Disparities in Access to Emergency Care: The Intersection of Race and Rurality

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

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Introduction

Access to emergency medical care is a critical determinant of health outcomes, yet it remains highly uneven across racial and geographic lines in the United States. Despite advances in medical technology and emergency response systems, disparities between who receives timely, high-quality care still exists. Rural populations face structural barriers such as fewer medical facilities, longer travel distances, and limited emergency medical services (EMS) coverage. Simultaneously, racial and ethnic minorities experience unequal treatment due to implicit biases in healthcare, socioeconomic constraints, and infrastructural barriers like inadequate public transportation. The intersection of these two factors—race and rurality—creates compounded inequities that leave certain communities disproportionately vulnerable to poor emergency healthcare outcomes. This study examines these disparities by investigating various emergency department utilization studies as well as a case study analysis. Specifically, it seeks to answer the question: How is access to prompt, quality emergency medical care distributed between racial and ethnic communities in urban versus rural United States, why do these disparities exist, and what are the outcomes of such differences?

The research is set within the broader landscape of emergency healthcare infrastructure in the United States with a focused case study on the Charlottesville, Virginia area. This setting is particularly relevant due to its mix of urban and rural populations, allowing for a comparative analysis of EMS across different demographics. The key actors in this study include emergency healthcare providers such as paramedics, emergency room physicians, and trauma nurses as well as patients who experience the system firsthand. Furthermore, policymakers, urban planners, and hospital administrators all play a role in shaping the availability and efficiency of EMS through

funding, regulations, and infrastructural development. However, their involvement is less scrutinized in this particular study.

The research strategy employs a multi-method approach. A comprehensive literature review analyzes existing studies on racial and rural disparities in emergency care, identifying systemic patterns, historical trends, and policy gaps. Additionally, a case study of Charlottesville area explores the ins and outs of one emergency healthcare system to gauge local disparities. This study argues that disparities in emergency care access are not only the result of geographic isolation or socioeconomic barriers but also stem from systemic inequities embedded in healthcare institutions. The research demonstrates how race and rurality interact to shape healthcare outcomes, revealing that even in urban areas, racial minorities may face obstacles to care despite proximity to medical facilities. Ultimately, the study offers policy recommendations for improving EMS policies, healthcare infrastructure, and medical training to mitigate these disparities and create a more equitable emergency care system.

Background and Significance

Emergency medical care is a critical component of the healthcare system, designed to provide life-saving treatment in moments of crisis. However, not all individuals in the United States have equal access to prompt and high-quality emergency services. Disparities exist at the intersection of race and rurality, with certain communities facing significant structural barriers that affect their ability to receive adequate care. While geographic distance from trauma centers is a well-documented issue for rural populations, racial and ethnic minorities in both urban and rural areas face additional challenges including biases in medical treatment, transportation barriers, and systemic inequities in healthcare infrastructure. Understanding these disparities is

essential for addressing gaps in the healthcare system and ensuring that EMSs operate equitably across all populations.

To start off with, a significant body of research highlights racial disparities in emergency medical care. They demonstrate that minority patients often receive lower-quality treatment than their white counterparts. Studies have shown that racial minorities experience longer EMS response times, are less likely to receive pain management, and are more frequently transported to under-resourced hospitals. For example, Soares et al. found that Black and Hispanic patients were less likely to receive adequate pain medication in emergency settings compared to white patients, reflecting long-standing racial biases in pain assessment and treatment (Soares et al., 2019).

Beyond racial disparities, geographic location plays a major role in determining access to emergency care. Rural Americans face distinct challenges due to the limited availability of hospitals, fewer trauma centers, and reliance on understaffed EMS services. According to Carr et al., nearly 30 million Americans live more than an hour away from a Level I or II trauma center which significantly increases their risk of death from time-sensitive conditions such as heart attacks, strokes, and severe injuries (Carr et al., 2017).

While racial disparities and rural healthcare challenges have been studied independently, their intersection presents a unique and pressing problem. Essentially, rural minority populations face a double burden: the geographic barriers of rurality combined with the systemic inequities of race. In fact, Eberth et al. found that rural Black and American Indian/Alaskan Native populations were significantly farther from hospital services than rural White populations, exacerbating the challenges of accessing emergency care. In contrast, urban areas may have

hospitals in closer proximity, but minority populations still face barriers such as reliance on public transportation, lack of health insurance, and discrimination in care settings (Eberth et al., 2022).

There are numerous implications of this research. First, these disparities in emergency medical care have serious consequences for health outcomes, particularly for conditions that require rapid intervention. Also, when patients do not receive timely and adequate emergency care, they are more likely to experience long-term health complications, increased medical costs, and a diminished quality of life. Both of these can be directly observed through health metrics and mortality rates. By exposing the ways in which race and rurality intersect to limit access to life-saving treatment, it provides a foundation for advocating for policy reforms that will improve the healthcare outcomes for all patients, regardless of their background or location.

Methodology

To investigate how access to emergency medical care is distributed among racial and ethnic communities in urban versus rural settings in the United States and to understand why these disparities exist, this study employs a mixed-methods approach. Specifically, this research is framed using an Intersecting Structures of Power Framework, which examines how race, geography, and the healthcare system interact as overlapping systems of inequality. In terms of data collection, it consists of a combination of a literature review and case study which provides a comprehensive understanding of systemic inequities in emergency healthcare access. This methodology is designed to capture both macro-level patterns through secondary data analysis and micro-level experiences through a case study investigation. This allows for a nuanced exploration of structural and social determinants of emergency care disparities.

The first component of this research is a comprehensive literature review of existing studies on racial and rural disparities in emergency medical care, specifically in the United States. This review analyzes peer-reviewed journal articles, policy reports, and government data to identify systemic patterns, historical trends, and gaps in healthcare infrastructure. Naturally, there are three areas of interest: racial disparities, rural disparities, and the intersection of the two. The data collected on racial disparities in emergency care includes studies on racial bias in pain management, EMS response times, and hospital referral patterns. Next, research on rural barriers to healthcare, such as trauma center deserts, EMS shortages, and the decline of rural hospitals, provides insight into geographic inequalities. Finally, special attention is given to studies examining the intersection of race and rurality. However, these studies are far more limited than either of the factors in isolation, so they are not relied on entirely. Instead, by synthesizing the findings from all areas of interest, the literature review establishes an overarching perspective for understanding the scale and impact of emergency care disparities. It also highlights policy shortcomings and structural inequalities that contribute to these inequities, ultimately informing the case study.

To complement the literature review's broad overview, this study conducts a case study of EMS in Charlottesville, Virginia. Charlottesville presents an ideal setting due to its mix of urban and rural populations, allowing for a comparative analysis of emergency care disparities across different geographic and racial demographics. The city of Charlottesville has two major hospitals, the University of Virginia and Martha Jefferson Hospital which are Level I and Level III centers, respectively. Furthermore, the Charlottesville-Albemarle Rescue Squad (CARS) is responsible for much of the ambulatory response system within the city. Additionally, there are several fire departments in the surrounding Albemarle County that service more remote

locations. The primary focus of this case study is analyzing demographic and service utilization data from these local hospitals and ambulatory care providers to help quantify disparities in response times, hospital referrals, and treatment outcomes. Also, this case study involves reviewing the experiences of emergency care providers, including trauma doctors, nurses, paramedics, and EMTs, to gain insight into how they treat patients from diverse racial and geographic backgrounds. This will uncover their perceptions of bias, resource limitations, and systemic inefficiencies in EMS. Equally as important are the experiences of patients and community members offering firsthand accounts of barriers to care such as transportation challenges, financial constraints, and perceptions of care quality. By integrating qualitative data from frontline healthcare workers and patients, the case study provides a human-centered perspective on systemic inequities that might not be fully captured in national datasets.

In conclusion, this multi-pronged research strategy is necessary to fully capture the complexity of emergency care disparities. The literature review provides a macro-level understanding of systemic inequities, while the case study offers micro-level insights into how these disparities manifest in real-world settings. Combining quantitative data, such as EMS response times and hospital statistics, with qualitative insights from provider and patient experiences allows for a more holistic picture of emergency healthcare inequities. Ultimately, this approach provides a powerful argument for policy reforms that can improve healthcare access and outcomes for marginalized populations.

Literature Review

Health disparities related to race and geographic location remain persistent challenges in EMS and hospital care across the United States. Several studies have highlighted how systemic

biases, and structural issues contribute to unequal treatment and healthcare access for minority and rural populations. While racial disparities in healthcare decisions, treatment, and outcomes have been widely documented, the intersection of race and rurality adds another layer of complexity, exacerbating these issues. This literature review explores the impact of racial bias in EMS, the challenges faced by rural healthcare facilities, and the compounded effects of these factors on patient care outcomes. By examining the findings of key studies, this review seeks to illuminate how these structural inequities perpetuate cycles of disadvantage for marginalized populations.

First, Ventura et al. reported that some medical professionals hold inaccurate beliefs about biological differences between Black and White patients, leading to disparities in care decisions (Ventura et al., 2022). These biases extend beyond individual providers to the structure of EMS itself; in fact, minorities are more likely to rely on EMS for emergency care but are also more likely to experience delays in transport and treatment. In many cases, minority patients are transported to “safety-net” hospitals which often lack the resources and specialized trauma care available at larger, more well-funded institutions (Parast et al., 2021). This pattern perpetuates cycles of healthcare inequity as patients who begin their care in under-resourced settings are more likely to experience negative health outcomes.

Greenwood-Ericksen & Kocher further highlight that rural hospitals are closing at alarming rates which leaves many communities with only small, low-resourced facilities—or no hospital at all. In addition to limited medical facilities, ambulatory response times are significantly longer in rural areas, often due to the sheer distances they must travel (Greenwood-Ericksen & Kocher, 2019). A study by Eberth et al. revealed that rural populations experience longer wait times for EMS services which can have dire consequences in emergencies where

immediate intervention is critical. Moreover, the availability of advanced medical care, such as trauma surgeons and specialists, is far lower in rural hospitals than in their urban counterparts, thereby reducing the likelihood of positive outcomes for critically ill or injured patients (Eberth et al., 2022).

A ZIP Code Tabulation Areas (ZCTA) analysis conducted by Puissant et al. further illustrates the disparities in emergency care based on race and rurality. The study found that while urban minority populations were physically closer to hospitals than their white counterparts, this proximity did not necessarily translate into better care outcomes due to infrastructural and socioeconomic obstacles. In rural areas, the situation was even worse, as minorities were both farther from hospitals and more likely to experience substandard care upon arrival (Puissant et al., 2024).

The research reviewed highlights a clear and concerning pattern of healthcare inequities that disproportionately affect racial minorities and rural populations. From biased treatment decisions in EMS to the systemic challenges faced by rural hospitals, these disparities are deeply rooted in both individual biases and broader infrastructural issues. The findings suggest that while proximity to healthcare facilities may seem like a solution, it does not guarantee equitable care, especially for underserved communities. Addressing these disparities requires systemic change, from improving EMS response times and hospital resources in rural areas to dismantling racial biases within medical decision-making. It is crucial to continue efforts to address these inequities to ensure that all patients receive the timely and effective care they deserve.

Results and Discussion

The healthcare landscape in Charlottesville, Virginia, is marked by notable disparities in access to emergency medical services and hospital care, particularly for racial minorities and rural populations. Despite the presence of well-established medical institutions like the University of Virginia (UVA) Hospital and Sentara Martha Jefferson Hospital, systemic inequities persist, impacting the timeliness and quality of care received by marginalized communities. These disparities are driven by a combination of factors, including variations in EMS response times, hospital readmission rates, and the financial and geographic barriers that disproportionately affect vulnerable groups. This case study explores the intersection of healthcare access and inequity in Charlottesville, with a focus on how racial and rural disparities impact emergency care. Through an examination of local EMS data, hospital practices, and demographic challenges, this study aims to shed light on the critical need for systemic changes to improve healthcare access and outcomes for underserved populations.

The University of Virginia Hospital in Charlottesville, Virginia, is a leading medical facility with a wide range of services, including emergency care, surgery, and specialized treatments. It features a robust capacity, with 612 beds and an extensive staff. The hospital is part of the University of Virginia Health System and plays a critical role in patient care, research, and education. Its focus on advanced medical procedures and patient outcomes makes it a key healthcare provider in the region. Sentara Martha Jefferson Hospital, located in Charlottesville, Virginia, is a 176-bed nonprofit community hospital founded in 1903. Over the years, it has evolved to meet the diverse healthcare needs of the community. In June 2011, the hospital merged with Sentara Healthcare, becoming its tenth facility. In terms of ambulatory services, there are a total of 16 fire and rescue squads in Charlottesville and the surrounding area. Emergency medical services accessibility in Charlottesville and Albemarle County reveals

significant disparities affecting both racial minorities and rural populations. These inequities are driven by factors such as response time variations, hospital readmission rates, and socioeconomic barriers.

A study conducted at UVA Health found that certain demographics, particularly racial minorities and low-income individuals, have higher emergency department (ED) revisit rates due to limited access to primary care and chronic health conditions. Many of these patients rely on the ED as their primary point of care, exacerbating overcrowding and resource strain. Additionally, financial and patient data from UVA University Hospital indicate that a high number of uninsured or underinsured patients use emergency services out of necessity, highlighting a systemic issue in healthcare accessibility (Fowler et al., 2017).

Geographic disparities also play a critical role in EMS response times. According to Albemarle County's Performance Objectives, emergency response time standards are significantly different for urban and rural areas. While urban response times are expected to be within eight minutes 90% of the time, rural response times extend to 21 minutes, creating a substantial delay in care for rural residents (ACFR Performance Objectives, 2019). This delay can have life-threatening consequences, especially for time-sensitive emergencies such as strokes and cardiac arrests. Additionally, data from the Charlottesville-Albemarle Rescue Squad (CARS) report shows that volunteers provide a significant portion of EMS coverage, leading to inconsistencies in response reliability. High call volumes in Charlottesville often divert resources away from rural communities, compounding access challenges (CARS Annual Report, 2021).

The reliance on volunteer EMS services further underscores accessibility concerns. While Albemarle County's EMS guidelines allow for cross-staffing in areas with lower call volumes,

this policy may not adequately address the needs of rural patients, who already face extended response times. Moreover, predictive modeling from UVA Health's patient revisit study suggests that targeted interventions could help mitigate emergency department overuse by identifying high-risk patients and providing them with alternative care solutions (Fowler et al., 2017).

In summary, racial minorities and rural populations in Charlottesville experience significant barriers to timely emergency care due to systemic inequities in healthcare access, resource allocation, and geographic constraints. Addressing these disparities requires investment in additional EMS units, improved staffing models, and the integration of predictive analytics to enhance care coordination. Without these efforts, marginalized communities will continue to face disproportionate challenges in accessing lifesaving medical services.

Conclusion

In conclusion, this study has highlighted the significant disparities in emergency medical care access that affect racial minorities and rural populations in the United States, particularly in the Charlottesville, Virginia area. Despite the presence of well-established hospitals like the University of Virginia Hospital and Sentara Martha Jefferson Hospital, the intersection of race and rurality creates compounded barriers to timely, quality care. These disparities are evident in the longer response times for rural residents, the higher emergency department (ED) revisit rates for racial minorities, and the reliance on under-resourced safety-net hospitals by underserved populations. These inequities are further exacerbated by structural issues such as the lack of adequate public transportation, financial limitations, and systemic biases within the healthcare system.

The findings from this study underscore the critical role that both geographic location and racial identity play in determining access to EMS. Rural populations face logistical challenges, including longer travel times and fewer trauma centers, while racial minorities encounter biases in treatment, inadequate pain management, and delayed responses from emergency medical services. This dual burden leaves these communities disproportionately vulnerable to poor health outcomes and diminished quality of care.

Moreover, this research suggests that the current healthcare infrastructure, including volunteer EMS services, is not adequately equipped to address the unique needs of rural patients. The reliance on volunteers, coupled with the increasing demand for services, creates inconsistencies in response times and overall care reliability. The integration of predictive analytics, targeted interventions, and improved EMS staffing models could mitigate these disparities and improve the efficiency of emergency care services in both urban and rural settings.

One example of policy changes that could improve the state of emergency healthcare is that UVA Health's Community Paramedicine program has effectively reduced unnecessary emergency department visits by providing in-home care and support to patients with chronic conditions. By addressing underlying health issues and connecting patients to primary care providers, the program decreased the average number of emergency visits from eight to three in the 180 days following enrollment. Additionally, 30 out of 116 patients established new relationships with primary care providers (Swensen, 2024). This initiative not only improves patient health outcomes but also alleviates emergency department congestion.

To address these systemic inequities, policymakers must continue to prioritize investments in emergency medical services, particularly in rural areas, and implement reforms to eliminate racial biases in medical decision-making. Strengthening healthcare infrastructure, improving training for emergency care providers, and expanding access to primary care services are essential steps in reducing the overuse of emergency departments and ensuring that all individuals, regardless of their race or location, receive the timely and effective care they deserve. Ultimately, addressing these disparities will foster a more equitable and efficient emergency care system for marginalized populations.

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