

ORIGINAL ARTICLE

COVID-19 diagnostic testing among underserved Latino communities: Barriers and facilitators

Luz M. Garcini PhD, MPH^{1,2,3}  | Tommy Tam Pham MD² | Arlynn M. Ambriz BS² | Sarah Lill MA¹ | Joel Tsevat MD, MPH^{1,2}

¹Center for Research to Advance Community Health (ReACH), University of Texas Health Science Center at San Antonio, San Antonio, TX, USA

²Department of Medicine, Joe R. and Teresa Lozano Long School of Medicine, University of Texas Health Science Center at San Antonio, San Antonio, TX, USA

³Department of Psychiatry and Behavioral Sciences, Joe R. and Teresa Lozano Long School of Medicine, University of Texas Health Science Center at San Antonio, San Antonio, TX, USA

Correspondence

Luz M. Garcini, Center for Research to Advance Community Health (ReACH), 7703 Floyd Curl Drive, San Antonio, TX, USA.
Email: garcini@uthscsa.edu

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Abstract

In the U.S., Latinos are disproportionately affected by the COVID-19 pandemic. A critical step to reduce the spread of COVID-19 is diagnostic testing. Yet, for testing to be effective, barriers must be reduced or eliminated and facilitators promoted. Guided by principles of community-based participatory research, we collected data from 64 community health workers and *Promotor/as* (CHW/Ps) in Texas to identify relevant personal, community-level, and testing-related barriers and facilitators to diagnostic testing for COVID-19 among underserved Latino communities. Data were collected through an online survey and focus groups. A large majority of CHW/Ps (90.6%) reported that they perceived diagnostic testing to be important for their communities; however, only 42.2% believed that their communities understand the use of testing. Personal barriers to diagnostic testing included mistrust and fear, including fear of: becoming infected and infecting others, job/income loss, discrimination/stigmatisation, uncovering other diseases, and mishandling of personal information. Community-level barriers to testing included fear-inducing myths and beliefs. Test-related factors included cost and accuracy of testing, testing procedures, inadequate and insufficient information, and logistics pertaining to testing sites. Facilitators to testing included building trust between communities and those administering testing, along with receiving culturally and contextually appropriate testing information. Diagnostic testing for COVID-19 among underserved Latino communities is complex and suboptimal. Targeted efforts are needed to overcome personal, community and test-related barriers in a culturally and contextually sensitive manner in order to prevent harm and to reduce further risk among underserved communities.

KEYWORDS

community, COVID-19, diagnostic, disparities, latinos/hispanics, testing

1 | INTRODUCTION

In the U.S., Latinos are being disproportionately affected by the COVID-19 pandemic. As of mid-January 2021, approximately 1 year after the pandemic reached the U.S., Latinos accounted for 21% of all COVID-19 cases (CDC 2020). Recently, COVID-19 cases and

related deaths among Latinos have surged (United States Census Bureau 2021), with a disproportionate number of cases and fatalities reported among Latinos residing near the U.S.-Mexico border where chronic and infectious diseases are highly prevalent (CDC 2021). The high COVID-19 risk among Latinos near the U.S.-Mexico border is further compounded by poverty, social disadvantage, and limited

access to health and social resources, as well as by a heavy presence of immigration law enforcement, which increases distress in these border communities (Lapeyrouse et al., 2011). The aforementioned factors make U.S.-Mexico border region residents vulnerable to increased risk of morbidity and mortality from COVID-19 and its associated economic and social consequences (CDC 2021).

A critical step in the control of COVID-19 is diagnostic testing. Diagnostic testing is essential to rapidly identifying cases; isolating and potentially treating infected individuals; and quarantining people exposed to COVID-19 (Kuniya & Inaba, 2020). From a public health perspective, diagnostic testing is also important to provide public health officials, healthcare organisations, and providers with information about the prevalence, incidence, spread and contagiousness of the disease, information needed to plan interventions and resource allocation (Binnicker, 2020). For diagnostic testing to be effective, tests must be widely available and barriers must be reduced or eliminated if possible (Salathé et al., 2020). Yet, throughout the pandemic, the U.S. has encountered challenges with the accuracy of diagnostic testing, confusion around the different types of diagnostic testing, delays in the return of test results, and conflicting opinions as to who should be tested and under what conditions. These challenges have limited the effectiveness of testing for containing COVID-19 (Capps & Gelatt, 2020; Kim et al., 2020). Importantly, barriers and facilitators to testing may differ across settings and populations depending on the contextual environment, available resources, and prevalent cultural myths, beliefs, and practices (Romer & Jamieson, 2020; Wang et al., 2020). The goal of this project was to identify barriers and facilitators to diagnostic testing for COVID-19 among underserved Latino communities, in particular those residing in proximity to the U.S.-Mexico border.

2 | MATERIALS AND METHODS

From its inception, the conceptualisation and development of this project relied on shared cultural and contextual knowledge from collaborating community and academic partners, including representatives from Community Health Worker associations in South Texas. The collaborative process with Community Health Workers and *Promotor/as* (CHW/Ps) has been longstanding, and it was established prior to the development and launching of this project. *Promotor/as* are lay health workers in the Latino community who provide health education and resources. As members of the communities in which they work, CHW/Ps share the experiences of the friends, neighbours, and other fellow community members they represent (Peretz, 2020). As such, they are knowledgeable advocates who can justly speak on behalf of their communities and offer accurate needs assessments of barriers and facilitators to healthcare access. In this project, consultation with collaborating CHW/Ps was undertaken to develop and evaluate the appropriateness of the questions and language used in the survey and in the focus groups. In addition, collaborating CHW/Ps assisted in conducting the focus groups, note-taking, and with the interpretation of findings.

What is known about this topic

- The COVID-19 pandemic has disproportionately affected Latinos.
- A critical step in the control of COVID-19 is diagnostic testing.
- Latinxs have limited access to health services, including preventive services and screening.

What this paper adds

- Despite its importance, the use of diagnostic testing for COVID-19 is not well understood among underserved Latino communities.
- There are salient community and cultural factors, such as fear-inducing rumours surrounding testing for COVID-19, which are rooted in deception and mistrust of government authorities.
- Among Latinos, guilt and shame surrounding a positive diagnostic test for COVID-19 need to be addressed using culturally sensitive interventions.

Data were collected in July 2020 from a sample of 64 CHW/Ps. Bilingual CHW/Ps were recruited by using network-based referrals from academic and community partners in underserved communities. Bilingual CHW/Ps were recruited using network-based referrals from academic and community partners in underserved communities. Recruitment strategies used included emails, social networks, and presentations offered at online meetings for local CHW associations. To determine eligibility, CHWs had to reside and work with underserved communities in the target region. Fluency in English or Spanish was also required for participation.

All data were collected remotely to avert person-to-person exposure during the pandemic. We collected quantitative data via an online Qualtrics survey (Qualtrics), and qualitative data through online focus groups facilitated by a bilingual facilitator, 2 research assistants, and 2 CHWs that work extensively with Latino communities in the area. All participants were required to complete the survey and attend one focus group. The survey was completed prior to the focus groups in order to introduce the topic and motivate discussion. Out of the 5 focus groups conducted, 2 were in English and 3 in Spanish. The online focus groups and the online survey each took about an hour to complete. Participants who completed the survey and attended a focus group received a \$40 online gift card for their participation. Participants consented to audiotaping the focus groups. Audiotapes from the focus groups were translated and transcribed by a professional service to facilitate the analysis of data. The University of Texas Health Science Center at San Antonio Institutional Review Board reviewed this project and deemed it to be a needs assessment project and thus non-regulated research activity.

2.1 | Measures

Quantitative data included 80 questions to assess information on demographics; health issues typically addressed by CHW/Ps; and perceived willingness, barriers, and facilitators faced by people in their communities for COVID-19 diagnostic testing, vaccination, and engagement in protective measures. To assess barriers to diagnostic testing, we asked "On a scale from 1 (not at all) to 4 (extremely), how likely is it that the following concerns may prevent people in your community from getting diagnostic testing for COVID-19?" Responses were provided using a Likert scale with higher values denoting a more serious concern or barrier. Focus group questions were semi-structured and expanded on: (1) beliefs, attitudes, and barriers to diagnostic testing for COVID-19 among underserved Latino communities, and (2) facilitators that may increase knowledge and willingness to be tested.

2.2 | Analyses

Quantitative survey data were analysed by using descriptive statistics (i.e., frequencies, measures of central tendency). Qualitative data from the focus groups were analysed through systematic methods outlined by Miles and Huberman (1994), including starting with specific questions previously developed by the investigators and then proceeding through the steps of data categorisation, data reduction, data display, and conclusion drawing and confirmation. The qualitative transcripts were analysed by the principal investigator (PI) and two research assistants. Initially, the PI and one research assistant independently coded two of the focus group transcripts to come up with a coding frame to highlight primary codes and subcodes, including developing definitions and examples for the codes identified. Agreement in coding was achieved through discussion of overlaps and divergences. The coding frame and definitions were shared and discussed with collaborating CHWs for feedback, and adjustments were made to the coding frame. Subsequently, the coding frame was used to code the rest of the transcripts. Each transcript was analysed independently by two coders and collaborative weekly team meetings were used to check results for clarification. In addition, triangulation of multiple data sources and agreement checks were used to ensure trustworthiness, credibility, transferability, and accuracy of the qualitative findings. A table displaying salient codes and subcodes from the qualitative data was used to compare to frequency data from the quantitative survey. Convergence of all of the aforementioned data sources was examined to enhance the trustworthiness of our findings.

3 | RESULTS

3.1 | Participants

Overall, 64 CHW/Ps participated in the survey and in the focus groups. Focus groups ranged in size from 7 to 15 participants.

Most CHW/Ps were women and of Latino origin (Table 1). Their mean age was 45.3 ($SD = 13.7$). Approximately half (46.9%) regularly worked with immigrant communities, and most worked across various settings, including community locations (e.g., homes, schools, community centres; 62.5%), non-profit organizations (50.0%), churches or faith-based centres (21.9%), and primary care clinics (14.1%).

3.2 | Perceived relevance and importance of COVID-19 diagnostic testing in South Texas

Overall, 85.7% of CHW/Ps reported that people in their communities perceive COVID-19 to be a serious illness and 90.6% reported that they perceived diagnostic testing to be important for their communities. Nonetheless, only 42.2% of participants reported that people in their communities understand the use of diagnostic testing for COVID-19. Regarding circumstances for diagnostic testing, almost half of the participants reported that it is important to get tested even if people do not have symptoms (48.4%), whereas the other half reported that is important to get diagnostic testing only when a person has symptoms (51.6%).

Among CHW/Ps reporting that diagnostic testing is important for their communities, qualitative data showed that primary reasons include: (1) testing can keep communities and families safe and prevent the spread of the disease, for instance by identifying asymptomatic people; (2) testing can help detect people in early stages of the disease, potentially reducing complications; (3) testing can motivate people to use personal protective equipment and follow safety guidelines; (4) testing can help in the differential diagnosis of other diseases such as influenza; and (5) testing is useful to identify people who can donate plasma to infected people. Barriers to COVID-19 diagnostic testing among underserved Latino communities

TABLE 1 Demographic characteristics of community health workers and *Promotor/as*

Characteristics	Total (N = 64)
Sex	
% Women	89.8
Age, years (M, SD)	45.3 (13.7)
Race/ethnicity	
% Latino	91.5
Education	
% High school graduate or beyond	89.8
Employment	
% Full or part time	85.7
Years as CHW/ <i>Promotor/as</i> (M, SD)	6.4 (7.0)

3.2.1 | Personal and community factors

Quantitative results showed that the most frequently reported barriers to diagnostic testing at the individual level were fear and mistrust. Fear of becoming infected was identified as the most concerning ($M = 3.39$; $SD = 0.77$), particularly among those with limited access to healthcare. Additional fears identified included fear of job or income loss due to a positive test result ($M = 3.19$; $SD = 0.95$), concerns about immigration legal status, such as not having adequate identification requirements ($M = 3.03$; $SD = 1.06$), fear of being discriminated against or stigmatised ($M = 3.02$; $SD = 1.00$), and fear of sharing personal information ($M = 2.72$; $SD = 1.01$). Pertaining to mistrust, the most salient barriers were concerns related to mishandling confidential information ($M = 2.93$, $SD = 0.09$), which may be particularly concerning for people with undocumented immigration legal status due to fear of deportation and family separation.

In addition to the aforementioned fears and mistrust, results from qualitative data identified that fear of discovering that one has a positive test result and thus could have infected others were associated with feelings of shame, guilt and fears of rejection and discrimination. Fears of a positive test result were also associated with feelings of failure, particularly in regards to self-care and failing to keep loved ones and the community safe, which may cause embarrassment (Table 2). Additional fears identified included: (1) that test results may reveal other highly stigmatised infectious diseases, such as HIV or STDs, which may lead to discrimination, stigmatisation, and/or rejection; and (2) that a positive test result would affect caregiving given the need to isolate, which may lead to family separation and feelings of rejection and loneliness.

At the community level, results from qualitative data identified specific myths and beliefs that may interfere with diagnostic testing, such as rumours and spiritual/religious beliefs, which may precipitate fear, worry, shame, guilt and deceitfulness. For instance, a salient rumour identified was believing that diagnostic testing itself would be harmful—regardless of the results.

3.2.2 | Test-related factors

Quantitative results showed that the most salient barriers pertaining to testing were the cost of testing ($M = 3.49$; $SD = 0.81$) and concerns about the accuracy of the test ($M = 3.12$; $SD = 0.85$). Pertaining to logistics of diagnostic testing, the most salient barrier was limited access to a testing site ($M = 3.30$; $SD = 0.79$). Insufficient information about testing was also identified as a prominent barrier ($M = 2.88$, $SD = 1.05$), including not knowing where to get tested ($M = 2.80$, $SD = 0.92$).

Results from qualitative data identified additional test-related barriers including: (1) variations in the procedures for testing (e.g., nasal swab vs. oral; self-administered vs. administered by health-care workers) as contributing to confusion, mistrust, and preoccupation with the accuracy of test results; and (2) misunderstanding

or rumours about the testing procedure, such as believing that testing is extremely painful. Qualitative results also confirmed quantitative findings and showed information about testing to be a salient concern, specifically limited information about where and when to get tested reliably and safely. Believing that testing is only required for people at risk, such as the elderly or those in poor health; believing that a doctor's referral is needed in order to get tested; and being uncertain about documents needed for testing (e.g., identification) were also identified as gaps in information. According to the CHW/Ps, documentation and identification requirements for testing pose a substantial barrier for community members who are undocumented. Another gap identified was the limited understanding of the difference between diagnostic and antibody testing, resulting in confusion, frustration, and doubt. Respondents also mentioned test scarcity, inconvenient testing sites and times, and long waits for testing and testing results as barriers (Table 3). Facilitators to COVID-19 diagnostic testing in underserved Latino communities

3.2.3 | Personal and community facilitators

Quantitative results showed that making diagnostic testing confidential or anonymous is important ($M = 3.50$; $SD = 0.82$). Moreover, qualitative findings showed that an essential facilitator to diagnostic testing is building trust between community members and those providing testing. To increase trust, CHW/Ps emphasised (1) protecting personal information of people tested and informing people how the information will be used (e.g., who is informed when a person has a positive test result? Who will have access to the records?); (2) providing legal protection at testing sites, particularly for undocumented immigrants; and (3) having trusted networks for providing testing, such as faith-based organisations, community non-profits, and CHW/Ps. Of note, participants mentioned that increasing trust would also decrease fear prevalent in underserved Latino communities, particularly those near the border.

3.2.4 | Test-related factors

Quantitative results showed that low-cost or affordable diagnostic testing, as determined by the socio-economic status of each person (e.g., sliding scale cost) is important ($M = 3.95$; $SD = 0.22$). Facilitating information about test result interpretation, specifically what steps to take if the test is positive, was also seen as needed ($M = 3.90$; $SD = 0.30$), as was providing referral information for people with positive test results ($M = 3.88$; $SD = 0.38$).

Qualitative results highlighted additional facilitators related to the convenience of diagnostic testing and testing sites: (1) setting up more sites at nearby locations with hours that accommodated standard work hours; (2) providing transportation to testing sites; (3) using mobile clinics or at-home testing for individuals unable to leave their homes; (4) providing childcare services for those needing to get

TABLE 2 Personal and community barriers to diagnostic testing and their associated psychological consequences, according to community health workers and *Promotor/as*

Barriers sub-categories		Sample quotations	Psychosocial consequences
Fear	1. Becoming infected or exposed	They were afraid that there would be a lot of people [at the testing centre], and ... if they were not sick that there was a possibility of getting infected by going.	<ul style="list-style-type: none"> • Disappointment • Shame • Guilt • Stigmatisation • Fear of rejection
	2. Getting others sick	I felt like a putrid person ... because [the clinic staff member] is blaming me for infecting others ... there is a stigma ... you got people sick because you did not use protection and people are going to find out about that ... it is feeling the guilt of knowing that you are responsible if somebody else gets sick.	
	3. Uncovering other diseases (e.g., STDs, HIV)	I am working with the LGBTQ community and they are scared that something else might come up: HIV, AIDS, STDs ... that is another fear, that you may go for COVID, but you will bring back more diseases.	
	4. Failure (i.e., self-care, care for family, care for community)	Nobody wants to look like they failed ... they failed to - to take care of themselves, they failed to keep their families safe, and they feel like they let the community down. They are just embarrassed.	
	5. Discrimination	People are afraid to test positive because they are going to be discriminated against ... they will get labelled ... their families will find out they had the virus, so they will not want to get close to them... their families can make them feel less because now they have the virus, they do not want to visit with them ... It is a type of discrimination.	
		There are a lot of people who do not want to say they have had it or that they have it, because of fear of rejection ... if someone says that they have it ... [the community looks] at them weird ... do not touch them, do not look at them ... do not visit them.	
	6. Caregiving concerns	If you are sick and people don't want to be near you, who is going to help you, right? It is that sense of being left alone and left behind.	
	7. Job or income loss if testing positive	People are afraid to say they have the virus because they are afraid that they are going to be sent home, and they will not get paid ... there is fear of lack of employment. If I test positive, I am going to have to stay home and not work ... I can't miss work ... I have bills to pay ... I am afraid of getting tested because what if I am [positive]? Who is going to pay for the bill ... that is the worst fear.	
8. Immigration legal status	There were immigration trucks parked in one of the testing sites [at the border] when people who are undocumented see the truck, they leave ... they tell me, "they are going to take down my information there, and what if they pick me up?"		
Mistrust	1. Mishandling personal information	Their biggest worry is to give out their personal information and that they are tracked ... we hear that for people who test positive, human services are taking their children away ... and they would rather not get it done, so they do not get them separated.	<ul style="list-style-type: none"> • Fear of persecution • Fear of deportation • Fear of family separation • Deception
		People are terrified of getting tested because they are fearful that the government will track them and follow them ... there are immigration trucks parked in one of the testing sites ... when people see the truck, they leave ... they tell me, "They are going to take down my information and what if they pick me up?"	

(Continues)

TABLE 2 (Continued)

Barriers sub-categories		Sample quotations	Psychosocial consequences
	2. Concern about financial scams	There is a rumour going around and people feel fearful ... supposedly, for every positive test, the hospital or the clinic receives an X amount of money from the state so they are giving false positives just to get money. They do not have...	
Myths/Beliefs	1. Rumours	A lot of people are saying that they regret getting tested because there is a rumour that those [testing positive] will be the first to receive the vaccine, whether they want to or not, because they had the virus already ... that sets us back a step in having people going in to get tested. [People] are afraid to get tested because they are afraid that the test may have the virus ... they are afraid they may be inserting the virus through the test ... there is a conspiracy and [testing] is government's way of eliminating the weak.	<ul style="list-style-type: none"> • Fear • Doubt • Disappointment
	2. Spiritual/religious beliefs	Why has this whole wrath of God arrived? ... People say, the wrath of God is on this country or this community or these people ... it is a lot about God being upset, so when somebody from the community gets COVID, it is hard to accept because it is, like, wait a minute. We were supposed to be protected.	

Abbreviations: LGBTQ, lesbian, gay, bisexual, transgender, queer; STD, sexually transmitted disease.

tested; (5) returning test results quickly; and (6) ensuring bilingual services, resources, and staff at testing sites.

Pertaining to testing information, qualitative results emphasised the need to explain why diagnostic testing is important, while considering cultural values that are relevant for these communities (e.g., *familismo*, collectivism). Using infographics and instructional videos was strongly recommended, particularly to overcome myths and beliefs about the testing procedure (i.e., painfulness of testing). The use of testimonials from people in the community, which has been tested, was identified as helpful. Moreover, participants stressed the importance of carefully explaining the difference between diagnostic and antibody testing to avoid confusion and reduce mistrust.

4 | DISCUSSION

Diagnostic testing for COVID-19 is key to preventing the spread of the disease and facilitating early isolation, quarantine, and treatment, yet, throughout the pandemic, many barriers have undermined testing efforts in underserved communities (Botti-Lodovico, Rosenberg, Sabeti 2021). Research on COVID-19 has focused primarily on documenting health disparities related to the pandemic (e.g., infection, death, vaccination, and testing rates) and identifying demographic risk factors, with less attention given to identifying and understanding social and test-related factors that may influence such disparities. This project identified personal, community and test-related barriers to diagnostic testing for COVID-19 among underserved Latino communities, as well as facilitators that may improve testing efforts.

Consistent with prior studies on personal barriers to testing for highly stigmatised diseases (e.g., HIV, sexually transmitted diseases, hepatitis C), the present project identified fear and mistrust as the most salient barriers to testing among Latinos, confirming previous reports (Blondell et al., 2015; Shehata et al., 2018; Solorio, Forehand, Simoni 2013). For many people in underserved communities, a positive test result occurs in the face of limited or non-existent access to healthcare, the possibility of losing employment, and concerns about being discriminated against or stigmatised. In addition, distrust about mishandling personal information makes diagnostic testing particularly stressful for many Latinos, particularly the undocumented, given that release of information could lead to detention, deportation, and family separation (Blondell et al., 2015; Shehata et al., 2018; Solorio, Forehand, Simoni 2013). Thus, for many, the task of weighing the pros and cons of testing is difficult and frightening. Some potential ways to reduce fear and mistrust about diagnostic testing, particularly regarding concerns about mishandling personal information, may include providing home testing kits or anonymous testing sites that use a secure coding system to reduce the number of people with access to personally identifiable information.

Additional barriers to diagnostic testing are those that pertain to community and cultural factors. This project identified specific myths and beliefs, particularly fear-inducing rumours, as salient barriers, a finding that is consistent with the negative effect that rumours can have on screening and testing practices for stigmatising diseases (Blondell et al., 2015). Our findings suggest that rumours surrounding testing for COVID-19 are rooted in deception and mistrust of government authorities (Garcini et al., 2020). Religious beliefs or cultural values may also deter people from testing. Specifically salient

TABLE 3 Test-related factors as barriers to diagnostic testing and their associated psychosocial consequences, according to community health workers and *Promotor/as*

Barriers	Sub-categories	Sample quotations	Psychosocial consequences
Cost of test	1. Affordability	Often, when they do the blood test, they charge \$75 or \$50 and [people] don't have [the money] ... if you are active with COVID-19, what is going to happen next? Who is going to carry the bill? A lot of [people] in my area do not have medical insurance. So it seems l.	<ul style="list-style-type: none"> • Worry • Fear • Confusion • Doubt • Frustration • Despair • Perceived discrimination • Sense of unfairness
		What they have heard is horror stories that the testing is very expensive ... they rather not get tested and just wait and see if they have symptoms.	
Test characteristics	1. Accuracy	It is costing people a lot of money, with unreliable results. They know that the accuracy of the test is not good, so they do not trust in those things ... people are scared and frantic they are paying just to find out and then it is not even 100 percent [accurate].	
	2. Variations in test administration	I do not think it is that accurate, because ... if you did it [tested] yourself, you do not know if everyone does it [that way]. You wonder if you did it correctly because you are not someone who knows or has practiced doing those types of [self-administered nasal swab] tests.	
Testing Information	1. Confusion between diagnostic and antibody testing	they rather not ge It seems like there is a disparity in [testing] price and confusion in terms of what test [to take] ... [people] have a lot of questions because one [test] is through the nasal cavities and another is with a blood sample ... [people] do not know which test to get done.	
		Someone that I knew took a test ... they did blood work and then they did the swab ... she did say, "Well, with the blood, I came out negative, so I am good" ... I did not understand what she meant by that.	
	One of the employees ended up being positive with COVID ... he was so scared because his wife was pregnant ... he ended up going to get tested somewhere else but with the nasal [swab] ... it ended up saying that he was negative.		
	2. Poor understanding or rumours about the testing procedure	I heard that it is dangerous to have the test go down so far into your nose and it may choke you ... they say they hurt you, that they make you bleed ... I am afraid of doing the test myself.	
	[People say] that [testing] is painful ... I had a client who claimed it was as if they were touching the brain.		
3. Not knowing where to test	The information they are lacking is where to go ... several people have called me because they do not know where to go get tested.		
4. Not knowing when to test	There is a lot that we need to know... when is it a right time to check? What to do?		
5. Testing requirements (e.g., documentation)	A big question is whether or not they will accept their <i>Matricula</i> , whether or not they will accept the identification ... if they have an identification or if it is expired ... [many] find out later that they are not qualified ... people think that legal documents are required prior to testing and that people need a doctor's prescription to get tested.		

(Continues)

TABLE 2 (Continued)

Barriers	Sub-categories	Sample quotations	Psychosocial consequences
Testing logistics	1. Scarcity of tests	There are not enough tests ... many times [people] do not get tested because by the time their turn comes, they are turned away and told there are no more tests available, even though they are getting up very early to get tested.	
		A lot of testing sites are booked ... it is a big problem because you go to the website and it is constantly booked and you cannot book a week in advance.	
	2. Not convenient (e.g., long wait; competing demands; safety protocols)	I have to work, and I do not have the time to go stand in line, so I am not going to get tested.	
		I had an experience with an individual who came to the local clinic ... upon arrival, a staff member told her she had to get in her car, because she couldn't be outside there because she was putting others at risk ... she replied, "Miss, look, I do not have a car, I took the bus" ... the staff member told her, "Then, I am terribly sorry, but I can't test you."	

Note: Other people to know. It is like.

in this population are guilt and shame for people testing positive. For instance, our respondents reported that fear of letting down one's family due to embarrassment was as a deterrent to testing. For many Latinos, obtaining a positive test result is regarded as having been careless, as placing the family at risk of infection, and as risking one's job or income, all of which could compromise caring and/or providing for one's family (Tienda et al., 2006). The Latino cultural value of *familismo* emphasises the need to put one's family above oneself, including protecting family bonds and making contributions to the wellbeing of family members (Campos et al., 2014). Thus, reframing or formulating health messages that approach testing as an act of love and care for one's family and as an effective strategy to protect family bonds by keeping family members healthy could be helpful to overcome the guilt and shame that is often associated with obtaining a positive test result. Similarly, enhancing health messages with metaphors in the form of *dichos* or folk sayings rooted in cultural and collectivistic values (Spina et al., 2018) and using story-telling and testimonials from people in the community, are effective strategies that could increase testing behaviour among Latinos (Larkey & Gonzalez, 2007). Further research is needed to identify ways to frame health messages about testing for COVID-19 in a culturally and contextually appropriate manner in order to debunk or reframe fear-inducing rumours and beliefs interfering with testing efforts.

Many test-related factors emerged as major barriers to testing in underserved Latino communities. Some of these barriers are similar across the general population, such as concerns about the accuracy of test results or differences in test administration (Capps & Gelatt, 2020; Kim et al., 2020). Nonetheless, medically underserved communities face a heavier burden pertaining to the affordability of the test when testing is not free, information is limited, and logistics of testing are not tailored to the needs of the community (e.g., difficult access, inconvenient schedules, overcrowding,

identification requirements). Yet, of the aforementioned test-related factors, the lack of reliable and consistent information in Spanish has substantially stymied efforts to slow the spread of the virus in Latino communities (Perez, Uppal, Velasquez, 2020). Lack of or inadequate information often contributes to fear and mistrust among marginalised communities, which in turn deters people from seeking or engaging in essential health services such as diagnostic testing (Jaisawl, LoSchiavo, Perlman 2020). Efforts to facilitate access to accurate information about testing for COVID-19 is needed, including information to clarify the difference between diagnostic and antibody testing, details about the testing procedures, information about logistics (e.g., testing sites, testing requirements, identification needed), and most importantly, information about what to do, and how and where to seek help if you test positive.

To overcome the aforementioned personal, community and test-related barriers, health providers and public health authorities should partner with non-traditional but trusted sources of service delivery in underserved communities. In this regard, community non-profits and faith-based institutions can be key collaborators (National Academies of Sciences, Engineering, and Medicine 2017). Likewise, CHW/Ps are trusted members of the community who work in association with local healthcare, community, and government systems as an extension for providing services (Landers & Levinson, 2016). CHW/Ps play a variety of roles in education and healthcare delivery, including acting as liaisons with their communities, assisting with health system navigation, case management, counselling, and education to combat misinformation and rumours; and collecting data for disease surveillance, among many other important activities (Landers & Levinson, 2016; Peretz et al., 2020). CHW/Ps are becoming increasingly involved in public health interventions that are culturally and contextually sensitive to underserved communities (Landers & Levinson, 2016). To maximise success, the

aforementioned collaborations have to be carefully and respectfully established, adequately funded, and provided with ongoing training and support during and beyond the pandemic.

4.1 | Limitations

This project has several limitations. Our sample size was modest, and although drawn from a large region, the sample represents underserved Latino communities in South Texas. U.S. Latinos are a heterogeneous population, so a larger community needs assessment to identify barriers and facilitators that may influence testing across different U.S. Latino communities is needed. Additionally, due to COVID-19, we conducted our survey and focus groups over a videoconferencing platform (web-based and telephone-accessed), which may have excluded participants lacking access to the internet or reliable phone service. Nonetheless, in case any CHW/Ps had limited computer literacy, participants were given the option to complete the focus group and survey via telephone assisted by a research assistant. None of the participants requested that option.

5 | CONCLUSION

Diagnostic testing for COVID-19 among underserved Latino communities is complex and suboptimal. Given that diagnostic testing is key to preventing the spread of the virus and to facilitating early treatment, targeted efforts are needed to overcome personal, community and test-related barriers in a culturally and contextually sensitive manner. The barriers identified in this project are not unique to diagnostic testing, but highlight problems in the availability and accessibility of healthcare more broadly for underserved Latino communities.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

AUTHORS' CONTRIBUTIONS

Contributors to study conception and design included Luz Garcini, Sarah Lill, and Joel Tsevat. Data collection was undertaken by Luz Garcini and Sarah Lill. Data analyses were done by Luz Garcini, Tommy Pham, and Arlynn Ambriz. All authors contributed to material preparation and writing of the manuscript. The first draft of the manuscript was written by Luz Garcini, Tommy Pham, and Arlynn Ambriz, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

DATA AVAILABILITY STATEMENT

Data are available upon request.

ORCID

Luz M. Garcini  <https://orcid.org/0000-0002-3834-9107>

REFERENCES

- Binnicker, M. J. (2020). Emergence of a novel coronavirus disease (COVID-19) and the importance of diagnostic testing: Why partnership between clinical laboratories, public health agencies, and industry is essential to control the outbreak. *Clinical Chemistry*, 66(5), 664–666. <https://doi.org/10.1093/clinchem/hvaa071>
- Blondell, S. J., Kitter, B., Griffin, M. P., & Durham, J. O. (2015). Barriers and facilitators to HIV testing in migrants in high-income countries: A systematic review. *AIDS and Behavior*, 19(11), 2012–2024. <https://doi.org/10.1007/s10461-015-1095-x>
- Botti-Lodovico, Y., Rosenberg, E., & Sabeti, P. C. (2021). Testing in a pandemic—improving access, coordination, and prioritization. *New England Journal of Medicine*, 384(3), 197–199. <https://doi.org/10.1056/nejmp2025173>
- Campos, B., Ullman, J. B., Aguilera, A., & Schetter, C. D. (2014). Familism and psychological health: The intervening role of closeness and social support. *Cultural Diversity and Ethnic Minority Psychology*, 20(2), 191–201. <https://doi.org/10.1037/a0034094>
- Capps, R., & Gelatt, J. (2020). "Barriers to COVID-19 Testing and Treatment: Immigrants without Health Coverage in the United States." *Migration Policy Institute*, July 17. Available from: <https://www.migrationpolicy.org/research/covid-19-testing-treatment-immigrants-health-insurance> [last accessed 3 February 2021].
- CDC (2020). "CDC COVID Data Tracker." Centers for Disease Control and Prevention. Available from: <https://www.cdc.gov/covid-data-tracker/index.html#demographics> [last accessed 5 August 2020].
- CDC (2021) "United States COVID-19 Cases and Deaths by County." Centers for Disease Control and Prevention. Centers for Disease Control and Prevention. Available from: <https://covid.cdc.gov/covid-data-tracker/#county-view>. [last accessed 4 February 2021].
- Garcini, L. M., Domenech, M. M., Rodríguez, A. M., & Paris, M. (2020). A tale of two crises: The compounded effect of COVID-19 and anti-immigration policy in the United States. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(S1), S230–S232. <https://doi.org/10.1037/tra0000775>
- Jaiswal, J., LoSchiavo, C., & Perlman, D. C. (2020). Disinformation, misinformation and inequality-driven mistrust in the time of COVID-19: Lessons unlearned from AIDS denialism. *AIDS and Behavior*, 24(10), 2776–2780. <https://doi.org/10.1007/s10461-020-02925-y>
- Kim, H. N., Lan, K. F., Nkyekyer, E., Neme, S., Pierre-Louis, M., Chew, L., & Duber, H. C. (2020). Assessment of disparities in COVID-19 testing and infection across language groups in Seattle, Washington. *JAMA Network Open*, 3(9), e2021213. <https://doi.org/10.1001/jamanetworkopen.2020.21213>
- Kuniya, T., & Inaba, H. (2020). Possible effects of mixed prevention strategy for COVID-19 epidemic: Massive testing, quarantine and social distancing. *AIMS Public Health*, 7(3), 490–503. <https://doi.org/10.3934/publichealth.2020040>
- Landers, S., & Levinson, M. (2016). Mounting evidence of the effectiveness and versatility of community health workers. *American Journal of Public Health*, 106(4), 591–592. <https://doi.org/10.2105/ajph.2016.303099>
- Lapeyrouse, L. M., Morera, O., Heyman, J. M., Amaya, M. A., Pingitore, N. E., & Balcazar, H. (2011). A profile of US-mexico border mobility among a stratified random sample of Hispanics living in the El Paso-Juarez area. *Journal of Immigrant and Minority Health*, 14(2), 264–271. <https://doi.org/10.1007/s10903-011-9453-x>
- Larkey, L. K., & Gonzalez, J. (2007). Storytelling for promoting colorectal cancer prevention and early detection among latinos. *Patient Education and Counseling*, 67(3), 272–278. <https://doi.org/10.1016/j.pec.2007.04.003>

- Miles, M. B., & Huberman, M. (1994). *Qualitative data analysis*. Sage.
- National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division, Board on Population Health and Public Health Practice, and Committee on Community-Based Solutions to Promote Health Equity in the United States (2017). *Communities in Action: Pathways to Health Equity*. Edited by Alina Baciuc, Yamrot Negussie, Amy Geller, and James N. Weinstein. Washington, District of Columbia: The National Academies Press.
- Peretz, P. J., Islam, N., & Matiz, L. A. (2020). Community health workers and Covid-19—Addressing social determinants of health in times of crisis and beyond. *New England Journal of Medicine*, 383(19), e108. <https://doi.org/10.1056/nejmp2022641>
- Perez, D. V., & Numa, N. U. (2020). "Equitable Access To Health Information For Non-English Speakers Amidst The Novel Coronavirus Pandemic: Health Affairs Blog." *Health Affairs*, April 2. Available from: <https://www.healthaffairs.org/doi/https://doi.org/10.1377/hblog20200331.77927/full/>. [last accessed 4 February 2021].
- Qualtrics [computer software]. Qualtrics. <https://www.qualtrics.com>.
- Romer, D., & Jamieson, K. H. (2020). Conspiracy theories as barriers to controlling the spread of COVID-19 in the U.S. *Social Science & Medicine*, 263, 113356. <https://doi.org/10.1016/j.socscimed.2020.113356>
- Salathé, M., Althaus, C. L., Neher, R., Stringhini, S., Hodcroft, E., Fellay, J., Zwahlen, M., Senti, G., Battagay, M., Wilder-Smith, A., Eckerle, I., Egger, M., & Low, N. (2020). COVID-19 epidemic in Switzerland: On the importance of testing, contact tracing and isolation. *Swiss Medical Weekly*, 150, w20225. <https://doi.org/10.4414/smww.2020.20225>
- Shehata, N., Austin, T., Ha, S., & Timmerman, K. (2018). Barriers to and facilitators of hepatitis C virus screening and testing: A scoping review. *Canada Communicable Disease Report*, 44(7/8), 166–172. <https://doi.org/10.14745/ccdr.v44i78a03>
- Solorio, R., Forehand, M., & Simoni, J. (2013). Attitudes towards and beliefs about HIV testing among Latino immigrant MSM: A comparison of testers and Nontesters. *AIDS Research and Treatment*, 2013, 1–10. <https://doi.org/10.1155/2013/563537>
- Spina, M., Arndt, J., Landau, M. J., & Cameron, L. D. (2018). Enhancing health message framing with metaphor and cultural values: Impact on Latinas' cervical cancer screening. *Annals of Behavioral Medicine*, 52(2), 106–115. <https://doi.org/10.1093/abm/kax009>
- Tienda, M., Mitchell, F., Landale, N. S., Salvador Oropesa, R., & Bradatan, C. (2006). Hispanic families in the United States: Family structure and process in an era of family change. *Hispanics and the future of America*. The National Academies Press.
- United States Census Bureau (2021) "U.S. Census Bureau QuickFacts: Texas." United States Census Bureau. Available from: <https://www.census.gov/quickfacts/geo/chart/TX/RHI725219>. [last accessed 16 January 2021].
- Wang, M. L., Behrman, P., Dulin, A., Baskin, M. L., Buscemi, J., Alcaraz, K. I., Goldstein, C. M., Carson, T. L., Shen, M., & Fitzgibbon, M. (2020). Addressing inequities in COVID-19 morbidity and mortality: Research and policy recommendations. *Translational Behavioral Medicine*, 10(3), 516–519. <https://doi.org/10.1093/tbm/ibaa055>

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