# Qualitative review of promising practices for testing vulnerable populations at off-site COVID-19 testing centers

Elizabeth Winterbauer [a], Phillip D. Levy [b], Dustin Calhoun [c], Timothy Elwell [a], Eliza Fishbein [a], Stacy Donohue [d,*], Jessica Little [d]

[a] *Qualidigm, USA*
[b] *Wayne State University School of Medicine, Associate Chair for Research in the Department of Emergency Medicine, Wayne State University, USA*
[c] *University of Cincinnati Medical School, Medical Director for Emergency Management, University of Cincinnati Medical Center, USA*
[d] *Network for Regional Healthcare Improvement, USA*

A B S T R A C T

*Background:* Many off-site COVID-19 testing centers (OSCTCs) are struggling with strategies to serve vulnerable populations who have some of the highest rates of COVID-19 cases, hospitalizations, and deaths. Inter-OSCTC sharing of successful protocols and systems has been hampered by evolving resource constraints, the changing science of testing, and ever increasing COVID-19 case counts.
*Objective:* The aim of the present study was to identify promising approaches to testing vulnerable populations.
*Methods:* We conducted a qualitative study using semi-structured interviews with 26 leaders of OSCTCs and public health departments across the United States between June 8th and August 10th, 2020. All interviews were coded utilizing oral coding via rapid identification of themes from audio recordings, and analysis occurred concurrently with data collection to assess when saturation was achieved.
*Results:* Six main themes emerged highlighting approaches to testing within vulnerable populations including: 1. Expanding services to support health and health-related needs beyond COVID-19; 2. Gaining community trust; 3. Developing and leveraging community partnerships; 4. Promoting clear and creative messaging; 5. Prioritizing patient experience; and 6. Managing patient results.
*Conclusions:* Testing among the vulnerable not only helps those at highest risk of severe disease or death from COVID-19, but also presents a critical opportunity to control viral spread within and from these communities. Reaching vulnerable populations is challenging and requires multi-sector collaboration, additional funding, and high levels of creativity and flexibility.

## 1. Introduction

The United States reported its first confirmed COVID-19 case in January 2020.[1] On March 3rd, the U.S. lifted all federal restrictions on testing, with promises of continued increases in the availability of testing.[2] Since then, challenges related to test availability, laboratory turnaround time, and shortages of personal protective equipment (PPE) have been well documented.[3–5]

Testing, when appropriately combined with quarantine/isolation and contact tracing, is a crucial tool to contain the spread of infections and support states' reopening.[6] Since March 2020, over 25,000 testing sites have been established in the United States, enabling over 30 million

tests per week nationwide.[7] To minimize infection risk and reduce use of limited PPE, many providers are using an off-site testing approach, often modeled after an early drive-through screening center in South Korea, where specimen collection occurs outside a healthcare facility.[8]

The setup of off-site COVID-19 testing centers (OSCTCs) is selected based on the needs of the population being served and includes, but is not limited to, drive-through, walk-up, mobile vans, and workplace/facility clinics. Given the urgency created by the pandemic, novelty of OSCTCs, and dearth of federal guidance, most OSCTCs have independently developed their own protocols and systems for coping with COVID-19. Additionally, OSCTCs have reported challenges around OSCTC leadership, access to personal protective equipment, weather,

testing capacity, follow-up processes for results, and reimbursement for sample collection, as described in our earlier research.[9] As a result, many OSCTCs have been unable to incorporate strategies to serve vulnerable populations, who are disproportionally impacted by the disease.[10]

In August 2020, COVID-19 cases, hospitalizations and deaths in the United States were higher among racial and ethnic minorities when compared to whites, with hospitalizations averaging over 4 times higher among American Indian/Alaska Natives, Blacks, and Hispanic or Latinx persons.[11] As of October 2020, the worst COVID-19 outbreaks in the United States are in rural areas.[12] High Social Vulnerability Index and disability are also associated with increased COVID-19 case counts.[13] The pandemic has not only highlighted, but compounded the known challenges of our current healthcare system in providing equitable, accessible, and comprehensive care in underserved communities.[14]

The aim of the present study was to identify promising approaches and best practices to testing vulnerable populations in OSCTCs using a qualitative approach. The National Collaborating Center for Determinants of Health defines vulnerable populations as groups and communities with higher risk of poor health due to barriers they experience accessing social, economic, political, and environmental resources, or limitations due to illness or disability.[15] These criteria include the economically disadvantaged, racial and ethnic minorities, the uninsured, low-income children, the elderly, the homeless, those with HIV, and those with other chronic health conditions, including severe mental illness.[16]

## 2. Methods

We conducted a qualitative study using semi-structured interviews with 26 leaders of off-site COVID-19 testing centers (OSCTCs) and public health departments across the United States between June 8th and August 10th, 2020. Although recruitment efforts were reliant upon snowball and convenience sampling, the recruitment was purposeful based on our need to meet a diverse geographic sample across the United States. As there are many variations between the types of communities, including geography and setting, the sampling approach captured central themes that described the diversity of OSCTCs. The identified OSCTCs diversity characteristics included: weather-related climate, demographics of the community served, testing methodology, capacity for testing, type of medical center affiliation, and state/federal partnerships.

This study was designed to follow-up on important themes and ideations brought forth from the results of a Phase I OSCTCs study conducted in March through April 2020.[9] The Phase II interview guide, created by the research team's epidemiologist and a qualitative researcher, was informed by the Phase I work in an attempt to identify progress and best practices associated with OSCTCs from a broader United States population sample. Questions covered OSCTCs' COVID-19 sample collection protocols, populations tested, supporting partnerships, reimbursement processes, as well as general successes, challenges, and recommendations for other OSCTCs.

Interviews were conducted via RingCentral™, a cloud-based video conferencing solution, and lasted between 30 and 60 min. All interviews were audio recorded and transcribed using New Dragon Professional 15 Individual dictation software for analysis purposes. To ensure confidentiality, only the research team had access to each interview and the identifiable interview information and recordings. Subject consents were received in advance before each interview.

All interviews were initially coded utilizing oral coding via rapid identification of themes from audio recordings, and then were coded in NVivo 11 for further refinement and thematic analysis. Analysis occurred concurrently with data collection to assess when saturation was achieved. To ensure true reliability of the data, triangulation was achieved via cross-analysis utilizing the research team's field notes, group coding sessions including peer debriefing and member checking, and analyzing the interview transcriptions.

## 3. Results and discussion

A total of 26 interviews were completed representing OSCTC leaders from 16 states encompassing all major geographic areas across the United States. Three OSCTC leaders had been previously interviewed during the Phase I study. The majority (13) of leaders interviewed were affiliated with health systems or provider organizations; 9 were leaders at the state or municipal level providing coordination across health systems; and another 4 interviewees were from pharmacies and laboratories. A total of 22, or 85% of OSCTCs interviewed, reported focusing on how to reach specific vulnerable populations for COVID-19 testing. While many of the OSCTCs served rural areas, rural penetration statistics were not collected. Additional detail on the sample is provided in Table 1.

The diversity amongst the data sample is a strong feature of the evaluation, as common patterns captured the core experiences and overarching processes of OSCTCs. At the completion of each interview, the research team utilized triangulation techniques to verify data collection, which enhanced the reliability of the sample observations and interpretations. Theme redundancy signaled saturation, which was attained in this study.

As the aim of this study was to identify promising approaches to testing vulnerable populations in OSCTCs, we have identified the following six main themes, with supporting representative quotes:

1. ***Expanding services to support health and health-related needs beyond COVID-19:*** One OSCTC currently implements a "Portable Population Health" model that uses vans to bring testing and healthcare services directly to communities and vulnerable populations. While this "drive-to" model was originally developed to support testing for COVID-19, it has evolved to provide services such as blood pressure, HIV, and Social Determinants of Health (SDoH) screenings; nutritional support such as access to canned goods and fresh produce; assistance with Medicaid enrollment; and referrals to appropriate clinical, social service, and mental health providers:

   *…we really see these sites as growing much beyond the scope of COVID testing… we see this as really important to build up the resilience of the community, not just by virtue of COVID testing but by addressing all the fundamental other issues that really contribute to adverse outcomes.*

   Some additional OSCTCs reported offering connections to primary care providers:

   *Ideally when somebody arrived for testing … we can say 'do you have a primary care provider'; if they don't, we can say 'hey here's one in your neighborhood, call this clinic.'*

   Others offered navigation to additional resources:

   *I think during this time people should be able to look at the patient, understand what their needs are, and then look across the organization, including on (the) health plan side to figure out what kind of resources we can hook somebody up with.*

**Table 1**

Sample characteristics for Phase II off-site COVID-19 testing center qualitative review, June 8 – August 10, 2020.

| Sample Characteristics | |
| --- | --- |
| # of OSCTCs | 26 Total OSCTCs, including: 23 New OSCTCs (not interviewed in phase 1) 3 included in Phase I OSCTCs |
| States Covered | AK, CA (4), CO (2), CT (2), FL, IL, LA, ME (2), MI, NH, NJ, OH, RI, TN (3), VT, WA (2) |
| Type of Site | State/municipal oversight (includes Public Health): 9 Health System/Provider oversight: 13 Laboratory/Pharmacy: 4 |

A few OSCTCs reported providing food, although one terminated this service as they felt their partners could do a better job:

*We've done a lot of food distribution at testing sites at the early days... I think it was a great idea and concept; it's not super functional particularly with the delays and testing results that we see sometimes ... we have a lot of different avenues for people to get food in [name] county.*

Other OSCTCs expressed a desire to reach beyond testing, but most were not yet doing so:

*...when we are out in the community doing mobile testing and they test positive, what resources are we giving them if they get sicker or they have additional questions? ...I think that's an important piece to think about, and we're still working through those pieces.*

And another identified pediatric immunizations as a concern:

*We fell behind in pediatric immunizations and so [are] trying to figure out a way to catch up on those - we don't want to get a measles outbreak.*

2. **Gaining community trust:** Many respondents indicated an OSCTC would not be successful without establishing trust within the community. Its leaders must listen to the community members and become educated on the issues impacting them:

*...one of the most important things is for people to listen. I think that so many people want to come into the community and tell them what they need, and that is always the wrong approach ... you have to come in and offer, not foist upon the community but ... work with the community members who best understand the way they want things to flow.*

Additionally, there is a need to understand the unintended consequences of the OSCTC's work. For example, in areas with high numbers of undocumented immigrants, a positive test could have implications beyond COVID-19:

*One family had multiple people living in a single-family apartment ... 'if we test positive, you guys are going to investigate and go forward with contact tracing' that could affect the housing for the family.*

Others reported that some patients:

*...fear getting tested because they will get 'locked up' [quarantined] for 14 days, and they can't work, and they can't feed their kids.*

In some communities the National Guard was often reported as a valuable support for OSCTCs, however, in others, its mere presence could arouse distrust:

*...the governor is sending army people in uniform to predominantly African American public housing structures to test them, so you can imagine the challenge that arose, right? ...we wanted to be very sensitive to that and to the National Guard thing.*

3. **Developing and leveraging community partnerships.** Partnerships were emphasized repeatedly as one of the keys to success for an OSCTC:

*...we no longer can be siloed. We have to have a partnership. We have to be a family of resources for everyone in our communities... we have to band together... looking at it through the lens of what each organization does well.*

Identifying established, community-based partners ensures that locally relevant needs and preferences are infused into an OSCTC:

*...you need trusted community partners to not only be the conduit to get information out to the community but to help organize the communities' attendance at these events.*

Places of worship were often highlighted as trusted conduits of information around testing, as well as sources for volunteers:

*...We've had a lot of success using churches as testing event sites where they're reaching out in their community to do the testing.*

And finally, OSCTCs can get help from community organizations to make sure their efforts are culturally sensitive:

*...looking to some of the already formed social justice groups specifically who are in touch with the Latinx community saying what we are doing wrong and how we can help communicate with the Latinx population.*

4. **Promoting clear and creative messaging.** Regular, clear communication was a priority for many OSCTCs:

*Communicating to the public about the specifics of testing, what it means and what it is, not only in scientific terms but in layperson's terms so they can understand ... can reduce any anxiety that folks might have. We are seeing a lot of environmental anxiety now.*

Creativity in advertising and consistency in messaging are both reported to be effective strategies. In particular, use of social media was effective:

*...the disparities particularly affecting the African American Community [were] really concerning to us.... So, we launched a statewide campaign [on Facebook] really promoting the importance of getting tested and the importance of protecting your family as related to COVID-19.*

Additionally, consistency across different platforms is important:

*Things were changing daily ... so ensuring that all of our different communication outlets from the news stations to social media to website, voicemail recordings, billboards – they all needed to align to where you could be tested and how you can either schedule an appointment or where you could drive up to be freely tested.*

One OSCTC tapped into local artists to help get the word out:

*...using the artists that you have locally and putting together info-commercials and videos and posters and things like that really worked well.*

5. **Prioritizing patient experience.** OSCTCs are healthcare providers, and like all healthcare providers, are judged based on the experience of care patients receive:

*From the time they walk in, the welcoming, the greeting that they receive, the warm handoffs from station to station... We keep it very clean; we keep it very simple ... and in the end we give them snacks.*

For some OSCTCs, appropriate engagement was a challenge:

*One of the more recent challenges for many of us is just making sure we are engaging properly with patients... making sure patients know that we are there for them...*

Ultimately, OSCTC leaders recognized that patients will come back to a testing center and promote it to others if they had a positive patient experience:

*I think it's almost exclusively word-of-mouth... COVID Facebook groups and people just commenting like, 'I went to the drive-thru on [site] and here was my experience'.*

6. ***Managing patient results***: The process of getting results to patients should begin before any sample is collected. OSCTCs emphasized the importance of identifying a responsible person:

*We don't start testing with anybody unless it's very clear who is going to be the ordering provider for them and who will provide the follow-up. This includes following up with negatives as well.*

Many OSCTCs are using electronic systems and patient portals to build efficiencies in delivering results:

*You would be handed a pamphlet that says please login to this [name] portal and access your own account …as soon as [name] posts your results, you would get real-time notification of when your results are up.*

The identified strategies require additional creativity when working with vulnerable populations, who may not have access to a phone or email. One OSCTC articulates the adaptations they've made:

*The key is that you, on the intake, find out every possible mechanism of getting information to a person and incorporate that in the consent process to share that information… to try and make sure you can close the loop. We are continually culling through data to try and make sure that nobody gets left hanging.*

The homeless population was highlighted by many OSCTCs as one of the more challenging populations to reach with results. One OSCTC included a question in the consent process on whether they could share the results with shelters. Another OSCTC successfully used the following strategy:

*We would tell them, contact us at this time, come by here and will have the results for you. And they would just stop by, we would hand them an envelope, and we would have a nurse come out and speak with them.*

Or, a central, well-publicized *"hotline … you can call to see if your results are back"* may be an effective way of ensuring access for patients you're unable to contact directly.

## 4. Limitations

Although this study has contributed to filling gaps in the understanding of how OSCTCs can support vulnerable populations, there should be some considerations when interpreting the results. The sample in this study included 26 geographically diverse sites but may not be representative of the entire universe of OSCTCs across the United States. Consequently, results from this study may not be generalizable to all OSCTCs across the United States. Moreover, this study was based on the opinions and experiences of respondents, and they could have provided socially desirable responses and/or personal bias.

## 5. Conclusion

Testing among the vulnerable not only helps those at highest risk of severe disease or death from COVID-19, but also presents a critical opportunity to control viral spread within and from these communities. Many OSCTCs emphasized the importance of supporting vulnerable populations, but few had enough resources to address their needs. The possible arrival of tests with quicker turnaround times, adequate access to PPE, lower costs, and higher sensitivity and specificity of testing, might ease some of the challenges of testing the underserved. It will not erase the many systemic factors that make serving this population so challenging. Nor will it erase the disproportionate needs of these communities.

Communities hardest hit by COVID-19 may already have a tenuous relationship with the medical system and government services, after years of neglect and discrimination. OSCTCs must consider broader community challenges, prioritize building trust, and marshal resources needed to innovate in order to successfully meet testing goals within underserved communities. Controlling the spread of COVID-19 will not be possible until we are able to adequately address the needs of vulnerable populations.

Now that COVID-19 vaccinations have become available, the United States is faced with the added challenge of distributing limited vaccines to selected populations while continuing to provide mass testing programs. Vaccine willingness and complex logistical issues around dosing and cold storage highlight additional challenges vaccine leaders need to address. Many of the lessons learned from OSCTC experiences are relevant for vaccine distribution. We believe it will be critical to apply these findings to support timely, high quality, and equitable distribution of vaccines and ultimately end this pandemic.

## References

1 Harcourt J, Tamin A, Lu X, et al. Severe acute respiratory syndrome coronavirus 2 from patient with coronavirus disease, United States. *Emerg Infect Dis.* 2020;26(6): 1266–1273. https://doi.org/10.3201/eid2606.200516.

2 Steinhauer J, Rogers K, Goldbaum C, et al. *U.S. Will Drop Limits on Virus Testing, Pence Says.* The New York Times; 2020. https://www.nytimes.com/2020/03/03/world /coronavirus-live-news-updates.html (accessed 18 August 2020).

3 Wu KJ. *"It's like Groundhog Day": Coronavirus Testing Labs Again Lack Key Supplies.* The New York Times; 2020. https://www.nytimes.com/2020/07/23/health/coron avirus-testing-supply-shortage.html. accessed 18 August 2020.

4 *FAQs on Shortages of Surgical Masks and Gowns during the COVID-19 Pandemic.* Food and Drug Administration (FDA); 2020. https://www.fda.gov/medical-devices/per sonal-protective-equipment-infection-control/faqs-shortages-surgical-masks-and-g owns-during-covid-19-pandemic. accessed 18 August.

5 *Hospital Experiences Responding to the COVID-19 Pandemic.* OIG: U.S. Dept of Health & Human Services; 2020. https://oig.hhs.gov/oei/reports/oei-06-20-00300.pdf. accessed 17 August.

6 Fraser C, Riley S, Anderson RM, Ferguson NM. Factors that make an infectious disease outbreak controllable. *Proc Natl Acad Sci Unit States Am.* 2004;101(16): 6146–6151. https://doi.org/10.1073/pnas.0307506101. April.

7 *GISCorps COVID-19 Testing Sites Locator*; 2020. https://www.giscorps.org/c ovid-19-testing-site-locator/. accessed 28 October.

8 Kwon KT, Ko J-H, Shin H, Sung M, Kim JY. Drive-through screening center for COVID-19: a safe and efficient screening system against massive community outbreak. *J Kor Med Sci.* 2020;(11):e123. https://doi.org/10.3346/jkms.2020.35. e123, 23;35.

9 Brammer C, Donohue S, Elwell T, et al. Qualitative review of early experiences of off-site COVID-19 testing centers and associated considerations. *Healthcare.* 2020;8(3). https://www.sciencedirect.com/science/article/pii/S2213076420300488?via% 3Dihub. September.

10 Network for Regional Healthcare Improvement. *Off-Site COVID-19 Testing Toolkit*; 2020. https://www.nrhi.org/offsite-testing-toolkit/. accessed 28 October.

11 CDC. *COVID-19 Hospitalization and Death by Race/Ethnicity*; 2020. https://nccdh. ca/index.php?/glossary/entry/vulnerable-populations#:~:text=Vulnerable%20pop

ulations%20are%20groups%20and,due%20to%20illness%20or%20disability. accessed 18 August 2020.

12  Leatherby L. *The Worst Virus Outbreaks in the U.S. Are Now in Rural Areas, the New York Times*; 2020. https://www.nytimes.com/interactive/2020/10/22/us/covid-rural-us.html. accessed 28 October 2020.

13  Karaye IM, Horney JA. The Impact of Social Vulnerability on COVID-19 in the U.S.: an analysis of spatially varying relationships. *AJPM*. 2020. https://doi.org/10.1016/j.amepre.2020.06.006.

14  Healthcare Information and Management Systems Society. *The Impact of Underserved Communities in Times of Crisis*; 2020. https://www.himss.org/resources/impact-underserved-communities-times-crisis. accessed 10 December 2020.

15  National Collaborating Center for Determinants of Health. Vulnerable populations. https://nccdh.ca/index.php?/glossary/entry/vulnerable-populations#:~:text=Vulnerable%20populations%20are%20groups%20and,due%20to%20illness%20or%20disability; 2020. accessed 18 August.

16  Vulnerable AJMC. *Populations: Who Are They? 1*; 2006. November https://www.ajmc.com/view/nov06-2390ps348-s352. accessed 18 August 2020.