

**Disconnected: The Digital Divide and Its Impact on Marginalized Communities**

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## **Disconnected: The Digital Divide and Its Impact on Marginalized Communities**

Technology is a fundamental component of today's society, and it can be largely considered a worldwide dependency. However, an abundance of individuals within marginalized communities, specifically Southern and rural areas, are negatively impacted by their lack of access to these technologies that society is increasingly reliant on. The digital divide – a longstanding issue refers to the gap or disconnection between those with access to modern technology (such as devices, internet, digital literacy) and those without access – further exacerbating the problem as technology rapidly develops and is continuously interwoven into the fabric of a digitally centered culture. This disparity is particularly acute in the Southern United States, where systemic inequities have intensified the effects of the digital divide, disproportionately affecting Black communities and other marginalized populations. This study examines how these inequities limit access to essential healthcare, education, and economic opportunities, emphasizing the urgent need for refined policies and initiatives to bridge the digital gap and promote social equity.

### **Literature Review**

Furthermore, this study explores scholarly sources to investigate the digital divide through four key themes: 1) the systemic nature of the digital divide, 2) the role of technology in education, 3) the impact of the COVID-19 pandemic, and 4) geographic disparities in digital access.

#### **The Systemic Nature of the Digital Divide**

Sanders and Scanlon highlight the structural challenges to expanding broadband access in rural areas, stating:

“Broadband providers are less likely to enter rural markets due to the actual or perceived lower profitability of markets with lower population densities or rugged terrain which may be difficult to reach or build technological infrastructure” (Sanders and Scanlon).

### **The Role of Technology in Education**

Pierce and Cleary emphasize the importance of providing educational technology in schools when home access is unavailable:

“It is clear that if fundamental educational technology and the resources needed to effectively achieve academic success are unavailable in the home, then they must be provided in schools” (Pierce and Cleary).

### **The Impact of the COVID-19 Pandemic on the Digital Divide**

Greiman et al. discuss how the pandemic has increased digital inequities, noting:

“The ongoing COVID-19 pandemic has further highlighted the essential role that internet access plays in the 21st century. For instance, internet access has allowed many individuals to continue working, attend school, and visit with their health-care providers during COVID. However, the disparities in access ... have been amplified by the pandemic, further illustrating not only the value of access but also the digital divides between groups and communities” (Greiman et al.).

### **Geographic Disparities in Digital Access**

Graves et al. highlight the challenges faced by rural populations in accessing critical services due to inadequate broadband infrastructure:

“Inadequate broadband infrastructure is a critical barrier to provision of telehealth services and remote learning in rural areas, particularly for approaches that involve synchronous video communication between provider and recipient. This barrier can be compounded by lack

of technology to utilize these services and costs to obtain them.... Rural residents more often lack adequate cellular coverage to reliably access video telehealth services and remote learning through mobile technologies, such as smartphones” (Graves et al.).

Through these scholarly perspectives, it can be noted that there are pressing educational, and health-related impacts due to the digital divide. In many schools, students are increasingly required to use technology, such as laptops and tablets, to complete their schoolwork. In tandem, in the post-COVID-19 era, healthcare has leaned into telehealth – using technology to access healthcare services remotely – over in-person visits, when possible. This transition oftentimes requires a reliable internet connection and high level of digital literacy or the ability to effectively and critically navigate, evaluate, and create information using various technologies, typically involving skills such as technical proficiency, digital communication, critical thinking, and content creation. Concurrently, the lack of broadband infrastructure to support these necessary digital technologies is another significant barrier. Broadband providers often avoid expansion of service to areas with low population densities due to expected lower profits and the challenges of building the necessary infrastructure on unfavorable terrain, further exacerbating the digital divide. Influencing not only education and healthcare but also economic and social opportunities as a result, understanding these challenges and their impacts is essential for exploring the complexities of the digital divide.

### **Research Question and AI Prompt**

Therefore, this opens the door for the following research question (*italics*) and follow-on context-based prompt:

*“How does the digital divide in rural, low-income communities- particularly in the Southern United States – impact social determinates of health? Provide me with the current data,*

breaking it down by State, demographic, determinant of health, and gender. Be sure to create a list by state, demographic, determinant of health, gender. Highlight the differences between marginalized populations and the majority and note why they may be differences. Note any solutions to these issues. Provide resources available for each state. At minimum include the following states: Alabama, Georgia, Arkansas, Louisiana, Mississippi, North Carolina, Tennessee, South Carolina, Kentucky, Texas, and Florida. Don't loop them into multiple states. Do it by each state.”

In consideration of how this prompt addresses the complexities inherent in Critical Data Studies, this research examines how rural, low-income communities' access—or lack thereof—to digital technologies intersects with social determinants of health, demographics, and gender, highlighting systemic inequities and their broader societal impacts. As defined by Purdue University, “Critical Data Studies is an emerging, interdisciplinary field that addresses the ethical, legal, social, cultural, epistemological and political aspects of data science, big data and digital infrastructures” (Purdue University, n.d.). It emphasizes the importance of examining not only the access to data and technology but also the structural and systemic conditions that create and reinforce the disconnect. By focusing on the digital divide in the Southern United States, this research places itself within the scope of Critical Data Studies, showcasing how unequal access to digital resources is not just a technical issue but one deep-rooted in historical and social inequalities.

The disparities encountered by marginalized communities, such as Black and Hispanic/Latino populations in rural areas, show how data access and technology play a role in shaping social outcomes and prolonging inequities. This study emphasizes social determinants like income, education, and geographic location intersect with digital access, influencing health

outcomes, and educational opportunities. Additionally, it explores the implications of these data gaps, suggesting that the digital divide is a form of power imbalance that reinforces existing societal systems and structures, preventing marginalized communities from fully participating in the digital age. Even so, referenced by the reading “Critical Questions for Big Data,” “behavioral networks are derived from communication patterns, cell coordinates, and social media interactions...” (Boyd & Crawford, 2012). When members of society, especially marginalized individuals, are unable to access devices and connect digitally, they are unable to participate in the development of core understanding of human and society today.

By highlighting these systemic issues, this research places focus on the relevance of Critical Data Studies in understanding how data and technology intersect with various power structures. The AI findings may contribute to discussions on how policies and initiatives can bridge the digital divide, advocating for an equitable approach that underlines the needs and voices of marginalized communities.

### **Methods**

This research utilized a combination of generative AI tools, the respective prompt, and data analysis techniques to gather and analyze information related to the digital divide in rural, low-income communities, with a focus on the Southern United States, rural, and marginalized populations. The following methods were used to facilitate the study:

1. **Creation of Basic AI Prompt:** The initial step involved formulating a basic AI prompt based on the research topic. This prompt was designed to guide the AI in generating relevant insights and data.

2. **Selection of Generative AI Platform:** For this research, ChatGPT with the GPT-4 and GPT-4o models was chosen as the generative AI platform due to its advanced capabilities in processing natural language and producing detailed responses.
3. **Prompt Engineering:** The initial AI prompt draft was fed into the language model(s), followed by an iterative approach to improve its quality and desired formatted output. This process involved: 1) Providing additional context to the AI to ensure the output would meet the research requirements 2) Continuously adjusting the prompt to align with the study's primary focus on Southern states and marginalized communities, ensuring that the generated content was relevant and targeted.
4. **Solidification of the Final AI Prompt**
5. **Feeding the Final AI Prompt to the AI System:** The finalized prompt was input into ChatGPT to produce detailed responses related to the study's research focus.
6. **Dataset Augmentation:** Full responses generated by ChatGPT were captured and stored in Microsoft OneNote for data organization and further analysis.
7. **Data Extraction and Organization:** Relevant data was extracted from the saved responses and organized in Excel spreadsheets for analysis. This step involved filtering information based on the study's focus and criteria.
8. **Analysis of Data for Results/Findings:** The extracted data was analyzed using Jupyter Notebooks, specifically using the pandas library. This allowed for efficient data manipulation and analysis of results to identify meaningful insights.

## Results/Findings

### Reported Differences Between Majority and Marginalized Populations

The findings indicate that Black communities in Alabama face significant barriers in broadband access and healthcare delivery, contributing to poorer health outcomes, especially in chronic conditions such as diabetes and hypertension. Digital disparities were noted to be particularly associated with lower-income households and minority populations, who do not have the same level of broadband access as wealthier communities. Additionally, rural populations in Kentucky are at a disadvantage in terms of broadband access, leading to worsened health outcomes. AI data findings from Arkansas showed that 25-35% of rural residents lack internet access, which negatively impacts access to healthcare resources and digital literacy.

### Demographics

The demographic analysis of the responses revealed the following:

- **Rural Impact:** 95% of the responses indicated that rural communities are notably affected by the digital divide. **Black Communities:** 60% of the responses identified Black communities as significantly impacted. **Hispanic/Latino Communities:** 20% of the responses highlighted the impact on Hispanic/Latino communities.

### Determinants of Health

**Access to Healthcare:** The impact of the digital divide on healthcare access and related services was reported by all 11 states included in the study. Key findings include:

Limited access to telehealth services exacerbates disparities in managing chronic conditions such as obesity and infant mortality. The lack of reliable broadband access was particularly problematic for mental health services and telemedicine. The COVID-19 pandemic highlighted and intensified healthcare access gaps, especially for telemedicine. Additionally,

supplementing the AI findings, Frueh states “Black Americans are getting sick and dying from COVID-19 at higher rates than white Americans — the most recent manifestation of racial disparities in health that have long been evident in the United States” (Frueh). This highlights possible consequence of the 60% impact noted via ChatGPT.

**Social Connection:** The impact of digital disparities on social connection was reported by states such as Georgia (GA), Tennessee (TN), and Florida (FL). The examples below illustrate these findings:

- **Georgia (GA):** Digital isolation negatively affects mental health and limits access to community services. **Tennessee (TN):** The absence of internet access hampers residents’ ability to engage with community support networks. **Florida (FL):** Seniors in rural areas face increased isolation due to a lack of digital tools, adversely affecting their social connectedness.

### **Gender Disparities**

**Women Disproportionately Affected:** The analysis found that 96% of individuals impacted by the digital divide were women: **Rural Women:** 56% of those affected were rural women. **Black Women:** 33% of those affected were Black women. **Limited Impact on Men:** While the digital divide affected all 11 states in the study, its impact on men was found to be significant only in Arkansas and Kentucky.

### **Solutions**

The AI output several initiatives aimed at addressing the broadband access gap were identified:

**Alabama Broadband Connectivity Plan:** Supports the Connect Alabama Act, facilitating the expansion of high-speed broadband to rural, underserved, and unserved areas. **GUMBO Grant (Granting Unserved Municipalities Broadband Opportunities):** A multi-phase, competitive

grant program in Louisiana designed to fund broadband infrastructure projects in areas lacking access to internet speeds of 25/3 Mbps. The initiative has a funding allocation of \$171,439,608.

### **Conclusion**

In conclusion, the AI findings via ChatGPT offer a perspective that complements existing research, offering new opportunities for exploration of the impact of the digital divide and tentative solutions. It must be acknowledged that "data is a powerful tool for social change" (Milner). It is evident that the digital divide disproportionately impacts rural and marginalized communities in the Southern United States, and with this being a deep-seated systemic issue, short-term solutions are not enough to address the systemic and structural inequities that perpetuate the digital divide. Bridging the digital divide is essential for promoting social inclusion, fostering economic opportunity, and ensuring equitable access to education and healthcare in rural and marginalized communities across the South. By investing in infrastructure, promoting digital literacy, and advocating for policies that prioritize universal access, we can work towards a more connected and just future for all.

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