



Disconnected: The Digital Divide and Its Impact on Marginalized Communities

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Introductory Thoughts

This study examines how the digital divide in the Southern United States disproportionately impacts marginalized populations, especially Black communities, limiting their access to essential healthcare, education, and economic opportunities. By exploring these inequities, the research highlights the urgent need for refined policies and urgent initiatives to bridge the digital gap and promote social equity.

DIGITAL DIVIDE

The gap between those with access to modern technology (devices, internet, digital literacy) and those without. Factors like income, geography, education, race, and gender drive this divide, deepening inequalities in education, healthcare, and economic opportunities.

Literature Review

On the systemic nature of the digital divide: “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).

On the role of technology in education: “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).

On the impact of the COVID-19 pandemic on the digital divide: “The ongoing COVID-19 pandemic has further highlighted the essential role that internet access plays in the 21st century (Board, 2020). For instance, internet access has allowed many individuals to continue working, attend school, and visit with their health-care providers during COVID (Barna, 2020). 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.)

On geographic disparities in digital access: “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.^{18,19} 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.)



Q. How does this prompt address the complexities inherent in Critical Data Studies?

How does the digital divide in rural, low-income communities—particularly in the Southern United States—impact social determinants 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.

State | Demographic | Determinant of Health | Gender

A. This prompt addresses the complexities inherent in Critical Data Studies by examining 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.

Research Question

Data Breakdown

- 1. Create Basic AI Prompt from Research Topic**
- 2. Select Generative AI Platform – ChatGPT (GPT-4 and GPT-4o models)**
- 3. Prompt Engineering - Expand/Refine Initial AI Prompt**
 1. Fed LLM basic AI prompt draft
 2. Added context, continually, to create a more refined prompt that would produce the desired *formatted* results (i.e., primarily targeted southernmost states and associated marginalized populations)
- 4. Solidify Final AI Prompt**
- 5. Feed Final AI Prompt to AI System**
- 6. Dataset Augmentation**
 1. Capture Full Responses in OneNote
- 7. Extract Relevant Data to Excel**
- 8. Analyzed Data for Results/Findings using Jupyter Notebooks (i.e., pandas)**



Reported Differences between Majority and Marginalized Populations:

- Black communities in Alabama face significant barriers in both broadband access and healthcare delivery, contributing to lower health outcomes, especially in chronic conditions like diabetes and hypertension.
- Digital disparities are linked to lower-income households and minority populations who do not have the same broadband access as wealthier communities.
- Kentucky's rural populations are at a disadvantage in broadband access, contributing to worsened health outcome.
- 25-35% of rural residents (Arkansas) lack internet access, affecting access to healthcare resources and digital literacy.

Demographics

- **95%** of the responses contained a rural demographic.
- **60%** of the responses indicated a **Black** demographic.
- **20%** responses indicate Hispanic/Latino demographic.



Q. How does the digital divide in rural, low-income communities—particularly in the Southern United States—impact social determinants of health?

AI Data Findings

Determinants of Health

Access to Healthcare: Impact of the digital divide on access to healthcare and related services was reported by **all 11 states**.

(i.e.,

- limited telehealth access exacerbates disparities in managing chronic diseases (i.e., obesity, infant mortality)
- Healthcare access, particularly mental health services and telemedicine
- healthcare - poor access to telemedicine during the covid-19 pandemic highlighted the gap)

Social Connection: Impact of social connection was reported by GA, TN, and FL.

(i.e.,

- Social connection - digital isolation affects mental health and access to community services (GA)
- Social connection - lack of internet hampers access to community support networks (TN)
- Social connection - seniors in rural areas face greater isolation due to lack of digital tools (FL)

Gender

Women Disproportionately Affected: **96%** of reported individuals impacted by the digital divide are women.

56% - Rural Women

33% - Black Women

Limited Impact on Men: While the digital divide affected all 11 states, its impact on *men* was significant in **only 2** states.

Arkansas and Kentucky



Q. How does the digital divide in rural, low-income communities—particularly in the Southern United States—impact social determinants of health?

AI Data Findings

Solutions:

- **Alabama Broadband Connectivity Plan**

--In support of the Connect Alabama Act, Facilitating the expansion of high-speed broadband and considering the need for broadband expansion in rural, underserved, and unserved areas

- Louisiana Broadband Initiative

- Georgia's Broadband Infrastructure Program

- **GUMBO Grant**

-- Granting Unserved Municipalities Broadband Opportunities (GUMBO) (\$171,439,608)

GUMBO is Louisiana's multi-phase broadband infrastructure competitive grant program. GUMBO funds broadband infrastructure projects in areas that currently lack access to internet at speeds of 25/3 Mbps.

- Texas Rural Broadband Fund

Concluding Thoughts

Bridging the digital divide is crucial for fostering equity in education, healthcare, and economic opportunities

Addressing systemic barriers requires targeted investments, inclusive policies, and community-driven solutions to ensure marginalized populations gain access to essential digital resources and tools far beyond the extent proposed via AI.

Nonetheless, empowering these communities is key to achieving a more just and connected society.

While the AI findings display results from a limited set of data, they offer a perspective that complements existing research, offering new opportunities for exploration of the impact of the digital divide and tentative solutions.

- The digital divide disproportionately impacts rural and marginalized communities in the Southern United States.
- The COVID-19 pandemic exacerbated existing disparities in access to technology and highlighted the divide's far-reaching consequences, particularly in education and healthcare.
- Short-term solutions are not enough to address the systemic and structural inequities that perpetuate the digital divide.

Works Cited

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- Sanders, Cynthia K, and Edward Scanlon. "The Digital Divide Is a Human Rights Issue: Advancing Social Inclusion Through Social Work Advocacy." *Journal of human rights and social work* vol. 6,2 (2021): 130-143. doi:10.1007/s41134-020-00147-9
- Greiman, Lillie et al. "Mapping the digital divide: What predicts internet access across America?." *Local development & society* (2023): 1–13.
- "Former School Superintendent Pleads Guilty in Virtual Education Fraud Case." *Justice.gov*, 17 Dec. 2021, www.justice.gov/usao-mdal/pr/former-school-superintendent-pleads-guilty-virtual-education-fraud-case.



**Thank you for your time
and attention.**

```
1]: fp[fp['gender'].str.contains(" men ") == True]
```

```
1]:
```

	response#	state	demographic	doh	gender	resources	solutions	differences (majority vs. minority)
13	2.0	Arkansas	Significant rural and low-income populations, ...	health education, employment opportunities, an...	both men and women, particularly low-income women	na	Arkansas has focused on broadband expansion ef...	Rural Black communities face both geographic a...
19	2.0	Kentucky	Rural white and Black populations, with high p...	access to healthcare, education, and employment	both men and women, majority rural women	na	Kentucky's state initiatives focus on expandin...	Kentucky's rural populations are at a disadvan...

Gender Data - Men

response#	state	demographic	doh
1	Alabama	Rural Black communities lack access to affordable broadband, with 38% reporting no home internet access compared to 23% of white counterparts.	healthcare - limited telehealth access exacerbates disparities in managing chronic diseases, education - poor internet access hinders online learning for black students, impacting education
1	Georgia	High rates of digital redlining disproportionately affect Black communities in rural counties.	healthcare - poor access to telemedicine during the covid-19 pandemic highlighted the gap, social connection - digital isolation affects mental health and access to community services
1	Arkansas	Both Black and Indigenous populations face broadband deserts in rural areas.	economic stability - limited online job resources perpetuate poverty cycles, education - students in marginalized groups perform worse due to digital inequity
1	Louisiana	Rural parishes have stark divides in internet access by race and income.	healthcare - challenges in accessing telehealth services for elderly black populations, education - students in rural areas struggle with e-learning due to high costs of broadband
1	Mississippi	One of the least connected states, particularly affecting Black and low-income residents.	healthcare - disparities in telehealth use lead to poorer health outcomes, economic stability - fewer online job-training programs available for underserved populations
1	North Carolina	Rural Black populations report the lowest internet speeds and availability.	healthcare - limited telemedicine creates gaps in managing rural healthcare needs, education - rural students face barriers to digital learning
1	Tennessee	Marginalized rural communities face digital redlining, impacting 25% of Black households.	social connection - lack of internet hampers access to community support networks, healthcare - residents in rural tennessee often skip telehealth due to poor connectivity
1	South Carolina	Black rural communities face limited ISP investment and higher costs.	education - poor connectivity contributes to higher dropout rates among black students, healthcare - limited options for telehealth in rural hospitals
1	Kentucky	High poverty areas with significant Black and Appalachian populations lack broadband.	education - poor connectivity contributes to higher dropout rates among black students, healthcare - limited options for telehealth in rural hospitals
1	Texas	Rural Hispanic and Black populations suffer disproportionately from digital inequity.	economic stability - fewer resources for small businesses in underserved areas, education - rural schools report significant performance gaps tied to internet access
1	Florida	Marginalized populations in rural panhandle areas are most affected.	healthcare - limited use of telehealth services during emergencies, social connection - seniors in rural areas face greater isolation due to lack of digital tools
2	Alabama	Predominantly rural, with high rates of Black and low-income communities.	education, healthcare access, and employment
2	Georgia	High number of rural areas with Black and Latino populations.	mental health access, chronic diseases (e.g., obesity), and infant mortality
2	Arkansas	Significant rural and low-income populations, with large Black communities.	health education, employment opportunities, and healthcare access
2	Louisiana	Rural Black communities, high poverty levels.	access to healthcare services, mental health resources, and employment.
2	Mississippi	Large Black population in rural areas.	education, healthcare, employment, and mental health services
2	North Carolina	Rural Black and Latino populations, with significant economic disparities.	education, employment, healthcare access
2	Tennessee	Predominantly rural with growing immigrant populations.	healthcare access and chronic disease management
2	South Carolina	High African American population in rural areas.	health literacy, healthcare access
2	Kentucky	Rural white and Black populations, with high poverty levels.	access to healthcare, education, and employment
2	Texas	Large rural and Hispanic communities, with significant poverty in certain areas.	healthcare, education, and mental health services
2	Florida	Diverse rural populations, including Black, Latino, and immigrant communities.	education, mental health services, and access to healthcare
3	Alabama	Predominantly Black populations, with significant rural areas.	healthcare access, education, economic mobility
3	Georgia	Rural African American communities, especially in the south and central parts of the state.	health disparities (lack of telemedicine options), education access (students in rural areas unable to participate in online learning), food security (reliance on digital platforms for grocery d
3	Arkansas	na	na
3	Louisiana	Rural and Black populations.	health disparities, mental health services, education attainment (lower due to digital barriers)
3	Mississippi	High percentage of African Americans and rural poor.	healthcare access, education, economic opportunities (constrained by poor broadband access)
3	North Carolina	Predominantly rural, with significant Black populations in the eastern part of the state.	healthcare access (particularly mental health services and telemedicine), education access, economic opportunities
3	Tennessee	na	na
3	South Carolina	na	na
3	Kentucky	na	na
3	Texas	Hispanic, Black, and rural communities.	education gaps (students without access to online learning tools), healthcare access (lack of telehealth availability), employment (limited remote work opportunities)
3	Florida	na	na
4	Alabama	Predominantly rural, low-income, and African American communities	healthcare access, educational opportunity, economic mobility
4	Georgia	Low-income rural areas, significant African American population	health education, healthcare access, mental health services
4	Arkansas	Predominantly rural and low-income, with a significant African American population	economic stability, education access, healthcare, social services
4	Louisiana	African American and rural communities	telemedicine access, healthcare services, mental health resources
4	Mississippi	Predominantly Black, rural, and low-income areas	economic stability, education, healthcare access
4	North Carolina	Rural low-income and African American communities	healthcare, education, economic opportunity
4	Tennessee	Predominantly rural and African American	healthcare access, education economic opportunity
4	South Carolina	Rural, low-income, predominantly Black communities	access to education, healthcare, economic mobility
4	Kentucky	Rural and economically disadvantaged, with a significant African American population	economic stability, education, healthcare access

Excel Data

The digital divide in rural, low-income communities, particularly in the Southern U.S., significantly impacts various social determinants of health. These communities often face barriers to accessing high-speed internet, which exacerbates existing health disparities and limits access to essential services like healthcare, education, and job opportunities. The consequences of this divide are particularly evident in marginalized populations, including Black, Indigenous, and low-income individuals.

Breakdown by State, Demographic, Determinant of Health, and Gender

1. Alabama

- **Demographic:** Predominantly rural, with high rates of Black and low-income communities.
- **Determinant of Health:** Education, healthcare access, and employment.
- **Gender:** Women, particularly Black women, are disproportionately affected due to intersecting social factors like income and racial inequalities.
- **Difference:** Black communities in Alabama face significant barriers in both broadband access and healthcare delivery, contributing to lower health outcomes, especially in chronic conditions like diabetes and hypertension **[6+source]** .
- **Solutions:** The Alabama Broadband Connectivity Plan and federal initiatives like the Affordable Connectivity Program (ACP) aim to bridge these gaps **[6+source]** **[7+source]** .

2. Georgia

- **Demographic:** High number of rural areas with Black and Latino populations.
- **Determinant of Health:** Mental health access, chronic diseases (e.g., obesity), and infant mortality.
- **Gender:** Women, especially Black women, experience worse mental health outcomes due to limited access to online therapy or telehealth services.
- **Difference:** Internet access is lower in rural Black communities compared to white counterparts, impacting their access to healthcare and education **[7+source]** .
- **Solutions:** The Georgia Broadband Deployment Initiative aims to increase internet access in underserved areas **[6+source]** .

3. Arkansas

- **Demographic:** Significant rural and low-income populations, with large Black communities.
- **Determinant of Health:** Health education, employment opportunities, and healthcare access.
- **Gender:** Both men and women face challenges, but women, particularly those in low-income households, struggle more with telehealth access for maternal and mental health.
- **Difference:** Rural Black communities face both geographic and economic barriers to broadband access, exacerbating health disparities in maternal and chronic health conditions **[6+source]** .
- **Solutions:** Arkansas has focused on broadband expansion efforts, like the Arkansas Rural Connect Program **[7+source]** .

4. Louisiana

- **Demographic:** Rural Black communities, high poverty levels.
- **Determinant of Health:** Access to healthcare services, mental health resources, and employment.
- **Gender:** Black women in rural areas are particularly disadvantaged by the lack of access to mental health care and telemedicine options **[6+source]** .
- **Difference:** A direct correlation exists between low broadband penetration in Black communities and poorer health outcomes, including mental health struggles and maternal health disparities **[7+source]** .
- **Solutions:** The Louisiana Broadband Initiative works to enhance internet infrastructure in underserved rural areas **[6+source]** .

5. Mississippi

- **Demographic:** Large Black population in rural areas.
- **Determinant of Health:** Education, healthcare, employment, and mental health services.
- **Gender:** Black women in rural Mississippi are often the most impacted by digital exclusion in terms of healthcare and educational attainment **[7+source]** .

Response Snippet

```
[126]: len(fp[(fp['doh'] == 'na')])
```

```
[126]: 5
```

```
[145]: fp[(fp['doh'].str.contains('social'))]
```

```
[145]:
```

	response#	state	demographic	doh	gender	resources	solutions	differences (majority vs. minority)
1	1.0	Georgia	High rates of digital redlining disproportiona...	healthcare - poor access to telemedicine durin...	na	Georgia's Broadband Deployment Initiative supp...	single statement for all states provided	single statement for all states provided
6	1.0	Tennessee	Marginalized rural communities face digital re...	social connection - lack of internet hampers a...	na	Tennessee Broadband Accessibility Grant is bri...	single statement for all states provided	single statement for all states provided
10	1.0	Florida	Marginalized populations in rural panhandle ar...	healthcare - limited use of telehealth service...	na	Florida Broadband Expansion program prioritize...	single statement for all states provided	single statement for all states provided
35	4.0	Arkansas	Predominantly rural and low-income, with a sig...	economic stability, education access, healthca...	low-income women	single statement for all states provided	Arkansas has invested in digital literacy prog...	25-35% of rural residents lack internet access...

```
[152]: fp.iloc[35].doh
```

```
[152]: 'economic stability, education access, healthcare, social services'
```

```
[139]: fp[fp["state"] == "Texas"]
```

```
[139]:
```

	response#	state	demographic	doh	gender	resources	solutions	differences (majority vs. minority)
9	1.0	Texas	Rural Hispanic and Black populations suffer d...	economic stability - fewer resources for small...	na	Texas Broadband Development Office leads state...	single statement for all states provided	single statement for all states provided
			Large rural and Hispanic	healthcare, education, and			Texas has several	The digital divide in Texas

Jupyter NB Snippet