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Ellery Denny, Student

Dr. Maureen Jones, Committee Chair

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An Analysis of Rural-Urban Differences in Health Care Access Among Women in the United States

A paper submitted in partial fulfillment of the
requirements for the degree of
Master of Public Health
in the
University of Kentucky College of Public Health

By
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Danville, Kentucky

Final Examination
Lexington, Kentucky
April 14, 2022

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ACKNOWLEDGEMENTS

I would sincerely like to thank my friends for encouraging me to never give up, my family for always loving and supporting me, and my classmates for aiding me throughout my academic career. I would also like to thank my committee for their patience and guidance throughout this process, as this research would not be possible without them.

ABSTRACT

The purpose of this project was to examine the relationship between women's health care access and rural and urban America. Extensive review of existing literature was completed and showed that the United States ranked last out of 11 high-income countries in regard to access to care, administrative efficiency, equity, and health care outcomes (Schneider, 2021). Additionally, women in the United States faced heightened financial barriers to health care that men do not, and also faced unique disadvantages that resulted in reduced utilization of care (Cameron, 2010, p. 1649).

Results showed that rural women were significantly more likely to have one or more personal doctors/ healthcare provider compared to urban women, 87.82% versus 87.38%, respectively ($p=0.03$). Urban women were significantly more likely to have been unable to visit a doctor in the past year due to cost compared to rural women, 9.16% versus 8.52%, respectively ($p=0.001$). Urban women were significantly more likely to have visited a doctor for a routine checkup within the past two years compared to rural women (93.00% versus 92.46%, respectively) who were more likely to report it had been more than two years since their last routine checkup ($p=0.0005$). Results did not show a significance between rurality of women and having any type of health care coverage.

This research discussed the implications of each result and the impact it has on women's access to care. This analysis also provided guidance for health care workers, policy makers, and public health professionals where best practices for improving access to health care for women in rural America can be implemented.

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KEYWORDS: health care access, gender disparity, rural America

INTRODUCTION

Sufficient access to high-quality, affordable health care has become an increasing problem in America in the last decade and can be influenced by different factors and conditions that an individual might experience (Todd, 1991, pp. 2504). These factors and conditions where people live, learn, work, play, worship, and age are called social determinants of health (SDOH) and they affect a wide range of health outcomes, including access to and quality of health care (Healthy People, 2020). Two SDOHs that affect health care access are gender and geographic location (Healthy People, 2020). Women, especially those living in rural America, face unique hurdles to obtaining health care due to financial and logistical barriers in regard to their roles as mothers and employees (Ranji, 2018). Furthermore, rural American women with limited health care access are more at risk for chronic diseases such as diabetes, cancer, and cardiovascular diseases compared to their urban counterparts (CDC, 2017). Health care access can be measured in many ways including having health care coverage, having at least one personal doctor or health care provider, being financially able to see a doctor and the length of time since an individual's last routine checkup.

This research further investigated the statistical relationship of those health care access variables and gender and geographic location, specifically within the year 2020. The purpose of this investigation is to advocate and promote awareness for women living in the United States who have limited access to health care. Additionally, this research will provide better guidance for healthcare workers, policymakers, and public health professionals that create and implement programs and policies that increase health care access in America in regard to gender and geographical disparities.

LITERATURE REVIEW

The impact of either gender or geographic isolation on health care access has been individually well researched (Keisler-Starkley, 2021; Marmot, 2005). Previous research reported the independent relationships between each of these factors and the influence they have on health care access (Keisler-Starkley, 2021; Marmot, 2005; Cameron, 2010). Specifically, this review will focus on women in rural and urban America and the influence that gender and geographic location have on the four variables of health care access highlighted in the 2020 Behavioral Risk Factor Surveillance System (BRFSS): having some type of health care coverage, having one or more personal health care providers, financially being able to obtain care in the last 12 months, and the length of time since the last checkup. This section will review literature focusing on health care access in rural and urban America and the impact of gender and geographic location disparities in both areas.

Health Care Access

Access to health services is a multifaceted issue faced by many Americans (Healthy People, 2020; Millman, 1993, p. 1). Specifically, the United States ranks last out of 11 high-income countries in regard to access to care, administrative efficiency, equity, and health care outcomes (Schneider, 2021). The same report concluded that the four common features that distinguish high performing countries from the United States are that the high performing countries: 1) provide for universal coverage and remove cost barriers; 2) invest in primary care systems to ensure that high-value services are equitably available in all communities to all people; 3) reduce administrative burdens that divert time, efforts, and spending from health improvement efforts; and 4) invest in social services, especially for children and working-age adults (Commonwealth Fund, 2021, p. 4). Health care access has been a complex issue in

America and is complicated by the country's large size, political environment, and the multiple social determinants of health that influence access to care (Lipsitz, 2013, p. 243). Differing populations have demonstrated unique, independent needs based on specific factors that make healthcare accessible. Even in isolated communities, different regions have experienced different access to care due to limited resources, high travel times, and lack of financial ability to visit a doctor. Additional social determinants of health have affected individuals' ability to receive care including gender and geographic location which are two examples of these social determinants of health that have influenced a population's access to care.

Gender Disparity

Gender, understood as “social relationships between males and females in terms of their roles, behaviors, activities, attributes and opportunities, and which are based on different levels of power”, is one of the main social determinants of health that influence an individual's access to care (Manandhar et al., 2018, p. 650; Marmot, 2005. p. 1100). Specifically, women have experienced drastic differences in preventative care and hospital services compared to men (Cameron, 2010, p. 1645). The study found that women were less likely to have hospital stays (adjusted odds ratio [OR] = 0.79) and had fewer physician visits (3.07 vs. 3.30 median visits within 2 years) than men with similar demographic and health profiles (Cameron, 2010, p. 1644). Gender differences have been researched in a multitude of economic sectors including wealth, income, and education. Specifically, women on average earned lower wages, had fewer financial assets, accumulated less wealth, and had higher rates of poverty compared to men (Kaiser Family Foundation, 2017, p. 1). These financial barriers translated into reduced access to healthcare services, which in turn influenced the utilization of medical care (Cameron, 2010, p. 1648). In addition to the unique financial barriers that women face, many women also reported in the 2017

Kaiser Women's Health Survey that workplace benefits and flexibility, childcare, and transportation restricted their availability and access to receive care (Kaiser Family Foundation, 2017). Overall, women in the United States faced heightened financial barriers to health care that men do not, and also faced unique disadvantages that resulted in reduced utilization of care (Cameron, 2010, p. 1649; Kaiser Family Foundation, 2017).

Geographic Location

Another factor that influenced health care access is geographic location, specifically geographic isolation and high travel times to healthcare facilities (Dummer, 2008, p. 1178; Delamater, 2012). Many studies showed that there are significant health differences between individuals living in different geographic locations (Delamater, 2012; Pickle, 1996). Disparities in the geographic accessibility of healthcare services arose due to the way people and facilities are arranged spatially, the lack of financial resources available, and the low health literacy rates of the people living in these isolated regions (Delamater, 2012; Wang, 2013). At a national level, overall mortality rates were much higher in the Southeast, the Appalachians, and parts of the Intermountain West (Pickle, 1996). Within states, differences were associated with areas with lower incomes, higher numbers of minority populations, and cultural and historical risk patterns that contributed to higher rates of morbidity and mortality (Swift, 2002). On an even smaller scale, the same patterns were seen within cities and counties where neighborhoods and census tracts reflected similar health disparities (Swift, 2002). One specific concern of this disparity was the amount of time it takes certain individuals to drive to receive care. Isolated populations experienced greater difficulty in gaining access due to increased travel times on top of poor infrastructure and lack of public transportation options (Delamater, 2012). Based on these pieces of literature, isolated regions (typically rural areas) in the United States tended to have limited

accessibility and therefore poorer health outcomes than areas with health care settings conveniently nearby (Pickle, 1996; Delamater, 2012).

Urban America

The Bureau of the Census defined urban areas as “densely developed territories that encompass residential, commercial, and other non-residential urban land uses” (Keisler-Starkley, 2021, p. 1). Urban areas experienced unique disparities in health care due to the nature of having a dense population and reliance on public transportation (Keisler-Starkley, 2021, p. 1). According to a 2019 study, urban areas had the highest reported infant mortality rates, homicides, adult major depressive episodes, and mortality from unintended injuries (Cyr, 2019). Additional to these rates, four specific health care access variables were researched and analyzed to better identify access to care in urban America.

Health Care Coverage

One factor that influenced health care access is having any type of health care coverage. There was limited literature reviewing health care coverage exclusively in urban areas. However, the Robert Wood Foundation stated that health care coverage is more accessible in urban areas due to lowered premiums resulting from the large population size and increased insurance competition (Wengle, 2018, p. 2). Additionally, competition in the provider sector proved to be greater in urban areas, which also could lower insurance prices, making insurance more accessible to urban residents compared to their rural counterparts (Wengle, 2018, p. 2). The Kaiser Family Foundation (2003, p. 1) also reported that the chance of being uninsured among persons living in urban areas is 18%, which is still lower than rural reports. Although not at the rate of rural residents, people living in urban areas faced a lack of or limited health care coverage.

Personal Doctor

A second variable that influenced an individual's access to care is having one or more personal care providers. There was limited existing literature and research available for understanding and exploring the rates of exclusively urban residents having a personal doctor, but there was research that suggested the availability of primary care providers in urban areas. In 2017, urban counties had a median density of 2.66 primary care clinics per 3500 people (Zhang, 2020, p. 6). According to the American Academy of Family Physicians, a ratio of 1:1500 for a personal care provider to patient was ideal in most primary care settings (Murray, 2007, p. 49). Based on this 2017 study, urban counties were below the desired ratio and therefore had enough physicians to safely provide primary care to their residents.

Medical Cost

Thirdly, being able to afford a doctor's visit was another factor that influenced health care access. A 2014 study concluded that urban populations spent an average of \$1,061.40 on prescription drugs and \$1,636.40 on emergency room services (Blewett, 2008). Additionally, this study found that a higher proportion of urban residents (compared to rural) had zero total health expenditures (Blewett, 2008). Some urban residents still experience high average medical costs but were more likely to experience no cost in regard to health expenditures.

Time Since Last Check Up

The last variable analyzing health care access was the time since an individual's last checkup. While there was limited existing literature on specific rates of when/ how often urban residents receive routine checkups, literature found that only 73% of Americans went to the doctor for a routine checkup in 2010 (U.S. Census, 2012). Additionally, urban residents were able to visit a doctor more often due to the low travel times it takes to get to health care facilities.

A 2018 study concluded that it took an average of 19 minutes for the quarter of urban Americans who had the longest travel time to get to the nearest acute care facility, compared with five minutes for the quarter of urban residents positioned at the other end of the spectrum (Lam, 2018, p. 1).

Rural America

The Census Bureau defined rural as “any population, housing, or territory not in an urban area” (Ratcliffe, 2016, p. 3). The Census also found that about 60 million people, or one in five Americans, lived in rural America (Ratcliffe, 2016, p. 6). In general, rural areas were sparsely populated, had low housing density, and were far from urban centers (Ratcliffe, 2016, p. 3). Conversely, 97 percent of the country’s land mass was found to be rural with only about 20 percent of the population living there (Ratcliffe, 2016, p. 6). Americans living in these rural areas faced numerous health disparities, including higher rates of cigarette smoking, high blood pressure, obesity, and poverty (CDC, 2017). Additional literature was reviewed on the four health care access variables in rural America.

Health Care Coverage

Rural America experienced low rates of residents being insured; specifically, about 12.3 percent of people in completely rural counties lacked health insurance compared with 11.3 percent for mostly rural counties (Day, 2019). The Kaiser Family Foundation (2003, p. 1) also identified the chance of being uninsured among persons living in rural areas as being 24%. Furthermore, non-elderly individuals in rural areas were less likely to have private coverage compared to those in urban and other areas (61% vs. 64% and 66%, respectively) (Foutz, 2017). Medicaid helped fill this gap in private coverage, insuring 24% of nonelderly individuals living

in rural areas (Foutz, 2017). Rural America had lower rates of health care coverage, but higher rates of Medicaid compared to urban America (Foutz, 2017).

Personal Doctor

There was more research focusing on primary care physicians in rural America when comparing rural and urban regions of the country. The Commonwealth Fund (2019) reported that rural areas in the United States had 40 physicians per 100,000 people. Further, primary care providers in rural areas often served a large geographic area and populations with a growing need for an array of services (The Commonwealth Fund, 2019). Rural America experienced a greater physician shortage and the limited doctors who do work in rural areas were expected to serve across multiple specialties to meet the needs of the community (The Commonwealth Fund, 2019). Only about 11 percent of the nation's physicians worked in rural areas, despite nearly 20 percent of Americans living there (Cromartie, 2021). One factor that contributed to the shortage of physicians was the number of medical graduates who chose to practice rural primary care was insufficient to replace the rural doctors who were retiring. A recent study found nearly 30 percent of rural primary care physicians were at or nearing retirement age, while younger doctors (those under age 40) accounted for only 20 percent of the current workforce (Ewing, 2013, p. 2). The lack of primary care physicians in rural America has resulted in fewer residents having a personal doctor (Ewing, 2013, p. 1).

Medical Cost

Current literature also showed that rural America experienced higher medical costs, a common barrier to accessing care. In a 2008 study that analyzed health care expenditures for different regions in America, results showed that rural areas spent \$1,278.30 on prescription drugs and \$1,167.40 on emergency services (Blewett, 2008). This was especially concerning

considering the median household income in rural America was \$52,386, which was lower than urban America's median household income of \$54,296 (U.S. Census, 2016). Additionally, individuals living in rural regions of the country experienced higher levels of unemployment and therefore could not afford to receive medical care, pay for prescriptions, or purchase health insurance at the same rates residents of urban regions could (Cromartie, 2021). Overall, rural America had high health expenditure rates, lower median household income, and higher rates of unemployment which has created an exacerbated barrier to receiving care.

Time Since Last Check Up

Similar to urban America, there was a lack of research investigating a rural American resident's length of time since the last checkup. However, Rural Health Information Hub stated that the "means to reach and use services, such as transportation to services that may be located at a distance, and the ability to take paid time off of work to use such services" could prevent rural residents from receiving quality, consistent care (RHI Hub, 2021). Additionally, the physician shortage in rural America has limited the accessibility for residents to make maintenance appointments (Ewing, 2013, p. 2). Although there is no existing data on rural America's time since receiving an annual checkup, existing literature highlighted the lack of preventative care and inaccessibility to routinely visit a doctor.

Comparatively, rural America experienced higher rates of uninsured residents (12.3% vs 10.1%), lower rates of available and accessible primary care providers (11%), and higher health expenditures (\$1,278.30 vs \$1,061.41) (Day, 2019; Cromartie, 2021; Blewett, 2008). There was a gap in the literature surrounding the length of time since the last checkup, but it is hypothesized that rural residents received routine checkups less than urban residents. Overall, there was limited research focusing on these four specific variables and the influence that gender and

geographic location had on them. This research will further explore the barriers to health care for women in urban and rural America.

METHODS

This study aimed to better understand the relationship between women's access to health care and their geographic location. Quantitative methods were used to gain in-depth insight into the significance of four variables outlining health care access of women living in rural and urban counties in the United States. This research's data was conceptualized with a review of existing literature on health care access and statistical analyses utilizing previously collected data from a national health survey.

Data Source

The Behavioral Risk Factor Surveillance System (BRFSS) is a nationwide survey system that utilizes telephones to collect health related data from residents in the United States. The state level data that is collected consists of health-related risk behaviors, use of preventative services, and chronic health conditions. BRFSS was first established in 1984 and only collected information from 15 states. However, BRFSS now collects data from all 50 states, the District of Columbia, and three U.S. territories. In 2011, BRFSS updated their system to incorporate cellular telephone use and a new weighting methodology. Cell phone use allowed for better participation and therefore more representative of the population. The new weighting methodology now includes the ability to weigh variables such as education attainment, marital status, tenure, and telephone ownership. This update in the weighting process can reduce selection bias and increase representation.

BRFSS is considered the largest conducted health survey in the world, currently collecting around 400,000 adult interviews each year. Since the survey collects data on health

and behavioral risks, BRFSS is a great tool used to target and build health promotion interventions in specific populations. The 2020 BRFSS survey collected data from 402,212 individuals: 124,766 from landline interviews and 277,446 from cell phone interviews.

Variables of Interest

The independent variable for this research is the urban/ rural status of women who participated in the 2020 BRFSS survey. The dependent variables for this research include variables of health care access included in the 2020 BRFSS survey. These variables include having any type of health care coverage (HLTHPLN1), having one or more health care providers (PERSDOC2), financially being able to see a health care provider in the last 12 months (MEDCOST), and length of time since last checkup (CHECKUP1). The questions and response options are illustrated in Table 1.

Analytic Plan

The rural/ urban status of respondents was combined with the sex variable, exclusively female, to create dichotomous variables labeled as “Rural Women” and “Urban Women”, respectively. There are 31,744 number of respondents considered “Rural Women” and 177,783 number of respondents labeled “Urban Women”. For each variable, all responses of “Don’t know/ not sure”, “Refused to answer”, and “Missing” will be removed from the dataset prior to analysis. The different health care access variables will be analyzed using chi-square tests to investigate a potentially significant relationship. A chi-square test is a statistical test used to compare observed results with expected results (Rana, 2015, p. 70). The purpose of this test is to determine if a difference between the variables is due to chance, or if it is due to a relationship. A significance value of $\alpha=0.05$ will be used to analyze the relationship between health care access in rural women. The null hypothesis of this research is that there will not be a significant

relationship between the multiple responses of different health care variables and women living in rural counties in the United States. The alternative hypothesis is that there is a significant relationship between health care access and rural women in the United States.

RESULTS

Chi-square tests were utilized to determine if there is a relationship between each health care access variable and rural/urban women with a significance level of 0.05. Results showed that rural women were significantly more likely to have one or more personal doctors/ healthcare provider compared to urban women, 87.82% versus 87.38%, respectively ($p=0.03$). However, urban women were significantly more likely to have been unable to visit a doctor in the past year due to cost compared to rural women, 9.16% versus 8.52%, respectively ($p=0.0003$). Additionally, urban women were significantly more likely to have visited a doctor for a routine checkup within the past two years compared to rural women, 93.00% versus 92.46%, respectively ($p=0.0005$). Results did not show a significance between rurality of women and having any type of health care coverage. Results can be seen in Table 2 in the appendix.

DISCUSSION

The purpose of this research is to further investigate the relationship between women's healthcare access and rural and urban America based on a 2020 national telephone survey, BRFSS. Overall, this research emphasized the need for better healthcare access for women across all geographic locations. According to the CDC (2020), geographic location, or the urban/rural status of an individual, is one factor contributing to inequitable health distribution in the United States. This research's results showed that rural women are more likely to have one or more personal health care provider, urban women are more likely to not be able to see a doctor in

the last 12 months because of cost, and urban women were more likely to have a recent routine checkup. Existing literature attributes these differences to many factors including the physician shortage, lack of transportation, and income disparity which create barriers for individuals to access care (Ewing, 2013; Lam, 2018).

While rural women are more likely to have a primary care provider (PCP) and less likely to report that there was a time within the last year that they could not visit a doctor because of cost, it appears they are less likely to utilize their PCP for a routine checkup within recent years compared to urban women. This could be attributed to the lack of facilities and physicians accessible in rural areas. Perhaps urban women have a greater array of urgent care centers, emergency rooms, and specialty physicians whereas rural women seek all medical care from the same PCP. Additionally, while urban women are more likely to have received a routine checkup within the last two years, they also report being unable to access care within the past year because of cost, suggesting they have unmet medical/healthcare needs because of their inability to afford the care they need. This implies that urban women are foregoing preventative services and seeking care in the advanced stages of disease due to cost, a scenario that yields poorer health outcomes (Hadley, 2016).

On the other hand, there was no significant difference between an individual having health care coverage for women in rural and urban America. However, literature focused on insurance rates in different regions of America states that rural America have higher rates of uninsured individuals (Day, 2019). Based on these results, it is apparent that healthcare access is a disparity seen by women throughout the United States and exacerbated by financial ability and the accessibility to healthcare facilities. Urban and rural women experience unique disparities that prevent them from receiving adequate care. These conclusions add to existing knowledge in

public health that the country needs to focus on making health care services more accessible to all its residents, specifically women in rural and urban areas.

Implications

Healthcare is a complex issue with many different domains including food security, safe housing, and reliable transportation that all influence access. When looking at interventions, it is critical to address transportation barriers and the physician shortage, create policies inclusive of women's needs, and implement population specific assessments to improve healthcare access for women in the United States. Similarly, alleviating health disparities will require a deliberate and sustained effort to address social determinants of health such as poverty, education, environmental degradation, and gender discrimination (Khuller, 2018). Specifically, three workforce sectors can use this research to make health services more accessible to women in both urban and rural regions.

Health Care

There are multiple ways the healthcare workforce can improve access to care for women in America. One way is to address the physician shortage in rural regions. These results showed that rural women were more likely to have one or more personal doctors, but it is not sustainable for a primary care physician to provide all of the medical care that a woman might need. More incentives need to be offered for medical students and current specialty doctors to work in rural regions of the United States (RHI Hub, 2022). Investing in healthcare workers to learn, research, and work in rural America will increase accessibility for women to obtain services that meet their diverse medical needs (RHI Hub, 2022). This includes increasing women's health physicians in isolated regions so personal care doctors can focus on individual's primary care needs. Additionally, this research showed the need for more financially accessible healthcare

options for women in urban areas. Increasing the capacity of physician extenders, including physician assistants and nurse practitioners, will increase physicians reach in urban areas at a lower cost for women. Health care workers should also embrace and encourage innovative techniques for delivering care, including telehealth. Transportation is a common barrier for all women, but specifically those living in isolated areas, and allowing individuals to virtually attend appointments will reduce or eliminate the burden of long travel times to care facilities. Healthcare workers should invest time, funding, and innovation in making health care more accessible so women in both rural and urban areas can experience greater health outcomes.

Policy Makers

Policy can have a great impact on making healthcare more accessible for women across America. To ensure policy makers investments are adequately aligned with women's needs, women must be involved as decision-makers in every step of the design and delivery of health services (Cowan, 2019). Efforts to invest in female leadership in policy spheres will ensure the needs of women are heard and evaluated during all policy decision-making. Additionally, policies to close the gap and address the diverse social needs of women in the country are fundamental to inclusive growth of healthcare access in America. Following a Health in All Policies approach will better collaborate, integrate, and articulate health considerations in all communities for women (CDC, 2016). The Health in All Policies approach also provides recommendations and actions across multiple settings to focus on increasing and ensuring people's lives are healthy and productive (CDC, 2016). One specific policy that would improve rural American women's access to care is prioritizing and investing in transit services. Small rural transit providers should be given the tools and technical support needed to design their transit systems to meet residents' needs as directly and cost-effectively as possible—needs which

can vary significantly across rural communities. That could mean increased funding in public health to determine exactly where and when people are traveling to and from to help rural agencies tailor their services or clear guidance about rural transit strategies and outcomes to measure. The broad goal of improving health and increasing health access for women has resulted in a call to action across the country that encompasses everything from including women in decision-making processes, creating policy that reduces health disparities in communities, and providing a more holistic approach to improving access to care.

Public Health Professionals

Needs assessments are key tools for public health professionals as they work to understand the specific health access barriers for women in different communities (Barnett, 2012). There is an urgent need to utilize tools that discern the issues around why rural Americans cannot gain access to consistent, quality care (RHI Hub, 2022). To do so, population health research is needed to demonstrate relationships between specific social determinants of health and health care access (Barnett, 2012). Women from different populations have different needs and specific assessments to identify those needs are necessary when creating interventions that will effectively address the gaps each community faces. Understanding the root cause of economic, social, and medical adversity will help shape more holistic approaches that will improve health outcomes in all populations (Barnett, 2012).

Future Work

This research showed that women across the country are experiencing barriers to accessing health care services. However, future research at the state and community level might expand on the demographical needs of women and their access to health care. Future research should also consider the potential effects of a woman's race, education, marital status, and

income more carefully to better understand their specific healthcare needs and accessibility. This research provides a good starting point for discussion and further research on improving women's healthcare access in the United States.

Limitations

One limitation to this study is the nature of the survey. BRFSS is a cross-sectional, self-reported survey and is subject to social desirability bias and recall bias, which can influence what participants share at the time of the interview. BRFSS is also a telephone survey and is limited to people with landline or cell phones. Although BRFSS has updated its system to include weighting for certain variables, the exclusiveness of utilizing telephones for survey participation can reduce the representation of the data.

COVID-19

Data for this research was taken in 2020, a monumental pandemic year that affected healthcare in many ways. The number of visits to ambulatory practices declined nearly 60% in the year 2020 (Mehtrotra, 2020). Individuals were also unable to utilize healthcare for non-emergent reasons and fear of the virus kept people away from in-person visits (Mehtrotra, 2020). When analyzing these results, it is important to note the nature of healthcare at the time data was collected. Additional research utilizing data from multiple years to analyze women's healthcare access is crucial for understanding the impact of COVID-19 on women's health as their reduced ability to access preventive and necessary healthcare during the pandemic may have deleterious long-term outcomes.

CONCLUSION

In conclusion, this research analyzed the relationship between four health care access variables and women in rural and urban America using BRFSS 2020 data. Existing literature

showed a lack of research combining gender and geographic location to analyze the relationship with access to care. This research's results showed that rural women are more likely to have one or more personal health care provider, urban women are more likely to not be able to see a doctor in the last 12 months because of cost, and urban women were more likely to have a recent routine checkup. This information can be utilized by a multitude of professionals including health care workers, policy makers, and public health professionals. When creating interventions and policies targeted towards improving health care access for women in America, it is critical to involve women in the policy making process and consider population specific needs to understand the systematic, economic, and cultural makeup of women living in the community. This research gives a better understanding of health care access disparities specific to women and provides guidance for professionals who work to improve access to care for women in different regions of the country. Additionally, more time and research efforts are needed to address the unique needs of women to improve health care access in rural and urban areas.

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APPENDIX A

Table 1: Variable, Question, and Response Options

Variable	Question	Responses
Urban/rural status	Do you live in an urban or rural county?	1-Urban counties 2-Rural counties
Health Care Coverage	Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare, or Indian Health Service?	1-Yes 2-No
Personal Doctor	Do you have one person you think of as your personal doctor or health care provider? (If 'No' ask 'Is there more than one or is there no person who you think of as your personal doctor or health care provider?')	1-Yes, one or more 2-No
Medical Cost	Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?	1-Yes 2-No
Checkup	About how long has it been since you last visited a doctor for a routine checkup? [A routine checkup is a general physical exam, not an exam for a specific injury, illness, or condition.]	1-Within the past 2 years 2- 2 or more years or never

Table 2: Results of Chi-square Analyses Healthcare Access and Age Characteristics by Rural/Urban Residence (n=209,527)

	Total Sample (n=209,527)	Rural Women (n=31,744)	Urban Women (n=177,783)		
	Frequency (%)	Frequency (%)	Frequency (%)	χ^2	P-value
Health Care Access Variables					
Health Care Coverage	92.96%	93.12%	92.93%	1.4167	0.234
Personal Doctor	87.45%	87.82%	87.38%	4.6962	0.031
Inability to Visit Dr Due to Cost	9.06%	8.52%	9.16%	13.2473	0.000
Checkup Within the Last 2 Years	92.92%	92.46%	93.00%	12.1658	0.001
Age					
Age 18 to 24	5.25%	3.55%	5.56%		
Age 25 to 34	10.04%	7.35%	10.52%		
Age 35 to 44	12.58%	10.54%	12.94%		
Age 45 to 54	15.22%	13.78%	15.48%		
Age 55 to 64	19.41%	20.66%	19.19%		
Age 65 or older	37.49%	44.12%	36.31%		

BIOGRAPHICAL SKETCH

Ellery Denny recently completed her Master of Public Health degree with a concentration in Health Systems and Policy Analytics at the University of Kentucky. Ellery also has a Bachelor of Science degree in Biochemistry from Western Kentucky University. Ellery works in a local health department as a Population Health Strategist. Ellery can be reached at elleryc.denny@ky.gov.