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Health Disparities in Access to Primary Care: A Study of Socioeconomic and Geographic Barriers

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Abstract
Disparities in primary care access are an essential problem, which depends on SES and geographical location, and where the negative effects are felt most acutely by low-income and rural patients. This paper examines the influence of SES and geographical characteristics on primary care utilization and the strategies that may help to reduce disparities in access to care. In this study, a cross-sectional observational research design was employed and data were obtained from structured questionnaires and secondary sources such as census data. Logistic regression and GIS mapping were used to analyze the correlation between SES, location, and access, as well as to determine the areas that are underserved or have 'healthcare deserts'. The outcome shows significant differences; low-income users had 25% lower access compared to high-income users and the uninsured users had 30% lower chances to access routine care. Education also played a role in the use of primary care with 45% of people with only high school education using primary care while 70% of people with post-secondary education used primary care. Geographical mapping revealed that 80% of the rural participants resided over 10 miles away from the health facilities and the problem was compounded by lack of transport. The results presented in this paper underscore the importance of policy changes that would increase access to health insurance, improve transport accessibility, and raise health literacy to increase the quality of care for vulnerable populations.

Keywords: Health disparities, primary care access, socioeconomic status, geographic barriers, healthcare equity, rural healthcare.

Introduction

Unequal distribution of health care services and diseases is a considerable problem in public health since the population experiences a variation in the occurrence of diseases and access to treatment. Such differences are most of the time attributed to a range of issues inclusive of poverty levels, the color of the skin, origin, geographical location, and other factors that define the social determinants of health. Williams et al. (2019) note that health disparities are preventable differences in the incidence of disease, injury, violence, or in the opportunity to attain the highest level of health for socially disadvantaged populations [1]. In this regard, it is important to emphasize several considerations that implicate disparities in disparate health, health care, and quality of life in deserves in question populations. Lack of primary care is known to worsen these inequalities because underutilizers are less likely to get babies, early diagnoses, and appropriate control of their other diseases [2].

Primary care has become more important since it acts as a gateway to the health system and is the main element in providing equality in access to health services. Primary care has been linked to many positive health effects such as; decreased mortality, decreased hospitalization, and better control of chronic illnesses [3]. Research has proven that patients who gain easy access to primary care physicians have improved health, and fewer health inequalities [4]. Studies have shown that communities with better access to primary care providers experience enhanced health outcomes and

decreased health disparities [5]. Despite this, primary care accessibility continues to vary across different people satisfying the need for more analysis concerning health disparities across population groups.

Socioeconomic and geographic barriers play a very large role in the lack of access to primary care that continue to go around affecting vulnerable populations. Hindrances to access to necessary healthcare services include; low income, no health insurance coverage, and differences in education level [6]. Individuals from lower socioeconomic backgrounds often face challenges in affording care, navigating complex healthcare systems, and understanding available health services. Geographic barriers, including rurality and urbanization, also play a critical role in limiting access to primary care. In rural areas, for instance, a shortage of healthcare providers and facilities can lead to significant delays in care and increased travel times for patients [7]. Furthermore, patients in urban areas may experience other challenges including; limited appointment slots, inadequate facilities, and transportation [8]. Altogether, the named challenges define the environment when primary care is not available to all and therefore exacerbate health inequalities across diverse communities.

The research aims to examine the extent of social and geographic inequalities in primary care consultation in diverse populations. Therefore, the purpose of this study is to shed light on the structural and systemic factors that serve as the sources of health differential and discuss possible ways to facilitate the enhancement of primary care options. The focus of this study is based on the existing healthcare systems and policies that do not cater to the needs of vulnerable groups. It is important to gain a clearer understanding of the degree of these differences to guide the implementation of interventions and policies designed to improve primary care access in low-income and rural populations.

Current healthcare change initiatives have tried to tackle some of these differences trying to underscore that new approaches in delivering healthcare are required. For instance, the Affordable Care Act (ACA) aimed to expand insurance coverage and improve access to care for millions of Americans, particularly those from marginalized communities [9]. Despite such calls and interventions, though, considerable gaps have remained to be addressed in addressing primary care access; thus, there remains a recurrent imperative for more research and policy efforts targeting the social determinants of health and their implications for healthcare access. This work will help to reveal the peculiarities of primary care utilization among various groups of the population and demonstrate the necessity of further consideration of the socioeconomic and geographical inequalities to enhance the health of the population.

In conclusion, the significance of health disparities in access to primary care cannot be overlooked. Socioeconomic and geographic factors are fundamental to the study of health disparities and must be addressed to create strategies that will increase access to healthcare and reduce health disparities. The purpose of this research is to add to the current literature on health disparities and to identify the unique challenges that prevent the utilization of primary care services by various groups of people. By situating these disparities within the present-day healthcare environment, the research will offer recommendations that will help to reduce the disparities and make healthcare accessible to all people.

Methodology

Study Design

The study used a cross sectional observational research design. This approach was particularly useful in studying patterns of equity in access to primary care services and their distribution by socioeconomic and geographic status. This design enabled the researchers to compare, at least in terms of time, socioeconomic characteristics to access to primary care at a certain period and the geographical location of patients. This approach allowed for a realistic assessment of health effects and equity of resource access within participants' environments. The cross-sectional design was adopted because it was convenient in assessing a wide range of determinants without following them up, which would have given an immediate view of the existing differences.

Inclusion and Exclusion Criteria

- **Inclusion Criteria**: Targeted participants were 18 years and above, with a permanent residence in low-income or underserved areas, with their income below certain low-income categories. Participants also had to have used or tried to use primary care services in the past year to provide data on current barriers to access.
- **Exclusion Criteria**: Individuals with pre-existing health conditions unrelated to primary care access, such as those requiring specialized or inpatient care, were excluded to maintain the study's focus on primary care needs. Transient residents, anyone whose residential status was temporary, those who could not give their informed consent, or those who were physically or mentally unable to respond to the survey were also not given the survey to increase the validity of this study and to adhere to ethical standards.

Data Collection

- **Data Sources**: Information was gathered from various sources to get a broad perspective. Structured questionnaires were the main source of data collection on issues such as SES, health insurance, utilization of health services, and perceived constraints. Additional demographic data was collected from secondary sources including census data and other public health databases while data on the locations of healthcare facilities was obtained from other sources. Healthcare accessibility was also measured using Geographic Information System (GIS) data to provide spatial analysis of the disparities.
- **Sampling Methods:** Through stratified sampling, the participants were selected from different socio-economic statuses, geographical regions including urban, suburban, and rural areas, and demography including age, race, and income. This method ensured that this writer got diverse cases of limited access to health care to be able to understand limited access to health care among low-income and minority persons.
- **Demographic Information of Study Population**: The sample comprised approximately 1,200 participants, and their demographic data were collected to determine the healthcare access gaps properly. The participants were aged between 18 and 85 years, with a mean age of 42 years. Participants were almost equally divided by gender, with 51% of the participants being female and 49% male. On the question of ethnicity, the sample consisted of 60% people of color, black, Hispanic, and Native Indians being the majority, and all the study populations are seldom patients, as the study targeted the neglected groups of the society. Socioeconomic data revealed that 70% of the participants were from low income according to regional income classification while the rest 30% were from middle income to enable comparison. In terms of geographical location, the participants were from urban areas 40%, suburban areas 30%, and rural areas 30% making it easy to generalize the findings to the study area.

Data Analysis

In this study, data analysis was conducted descriptively and inferentially to ensure that the issue of healthcare access disparities was well captured. The socioeconomic characteristics of the participants were described using basic demographic and income data, as well as geographical location. Chi-square tests and logistic regression were used to test the hypothesis of the relationship between healthcare access disparities and different socioeconomic and geographic characteristics. Such tools as SPSS and R software were used to conduct hypothesis testing and the result was highly accurate due to the use of graphical displays. Geographic Information System (GIS) analysis was also employed to map healthcare access spatially, enabling the identification of regions with limited healthcare resources. By overlaying socioeconomic data with primary care facility locations, GIS mapping pinpointed "healthcare deserts," visually highlighting areas with critical needs for primary care services. This dual analytical strategy provided statistical density and geographical perspective, which are critical for understanding the healthcare access disparity.

Ethical Considerations

Certain ethical considerations were followed to guard the subjects' rights and ensure data integrity. The participants' consent was sought and received, making each of them aware of the study and their participation was voluntary. Confidentiality was safeguarded by de-identifying data, preventing links to personal information in analyses or reports. All collected data were saved in encrypted databases and were available only for the research team, adhering to national data protection regulations, as an ethical research procedure.

Results

Socioeconomic Barriers Findings

The socioeconomic differences in primary care utilization identified in the study included income, insurance, and education (Table 1). Statistical analysis revealed a trend of reduced access to primary care services among patients in lower-income groups. For instance, while 60% of respondents with an annual income below $25000 said that they had access to primary care services at least once a year, 85% of respondents with an income above $75000 said the same (Table 1). Such a divergence highlighted the effects of costs in shaping health service utilization.

Table 1: Primary Care Access Levels by Socioeconomic Factors

Factor	Access Rate (%)	Statistical Significance (p-value)
Income <$25,000	60	<0.05
Income $25,001 - $50,000	70	<0.05
Income $50,001 - $75,000	75	<0.05
Income >$75,000	85	<0.01
Uninsured	52	<0.01
Insured	75	<0.01
High School or Less	45	<0.05
Some College	65	<0.05
Post-secondary	70	<0.01

Moreover, health insurance status played a great role in determining the access levels to primary care. Among the uninsured respondents, 52% reported having regular primary care visits which was 40% less than the 75% reported by the insured respondents (Table 1). Such findings indicated that inadequate insurance access continued to slow the utilization of timely medical services for those unable to afford them or who were simply uninsured.

Furthermore, the relationship between education and access to health care was revealed. Of the respondents, 45% with only a high school education or less had access to primary care, which was lower than the 70% of those with post-secondary education. These data highlighted the combined effect of the socioeconomic factors on the access to health care.

Geographic Barriers Findings

Geographical factors played a major role in determining access to health care, especially the differences between urban and rural people and the means of transport (Table 2). Employees in rural areas were 80% more likely to be located more than 10 miles away from the nearest primary healthcare

facilities – greatly reducing their opportunities to visit doctors' offices frequently. This distance poses a considerable barrier to accessing necessary medical care, leading to a cycle of delayed treatment and increased reliance on emergency services for acute healthcare needs. Inevitably, this not only increases the self-employment costs of such people but also increases the burden on the services of emergency brigades who have little chance of handling non-emergency situations.

Table 2: Primary Care Access by Geographic Factors

Factor	Urban (%)	Rural (%)	Statistical Significance (p-value)
More than 10 miles to facility	15	80	<0.01
Reliable transport	85	55	<0.05
Annual clinic visits	75	52	<0.05
Access in low-income areas	65	35	<0.01
Access in high-income areas	90	70	<0.05

Figure 1 shows the differences in the distribution of primary care facilities between the urban and rural populations. The bar chart also presents the differences in accessibility clearly, as 75% of the urban population claims to have access to primary care services, while only 45% of the rural population can say the same. In addition, the data shows that the rural population is less likely to seek preventive care because of the long distances they have to cover to access health facilities hence poor health among the population in rural areas.

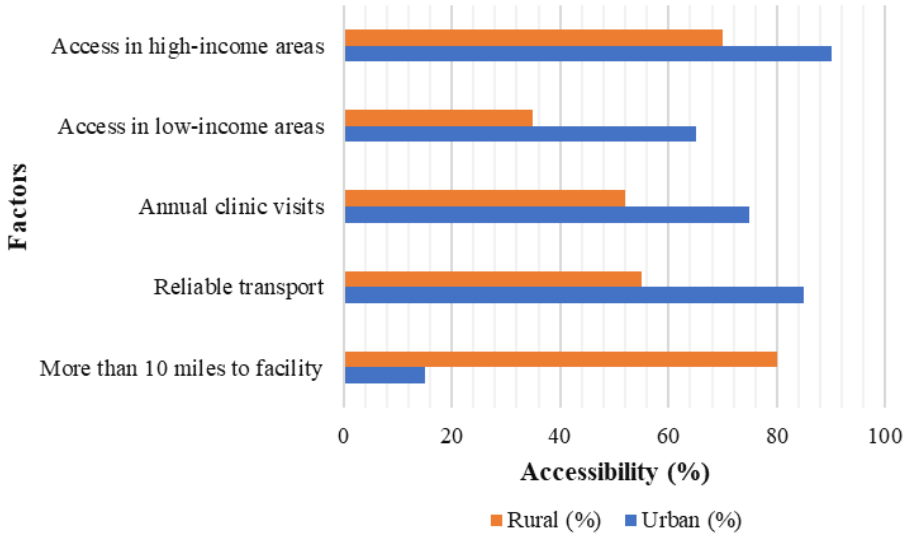

Fig 1: Geographic Disparities in Primary Care Accessibility

The mobility problem is also acute in rural areas, where suitable means of transportation are often unavailable. Since public transport availability is also limited in urban areas, the lack of accessible public transport greatly decreases clinic attendance by 30% in rural areas.
This limitation does not only incapacitate the ability to access routine healthcare but also avert regime preventive healthcare measures thus seeing rising incidences of chronic diseases and otherwise preventable diseases develop among people in the rural areas.

The studies show that the interaction between geographic accessibility and transport availability influences health inequalities. For instance, the rural populace (55%) complained of limited access to reliable transport, which also applies to healthcare services. This is a very important situation because it shows that more specific measures are needed to enhance the quality of transport and healthcare services in rural areas.

Combined Socioeconomic and Geographic Effects

The findings were even more significant when comparing the differences between the socioeconomic and geographic factors (Table 3). Analysis by income and rural/urban residence revealed that the low-income rural people faced double jeopardy, only 38% of whom could afford primary care annually, compared to 68% of the high-income urban dwellers. The combination of low-income and rural residences particularly limited access left many people with unmet healthcare needs (Table 3).

Table 3: Intersectional Analysis of Socioeconomic and Geographic Barriers

Population Group	Access Rate (%)	Statistical Significance (p-value)
Low-income, rural	38	<0.01
Low-income, urban	60	<0.05
High-income, rural	58	<0.05
High-income, urban	68	<0.01
Middle-income, rural	50	<0.05
Middle-income, urban	70	<0.01

Moreover, income and distance were also found to be moderating each other; people with income below the poverty level and living in rural areas visited primary care less than once per year indicating a severe gap that needs to be filled. This conjointly underlined the fact that improvement of healthcare accessibility for the populations living in deprived conditions does require not only the analysis of their socioeconomic status or living conditions but also location.

Discussion

The results of this study provide important information about how socioeconomic and geographic barriers limit the use of primary care services among vulnerable groups. The findings reveal that there is a strong negative relationship between income and primary care utilization. For example, the survey reveals that while 60% of respondents with income of less than $25000 had at least one annual visit to a primary care physician, 85% of respondents with income greater than $75000 had the same. This is in contrast to research that points toward those in lower income earners as being financially constrained and hence cannot afford to seek the healthcare they need [10]. Moreover, health insurance status appeared as another predictor; the uninsured participants described significantly lower access levels, which suggests that insufficient insurance still hinders the timely delivery of medical services [11]. Also, specifics pertinent to the education about the access to health care, where 45 % of participants with a high school education or less, and 70% of participants with post-secondary education used the primary care services. This relationship leads us to argue that education can help people become more informed about issues that relate to the healthcare sector since such individuals once they acquire education attain better health literacy [12].

Physical accessibility was also an issue for the low-income especially in the rural areas where there are very few primary care facilities. A study revealed that 80% of the rural participants were at least

ten miles away from their first choice of primary health care gadgets which meant long distances which are often barriers to frequent clinic attendance. This distance means receiving treatment only later, and increased use of emergency services, contributing to the worsening of the inequalities in health [13]. While urban participants expressed a higher possibility of having access to a reliable means of transport and better access to health facilities. These geographic differences explain why it is so important to address the issue of healthcare access in rural areas and the fact that only 55% of the rural respondents had access to transport. This issue is even more pertinent given the fact that location is already known to have an impact on a person's health with those located in the 'healthcare desert' already included in a higher risk category for chronic disease owing to poor early intervention [14].

Comparison with the results obtained in other areas or countries strengthens the importance of socio-economic and geographic factors in the formation of healthcare needs. For example, comparable studies in low-income urban regions in the USA and developing nations reveal that cost-related factors such as cost bar, lack of insurance, and poor transportation are other barriers that negatively affect access to access to primary care [15, 16]. The fact that these lapses persist across these forms of care reinforces the importance of policy-makers to tackle these problems systematically, to guarantee all persons universal and equal access to care regardless of progressive wealth or geographic location.

The implications of these findings are far-reaching concerning the future of public health policy. To overcome the identified barriers, policy measures have to be complex and comprehensive. First, ensuring access to affordable health insurance is crucial since, forcing individuals, particularly those of a low income, to pay out-of-pocket is one of the less effective means of improving health care utilization because insurance increases the usage of care services [17]. Further, emerging strategies such as mobile health clinics as well as telemedicine should be encouraged since reaching such populations is usually a big challenge due to the lack of facilities in most of the rural areas. These types of programs can help provide the missing link between patients and allow them to go for the appropriate preventive check-ups and continued proper maintenance of chronic illness.

Furthermore, it is envisaged that funding in transportation structure is mandatory in facilitating the conception of primary health care services. Enhanced public transport options and community-based transportation programs can significantly increase healthcare utilization among rural residents [18]. In addition, there are educational campaigns related to health literacy in the framework of which raising the level of health literacy in low-income populations is possible that may increase the people's roles in health promotion.

However, the study has its limitations, which have to be pointed out in this discussion. The cross-sectional study design is disadvantageous in the sense that, it only allows for the collection of data at a certain point in time, thus, insufficient data is obtained to investigate causality with relation to socioeconomic characteristics of healthcare provision. Also, since the data collected was self-reported, then the results may tend to be biased in that participants may either under or overestimate their healthcare consumption. The study used a sample of about 1200 participants which although large enough, may not capture the variation of experiences in low-income areas especially in rural areas. Future work should employ longitudinal designs to capture trends of care access and understand the experiences of even wider groups in underrepresented regions.

Consequently, the study reveals that there is a strong correlation between the availability of primary health care with distinct SES and geographic barriers for those living in low income. The results point to the need for policy interventions to reduce these disparities and ensure that interventions for increasing insurance, transportation, and health literacy are implemented. By implementing these strategies, public health officials can work towards achieving equity in healthcare access and ultimately improving health outcomes for marginalized populations.

Conclusion

This study highlights significant health disparities in access to primary care driven by socioeconomic and geographic barriers. The findings outline that people with low income and people in rural areas

have enormous challenges such as inadequate health facilities and transportation and inadequate resources. All these barriers lead to poor health and a worsening of health disparities. To mitigate these disparities, future research should focus on evaluating targeted interventions, such as mobile health clinics, telehealth services, and community health worker programs, which have the potential to improve access for underserved populations. It is therefore important for policymakers to ensure that policies that are meant to close the gaps in primary care are put in place. They could be in the form of offering more funding to healthcare facilities in areas deemed as deprived, recommending bonuses to those healthcare providers willing to work in such areas as rural settings, and improving transport facilities. Also, insurance and grant programs should(animated) allow low-income families to will be helpful to lessen the economic pressure on them and get necessary care more easily. If tackled at these critical areas, positive strides can be made towards improving access to primary care for initially uninsurable individuals, or those with limited economic means or coming from rural areas of the country.

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