Understanding Barriers to COVID-19 Testing Among Rural and Urban Populations in Kansas

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Significant disparities in COVID-19 prevalence and related hospitalization and mortality rates are well documented. In particular, historically excluded racial and ethnic minoritized populations and rural populations have been disproportionately affected by COVID-19.[1,2] Similarly, although diagnostic testing is a standard element of infectious disease control, disparities in COVID-19 testing by race, ethnicity, and rurality have been noted.[3–5]

Urban and rural differences in COVID-19–related preventive behaviors, such as wearing a mask or sanitization procedures, have been noted.[6] Few studies have examined barriers to COVID-19 testing in both urban and rural populations. In one study, 1288 Arkansas residents responded to a qualitative question about barriers to testing, and the identified barriers included confusion about when and where to go for testing, lack of accessible testing, pain associated with testing, and delays in getting results.[7] A study of five focus groups conducted with Black residents of urban and rural Alabama communities identified multiple barriers to testing, including fear of getting the virus from testing; distrust of health care, rooted in a lengthy history of systemic racism and mistreatment; inaccessible testing; a lack of understanding around criteria for testing; and cost.[8] Neither study described similarities and differences between urban and rural respondents.

Although access to care is affected by rurality, and residents in rural communities experience higher risks for a variety of acute and chronic health conditions,[9] little is known about differences between rural and urban communities in barriers to COVID-19 testing. The purpose of this study was to identify barriers to COVID-19 testing experienced by underserved or historically excluded populations, specifically examining similarities and differences between urban and rural respondents.

The primary aim of the Rapid Acceleration of Diagnostics-Underserved Populations (RADx-UP) Kansas project was to examine barriers to COVID-19 testing in rural and urban communities, and among racial and ethnic minoritized populations, and rapidly deploy interventions and strategies to increase COVID-19 testing for at-risk communities. RADx-UP Kansas was conceptualized and implemented by an academic–community partnership, which included a community member (B. C.) as a co–principal investigator. To better understand the barriers to testing that are experienced by underserved and historically excluded populations, this cross-sectional needs-assessment effort was nested within the broader RADx-UP Kansas project. A mixed-methods approach, including a community survey and key-informant interviews, was used to describe the barriers to testing and perceived assets to support testing. A full description of the methods used in this study is available in Appendix A (available as a supplement to the online version of this article at https://ajph.org).

IDENTIFIED BARRIERS TO TESTING

In total, 2196 respondents completed the survey between June and August 2021. Respondents in urban counties were more likely than those in rural counties to identify one or more

barriers to testing (38.6% vs 32.1%; $P = .001$). The specific types of barriers to COVID-19 testing identified by respondents in rural and urban counties are described in Table 1. More respondents in urban counties (6.8%) than rural counties (3.8%) noted that they did not know where or how to get tested ($P = .002$) or reported that testing did not occur at a site that was convenient (6.3% vs 4.2%; $P = .03$).

Interviews were conducted with 92 key informants. Qualitative analysis of interviews resulted in the identification of six overarching barriers: access to testing, test-related procedures, consequences of testing, cultural beliefs, misinformation and poor communication, and political beliefs and 28 subthemes shared by more than one county (Table A, available as a supplement to the online version of this article at https://ajph.org). Themes described as dominant in rural counties appeared either exclusively or in most of the rural counties but not in the urban counties, whereas the reverse was true for themes identified as dominant in urban counties. Additional information regarding themes and quotes is available in Appendix A.

The most commonly reported barrier was a subtheme of consequences of testing: "fear of lost income or employment associated with isolation or quarantine." This was illustrated by one participant who stated, "our Hispanic community has been really reluctant to test. Most of them work jobs that if they test, they lose their job if they're positive . . ." [Urban community 1 participant].

Common barriers for both rural and urban RADx-UP Kansas communities included the theme of "access to testing" and subthemes of "lack of transportation" and "lack of language supports for languages other than English."

Three subthemes appeared to be dominant in rural counties. Under the theme of "political beliefs," the subtheme "politicization of COVID-19 mitigation and response efforts" was an identified barrier for most rural counties. One participant noted,

> Sometimes it comes down to political party affiliation, which is sad, but it became a political time bomb at some point. I think you are probably going to find liberal people more likely to get tested, and some people who might be very wealthy, but more to the Republican side might not because they might feel like it is more of a sham or what have you. . . . [Rural community 4 participant]

Within the theme of "access to testing," another barrier that emerged among rural communities was the subtheme "concerns and contradictory information about the cost of testing." Within the theme of "consequences of testing," the subtheme of "documentation required and interacting with any official governing body increasing risk of deportation" was reported as a barrier in most rural communities. One participant stated,

> a family member that went and got tested and tested positive . . . the health department calls you to make sure that you have to stay home, but then I think a couple of days after, the sheriff stop by. . . . It's just checking to

TABLE 1— Factors That Would Prevent Survey Respondents From Getting a COVID-19 Test: Rapid Acceleration of Diagnostics-Underserved Populations (RADx-UP) Kansas, June–August 2021

	Rural (n = 1263), No. (%)	Urban (n = 933), No. (%)	OR (95% CI)
One or more barriers to testing	405 (32.1)	360 (38.6)	1.33 (1.12, 1.59)
Tests are not accurate	93 (7.4)	71 (7.6)	1.04 (0.75, 1.43)
I don't know how or where to get tested	48 (3.8)	63 (6.8)	1.83 (1.25, 2.70)
Local testing occurs during times when I can't go	94 (7.4)	85 (9.1)	1.25 (0.92, 1.69)
Testing does not occur at a site that is convenient for me	53 (4.2)	59 (6.3)	1.54 (1.05, 2.26)
Test is too expensive	63 (5.0)	54 (5.8)	1.17 (0.81, 1.70)
I don't know the testing criteria or I get conflicting information about getting a test	67 (5.3)	39 (4.2)	0.78 (0.52, 1.17)
I have heard testing is painful	123 (9.7)	83 (8.9)	0.91 (0.68, 1.21)
I don't want others to know if I test positive	16 (1.3)	14 (1.5)	1.19 (0.58, 2.45)
COVID-19 doesn't exist, so there is no reason to get tested	10 (0.8)	13 (1.4)	1.77 (0.77, 4.05)
Other	32 (2.5)	39 (4.2)	1.68 (1.04, 2.70)

Note. CI = confidence interval; OR = odds ratio.

> make sure that they're OK, but not everybody sees it that way, and they get afraid, or they get scared. [Rural community 6 participant]

Participants from urban counties identified one barrier that was not identified by rural county participants. Within the theme of "cultural beliefs," the subtheme of "lengthy history of mistrust resulting from historic and systemic mistreatment" was identified by urban participants as a barrier to COVID-19 testing. One participant reported,

> Some of them are not going to get tested because of the Tuskegee Experiment. . . . It resonates within our community. So, there are a lot of skeptics . . . "remember what happened with Tuskegee Experiment, no, we're not going to do that." And that voice, that conversation is still going on. It's very loud and very clear. [Urban community 3 participant]

IMPLICATIONS FOR PUBLIC HEALTH RESEARCH AND PRACTICE

The aim of this study was to identify barriers to COVID-19 testing experienced by underserved or historically excluded populations, specifically examining similarities and differences between urban and rural Kansas residents. This study's results suggest that many barriers to COVID-19 testing for underserved or historically excluded populations are similar in urban and rural counties. For example, regardless of population density, access to testing appears to be a barrier, including perceptions of cost, a lack of transportation, lack of non-English language supports, lack of understanding the criteria for testing, and testing facilities not being available at times when people are available. Although these barriers are noted in rural and urban communities, data from the current study's qualitative interviews suggest that they may manifest differently. Consider, for example, the lack of transportation barrier. Key informants from rural counties suggested that public transportation to towns that offered testing being located miles away was a problem, whereas urban participants noted challenges with getting to sites within the same community.

There were key points of divergence, which may have implications for the ability of communities to advance testing to mitigate COVID-19. For example, key informants from rural counties reported that Hispanic residents' fears related to lack of documentation and potential deportation served as critical barriers to COVID-19 testing. Conversely, key informants from urban counties noted that a lengthy history of mistrust because of systemic racism and mistreatment from the medical community inhibited COVID-19 testing, often referencing the US Public Health Service's Syphilis Study at Tuskegee, which unethically and inappropriately targeted Black or African American men.[10]

Some differences in identified barriers may be, in part, attributable to where various ethnic and racial populations reside in the state. In Kansas, although Hispanic populations are prevalent in urban communities, there are substantial concentrations of Hispanic populations in rural areas of the state associated with the meatpacking industry, whereas Black or African American populations are concentrated in urban areas.[11]

The identification of barriers to COVID-19 testing as perceived by underserved or historically excluded populations residing in rural or urban counties offers implications for practice and research. Identification and measurement of these barriers can allow practitioners to develop interventions and communication strategies specifically designed to address these barriers. Further research to better understand how barriers vary by population, particularly among populations that are underserved and historically excluded, may aid in the development of approaches for designing and promoting COVID-19 testing opportunities that are truly accessible to all populations. AJPH

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CONFLICTS OF INTEREST

The authors declare that they have no known conflict of interest that could have appeared to influence the work reported in this article.

HUMAN PARTICIPANT PROTECTION

The University of Kansas Medical Center institutional review board approved all data collection procedures described here (study 00146321).

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