.2	49.1	49.1	36.1	49.1	36.2	51.4	37.7
Other	3.1	2.0	1.8	3.0	2.9	2.2	2.9	2.1	2.9
College degree									
No	48.4	53.5	57.2	61.1	49.0	58.7	49.9	52.8	50.2
Yes	51.6	46.5	42.8	38.9	51.0	41.3	50.1	47.2	49.8
Insurance status									
No insurance	3.1	4.6	5.6	4.2	3.3	5.1	3.5	3.0	3.5
Has insurance	96.9	95.4	94.4	95.8	96.8	94.9	96.5	97.0	96.5

Abbreviations: Metro, metropolitan; RUCA, rural-urban commuting area classification scheme based on ZIP codes; RUCC, rural-urban commuting code classification scheme based on county. Values represent survey-weighted percentages. Characteristics reflect demographics of the respondent, not all adult members of the household.
^aSignificant difference between metropolitan and non-metropolitan respondents ($P < .05$) for RUCC classification only; using design-based Pearson chi square test.
^bSignificant difference between urban and rural ($P < .05$) for the 2-tier RUCA classification only; using design-based Pearson chi square test.

Table 2. Household-level respondent experience in using and accessing healthcare services, Washington State, 2018 to 2019.

	RUCA 4-TIER				RUCA 2-TIER			RUCC 2-TIER			TOTAL
	URBAN	SUBURBAN	LARGE RURAL	SMALL RURAL	SIGNIFICANCE	URBAN	RURAL	SIGNIFICANCE	METRO	NON-METRO	
Usual source of medical care					.06			.00			.00
Hospital emergency room	0.0	0.0	1.3	1.2		0.0	1.3		0.0	1.6	0.2
Other	4.7	3.8	2.0	3.6		4.6	2.6		4.5	2.6	4.3
PCP, such as a physician or nurse practitioner	85.3	88.8	86.2	86.7		85.7	86.4		85.8	85.4	85.8
Walk-in clinic (without an appointment)	10.1	7.4	10.5	8.5		9.8	9.8		9.7	10.4	9.8
Distance usually traveled to get medical care					.00			.00			.00
Your postal address city or town	63.9	34.0	48.3	46.6		60.4	47.7		60.2	47.0	58.9
Another city or town <30 miles away	32.3	58.0	40.4	25.8		35.3	35.0		35.4	33.3	35.2
Distant city or town >30 miles away	3.9	8.0	11.3	27.6		4.3	17.3		4.3	19.7	5.9
Rating of community on the availability of good, affordable healthcare					.09			.03			.01
Excellent	12.3	13.3	9.8	5.5		12.4	8.2		12.6	5.9	11.9
Good	37.7	32.5	31.4	35.4		37.1	32.9		36.8	34.5	36.6
Fair	30.3	38.8	30.2	37.2		31.3	32.8		31.5	31.0	31.5
Poor	17.2	10.4	19.8	12.2		16.4	16.9		16.2	19.0	16.5
Very poor	2.5	5.1	8.9	9.8		2.8	9.2		2.9	9.7	3.5
Time since routine check-up with a PCP					.72			.49			.36
<12 month ago	72.1	75.6	70.5	76.7		72.5	72.8		72.3	74.3	72.5
1-2 year ago	14.7	11.0	11.5	9.2		14.3	10.7		14.3	9.7	13.9
2-5 year ago	5.4	7.6	9.7	7.4		5.7	8.9		5.7	9.1	6.1
5 or more years ago	7.8	5.9	8.2	6.8		7.5	7.7		7.6	6.9	7.6

Abbreviations: Metro, metropolitan; PCP, primary care provider; RUCA, rural-urban commuting area classification scheme based on ZIP codes; RUCC, rural-urban commuting code classification scheme based on county; Sig, significance. Values represent survey-weighted percentages. Significance indicates results from design-based Pearson chi square test comparing distributions across rurality classification schemes.

4-tier rurality scheme. Roughly 40% of residents in large rural and small rural areas perceived their healthcare as “good” or “excellent” compared to approximately 46% of those in suburban areas and 50% of those in urban areas. No significant differences were found across rurality classifications in time since respondents’ routine check-up with a health care provider.

Barriers to care

The most common system-level barrier reported by respondents was the inability to see a PCP in the last year because no appointment times were available (18.0%), with no statistically significant differences observed across rurality (Table 3). Compared to residents in more urban areas, significantly more respondents in small and large rural (4-tier RUCA), rural (2-tier RUCA), or nonmetropolitan (RUCC) areas reported lacking access to preventive care in the last year. Significantly more respondents in small rural (4-tier RUCA), rural (2-tier RUCA), or nonmetropolitan (RUCC) areas reported not having access to a PCP in their local area (Table 3). Other system-level barriers did not vary by geography except for residents of small rural areas more often reporting that needed medical care was too far away to access ($P=.05$). Individual-level barriers also did not vary across RUCA or RUCC categories, apart from the inability to pay for services, which affected 12.8% of urban residents and 5.6%, 6.9%, and 5.7% of suburban, large rural, and small rural residents respectively (Table 3, $P=.04$).

Logistic regression models show many of the same significant relationships as the proportions reported in Table 3, with significant differences across rurality observed after adjusting for respondent sex, age, race, education, and insurance status. Respondents in rural and non-metropolitan areas based on the 2-tier classification schemes had significantly greater odds of reporting multiple system-level barriers to health care services. In the 4-tier scheme, most system-level barriers were only statistically significant for those in small rural areas except for primary care providers not accepting new patients, which was only significant for those in large rural areas. Notably, compared to respondents in urban/metropolitan areas, those in small rural/non-metropolitan areas had 5 to 11 times greater odds of reporting that there was no PCP in their area and 6 to 7 times greater odds of lacking access to preventive care (Table 4). Respondents in rural or non-metropolitan areas (2-tier schemes) had 3.11 (95% CI 1.31-7.38) and 3.95 (95% CI 1.64-9.49) greater odds of reporting that their PCP was not accepting new patients, compared to urban or metropolitan respondents, and adjusting for covariates. No association between individual-level barriers to health care services and rurality were identified in multivariable models (Table 4).

Discussion

We examined differences in access and needs for general medical care by rurality among adult residents living in Washington State. Multiple barriers for access to care were examined across

the rural-urban spectrum, with significant differences identified in system-level barriers but not individual-level barriers, after adjusting for respondent characteristics. Similar to previous studies addressing rural-urban disparities in health care access,^{3,9,15,17} we found that rural residents were more likely than urban residents to experience multiple system-level barriers to accessing medical care when geographic location is dichotomized as rural or urban following a 2-tier RUCA classification scheme. When considering rurality on a 4-tiered RUCA continuum, the odds of experiencing most system-level barriers were no longer statistically different for residents of large rural areas relative to those in urban areas. However, compared to residents of urban areas, those living in small rural areas received little or no preventive care, lacked access to a PCP, and held the perception that medical care was too far away to access. Findings from this study underscore the importance for future research and policies to address geographic disparities in access to care by targeting system-level barriers in small rural communities.

While residents of small rural areas experienced multiple system-level barriers to accessing medical care, there were no statistically significant differences in individual-level barriers by rurality in our multivariable models. Financial concerns associated with insurance status and poverty have previously been noted as barriers to medical care that disproportionately affect rural residents,²⁹ yet rural residents in the current study were not more likely to report these as barriers. This finding may be due, in part, to regional nuances in rural-urban differences in poverty and health needs. Rural-urban disparities in poverty and poor health outcomes tend to be most pronounced in the South^{30,31} suggesting that Southern rural residents may need a higher frequency of medical care that they cannot afford. In contrast, the rural West tends to surpass not just the South, but all of rural America by consistently demonstrating lower rates in older adult mortality, mortality due to coronary artery disease, smoking prevalence, and physical inactivity.³⁰ While deprivation is prevalent among many counties in the rural West,³² the relatively healthier rural populations in the West may need fewer or different types of medical services, which potentially may make health care more affordable in the rural West compared to other parts of the rural US.

A significant finding from this study was that Washington State adult residents face differential access to medical care across levels of rurality, with residents of small rural areas having to travel farther for medical services compared to residents of large rural, suburban, and urban areas. In addition, proportionately fewer residents of small rural areas reported obtaining general medical care within their own postal address or town. These findings were expected and are consistent with previous research indicating that compared to residents in urban areas, rural residents generally travel farther to obtain medical care,¹⁵ have a lower density of health care specialists in their region,⁹ and are less likely to have access to facilities capable of providing intensive medical care.³³ While proportionately more rural

Table 3. Proportion of household respondents who experienced barriers in accessing healthcare services in the last year, Washington State, 2018 to 2019.

	RUCA 4-TIER			RUCA 2-TIER			RUCC 2-TIER			TOTAL		
	URBAN	SUBURBAN	LARGE RURAL	SMALL RURAL	SIGNIFICANCE	URBAN	RURAL	SIGNIFICANCE	METRO		NON-METRO	SIGNIFICANCE
System-level barriers												
No appointment times that fit their schedule ^a	19.7	11.3	13.4	11.7	.08	18.7	12.8	.11	18.5	13.6	.21	18.0
No PCP in their local area ^a	1.6	0.8	3.7	9.9	.02	1.5	6.0	.04	1.6	6.6	.02	2.1
Lacked access to preventive care ^b	2.3	0.3	7.4	7.8	.02	2.1	7.6	.02	2.2	7.7	.02	2.8
Accessed non-emergency care in the emergency room because they were unable to see a PCP ^b	14.2	9.8	7.7	12.8	.27	13.7	9.6	.20	13.4	11.6	.62	13.2
PCP was not accepting new patients ^a	7.1	3.2	12.5	7.7	.15	6.7	10.7	.19	6.7	11.3	.15	7.2
Needed medical care was too far away to access ^b	2.4	2.4	1.9	10.5	.05	2.4	5.0	.17	2.4	5.3	.15	2.7
Individual-level barriers												
Inability to pay for services ^a	12.8	5.6	6.9	5.7	.04	12.0	6.4	.06	11.8	6.5	.08	11.3
Delayed or canceled a surgical procedure due to lack of ability to pay ^b	8.6	5.3	5.7	6.1	.47	8.2	5.8	.36	8.1	6.1	.46	7.9
Inability to take time off work ^a	12.1	6.4	7.2	5.0	.10	11.4	6.4	.09	11.3	6.9	.17	10.8
Uninsured ^b	5.7	2.9	5.2	3.8	.59	5.3	4.7	.79	5.3	4.6	.77	5.3
Primary health care provider not accepting patients with your insurance plan ^a	6.5	3.2	9.6	5.7	.35	6.1	8.2	.45	6.0	9.6	.22	6.3

Abbreviations: Metro, metropolitan; PCP, primary care provider; RUCA, rural-urban commuting area classification scheme based on ZIP codes; RUCC, rural-urban commuting code classification scheme based on county; Sig, significance.
 Values represent survey-weighted proportions across all respondents. Significance indicates results from design-based Pearson chi square test comparing distributions across rurality classification schemes.
^aReported reasons why respondents were unable to see a PCP in the last 12 months.
^bReported health situation reported as a problem by respondents in the past year.

Table 4. Association between rurality and system- and individual-level barriers reported by household respondents, Washington State, 2018 to 2019.

	RUCA 4-TIER			RUCA 2-TIER			RUCC 2-TIER	
	URBAN	SUBURBAN	LARGE RURAL	SMALL RURAL	URBAN	RURAL	METRO	NON-METRO
System-level barriers								
No appointment times that fit their schedule ^a	Ref	0.69 (0.30-1.60)	0.91 (0.38-2.18)	0.75 (0.35-1.62)	Ref	0.88 (0.45-1.70)	Ref	1.03 (0.51-2.06)
No PCP in their local area ^a	Ref	0.75 (0.12-4.68)	2.31 (0.31-17.33)	11.37 (3.03-42.75)	Ref	5.25 (1.35-20.36)	Ref	5.73 (1.41-23.22)
Lacked access to preventive care ^b	Ref	0.14 (0.01-1.53)	4.19 (0.89-19.72)	7.31 (1.84-29.09)	Ref	5.88 (1.63-21.23)	Ref	6.44 (1.88-22.04)
Accessed non-emergency care in the emergency room because they were unable to see a PCP ^b	Ref	0.78 (0.32-1.92)	0.59 (0.24-1.46)	1.11 (0.54-2.29)	Ref	0.79 (0.41-1.53)	Ref	1.02 (0.51-2.06)
PCP was not accepting new patients ^a	Ref	0.52 (0.13-2.00)	3.94 (1.38-11.26)	1.67 (0.62-4.54)	Ref	3.11 (1.31-7.38)	Ref	3.95 (1.64-9.49)
Needed medical care was too far away to access ^c	Ref	1.35 (0.21-8.57)	1.11 (0.15-8.03)	7.41 (1.59-34.43)	Ref	3.07 (0.81-11.63)	Ref	2.67 (0.72-9.90)
Individual barriers								
Inability to pay for services ^a	Ref	0.48 (0.15-1.56)	0.43 (0.12-1.50)	0.60 (0.22-1.67)	Ref	0.52 (0.21-1.33)	Ref	0.66 (0.26-1.64)
Delayed or canceled a surgical procedure due to lack of ability to pay ^b	Ref	0.55 (0.18-1.64)	0.52 (0.15-1.81)	0.62 (0.22-1.73)	Ref	0.61 (0.24-1.54)	Ref	0.69 (0.27-1.78)
Inability to take time off work ^a	Ref	0.45 (0.14-1.49)	0.70 (0.20-2.46)	0.39 (0.11-1.38)	Ref	0.65 (0.23-1.79)	Ref	0.80 (0.29-2.24)
Uninsured ^a	Ref	0.36 (0.08-1.76)	0.52 (0.10-2.75)	0.74 (0.19-2.90)	Ref	0.68 (0.20-2.31)	Ref	1.06 (0.33-3.48)
Uninsured ^{a,c}	Ref	0.49 (0.11-2.10)	0.75 (0.15-3.67)	0.80 (0.24-2.72)	Ref	0.83 (0.26-2.71)	Ref	1.11 (0.32-3.85)
Primary health care provider not accepting patients with your insurance plan ^a	Ref	0.40 (0.10-1.71)	1.40 (0.36-5.36)	1.12 (0.36-3.48)	Ref	1.42 (0.51-3.96)	Ref	1.85 (0.66-5.17)

Abbreviations: Metro, metropolitan; PCP, primary care provider; RUCA, rural-urban commuting area classification scheme based on ZIP codes; RUCC, rural-urban commuting code classification scheme based on county; Sig, significance.

^aValues represent survey-weighted multivariable regression model results, adjusted odds ratios and 95% confidence interval. Multivariable models adjust for sex, age, race, employment, and insurance status.

^bReported reasons why respondents were unable to see a PCP in the last 12 months.

^cReported health situation reported as a problem by respondents in the past year.

^dExcluding insurance status as a covariate.

residents reported traveling greater distance to obtain medical care, there were no rural-urban differences in the timing of receiving a routine checkup with a PCP. This finding may be partly due to rural residents' willingness to travel long distances to obtain medical care despite having health conditions that limit their ability to travel.³⁴

Approximately 23% of residents in small rural areas and 28% in large rural areas reported having poor availability of good, affordable health care in their community compared to the approximately 15% of suburban and 20% of urban residents. Despite these discrepancies, we found no statistically significant differences in the availability of good, affordable health care across the rural-urban spectrum. This finding differs from previous research suggesting that rural residents are more likely than urban residents to have a usual source of medical care.^{15,35,36} Nevertheless, it's important to note that many rural residents must travel longer distances to access medical care,¹⁵ which is particularly concerning for cancer patients or those with poorly managed chronic conditions who require frequent monitoring and/or ongoing medical treatments.^{9,10}

Although not statistically significant, proportionately more residents of small and large rural areas perceived having poor availability of good and affordable health care in their community. This finding could partially reflect a lack of available health care options in rural areas or be indicative of rural-urban differences in perceived quality and affordability of available care. Among both rural and urban publicly insured residents of Minnesota, concerns pertaining to insurance coverage and high cost of medical care were 2 barriers associated with receiving no preventive care within the past year.³ Other research has indicated that the quality of clinical care is lower in rural areas³⁷ and that rural residents are less likely to receive certain preventive health services³⁸—even when they are more likely than urban residents to have a usual source of care.³⁵ Qualitative research is needed to expand on the results gleaned from quantitative investigations looking into rural residents' perceptions of the availability, affordability, and quality of the health care they receive.

Limitations

Findings from this study should be interpreted in the context of several limitations. First, while representative of Washington State households, our sample cannot account for the wide diversity of populations found in the United States. Rural-urban differences in access for primary health care services likely varies from state-to-state and should be studied in context to reflect regional differences. Access to care may also vary depending on the extent to which telehealth is adopted and supported in rural and urban areas across the United States. Although telehealth is becoming increasingly adopted in response to the COVID-19 pandemic, insufficient broadband Internet access remains a barrier for expanding care into many rural areas.¹⁸ Thus, it is likely that including indicators of

telehealth access would not alter study conclusions. Second, the sample size for this study is relatively small. Some of our findings on rural-urban differences should be interpreted with caution due to the small sample sizes within the 4 geographic settings used for this study: small rural, large rural, suburban, and urban. Although collapsing geographic settings to create a rural-urban dichotomy can be effective for increasing statistical power, this approach abrogates the inherent diversity of rural areas and risks producing findings that are overly generalized and not useful for addressing the health disparities that are specific to rural populations. For example, research on mortality and obesity disparities by rurality suggests that these outcomes are most favorable in highly rural areas compared to areas in the middle of the rural-urban continuum.^{39,40} And while research has shown that continuity of care is higher among residents in isolated and small rural communities compared to those in large rural and urban areas, this increase in health care continuity in the most isolated and rural locations may be further evidence of the overall lack of service providers and medical specialists in small town/outlying areas across the country.⁴¹ Simply classifying areas as rural or urban would negate these important differences. Finally, findings from our study were based on participant self-report of health care access. While self-reported data limit our ability to objectively determine access, it is important to examine health care availability from the participant's perspective to inform the development of health care policies and programs that are appropriate, affordable, and acceptable to diverse populations across the rural-urban spectrum.

Policy and practice implications

Several of our findings have policy and practice implications for addressing geographic inequities in healthcare access. Temporary policy changes that expanded telehealth during the COVID-19 pandemic helped reduce transportation-related barriers to receiving certain types of healthcare services such as initial screenings and follow-up appointments.⁴² Examples of flexibilities offered during the COVID-19 pandemic included allowances for telehealth services to be provided through commonly used apps and across state lines, expanding Medicare telehealth services, and allowances for billing of telehealth services as if care was provided in person.⁴³ Permanent policy changes based on lessons learned from the COVID-19 pandemic can continue to support telehealth expansion, which is particularly important for rural communities with limited healthcare accessibility. While investments to expand telehealth to increase healthcare access in rural and underserved communities are underway,⁴⁴ additional policies and investments for increasing broadband Internet access are needed to increase access to telehealth services^{18,45,46} and to improve connectivity issues that hinder telehealth adoption in rural areas.⁴⁷ As telehealth expansion continues, education and training may be needed to ensure that healthcare organizations provide telehealth services

effectively and are sensitive to unique cultural considerations of the geographic regions being served. Efforts to promote trusting and established patient-provider relationships are also warranted given that receiving care from an unknown provider can be a barrier for rural residents using telehealth services.⁴⁷

Policy changes are also needed to support the financial stability of rural hospitals given that telehealth is not a viable approach for delivering certain healthcare services such as medical procedures and diagnostics requiring specialized medical equipment.⁴² With nonprofit critical access hospitals as the exception, the financial viability of rural hospitals has declined from 2011 to 2017 placing them at increased risk for closing.⁴⁸ Since January 2005, 98 rural hospitals have completely closed and another 83 no longer provide in-patient medical care.¹³ Given that Medicaid expansion has been linked to a lower likelihood of hospital closures,⁴⁹ advocacy efforts to support Medicaid expansion in non-expansion states may be worth exploring. Policy changes for graduate medical education funding are also needed to better support rural residency programs, which are important for building the local healthcare workforce in which they are located.⁵⁰ For example, evidence suggests that 56% of family medicine residents practice within 100 miles of their program and 39% practice within 25 miles.⁵¹ Ensuring that rural residency programs receive the financial support needed to grow the rural healthcare workforce is therefore one long-term strategy to increase healthcare access in rural areas.

Future research

Findings from this study suggest that rural residents are more likely than urban residents to lack access to a PCP and preventive healthcare services in their communities. While telehealth is often touted as a strategy to increase access to care in rural communities,^{47,52} research will be needed to determine factors associated with telehealth uptake and utilization. Research conducted with academic and rural providers suggests that rural providers perceive they would use telemedicine less frequently and therefore should be involved in the design and implementation of telehealth programs to meet their needs and preferences.⁵³ Research conducted with rural patients provides evidence for high feasibility and acceptability for receiving certain telehealth services.⁴⁷ Evidence also suggests that rural residents are more likely to use telehealth than urban residents, yet overall telehealth utilization rates are very low.⁵⁴ In addition to the need for research to determine factors associated with telehealth utilization, research is also needed to examine the relationship between access to telehealth services and perceptions of healthcare access. While there is evidence for high patient satisfaction with receiving certain telehealth services and that satisfaction is comparable to in-person visits,⁵⁵ residents across the rural-urban continuum may perceive lacking access to healthcare services for health conditions that cannot be feasibly or safely addressed via telehealth.

Rural-urban differences in healthcare needs could therefore play a role in patient perceptions of healthcare accessibility even as telehealth expansion continues.

Conclusions

This is one of few studies examining self-reported access to medical care across multiple levels of rurality. Future research and policies must consider the unique facilitators and barriers to accessing healthcare across diverse geographic landscapes to improve equitable healthcare access. Addressing system-level barriers to accessing healthcare is particularly needed in small rural areas that tend to drive rural-urban differences in access to care.

Acknowledgements

Authors would like to thank Mary Roberts for her scrupulous and thoughtful editing assistance.

Author Contributions

JMG and DAA conceptualized the study, curated data collection, and acquired funding. JMG conducted analyses and wrote the first draft of the manuscript. All three authors substantially contributed to the study approach and methodological decisions. DAA and AGA critically reviewed the first and subsequent manuscript drafts. All authors read and approved the final manuscript and agreed to the submission.

ORCID iD

Janessa M Graves  <https://orcid.org/0000-0002-7659-2634>

REFERENCES

1. Bolin JN, Bellamy GR, Ferdinand AO, et al. Rural healthy people 2020: new decade, same challenges. *J Rural Health*. 2015;31:326-333.
2. Casey MM, Thiede Call K, Klingner JM. Are rural residents less likely to obtain recommended preventive healthcare services? *Am J Prev Med*. 2001;21:182-188.
3. Loftus J, Allen EM, Call KT, Everson-Rose SA. Rural-urban differences in access to preventive health care among publicly insured Minnesotans. *J Rural Health*. 2018;34(Suppl 1):s48-s55.
4. Nuako A, Liu J, Pham G, et al. Quantifying rural disparity in healthcare utilization in the United States: analysis of a large midwestern healthcare system. *PLoS One*. 2022;17:e0263718.
5. Davis D, Rui P. Urban-rural differences in visits to office-based physicians by adults with hypertension: United States, 2014-2016. *Natl Health Stat Rep*. 2020;2020:1-7.
6. Atkins GT, Kim T, Munson J. Residence in rural areas of the United States and lung cancer mortality: disease incidence, treatment disparities, and stage-specific survival. *Ann Am Thorac Soc*. 2017;14:403-411.
7. O'Connor A, Wellenius G. Rural-urban disparities in the prevalence of diabetes and coronary heart disease. *Public Health*. 2012;126:813-820.
8. Arcury TA, Gesler WM, Preisser JS, Sherman J, Spencer J, Perin J. The effects of geography and spatial behavior on health care utilization among the residents of a rural region. *Health Serv Res*. 2005;40:135-155.
9. Aboagye JK, Kaiser HE, Hayanga AJ. Rural-urban differences in access to specialist providers of colorectal cancer care in the United States: a physician workforce issue. *JAMA Surg*. 2014;149:537-543.
10. MacDowell M, Glasser M, Fitts M, Nielsen K, Hunsaker M. A national view of rural health workforce issues in the USA. *Rural Remote Health*. 2010;10:1531.
11. Chan L, Hart LG, Goodman DC. Geographic access to health care for rural Medicare beneficiaries. *J Rural Health*. 2006;22:140-146.
12. McCarthy S, Moore D, Smedley WA, et al. Impact of rural hospital closures on health-care access. *J Surg Res*. 2021;258:170-178.
13. University of North Carolina, Cecil G. Sheps Center for Health Services Research. 181 Rural hospital closures since January 2005. Accessed April 12,

2022. <https://www.shepscenter.unc.edu/programs-projects/rural-health/rural-hospital-closures>
14. McLaughlin CG, Wyszewianski L. Access to care: remembering old lessons. *Health Serv Res.* 2002;37:1441-1443.
 15. Kirby JB, Yabroff KR. Rural-urban differences in access to primary care: beyond the usual source of care provider. *Am J Prev Med.* 2020;58:89-96.
 16. Cyr ME, Etchin AG, Guthrie BJ, Benneyan JC. Access to specialty healthcare in urban versus rural US populations: a systematic literature review. *BMC Health Serv Res.* 2019;19:974.
 17. Siconolfi D, Shih RA, Friedman EM, et al. Rural-urban disparities in access to home- and community-based services and supports: stakeholder perspectives from 14 states. *J Am Med Dir Assoc.* 2019;20:503-508.e1.
 18. Graves JM, Abshire DA, Amiri S, Mackelprang JL. Disparities in technology and broadband internet access across rurality: implications for health and education. *Fam Community Health.* 2021;44:257-265.
 19. Cheraghi-Sohi S, Bower P, Mead N, McDonald R, Whalley D, Roland M. What are the key attributes of primary care for patients? Building a conceptual 'map' of patient preferences. *Health Expect.* 2006;9:275-284.
 20. Kenny P, De Abreu Lourenco R, Wong CY, Haas M, Goodall S. Community preferences in general practice: important factors for choosing a general practitioner. *Health Expect.* 2016;19:26-38.
 21. Kleij K-S, Tangermann U, Amelung VE, Krauth C. Patients' preferences for primary health care – a systematic literature review of discrete choice experiments. *BMC Health Serv Res.* 2017;17:476.
 22. Bellamy GR, Bolin JN, Gamm LD. Rural healthy people 2010, 2020, and beyond: the need goes on. *Fam Community Health.* 2011;34:182-188.
 23. Bennett KJ, Borders TF, Holmes GM, Kozhimannil KB, Ziller E. What is rural? Challenges and implications of definitions that inadequately encompass rural people and places. *Health Aff.* 2019;38:1985-1992.
 24. Federal Communications Commission. Proposed rule: promoting telehealth in rural America. 47 CFR Part 54. WC Docket No. 17-310; FCC 22-15; FR ID 75595. Published March 15, 2022. Accessed April 11, 2022. <https://public-inspection.federalregister.gov/2022-05191.pdf>
 25. United States Census Bureau, Department of Commerce. Urban area criteria for the 2020 census – final criteria. Docket Number 220228-0062. Published March 24, 2022. Accessed April 9, 2022. <https://public-inspection.federalregister.gov/2022-06180.pdf>
 26. Washington Hospital Association. Health inequities in rural communities. Published March 16, 2017. Accessed April 11, 2022. <https://www.wsha.org/articles/health-inequities-rural-communities>
 27. Washington State Office of Financial Management. Evaluation of using the 2020 ACS experimental weights for Washington State Health Coverage estimates. Research Brief No. 106. Published March 2022. Accessed March 29, 2022. <https://ofm.wa.gov/sites/default/files/public/database/research/researchbriefs/brief106.pdf>
 28. United States Department of Agriculture ERS. Rural-urban continuum codes. Updated December 10, 2020. Accessed December 29, 2020. <https://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx>
 29. Douthit N, Kiv S, Dwolatzky T, Biswas S. Exposing some important barriers to health care access in the rural USA. *Public Health.* 2015;129:611-620.
 30. Miller CE, Vasan RS. The southern rural health and mortality penalty: a review of regional health inequities in the United States. *Soc Sci Med.* 2021;268:113443.
 31. United States Department of Agriculture Economic Research Service. Rural poverty and well-being. Updated September 17, 2021. Accessed November 6, 2021. <https://www.ers.usda.gov/topics/rural-economy-population/rural-poverty-well-being/>
 32. Hale N, Probst J, Robertson A. Findings brief: area deprivation is higher among rural counties-but not all rural counties are deprived. Published August 2015. Accessed November 6, 2021. https://sc.edu/study/colleges_schools/public_health/research/research_centers/sc_rural_health_research_center/documents/1431areadeprivationhigherruralcounties2015.pdf
 33. Kanter GP, Segal AG, Groeneveld PW. Income disparities in access to critical care services. *Health Aff.* 2020;39:1362-1367.
 34. Henning-Smith C, Evenson A, Kozhimannil K, Moscovic I. Geographic variation in transportation concerns and adaptations to travel-limiting health conditions in the United States. *J Transp Health.* 2018;8:137-145.
 35. Caldwell JT, Ford CL, Wallace SP, Wang MC, Takahashi LM. Intersection of living in a rural versus urban area and race/ethnicity in explaining access to health care in the United States. *Am J Public Health.* 2016;106:1463-1469.
 36. Larson SL, Fleishman JA. Rural-urban differences in usual source of care and ambulatory service use: analyses of national data using urban influence codes. *Med Care.* 2003;41:iii65-iii74.
 37. Anderson TJ, Saman DM, Lipsky MS, Lutfiyya MN. A cross-sectional study on health differences between rural and non-rural U.S. counties using the county health rankings. *BMC Health Serv Res.* 2015;15:441.
 38. Krishna S, Gillespie KN, McBride TM. Diabetes burden and access to preventive care in the rural United States. *J Rural Health.* 2010;26:3-11.
 39. Cohen SA, Cook SK, Kelley L, Foutz JD, Sando TA. A closer look at rural-urban health disparities: associations between obesity and rurality vary by geospatial and sociodemographic factors. *J Rural Health.* 2017;33:167-179.
 40. James WL. All rural places are not created equal: revisiting the rural mortality penalty in the United States. *Am J Public Health.* 2014;104:2122-2129.
 41. Toth M, Quach C, Holmes GM. Findings brief: rural-urban differences in continuity of care among Medicare beneficiaries. Published December 2014. Accessed November 5, 2021. <https://www.shepscenter.unc.edu/wp-content/uploads/2014/12/Differences-in-Continuity-of-Care-Dec-2014.pdf>
 42. Oluyede L, Cochran AL, Wolfe M, Prunkl L, McDonald N. Addressing transportation barriers to health care during the COVID-19 pandemic: perspectives of care coordinators. *Transp Res Part A Policy Pract.* 2022;159:157-168.
 43. United States Department of Health and Human Services. Telehealth: delivering care safely during COVID-19. Published December 21, 2021. Accessed March 5, 2022. <https://www.hhs.gov/coronavirus/telehealth/index.html>
 44. United States Department of Health and Human Services. Biden-Harris administration invests over \$19 million to expand telehealth nationwide and improve health in rural, other underserved communities. Published August 18, 2021. Accessed March 29, 2022. <https://www.hhs.gov/about/news/2021/08/18/biden-harris-administration-invests-over-19-million-expand-telehealth-nationwide-improve-health-rural.html>
 45. Graves JM, Mackelprang JL, Amiri S, Abshire DA. Barriers to telemedicine implementation in southwest tribal communities during COVID-19. *J Rural Health.* 2021;37:239-241.
 46. Zahnd WE, Bell N, Larson AE, eds. Geographic, racial/ethnic, and socioeconomic inequities in broadband access. *J Rural Health.* Published online November 18, 2021. doi:10.1111/jrh.12635
 47. Butzner M, Cuffee Y. Telehealth interventions and outcomes across rural communities in the United States: narrative review. *J Med Internet Res.* 2021;23:e29575.
 48. Bai G, Yehia F, Chen W, Anderson GF. Varying trends in the financial viability of US rural hospitals, 2011-17. *Health Aff.* 2020;39:942-948.
 49. Lindrooth RC, Perrailon MC, Hardy RY, Tung GJ. Understanding the relationship between Medicaid expansions and hospital closures. *Health Aff.* 2018;37:111-120.
 50. Hawes EM, Fraher E, Crane S, et al. Rural residency training as a strategy to address rural health disparities: barriers to expansion and possible solutions. *J Grad Med Educ.* 2021;13:461-465.
 51. Fagan EB, Finnegan SC, Bazemore AW, Gibbons CB, Petterson SM. Migration after family medicine residency: 56% of graduates practice within 100 miles of training. *Am Fam Physician.* 2013;88:704.
 52. Centers for Disease Control and Prevention. Telehealth in rural communities: how CDC develops programs that deliver care in new ways. Updated August 18, 2020. Accessed April 9, 2022. <https://www.cdc.gov/chronicdisease/resources/publications/factsheets/telehealth-in-rural-communities.htm>
 53. Oest SER, Swanson MB, Ahmed A, Mohr NM. Perceptions and perceived utility of rural emergency department telemedicine services: a needs assessment. *Telemed J E Health.* 2020;26:855-864.
 54. Talbot JA, Burgess AR, Thayer D, Parenteau L, Paluso N, Coburn AF. Patterns of telehealth use among rural Medicaid beneficiaries. *J Rural Health.* 2019;35:298-307.
 55. Zimmerman M, Benjamin I, Tirpak JW, D'Avanzato C. Patient satisfaction with partial hospital telehealth treatment during the COVID-19 pandemic: comparison to in-person treatment. *Psychiatry Res.* 2021;301:113966.