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# Overcoming Barriers to COVID-19 Testing and Vaccination in Vulnerable Populations: The Role of Federally Qualified Health Centers and Community-Based Organizations

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B.A. Public Health

Agnes Scott College

2017

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An abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
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**Abstract**

Overcoming Barriers to COVID-19 Testing and Vaccination in Vulnerable Populations: The Role of Federally Qualified Health Centers and Community-Based Organizations

By Roseanne Ololade Weaver

African Americans, Hispanics, Native Americans, and Pacific Islanders are disproportionally affected by diabetes and COVID-19. In Georgia, the prevalence of diabetes is higher than the national average, putting these individuals living with diabetes at a greater risk of severe illness and death from COVID-19. The thesis investigates the strategies implemented by Federally Qualified Health Centers (FQHCs) and Community-Based Organizations (CBOs) in Georgia to increase COVID-19 testing and vaccination rates among vulnerable populations with a focus on people living with diabetes. The findings reveal that despite efforts made, significant testing and vaccination gaps exist in rural and underserved areas and the study identifies successful strategies for closing existing testing and vaccination gaps. Thematic analysis of the interview data resulted in eight main themes, including services and resources affected by COVID-19, barriers to testing, and strategies to address testing and vaccination needs. The results also emphasize the importance of education, healthcare resources, transportation, and health literacy in reducing the disproportionate impact of COVID-19 and improving access to testing and vaccination. The thesis concludes by emphasizing the need for partnerships between healthcare providers, public health agencies, and community organizations to ensure the effective delivery of care and support to vulnerable populations during pandemics. Increased investment in leadership and workforce development, data and IT capabilities, and public health funding is also necessary to ensure equal access to testing and care for vulnerable populations. The findings of this thesis will inform public health policies for ensuring equitable access to healthcare services for individuals living with diabetes and other vulnerable populations.

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# Chapter 1: Introduction

The COVID-19 pandemic has significantly disrupted the healthcare system in the United States, forcing many organizations and clinicians to rapidly adjust their services and messaging to meet the public health demands of the on-going crisis. This disruption has been especially challenging for vulnerable populations in Georgia, where an estimated 1.3 million people lack basic healthcare access.[1] In Georgia, 36.2% of all adults are at higher risk of serious illness if infected with coronavirus due to advanced age or underlying medical conditions, including heart disease, chronic obstructive pulmonary disease (COPD), uncontrolled asthma, diabetes, or obesity.[2] People living with diabetes (PLWD) are at increased risk of severe illness from COVID-19, with uncontrolled diabetes, obesity, and other comorbidities exacerbating this risk.[3]

Federally Qualified Health Centers (FQHCs) and Community Based Organizations (CBOs) play a critical role in providing healthcare access for these vulnerable populations including PLWD and have been instrumental in increasing COVID-19 testing and vaccination rates.[4] Despite their efforts, there are still significant gaps in testing and vaccination rates among vulnerable populations, particularly within rural and underserved areas.[5]

**This thesis aims** to explore the attitudes and beliefs towards COVID-19 and the infrastructure and approaches used to promote COVID-19 testing and prevention among clinicians and staff at FQHCs and CBOs across Georgia who work with PLWD. In the context of this study, these are local health department leaders, FQHC staff and administrators, and other key stakeholders working across 11 counties selected because of established community partnerships with FQHCs and evidence of high COVID-19 burden, diabetes risk, and demographic vulnerability. The research will identify recommendations to close existing testing

and vaccination gaps, through a review of existing literature and results from analysis of semi-structured in-depth interviews with key stakeholders at FQHCs and CBOs focused on providing insight into the adaptation of their services and messaging to meet the increased demand for testing and vaccination during the pandemic.

The findings of this thesis will provide insight into successful strategies for increasing COVID-19 testing and vaccination rates among vulnerable populations and inform public health policies for ensuring equitable access to healthcare services. Through an examination of the challenges faced by vulnerable populations and the corresponding actions taken by FQHCs and CBOs during the COVID-19 pandemic in Georgia, this research contributes to the broader conversation about creating a more resilient healthcare system that serves all members of society.

# Chapter 2: Literature Review

## 2.1. The relationship between COVID-19 and Diabetes

### Overview of Diabetes in Georgia

Diabetes is a very serious and costly chronic disease that affects millions of people across the United States. In Georgia, the prevalence of diabetes is 12.4%, which is higher than the national average of 8.7%.[6] There are approximately 1 million people living with known diabetes in the state, and it is estimated that an additional 234,000 people have undiagnosed diabetes.[7] Alarmingly, African Americans and Hispanics have the highest diabetes prevalence rates at 12.8% and 9.0%, respectively, compared to White Non-Hispanics at 8.4.[8] These statistics highlight the urgent need for targeted interventions to prevent and manage diabetes in Georgia's most vulnerable populations.

### COVID-19 disproportionately affects PLWD.

Individuals living with diabetes are at a significantly higher risk of severe illness and death from COVID-19 compared to those without the condition. People with type 2 diabetes are four times more likely to die from COVID-19 than those without the condition, while those with type 1 diabetes have a 1.5 times higher risk.[9] Additionally, PLWD are more likely to require intensive care or mechanical ventilation and experience long-term complications related to cardiovascular, respiratory, and kidney function due to the virus.[10] Furthermore, COVID-19 can lead to hypoglycemia, diabetic ketoacidosis, in PLWD and has also been associated with new-onset diabetes.[11] Given the disproportionate impact of the pandemic on PLWD, it is crucial for PLWD to take extra precautions to protect themselves from the virus and for healthcare

providers to communicate this information to their patients, emphasizing the importance of testing, vaccination and other preventative measures.

## Pathological Mechanism of COVID-19 and Diabetes

The relationship between COVID-19 and diabetes is very complex. Diabetes weakens the immune system, impairs lung function, and increases inflammation, all of which can worsen the effects of the COVID-19 virus.[12] Diabetes causes low-grade inflammation, which promotes insulin resistance and hyperglycemia, processes important in the development of chronic complications.[13] This chronic inflammatory state is thought to stimulate stronger immune and inflammatory responses in individuals with diabetes exposed to COVID-19 compared with those without diabetes, promoting cytokine release and hyperglycemic surges.[14] Diabetes increases the risk of developing severe symptoms if a person is infected with the virus due to the increased presence of ACE-2 receptors in their lungs, kidneys, and intestines which the virus can attach to.[15] In addition, diabetes can also increase the risk of ARDS (acute respiratory distress syndrome), a type of acute lung injury caused by a severe inflammatory response to the virus.[16] These findings underscore the importance of COVD preventative measures for PLWD to reduce the likelihood of experiencing severe COVID-19 symptoms and long-term complications.

## COVID and Diabetes have a synergistic effect on minority groups

COVID-19 and diabetes have a bidirectional relationship that can have serious implications for minority groups.  African Americans, Hispanics, Native Americans, and Pacific Islanders are disproportionately affected by diabetes with an increased risk of severe illness if infected by COVID-19, and higher rates of hospitalization, ICU admission, and mortality compared to non-

Hispanic whites (NHWs).[17] Social determinants, such as socio-economic status and access to healthcare increases the risk of exposure, as well as poor outcomes when sick with COVID-19[18]. Perceived fear of COVID-19 also negatively affects treatment compliance and metabolic control as patients avoid attending their regular diabetes care and management appointments due to concerns about COVID-19 exposure.[19] In addition, minority groups are overrepresented in low-wage jobs considered essential, such as transportation and grocery store workers, therefore increasing risk of exposure for these groups. Fewer than one in five Black Americans have job flexibility to work from home compared to more than a third of White and Asian American workers, and Black Americans may be additionally disadvantaged due crowding and a lower possibility of social distancing.[20]

To reduce the disproportionate burden of COVID-19 in minority groups living with diabetes, healthcare providers and public health officials must prioritize the health and safety of these groups by providing culturally competent healthcare, increasing availability of diabetes management resources, and implementing targeted interventions for testing and vaccination.

## Overview of COVID-19 Testing and Vaccination

As the COVID-19 pandemic continues to spread, testing and vaccination strategies have become increasingly important. According to the Centers for Disease Control and Prevention (CDC), testing is one of the most important tools for controlling the virus.[21] It helps identify those who are infected, allowing them to be isolated and receive appropriate treatment, while preventing the spread of the virus. The CDC recommends that people who have had close contact with someone with COVID-19 or who have symptoms of the virus should get tested.[22] In addition to testing, vaccination is another important tool for controlling the virus as it helps to

protect people from getting infected with COVID-19 and thus preventing spreading the virus. In addition to preventive measures such as masking, social distancing, isolating, testing, and monitoring for symptoms after exposure, the CDC recommends that children 6 months to 17 years and adults over the age of 18 get vaccinated against COVID-19.

## 2.2. The role of Federally Qualified Health Centers (FQHCs) and Community-Based Organizations (CBOs) in COVID-19 and Diabetes care

### FQHCs and CBOs Provide Healthcare to Underserved Populations.

Federally Qualified Health Centers (FQHCs) are healthcare organizations that provide an array of primary and preventative services to underserved populations in the United States. They are typically located in rural or urban areas, serve a designated Medically-Underserved Area (MUA) or Medically-Underserved Population (MUP), are funded by the federal government and are required to provide comprehensive medical care, regardless of a person's ability to pay.[23] They must adhere to strict federal regulations which include providing care to all patients, regardless of their insurance status, and ensuring that all services are provided in a culturally and linguistically appropriate manner.[24]

Community-Based Organizations (CBOs) are non-profit organizations that provide services, resources, and support to underserved populations.[25] CBOs can provide a variety of services, including health care, education, housing assistance, job training, and more. CBOs are typically located in the same communities that they serve and strive to involve the local community in the development and implementation of their services.[26] CBOs are typically funded through government grants, private donations, and other sources. Unlike FQHCs, CBOs

are not subject to the same federal regulations, and as such, may provide different services and levels of care than those offered by FQHCs.[27]

Overall, FQHCs and CBOs provide essential services to underserved populations particularly those with limited access to affordable healthcare. PLWD benefit through discounted diabetes medications through the 340B Drug Pricing Program which allows FQHCs to obtain medications at substantially reduced prices.[28] They also benefit through access to specialized healthcare providers like diabetes educators, dietitians, and endocrinologists as well as wrap around services like fresh food distributions, to help manage their condition.[29] Both organizations strive to be a source of support, guidance, and resources for their communities.

## FQHCs and CBOs' Role in Increasing Access to Testing and Vaccination

Federally Qualified Health Centers (FQHCs) and Community-Based Organizations (CBOs) were likely instrumental in increasing access to testing and vaccination for underserved populations in the United States. Through their local networks, FQHCs and CBOs have been able to reach those who are most vulnerable to the effects of the pandemic, providing life-saving health care services.[30] In 4 major cities, in the US, higher FQHC penetration was associated with reduced COVID-19 mortality rates, highlighting the importance of the high-quality health care delivered by FQHCs and its important role regarding COVID-19 in cities' most vulnerable communities.[31] Moreover, FQHCs can provide culturally and linguistically tailored services, increasing access to care and providing a more comprehensive approach to health care delivery.[32]

CBOs have served as key partners in the implementation of public health initiatives, leveraging their local networks to reach underserved populations and have been integral in implementing vaccination programs in low-income and racial and ethnic minority

communities[33]. As a result, they have been instrumental in increasing access to COVID-19 testing and vaccination, offering unique opportunities to address population-level health disparities as trusted testing, vaccine and public health messengers[34]. They have earned the trust of the communities they serve, and trust is central to influencing and delivering health messaging. For vaccine decision-making, trust in the vaccine and trust in the system that developed and delivers vaccines is particularly important to minority populations who have experienced historical injustices by medical professionals and the government, lower access to healthcare, lower participation in clinical trials, and high costs of care[35]. Additionally, CBOs have provided vital support in the form of patient navigation and education, increasing access to care, and helping to reduce disparities in health outcomes.

## Adaptations and Strategies Implemented to Increase Testing and Vaccination in Georgia

Federally Qualified Health Centers (FQHCs) and Community-Based Organizations (CBOs) in Georgia have been integral to the creation of programs aiming to increase testing and vaccination rates during the COVID-19 pandemic. To increase testing and vaccination rates, the Georgia Department of Public Health (GDPH) has promoted CDC's Vaccine Finder Tool and created a vaccine provider registry that helps individuals locate vaccine providers.[36] They have also partnered with local health systems, hospitals, and pharmacies to provide more vaccine access points.[37] FQHCs and CBOs have been essential in providing these much-needed services and messaging for those living with diabetes in Georgia during the COVID-19 pandemic. They have invested in digital technologies and virtual care, offered no-cost testing and vaccination services, expanded hours, increased staff, provided outreach and education to address the

specific needs of diabetes patients, and taken steps to ensure that those in need have access to the medications and care they need.[38]

### Impact of Service and Messaging Adaptations on Testing and Vaccination Rates

The impact of service and messaging adaptations by Federally Qualified Health Centers (FQHCs) and Community-Based Organizations (CBOs) for COVID-19 on testing and vaccination rates is likely far-reaching. By providing information and resources to underserved and vulnerable populations on COVID-19 testing and vaccination and increasing access to testing and vaccinations, FQHCs and CBOs are helping to reduce disparities in health outcomes for these groups.[39] This is important, as it helps to ensure that everyone in the state has access to the life-saving resources they need to stay safe and healthy.

The implementation of service and messaging adaptations has allowed for more effective communication between health care providers and their patients, resulting in increased awareness and accessibility of health care resources.[40] Additionally, this form of adaptation has enabled FQHCs and CBOs to better coordinate care for PLWD in Georgia, allowing for more efficient tracking and management of their health.[41]

## 2.3. Challenges Faced by FQHCs and CBOs in Increasing Testing and Vaccination

### Factors Limiting Access to Testing and Vaccination

PLWD face numerous challenges accessing COVID-19 testing and vaccines due to factors such as a lack of health insurance, inadequate healthcare facilities, and low public awareness.[42] Socioeconomic factors such as high unemployment rates and low median incomes

in certain neighborhoods, may also play a role in preventing PLWD in Georgia from accessing necessary care, which may increase their hospitalization risk.[43] Additionally, PLWD may encounter cultural barriers that may limit their ability to communicate effectively with medical professionals,[44] false beliefs about the risks of COVID-19 and fear of stigma from family and friends, that may lead to vaccine hesitancy.[45] Studies have found that vaccine hesitancy may be more prevalent in individuals with lower adherence to medical prescriptions and/or less concern for their health, as reflected by poor glucose and lipid control and obesity.[46] This suggests that those with the highest risk of severe COVID-19 may be the least likely to get tested and vaccinated, potentially exacerbating health disparities.

## Challenges Faced by FQHCs and CBOs in Increasing COVID-19 Testing and Vaccination

FQHCs and CBOs in Georgia face many challenges in increasing COVID-19 testing and vaccination. These challenges include limited resources, such as the financial resources, staff, and supplies, needed to meet the demand for testing and vaccination. This is especially true for CBOs, which often operate on limited budgets and rely on volunteers to provide services. Many FQHCs initially faced challenges in securing enough vaccines and tests, as they competed with larger healthcare systems and pharmacies for limited supplies.[47] Additionally, many individuals in the communities served do not have access to reliable transportation, are unable to leave their homes due to medical conditions or other factors or may be unable to take time off from work, making it difficult for them to access the services provided FQHCs and CBOs.[48] Finally, they were faced with lack of awareness of the COVID-19 services available at FQHCs and CBOs, as well as misinformation on the virus and why testing and vaccination are important.[49]

This thesis will build upon previous research and explore the attitudes and beliefs towards COVID-19 as well as approaches used to promote COVID-19 testing and prevention among clinicians and staff at FQHCs and CBOs across Georgia who work with PLWD. In the context of this study, these are local health department leaders, FQHC staff and administrators, and other key stakeholders working across 11 counties selected because of established community partnerships with FQHCs and evidence of high COVID-19 burden, diabetes risk, and demographic vulnerability. A review and analysis of semi-structured in-depth interviews with these key stakeholders will be used to examine the challenges faced by vulnerable populations and the corresponding actions taken by FQHCs and CBOs to meet the demand for COVID-19 testing and vaccination rates among vulnerable populations in Georgia. The findings from this thesis will be used to make recommendations on strategies to close existing testing and vaccination gaps and will contribute to the broader conversation about creating a more resilient healthcare system that ensures equitable access to healthcare services that serves all members of society.

# Chapter 3: Methods

This chapter describes the research design, data collection, and data analysis procedures used in the study. The purpose of the study was to examine the role of key stakeholders at Federally Qualified Health Centers (FQHCs) and Community-Based Organizations (CBOs) in providing COVID-19 testing and vaccination for PLWD in Georgia.

## Study Design and Instruments

This thesis builds upon the research being conducted by Project PEACH (Promoting Engagement and COVID-19 Testing for Health), which is a mixed-methods study that seeks to learn about the experiences with and perspectives on COVID-19 testing among members of at-risk communities, to improve messaging about testing, access and uptake of COVID-19 testing. Study participants were grouped by people living with diabetes, at risk for diabetes (including diagnosis of pre-diabetes, family history and/or risk factors), caregivers of someone living with diabetes and a key informants group comprised of community leaders, gate keepers, health care providers and pandemic responders.

This thesis analysis will include the Key Informant interview data from Project PEACH to explore the experiences, perspectives, and practices of key stakeholders involved in providing COVID-19 testing and vaccination of PLWD at FQHCs and CBOs in Georgia. The study employed in-depth, semi-structured interviews as the primary data collection method. Snowball sampling was used to recruit the participants who met the inclusion criteria (see Sample section for more details).

# Sample

The study participants were purposively sampled from FQHCs and CBOs in Georgia. The inclusion criteria for the study were as follows:

- Participants had to be key stakeholders involved in COVID-19 testing and vaccination of PLWD in FQHCs and CBOs in Georgia.
- Participants had to have at least one year of experience in their respective roles.
- Participants had to be fluent in English.

The study team worked with the Community Advisory Board, which contained representatives from all the FQHCs, and CBOs affiliated with Project PEACH, to identify individuals to approach for interviewing. A snowball sampling approach was then used to identify additional potential participants who met the inclusion criteria. This entailed asking participants for the names of additional FGHQ and CBO representatives who were engaged in community outreach and COVID-19 testing at the close of each interview. Those opting to participate in the qualitative study received an invitation to be interviewed and a link to complete an online informed consent and a brief intake survey to collect demographic information to enable comparisons of the data during analysis. A total of 15 key informants participated in the study, including staff, administrators, and stakeholders at participating FQHCs and CBOs in Georgia.

# Data Collection

The primary data collection method for this study was in-depth, semi-structured interviews. Participants were interviewed individually, and each interview lasted approximately 45-60 minutes. The interviews were conducted via video call using Emory's secure Zoom account. All interviews were audio-recorded with the participant's consent and later transcribed verbatim. Audio recordings were uploaded to a third party, HIPAA compliant transcription service for transcription, and transcripts were de-identified and checked for accuracy.

The interview guide was developed based on a review of the literature and consultation with the research team. The interview guide was pilot tested with two participants to refine the questions and ensure clarity and comprehensiveness. The final interview guide (Appendix ii.)e included open-ended questions on the following topics:

- Stakeholders' roles and responsibilities in testing and vaccination of PLWD
- Stakeholders' perspectives on provider barriers to conducting COVID-19 testing, contact tracing.
- Stakeholders' perspectives on the barriers and facilitators to patients accessing COVID-19 testing.
- Stakeholders' perspectives on the strategies for better communication and key Messages
- Stakeholders' views on how to provide testing to high-risk groups especially PLWD.

# Data Analysis

The primary researcher, Roseanne O. Weaver, has over 4 years of qualitative and mixed methods research and as an MPH candidate at Rollins School of Public Health was trained formally in Qualitative Data Methods and Analysis. Dr. Weber and Dr. Johnson lead the qualitative and quantitative aims of Project PEACH and provided oversight on the analysis. Qualitative analysis was conducted on the key informant interviews using a thematic analysis approach. This data analysis technique seeks to identify and analyze patterns within the data.[50] The process involved the following steps:

1. Familiarization: The primary researcher (ROW), read and re-read the transcripts, to become familiar with the interview data and identified high level themes and codes.
2. Coding: The interview transcripts were uploaded into MAXQDA, a qualitative research software used for coding and managing source material for analysis. The codes were then refined and expanded as new themes and codes emerged from the data during the analysis process. This involved reviewing the transcripts multiple times, identifying patterns and relationships between codes, and organizing them into a codebook.
3. Searching for and defining themes: The primary researcher organized the codes potential themes, gathering all data relevant to each potential theme then. The data was then read and re-read to narrow down the number of codes.
4. Reviewing and finalizing themes: The themes which were further refined and validated through ongoing discussions and consensus among the research team. This involved a preliminary check to see if the themes worked in relation to the coded extracts before applying it to the rest of the data set.

5. Interpretation: The coded interview responses were collated and developed into thick descriptions based on the overarching themes. This allowed for the interpretation of the findings and a deep exploration of the experiences and perceptions of stakeholders in this context. The primary researcher identified key implications and recommendations that can inform future interventions to close COVID-19 testing and vaccination gaps and mitigate the disproportionate impact of COVID-19 on underserved and high-risk diabetes populations in Georgia.

## Ethical Considerations

This study was approved by the institutional review board at Emory (STUDY00001904). All participants provided informed consent before participating in the study, and their confidentiality and anonymity were maintained throughout.

# Chapter 4: Results

This chapter presents the findings of the study on the experiences of key stakeholders (n=15) at Federally Qualified Health Centers (FQHCs) and Community-Based Organizations (CBOs) in testing and vaccination of PLWD in Georgia.

## Overview of Participants

The 15 participants included healthcare providers, administrators, educators, and advocates who represented a diverse range of organizations, including FQHCs, diabetes education centers, and patient advocacy groups. Their roles included: Clinical managers, Nurses, Nursing directors, Outreach and Mobilization managers, Diabetes educators, Team Coordinators, Treasurers, Security Managers, and Laboratory managers. They were responsible for various aspects of diabetes care, including screening, diagnosis, treatment, education, and advocacy.

We interviewed one primary coordinator from each of the following testing sites in table 1.

Table 1. Participating Key Informants' Organizations

| **Organization** | **# of participants** |
|---|---|
| Albany Area Primary Health Care | • 4 participants |
| CORE (Community Organized Relief Effort) Response | • 3 participants |
| Elizabeth Baptist Church | • 1 participant |
| MedLink Georgia | • 1 participant |
| Mercy Care | • 2 participants |
| RxMTM Consultants | • 2 participants |
| Big Miller Grove Baptist Church | • 2 participants |

# Themes

The thematic analysis of the interview data resulted in 8 main themes: 1. Services and resources affected by COVID-19, 2. Clinical outreach and service delivery adaptations due to COVID-19, 3. Barriers to testing (community members and providers), 4. Strategies to address the testing and vaccination needs of vulnerable communities, 5. Contact Tracing experiences, 6. COVID-19 Testing Messaging, 7. Testing High Risk Groups, 8. Vaccination efforts

## Services and resources affected by COVID-19

Participants in this study discussed the ways in which COVID-19 has affected the services and resources available to the populations they worked with including PLWD. One participant stated, *"We have our patients that couldn't come in when everything was closed down to COVID". (KI_104)* They noted that the pandemic has led to disruptions in healthcare services, including delays in routine appointments, a reduction in face-to-face visits as healthcare providers and facilities shifted their focus to managing the pandemic, as well as difficulties separating well and sick patients. Another participant noted the challenges introduced by utilizing outdoor spaces for patient visits, stating: *"all of our operations had to be conducted outside…in Georgia, it's very hot and can get up to 90 degrees…So it was very hard on our staff for a couple of months having to work out in the sweltering heat, wearing all their PPE gowns." KI 108*

The study participants described a range of challenges in the supply chain resulting in shortages of personal protective equipment (PPE), testing kits, and other essential supplies. For instance, one participant reported having to obtain PPE and testing supplies that were not previously required, such as extra gloves, masks, and gowns. Staffing shortages were also a

common issue, with one interviewee mentioning that a single person had to perform multiple tasks from collecting patient information to administering tests and running lab tests. To address this issue, FQHCs shifted staff between clinics and utilized executive and administrative nursing staff to assist in clinics and community-based testing sites. Contracted labs had long turnaround times for test results, and the shortage of rapid tests made retesting challenging, hindering accurate tracking of the virus's spread. One participant noted the difficulty in covering a vast area with a limited amount of test equipment, while another reported challenges with a contracted lab in providing timely batch results. Overall, the supply chain and staffing issues faced by FQHCs during the COVID-19 pandemic posed significant challenges to their ability to provide timely and effective care to patients.

Lastly, limited availability of medical supplies and equipment, testing trends, staff shortages, and supply chain disruptions also hindered testing. As a participant noted:

> "*we were at one point, for a few months, we did have to stop retesting…we were only able to do retesting for our current patients and we were not able to do rapid testing for patients that needed retesting to go back to work or for school, just due to not having the availability of our rapid test kits." (KI_112)*

Another participant noted that "*people get caught up in the rooms, or they get tired of you know running the lab and stuff like that. So, it would be helpful to have more staff,"* highlighting the need for adequate staffing to address the testing needs of the population.

## Clinical operations and service delivery adaptations due to COVID-19

Despite the challenges presented by COVID-19, several adaptations were made by FQHCs and CBOs to stay in operation and provide clinical outreach and services as the pandemic

prompted them to change their service delivery in several ways. Several participants mentioned that technology played an important role in providing virtual visits and daily updates on social media platforms, including changes to clinic hours and days. According to a participant, *"it's kind of made it, actually a little bit better because now we offer over-the-phone visits and what's called hello [health] visits, which are video visits, for patients that can't come in." KI_105* While technology played a role in FQHC services, it also posed challenges. For example, a participant mentioned "*in the beginning we did lose a lot of participants in the older population because they were not tech savvy so to speak…but we realized they could just call in on their phone and still be a part" (KI_106)* in reference to changing how they provide health education and counseling from in-person to virtual or telephone counseling.

Social distancing and hygiene measures were also essential, as they continued to offer services while limiting physical contact. To limit physical contact and reduce the risk of COVID-19 transmission, FQHCs implemented social distancing and hygiene measures, including remote work options for non-essential staff members and allowing only essential staff to work on-site during times of high positivity rates. Clinics were continuously reassessing how to best maintain regular care while accommodating COVID-19 health service delivery needs. In discussing how their patient workflow was iteratively adapted during the onset of the pandemic, one participant shared, *"Because we're such a large clinic…we see adults and pediatrician, pediatrics…the separation of well and sick by windows of time didn't work here in the clinic," (KI_102)* and then described how instead COVID-19 appointments were redirected to outdoor tents and portions of the clinic accessible through a separate entrance.

## Barriers to testing (community members and providers)

Interview participants reported several barriers to COVID-19 testing, such as lack of awareness on COVID-19 and health literacy, financial worries, transportation and limited access to resources, fear of healthcare providers, and mistrust of the healthcare system. For instance, one participant noted that the lack of information provided to black and brown communities resulted in a slow start to COVID-19 services. This same participant also cited historical examples, such as the Tuskegee syphilis experiment, as a reason for distrust in the healthcare system among African Americans. Another participant highlighted that:

> "*when you have communities that don't regularly go to the doctor, they're going to show a lot of hesitation to go get a COVID-19 test…we had a very hard time convincing people from lower income and minority groups that it was important for them to get tested on a regular basis…Whereas people from more affluent areas were very happy to do so and of course that was either it could have been due to a higher education levels or the fact that they had the disposable income to travel around the holiday times. (KI_108)*

This highlights the impact of historical medical mistreatment on the community's mistrust of the healthcare system. Systemic barriers related to health education and discerning fact from misinformation were also brought up. For example, a participant stated, *"A lot of folks didn't have a very clear understanding of what COVID was."* KI_108. Another noted, "*people feel that the nasal pharyngeal swabs that are being used for testing can somehow induce nanobots into your system and things…you have people that have these unbased fears KI_107."*

Funding for incentives and digital marketing efforts was often lacking, which limited the reach of these initiatives. According to one participant*:*

*"vulnerable communities are not high on social media...overall just funding if we got funding to do the work that we needed to do, it will come out a lot better. We'd be able to produce a lot more because right now all we're doing is spreading the good word but we're not able to give people a mask or a sanitizer for spreading the good word." KI_101*

Limited access to transportation was also a significant barrier. Participants noted that most community members don't have access to a car, or their only mode of transportation is MARTA or some form of public transport. Another participant noted that rideshare apps such as Uber and Lyft were not reliable as the drivers would drop off the patients but wouldn't wait for them, making it difficult for patients to get back home. In addition, there were patients who had increased challenges reaching the clinic during this period. For instance, patients with Medicare and Medicaid had to schedule the van three days in advance, which was not feasible for those who were sick and needed immediate care. The demand for previous transportation methods had increased significantly during this period, which caused them to become overburdened or limited. Previous transportation mechanisms were overburdened or limited during this period due to increased demand.

Healthcare providers' as well as their patients' financial worries were also seen as a barrier to providing testing and vaccination to vulnerable populations. There was a lot of pushback when providers switched to insurance-based testing with people not wanting to provide that information. As one participant noted:

"*this was something that was a bit tricky and challenging because people were not used to us even asking about insurance information, and then we all of a sudden started asking for it…and it was making it harder because let's say if you have an undocumented individual or you have someone who doesn't have health insurance. (KI_108)*

## Strategies to address the testing and vaccination needs of vulnerable communities

Awareness-raising initiatives, such as public education campaigns and community outreach programs, played a crucial role in informing people about the risks of the disease and the available resources. Community partnerships were very instrumental in spreading awareness about testing and vaccination events. One participant *said:*

> *"you're not going to convince or influence or educate people effectively, if you can't reach the people that they trust…so you have an imam of a mosque, or a pastor of a church, those are the people that are going to influence their congregants…those are the people who are going to reach those people." (KI_104)*

Participants emphasized the importance of community partnerships in raising awareness of COVID-19 testing events and ensuring that vulnerable populations were informed and had adequate time to plan. In addition, mobile testing sites were a vital resource in providing accessible testing services to those in need, with locations often being placed near community centers or other popular areas. Providing transportation assistance was also critical, with organizations partnering with rideshare companies and offering vouchers for ride credits to incentivize people to get tested. According to a participant, *"We often collaborated with third-party or auxiliary partnerships that were hosting testing to offer charter bus services. Even we tried to do what Uber and Lyft are doing now with vouchers for ride credits to get a COVID-19 test. "(KI_108)*

In rural areas where healthcare resources are limited, addressing health literacy becomes important. Creating spaces for discussion where participants were able to ask questions was also helpful. As one participant highlighted, "*we brought in medical staff to answer them - people don't care about what you know, they care about if you care about them…if I'm approaching*

*you…I want to hear what you've got to say, then I'm going to give you the facts." (*KI_106)

Testing services were also made available in multiple languages and offered during non-traditional for those who may have daytime commitments. To supplement this, telehealth services and remote consultations also offered alternatives to in-person visits and reduced the risk of exposure.

Providers were able to provide services to undocumented immigrants and uninsured clients free of charge or by offering alternative ways to provide proof of income. Many organizations made it a priority to emphasize that no ID or insurance is necessary to receive a test. For example, this participant stated:

> *"We explain to them if they don't have insurance when they come for their visit, they have to bring some proof of income from the household. If they can't do that, we have what's called the 30-day self-declaration…after the 30 days they have to bring the proof of income, or it becomes a self-pay visit…and we explain what that means monetarily." KI_102*

Another participant stated:

> *"We have tried to make the system read more clearly…you do not need identification…you do not need health insurance to receive a test. Really emphasizing in the publicity and onsite that it is free of charge. Big letters, free, just big, plain, and simple language to explain that. No ID, no insurance. Free*." (KI_109)

To reduce the disproportionate impact of COVID-19 and improve access to testing, they concluded that systemic issues like education, healthcare resources, transportation, and health literacy must be addressed, and that awareness and strategic partnerships should be promoted.

## Contact Tracing experiences

Interviewees discussed contact tracing efforts, pointing out that they have been inconsistent and have not always effectively reached vulnerable communities. Positive cases were reported to the Department of Health, however, interviewees acknowledged that they were limitations. As one said, "*we are limited with only to the client and what they tell us." (KI_112) To* fill the gaps, interviewees delivered supplies for testing, marketed services, and educated the public on contact tracing. A participant stated:

> *"I don't know if you know but the first three weeks of the pandemic, as it revved up in the State of Georgia...the COVID-19 virus was not listed on the send side for reportable diseases… that data was not being entered into you know the system for our Department of Public Health to initiate contact tracing.(KI_103)*

They also designed tools to monitor testing, and developed strategies to improve testing and contact tracing efforts. They created a tracking tool that provided timely information on patient demographics, and they held meetings with hospital representatives, providers, and the Department of Public Health to identify contact tracing gaps and offer assistance. To improve contact tracing efforts, interviewees also suggested tailoring them to the unique needs and preferences of the target population, providing educational materials and support services. They emphasized the importance of clients understanding the purpose of contact tracing, quarantine, and compliance follow-up and the accountability of healthcare providers in fulfilling their mandates.

## COVID-19 Testing Messaging

Participants discussed the importance of effective COVID-19 messaging tailored to target populations. They suggested utilizing multiple channels, such as social media, TV, and community organizations, to address myths and concerns. As on participant stated:

> "*We have education…you want more about vaccinations or more about testing? They'll say, yes. They'll say no. If someone says, no, we'll ask like, oh, well, why not? What's holding you back? And then that's how we get the conversation started. And most people it's just miseducation or misinterpretation of stuff. So then we offer to send them materials. We offer to give them materials." (KI_101)*

Strategies for reaching the target population about COVID-19 testing focused on building trust within the communities, raising awareness of available services, utilizing NGOs and mobile units, providing education in multiple languages, and addressing conflicting information. Messages were disseminated through community leaders, healthcare providers, religious leaders, grassroots organizers, news outlets, and social media. Benefits of testing and doing so regularly was emphasized, as a participant mentioned, *"the main thing is education… stressing the importance of the procedure…because people think, okay, since they either have taken the vaccine, they don't need to get tested again". (*KI_106) Messaging was monitored closely, with media teams providing accurate info to combat misinformation. For example, a participant noted,

> *"our marketing director, actually does that, and she will listen -- we get messages, we accept messages through Facebook as well. She will answer those and submit the questions, if she cannot answer then sends to our COVID team. We field those questions, and then she will respond to them. And as well as debunking myths that people come in*

*and talk about. She will also put that on Facebook about myths that people are hearing and misinformation. And providing links in our Facebook page for them to get accurate information." (KI_112)*

Monitoring messages, answering questions, and debunking myths was essential in combating misinformation and ensuring effective COVID-19 messaging tailored to target populations.

## Testing High Risk Groups

COVID-19 testing in high-risk groups presented several challenges that required a multifaceted approach to improve access and testing rates. Interview participants identified several high-risk groups, such as PLWD, older adults, and those with underlying health conditions, that may require targeted testing efforts during the pandemic. One participant said, *"The barriers that I've noticed with our clients is only the fact that they don't want to be tested" (KI_115)* emphasizing that instead they must go out into the community to reach at-risk groups. They suggested that testing efforts should be tailored to the unique needs and preferences of these groups and should be accompanied by educational materials, support services, and clear communication about the importance of testing. As a participant noted, "*Having a language interpretation service would be helpful…I think the inability to read and write…we have some patients that are illiterate and maybe ashamed and don't ask."(KI_109)* Participants reported that access to testing centers and other challenges posed major barriers to testing in these high-risk groups. To improve access, the participants suggested strategies such as setting up mobile testing centers at places where these individuals receive routine services such as dialysis centers or diabetes specialist clinics. Participants stressed the importance of meeting people where they are, which may require going to unconventional places like gas stations or grocery stores, or

even setting up testing clinics at non-medical locations like barbershops. In addition, interviewees emphasized the need to connect testing services with wraparound services such as offering food boxes or health education events in collaboration with community-based organizations and the city. This approach would provide additional resources like transportation, food, medication, and other forms of assistance to individuals in high-risk groups.

Testing events were held at malls or larger churches and incentives such as government and employer mandates, encouragement to wear masks in public, and clinics advocating for vaccines over testing were mentioned. Finally, participants discussed the need to monitor messaging closely, with media teams monitoring messaging in the community and providing accurate information to combat misinformation.

## Vaccination efforts

Interview participants discussed the importance of vaccination efforts in tackling the COVID-19 pandemic, highlighting the need to prioritize vulnerable populations, such as those with diabetes and provide educational materials and support services. Clear and consistent messaging about the vaccine's safety and efficacy was emphasized. Vaccine supply was not an issue, a participant noted:

> *"They're hesitant about getting the vaccine, again, because of different information that they've received, thinking that maybe it doesn't work, and the fact that they know people who've been vaccinated who still caught COVID and people who have passed away with COVID and they've been vaccinated."(KI_115)*

He highlighted that efforts to promote vaccination education and awareness were made across clinics, however, clients were hesitant due to misinformation.

Mobile vaccination units were also deployed to locations with a high population of unvaccinated people to promote vaccine equity. According to a participant, MedLink was selected to operate a mass vaccination clinic, which required an increase in staff. Vaccination organization and management was also prioritized, with clinics allocating specific days for COVID-19 vaccine clinics and limiting the number of patients to 20 per day. To promote vaccine equity, clinics partnered with local social media groups to help spread information and combat vaccine hesitancy, while mobile vaccination units were deployed to locations with a high population of unvaccinated people. Vaccinating children was also a focus, with an emphasis on educating parents about the importance of vaccinating their children. Promoting preventative measures such as testing, wearing face masks, and social distancing was also highlighted to combat vaccine hesitancy.

Overall, the clinics were taking multiple steps to ensure that the COVID-19 vaccine was accessible to all members of the community, with education and awareness playing a crucial role in their efforts. The use of mobile vaccination units, partnering with local groups, and focusing on vulnerable populations was helping promote vaccine equity, and the staff was increased to ensure efficient mass vaccination.

# Chapter 5: Discussion

The COVID-19 pandemic has brought to light significant health disparities that exist within underserved populations. The results from this thesis revealed a range of barriers faced by both patients and healthcare providers in accessing COVID-19 testing. The adaptations as well as solutions that were implemented by FQHCs and CBOs can be used as strategies to close existing testing gaps and mitigate the disproportionate impact of pandemics on underserved populations, particularly those at risk for or with diabetes. The findings from this study indicate that a lack of knowledge and understanding of the pandemic, access to testing centers and transportation, financial concerns, mistrust in the healthcare system, supply chain disruptions, and staffing shortages acted as major barriers to increasing access to COVID-19 testing and vaccination for both community members and the organizations serving them.

Many communities simply did not understand the complexities and risks of the COVID-19 virus and the need for testing and vaccination. This compounded with pre-existing mistrust in the healthcare system and financial concerns were identified as significant barriers for many community members. This is consistent with previous studies, [51,52] that show that in addition to financial burden, and lack of access, the historical mistreatment of racial minorities and resulting medical mistrust, play an important part in reluctant engagement with the medical system. In this study, addressing these barriers meant partnering with community-based organizations, such as churches, or community centers, to host testing facilities in familiar and trusted locations to increase the accessibility and uptake of testing services among vulnerable populations who may be hesitant to seek out testing in unfamiliar or clinical settings. Trust-building efforts through

education and leveraging partnerships with trusted CBOs helped to facilitate effective communication and implementation of testing and vaccination measures. Consistent with findings from the literature[53], amplifying the voices of trusted community leaders, ensuring concerns were heard and addressed through clear, consistent messaging and transparency helped to mobilize support and foster buy-in from the community. Understanding the unique cultural and social contexts of different communities is an important practice that should always be applied in public health practice.

Existing literature on promising practices for testing vulnerable populations provides evidence that awareness-raising initiatives, transportation assistance, testing during non-traditional hours, mobile test and vaccine units, leveraging technology, and collaborating with trusted Community-Based Organizations (CBOs) can help combat misinformation and encourage vulnerable populations in low-income communities or areas with high rates of chronic health conditions to access available COVID-19 testing and vaccination resources.[54]

Telehealth can potentially increase access to medical care by removing physical constraints like transportation and mobility issues, allowing patients to consult with their healthcare providers remotely, monitor their symptoms, receive testing referrals and in some cases, even conduct home testing.[55] It also helps to reduce the risk of exposure to COVID-19 by allowing patients to receive healthcare services without having to leave their homes. However, there is a concern that vulnerable populations who may benefit the most from telehealth may not be as ready to use it, which could lead to inequity in access to care.[56] Socioeconomically and medically vulnerable populations (older adults, low-income patients, less-educated patients, and those with chronic conditions) are less comfortable and less likely to use video-enabled

telehealth, even when given the option.[57] This is due to a digital divide that limits access to high-speed internet and video-enabled devices, like tablets, computers, and smartphones.[58] Despite having the right technology and the knowledge required to use telehealth applications, some people still don't feel in control and don't think they'll gain anything from it. Effective solutions to this problem can include increasing broadband access, implementing digital literacy programs, providing financial assistance, and improving infrastructure (e.g., mobile phone friendly platforms) and including family members in supporting the use of eHealth technologies.[59] While interventions suggested in the literature primarily address the economic and usability divide in accessing telehealth, the empowerment divide deserves specific attention in future research.

The findings of this thesis also highlight that ensuring that testing services and education are provided in multiple languages and tailoring messages to the specific populations, can reduce language barriers and improve upon efforts made to combat misinformation. These findings are echoed by research conducted among residents of five zip codes in Baton Rouge, Louisiana, U.S. with a high proportion (≥80%) of Black Americans.[60] Similar to the results from this thesis, the most prevalent factors preventing community members from getting tested that were found included lack of transportation, misinformation/lack of information, lack of time/long wait times, fear of test/fear of testing positive, test being uncomfortable, and cost of testing.

FQHCs and community-based organizations faced a range of challenges, including staffing shortages and burnout, supply chain disruptions resulting in inadequate PPE, testing kits, and limited availability of essential supplies and equipment. Inconsistent contact tracing efforts that did not effectively reach vulnerable communities also posed a significant challenge. Despite the challenges, FQHCs and CBOs continued to provide services while prioritizing the safety of

staff and patients. To fill the gaps, interviewees delivered supplies for testing, marketed services, and educated the public on contact tracing. They also designed a tracking tool to monitor testing and networked with providers and organizations to identify contact tracing gaps. Several adaptations were made, including the use of technology for virtual visits and social media updates, social distancing and hygiene measures, and remote work options for non-essential staff. While this study provides valuable insights into the ways in which these organizations addressed these challenges, additional research is needed to evaluate the impact of these efforts on patient outcomes, particularly for vulnerable populations. Future studies could investigate the best practices for contact tracing in underserved communities, as well as how to ensure that technological advancements are accessible and effective for all patients. Additionally, there is a need to examine the long-term effects of the pandemic on the mental health and wellbeing of healthcare workers, particularly those working in FQHCs and CBOs.

## Strengths and Limitations

There are a few limitations to be acknowledged in this study. Firstly, the sample size was relatively small, consisting of only 15 individuals from nine CBOs and FQHCs located in Georgia. However, it should be noted that despite the limited number of participants, thematic saturation was achieved through these interviews, hence additional participants were not deemed necessary. Secondly, the study had a narrow focus, exploring only how FQHCs responded to COVID and supported vulnerable populations, with a specific emphasis on people with diabetes. Finally, the study relied on the perceptions, experiences, and beliefs of key informants to understand the individuals in the communities served, rather than directly interviewing the individuals themselves.

This study has several strengths that make it a valuable contribution to the field of public health. It was built upon the research of Project PEACH, a much larger mixed-methods study that seeks to learn about the experiences and perspectives on COVID-19 testing among members of at-risk communities, with the aim of improving messaging, access, and uptake of testing. The study had a clear inclusion criteria for participants, ensuring that the findings reflect the experiences of the key stakeholders involved in COVID-19 testing and vaccination of PLWD in FQHCs and CBOs in Georgia. In-depth, semi-structured interviews were used to collect data, allowing for rich, detailed responses from the participants and a comprehensive understanding of the key stakeholders' perspectives. The thematic analysis approach was used to interpret the findings which helped to deeply explore the experiences and perceptions of stakeholders in this context. Finally, this study provides valuable insights into the role of key stakeholders in providing COVID-19 testing and vaccination for PLWD at FQHCs and CBOs in Georgia and contributes to the larger Project PEACH study's goal of improving messaging about testing, access, and uptake of COVID-19 testing among at-risk communities.

## Implications for Public Health Practice and Policymakers

COVID-19 provided a stark reminder of the human cost of disinvestments in public health. Public health funding has historically been insufficient and restrictive, lacking the ability to quickly reallocate funds to address emerging needs and crisis situations.[61] The challenge for health departments is to sustain partnerships beyond crisis settings, address neglected public health capabilities and improve preparedness for future emergencies. Priority actions include transforming public health funding,[62] structural alignment across the public health sector,

affirming the mandate for public health, investing in leadership and workforce development,[63] modernizing data and IT capabilities, and supporting partnerships and community engagement.[64]

The findings from this study have important implications for public health practice, policymakers, healthcare providers, and community organizations who seek to address the COVID-19 pandemic and improve the health outcomes of PLWD in Georgia and beyond. First, it is important to address systemic issues related to education, healthcare resources, transportation, and health literacy to ensure that all patients have equal access to testing and care during pandemics. It is also essential to promote awareness and develop strategic partnerships to support vulnerable communities and mitigate the disproportionate impact of pandemics. Additionally, healthcare providers must also be trained to understand the unique needs of vulnerable populations and to implement strategies that effectively reach these communities. Furthermore, investments and adaptations in public health infrastructure and preparedness can help mitigate the impact of future disruptions in care. In Massachusetts for example, repurposing excess transportation resources to address other health-related basic needs, providing real-time COVID-19 information in multiple languages, and subsidizing devices and internet services for those in need were crucial.[65] The Massachusetts DPH proactively reached out to at-risk, non-English speaking, and low literacy populations, and provided real-time COVID-19 information, resources, and referrals through 211 in 150+ languages.[66] Select school districts redirected excess transportation resources, deploying school buses to address other health- related basic needs such as mobile clinics food and supply delivery.[67] Finally, messaging and outreach strategies must be tailored to specific populations, while acknowledging that trust-building is necessary to address conflicting information. For example, in South Africa, the Zulu phrase “Zwakala” meaning “come on over” often used among friends as an invitation was the theme of an innovative

immunization campaign. In the days leading up to the pop-up vaccine clinics, campaign workers who were well known in the community engaged in door-to-door outreach, distributed posters and pamphlets, and provided information about the vaccination schedule and answered questions about the vaccines that are available. Community members related easily to the branding, they trusted it, and got vaccinated.[68] Effective communication and public trust are essential to the success of public health measures and must be maintained, especially among populations who may lack trust in authorities or systems that are supposed to serve their needs.

Proactive planning and collaboration between stakeholders can help ensure that vulnerable populations receive the care and support they need during times of crisis. In addition to the ongoing COVID-19 pandemic, lessons can be learned from successful responses to past disasters, such as 2009 H1N1 influenza pandemic and the Ebola outbreak in West Africa. In these cases, strong partnerships between healthcare providers, public health agencies, and community organizations were key to ensuring effective response and care delivery.[69] During the Ebola outbreak, the impact of reduced access to routine healthcare caused almost as many deaths as Ebola itself. To maintain essential health services for displaced and vulnerable populations, alternative treatment-delivery methods, extended medication supplies for HIV, tuberculosis, and chronic diseases were provided.[70]

## Conclusion

In conclusion, this study contributes to the literature by exploring strategies, attitudes, beliefs, and infrastructure associated with COVID-19 risk, testing, and prevention in underserved, high-risk diabetes populations. The results of this study can be used to inform the

development of effective strategies to close the testing gaps and improve access to testing and vaccination for vulnerable populations. There is still a need for continued investment in community-based COVID-19 testing and vaccination programs to mitigate racial and ethnic disparities in service delivery. Future studies should focus on assessing the effectiveness of strategies implemented by healthcare providers and community organizations in addressing the needs of vulnerable populations. Future research can also corroborate the results of this study by using with in-depth interviews of vulnerable community members to evaluate COVID-19 testing and vaccination interventions conducted in partnership with FQHCs and CBOs.

With the knowledge gained from this study, healthcare providers and policymakers can work together to create a more equitable and inclusive response to pandemics, providing the care and support that all vulnerable populations deserve. Through increased awareness and targeted efforts to address the unique needs of vulnerable populations, we can create a healthcare system that provides equitable access to testing and vaccination for all.

# Appendix

## i. Codebook

| THEMES | DESCRIPTION | EXAMPLE | CODE | SIMPLE DESCRIPTION | EXAMPLES |
|---|---|---|---|---|---|
| **Services and resources affected by COVID-19** | What everyday services and resources were affected to accommodate COVID? | Had to close location(s), virtual appointments, etc. | Affected resources | Aff Res | Medical Supplies: Refers to the limited availability of medical supplies, equipment, and personnel impacted by the pandemic. Examples include a lack of PPE, telehealth equipment, or staff shortages due to illness.<br><br>Medical Personnel: Refers to changes in staffing levels due to the pandemic, such as the need for new staff to meet increased demand. Examples include needing more contact tracers or additional medical professionals to meet increased patient demand. |
| | | | Affected services | Aff Serv | Affected services: Refers to the services affected because of the pandemic, such as the cancellation of certain in-person appointments or the discontinuation of routine physicals. long wait times or difficulty scheduling appointments. |
| **Clinical outreach and service delivery adaptations due to COVID-19** | How did the clinic adjust their regular procedures, staffing, etc. due to COVID-19? How did communication within the clinic change? | Scheduling method changes, new daily staff meetings to discuss COVID, daily all-staff email updates, etc. | Adjusted Services | Adj serv | Tech: Refers to the use of technology and telemedicine to provide care and services to patients, such as virtual doctor's visits or video conferencing. Examples include the use of video conferencing to provide medical advice or the use of telehealth to provide counseling services.<br><br>Hours/Days: Refers to changes in clinic hours and days due to the pandemic, such as the closure of certain days or the addition of new hours. Examples include the introduction of evening or weekend hours to increase access to care.<br><br>Patient Flow: Refers to the changes in the flow of patients in and out of the clinic due to the pandemic, such as the implementation of virtual waiting rooms or staggered appointment times. Examples include the use of virtual waiting rooms or the introduction of staggered appointment times to reduce overcrowding. |
| | | | Adjusted Resources | Adj res | Staffing protocols: Refers to changes in staffing protocols because of the pandemic, such as the introduction of new safety protocols or the implementation of social distancing measures. such as the hiring of new staff to meet increased demand. Examples include hiring more contact tracers or additional medical professionals to meet increased patient demand. Examples include the use of masks, hand sanitizer, or additional cleaning protocols. Examples include the type of training available to staff members (e.g., on-site, online, etc.). Examples include the type of support available to staff members (e.g., peer support, counseling, etc.). Examples include the type of mental health resources available to staff members (e.g., therapy, wellness apps, etc.). Examples include the type of PPE available to staff members (e.g., masks, gowns. Examples include the type of financial assistance available to staff members (e.g., hazard pay, childcare assistance, etc.).<br><br>Safety Protocols: Refers to the changes in safety protocols because of the pandemic, such as the introduction of PPE requirements or temperature checks. Examples include the use of masks, hand sanitizer, or temperature checks when entering a clinic. |
| **Barriers to testing (community members and providers)** | Patient: What prevents patients from getting tested? Clinic: What prevented/delayed the clinic from providing testing? | Patient: Transportation, discomfort, lack of trust, limited clinic hours, etc. Clinic: Lack of supplies, not enough staff, etc. | Testing Barriers for Community | Test Bar Cmty | Accessibility: Refers to the challenges that patients and clinics may face in accessing testing, such as limited availability or lack of information. Examples include long wait times, difficulty scheduling appointments, or lack of information about available testing sites.<br><br>Availability: Refers to the limited number of testing locations available, such as the lack of testing sites in certain areas or the closure of certain sites. Examples include the closure of certain testing sites due to lack of demand or the lack of testing sites in rural areas.<br><br>Information/Education: Refers to the lack of information or education about |

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| | | | | | testing that patients may face, such as a lack of understanding about the purpose of testing. Examples include not understanding the purpose of the test or not knowing where to go to get tested.<br><br>Financial Burden/Cost: Refers to the financial burden that patients and clinics may face when accessing testing, such as the cost of the test or additional fees. Examples include the cost of the test or additional fees for transportation or lab work. Refers to the financial burden that patients and clinics may face when accessing testing, such as the cost of the test or additional fees. Examples include the cost of the test or additional fees for transportation or lab work. |
| | | | Testing Barriers for Providers | Test Bar Prvd | Medical Supplies: tests, PPEs<br><br>Medical Personnel: Training, mental health/burnout, availability of staff<br><br>Financial: Refers to the financial burden that patients and clinics may face when accessing testing, such as the cost of the test or additional fees. Examples include the cost of the test or additional fees for transportation or lab work.<br><br>Social: Community trust<br>Staff Resources:<br>1. Training: Examples include the type of training available to staff members (e.g., on-site, online, etc.).<br>2. Support: Examples include the type of support available to staff members (e.g., peer support, counseling, etc.).<br>3. Personal Protective Equipment: Examples include the type of PPE available to staff members (e.g., masks, gowns, etc.). |
| **Strategies to address the testing and vaccination needs** | How were the barriers overcome? | Patient: Ubers to appointments, education, communication, extended hours, etc.<br>Clinic: Increase of supplies and staff; educating staff, etc. | Testing solutions for community | Test Sol Cmty | Tech: Refers to the use of technology and telemedicine to provide care and services to patients, such as virtual doctor's visits or video conferencing. Examples include the use of video conferencing to provide medical advice or the use of telehealth to provide counseling services.<br><br>Financial Assistance: Refers to the financial assistance that patients and clinics may receive to offset the cost of testing, such as subsidies or grants. Examples include subsidies for testing or grants to cover the cost of transportation or lab work.<br><br>Education/information: Refers to the availability of education and information about testing that patients may receive, such as information about the purpose of testing or where to go to get tested. Examples include an educational campaign about the importance of testing or the availability of information about testing sites.<br><br>Increased testing locations: Refers to the availability of additional testing locations, such as the opening of new sites or the expansion of existing sites. Examples include the opening of new testing sites in rural areas or the expansion of existing sites to increase capacity.<br><br>Resource allocation: Refers to the availability of resources to support testing, such as the allocation of additional funding or the availability of supplies and equipment. Examples include additional funding for testing sites or the availability of PPE and telehealth equipment. |
| | | | Testing solutions for providers | Test Sol Prvd | Tech: Refers to the use of technology and telemedicine to provide care and services to patients, such as virtual doctor's visits or video conferencing. Examples include the use of video conferencing to provide medical advice or the use of telehealth to provide counseling services.<br><br>Financial Assistance: Refers to the financial assistance that patients and clinics may receive to offset the cost of testing, such as subsidies or grants. Examples include subsidies for testing or grants to cover the cost of transportation or lab work.<br><br>Education/information: Refers to the availability of education and information about testing that patients may receive, such as information about the purpose of testing or where to go to get tested. Examples include an educational campaign about the importance of testing or the availability of information |

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| | | | | | about testing sites.<br><br>Increased testing locations: Refers to the availability of additional testing locations, such as the opening of new sites or the expansion of existing sites. Examples include the opening of new testing sites in rural areas or the expansion of existing sites to increase capacity.<br><br>Resource allocation: Refers to the availability of resources to support testing, such as the allocation of additional funding or the availability of supplies and equipment. Examples include additional funding for testing sites or the availability of PPE and telehealth equipment. |
| **Contact tracing experiences** | If and how organization handles, contact tracing. | Are patients reluctant to provide information? Parents are worried about children's privacy. | Challenges | CT Chall | Identifying the challenges associated with contact tracing, such as difficulty in obtaining contact information for those who may have been exposed to COVID-19. |
| | | | Resources and processes | CT Res | Examining the availability of resources needed to carry out contact tracing, such as staff, technology, and training. Analyzing the processes used in contact tracing, such as contact notification and follow-up. |
| | | | Impact | CT Impact | Investigating the impact and effectiveness of contact tracing on the spread of COVID-19 and the health of those who are traced. Assessing the effectiveness of contact tracing in reducing the spread of the virus. |
| **COVID-19 Testing Messaging** | What does the interviewee say about COVID-19 testing messaging from their organization and the media? How are test results delivered to patients? | Organization's Facebook posts to patients, word of mouth in the community, information in the local/national news around testing. | Availability/accuracy/Content | Test messaging | Assessing the effectiveness of messages related to testing, such as the accuracy and effectiveness of messages related to testing. Examples include the accuracy of messages about testing (e.g., correct information about testing, accurate results, etc.). Evaluating the accuracy and timeliness of information provided about testing, such as when and where to get tested. Examples include the types of messages used to promote testing (e.g., educational, motivational, etc.). Examples include the types of language used in the messages (e.g., positive, neutral, negative, etc.). |
| | | | Education Impact | Test messaging impact | Assessing the impact of educational messages about testing on knowledge, attitudes, and behaviors related to testing. Examining the impact of testing messages on the uptake and use of testing services. Examples include the types of responses the messages generated (e.g., uptake of testing, decrease in fear, etc.). |
| | | | Message delivery | Test messaging delivery | Examples include the types of media used to deliver the messages (e.g., print, radio, television, etc.). |
| **Testing in high-risk groups** | How does testing differ for populations living with or at-risk for diabetes? | Less likely to leave home, less or more trusting of healthcare providers, finances, etc. | Access and availability | HR Test avail | Examining the barriers to accessing testing for high-risk groups, such as those with limited mobility or limited access to transportation. he resources available to support high-risk individuals through the testing process (e.g., counseling, financial assistance, etc.). Investigating the availability of testing services for high-risk groups, such as those living in rural areas. |
| | | | Education/targeted messaging | HR Test msg | Assessing the impact of educational messages about testing on knowledge, attitudes, and behaviors related to testing among high-risk groups. Analyzing the messages related to testing that are targeted to high-risk groups, such as those in long-term care facilities. What does the interviewee say about COVID-19 testing messaging from their organization and the media? |
| | | | Impact on High-risk groups | HR Test Impact | Examining the impact of testing on the health of high-risk groups, such as those with underlying health conditions. increasing testing in high-risk groups, how community perceives, feasibility of implementation (resources needed and limiting factors), change in approach when high risk |
| | | | Testing environment | HR test Admin | How are test results delivered to patients? Examples include the type of equipment used for testing individuals (e.g., rapid tests, PCR tests, etc.). |
| **Vaccination efforts** | What has the organization done/plan to do regarding COVID-19 vaccines? What messaging is the clinic/organization/media putting out around COVID-19 vaccines? | Drive through clinics, scheduling appts, Availability, scheduling, safety, etc. etc. | Vaccine availability/accessibility/administration | Vax admin | Examples include the number of vaccines available and how access to vaccines is allocated within the organization. Examples include the types of delivery methods used to ensure staff and patients can access vaccines (e.g., mobile units, drive-thru clinics, etc.). Examples include the types of staff members responsible for administering vaccines (e.g., nurses, pharmacists, etc.). |
| | | | Vaccine awareness and messaging | Vax messaging impact | Examples include the types of campaigns used to encourage uptake of vaccines within the organization (e.g., posters, flyers, emails, etc.). What does the interviewee say about COVID-19 testing messaging from their organization and the media? How are test results delivered to patients? Examples include the types of audiences the messages were aimed at (e.g., healthcare providers, patients, etc.). Examples include the types of messages used to promote vaccination (e.g., educational, motivational, etc.). Examples include the types of media used to deliver the messages (e.g., print, radio, television, etc.). |
| | | | message impact | Vax messagin | What does the interviewee say about COVID-19 testing messaging from their organization and the media? How are test results delivered to patients? |

| | | | | | |
|---|---|---|---|---|---|
| | | | | g Delivery | |

## ii. Interview Guide

**RADx-UP Diabetes In-Depth Interview Guide: Key Informants**

Hello, my name is _____. I am a [title] at [institution]. Thank you for agreeing to participate in this interview as part of a study to understand perceptions of COVID-19 testing in communities most affected by the virus. As a person working with high-risk populations, you provide a valuable perspective that I hope to capture in today's interview. There are no right or wrong answers as this is about your experience.

This interview will take approximately one hour. We would like to record the interview, with your permission, to be sure that we have correctly and completely captured your responses. The recording will be destroyed once your responses are transcribed. You are one of several people who will share their experiences with us. All identifying information, including your name, will be removed from the interview transcripts, notes, or any other information about today's discussion. If you prefer, you can choose for us to call you a different name during the interview. Your interview data will remain confidential and secure throughout the entire project.

Your participation is completely voluntary. You may choose not to answer some of the questions or to discontinue the interview at any time for any reason and it will not impact your position at [name of health center].

Do you have any questions before we begin the interview?

[*Answer any questions they may have and then begin*.]

*[Start recording]*

We are now recording. For the record, do you agree to participate in this research study? Are you ok with being recorded?

**Introduction**

Ok. I'd like to begin by getting some information about your background.

1. How long have you worked at [institution]?

2. What is your role at [institution] when it comes to COVID-19 testing?
3. How has COVID-19 affected the services [institution] provides?

## *COVID-19 Testing*

**Provider barriers to conducting testing, contact tracing.**

4. What challenges has your center faced related to COVID-19 testing?
    a. Probe on re-testing here – do they do it and if so, what are the barriers.
5. Are there specific resources that would help you overcome these challenges?
6. What kinds of information are needed for clinics to make informed decisions regarding COVID-19 testing?
    a. How do you make decisions regarding shifting resources to meet anticipated testing demands?
        i. Probe: How do you assess your capacity for testing?
7. What have your experiences been when it comes to contact tracing?
    a. Are people generally willing to provide names and contact info?
    Why do you think some people are reluctant to provide information for contact tracing?

**Barriers and facilitators to patients accessing COVID-19 testing.**

8. What do you believe are the most common barriers to patients accessing COVID-19 testing?
    a. How are test results communicated to patients?
    b. Probe: What information about retesting is communicated when people are receiving their test result?
9. How has your center worked to help people overcome these barriers?
    a. Probe: why where these changes made?
10. What do you think could help your center work with the community to overcome these barriers?
11. Who or what has influence over your patients'/community's decision to get tested?
    a. Probe: What's the influence of news outlets, social media, family, etc.?

**Communication and Key Messages**

12. Does your organization encourage patients to get tested for COVID-19? If so, how?
13. How do you monitor messages in news and social media that may be affecting attitudes to testing in your community?
    a. How do you create new social media messaging to combat poor information being circulated in your community?

## *COVID-19 testing in high-risk populations.*

**Views on how to provide testing to high-risk groups.**

14. From your experience, what do you think is the best way to increase testing among high-risk groups, such as those at-risk for or living with diabetes?
    a. How do you think the community would perceive these strategies?

b. How feasible do you think it would be to implement the strategies you just mentioned?
    i. What resources are needed?
    ii. What are the limiting factors?
c. Probe: *Only ask of FQHCs* and other healthcare providers*:* How does your approach to COVID-19 testing change when managing patients at risk for or with diabetes?

**Conclusion**

As we come to the end of the interview, I just have a few final questions.

15. What concerns do you have regarding the vaccination efforts?
16. How has your organization started to educate your patient populations about the COVID-19 vaccine?
    a. What is the messaging?
    b. How is it being received?
17. Is there anything we did not cover that you would like to mention before we end the interview?

That's the end of our interview. Thank you so much for your time!

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