Quality Improvement

Informing Strategy to Ensure Detection: Perceptions of Coronavirus Testing in a Southeastern U.S. Urban Homeless Population

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Abstract

Introduction

Attitudes of those in the homeless population toward testing, particularly during a pandemic, are critical to understand, so that they and their communities may be safely triaged and protected. Homeless persons are more likely to be exposed during viral epidemics, and have greater vulnerability for more severe viral illness, due to greater medical comorbidities. The literature reflects a dearth of published papers describing the perceptions, interest, and motivations of homeless people to seek or receive viral testing, despite their status as a high-risk population.

Methods

A quality improvement project consisting of a cross-sectional survey took place at 8 SARS-CoV-2 infection testing sites (local shelters and drop-in sites) within Duval County, Jacksonville, FL.

Results

The vast majority of homeless individuals approached for testing completed demographic data and a checklist of beliefs and attitudes about testing (N=764) and underwent COVID-19 nasopharyngeal swab testing (n=679). Mean age was 48; 66% were male, and the predominant race was Black (51%) with 89% of non-Hispanic ethnicity. Of the total participants, 59.2% wanted testing and 4.6% declined testing. Attitudes toward testing varied by site and by wanting vs. not wanting to be tested. Top reasons in those wanting testing included curiosity; a belief that faith would protect them from the virus; and having shelter encouragement to be tested. Top attitudes among those not wanting to be tested were: shelter encouraged me; curiosity; and receiving a gift card. For the total group of subjects, being offered a $10 gift card did not affect their desire to be tested. Those who were not faith-influenced were less likely to want testing.

Conclusion

Findings from selected literature and this quality improvement study support the use of a variety of strategies to encourage participation in testing events with large numbers of homeless individuals, including education, gift cards, shelter staff encouragement, involvement of local faith leaders and more broad support by the community. An additional qualitative study would complement these findings, as populations appear to differ in beliefs and attitudes depending on their location and other demographics. Motivational strategies to influence testing rates can be fine-tuned if beliefs, perceptions and attitudes are better understood.

Keywords

SARS-CoV-2; COVID-19; coronavirus infections; coronavirus infections/prevention & control; pandemics; homeless persons; risk factors; infectious disease transmission; quality improvement; patient education as topic

HCA Healthcare
Journal of Medicine

Introduction

The current SARS-CoV-2 pandemic has raised concerns for the homeless in both social service agencies and medical communities, as the homeless are more likely to be both victims and vectors of disease spread. Homeless individuals historically have greater exposure to viral epidemics (influenza as a prime example), as well as greater vulnerability for more severe viral illness, due in part to comorbidities such as pre-existing respiratory and cardiac disease, drug use and diabetes.[1-6] Contributory environmental risks include inadequate sanitation, lack of access to healthcare services, crowded living conditions (e.g., shelters, hotels and rooming houses), interactions with legal and penal systems and general lack of personal protective equipment (PPE).[7] Baggett et al. states that "the high number of asymptomatic SARS-CoV-2 infections and the potential for rapid spread in congregate settings support the need for proactive, universal COVID-19 testing strategies" in homeless populations.[3]

Testing for both active and recent SARS-CoV-2 infection, via reverse transcription-polymerase chain reaction or antibody detection, are key components of general community prevention. Testing in 4 major U.S. cities between late March and mid-April 2020 found that up to 66% of San Francisco homeless shelter residents and 16% of homeless shelter staff were positive for SARS-CoV-2.[8] Community incidence outside of homeless shelters was highest in Boston, at 14.4%, as a comparison. After a rapid outbreak among 3 homeless service sites in King County, Washington State, the Centers for Disease Control stated that rapid interventions, including testing and isolation to identify cases and minimize transmission, were necessary.[9] A pilot study of COVID-19 testing and support to reduce outbreak risk in Hamilton, Ontario (Canada) used strategies of shelter facility restructuring, daily symptom screening and rapid testing via nasopharyngeal swab (NPS) for those endorsing viral symptoms. These strategies resulted in isolation precautions, but no denominator was given as to whether any residents refused testing or isolation, or what they understood about the virus and how to manage symptoms.[10]

Kumar Kar et al. note that homeless mentally ill people have a lack of health awareness and poor help-seeking behaviors due to marginalization.[11] Homeless populations receive preventive screening or test results less often, including for HIV and hepatitis (as well as for cervical and breast cancer in homeless women), despite greater risk.[3,6,10,12-14] Public health officials and homeless service providers emphasize that homeless persons need to follow virus precautions while maintaining usual ongoing health care due to their high risk for medical and psychiatric decompensation.[7] To prevent viral outbreaks in homeless communities, work has included: 1) enhanced communication strategies, 2) infection control actions including isolation quarantine methods, 3) resource allocation, to mitigate against illness exposure and environmental immune stresses (such as lack of sleep and nutrition) and 4) planning for future outbreaks.[15,16] Spirituality is an additional important factor to consider, as a study by Tsai and Rosenheck concluded that religious faith in chronically homeless adults may influence clinical and psychosocial outcomes.[17] The homeless must have basic knowledge and ideally connections with case managers, outreach staff and faith leaders to partner together in mitigation, infection control and ongoing health maintenance.

It is, therefore, critical to know the attitudes of homeless individuals about COVID-19 testing and their rates of accepting testing, so that the homeless and their communities may be safely triaged for illness, quarantined if exposed or tested and if positive, isolated, protected and appropriately treated. To better understand the testing attitudes, perceptions, and motivations in the Duval County, Jacksonville, FL homeless population, Sulzbacher Center, a Federally Qualified Healthcare Center, undertook a quality improvement (QI) project. The QI project was performed simultaneously to a clinical testing outreach and a collaborative research study with a university medical center to learn more about current health status and the comorbid health conditions in the Duval County homeless population. The QI project consisted of a questionnaire given before and after giving and reviewing a Centers for Disease Control (CDC) fact sheet on COVID-19 and/or NPS testing. The information learned from this project was to immediately inform feasible ways to increase testing and compliance with treatment and infection control strategies in

Figure 1. Bell Homeless Perceptions of Covid-19 Testing Checklist

Please place a check mark next to any of the following that may apply to your beliefs about coronavirus testing:
☐   I want the testing, I believe it will help me and others
☐   I don't really think I need it but I will get it done because:
           ☐   My family and/or friends have said I should
           ☐   My healthcare team has said I should
           ☐   I'm curious about the test and/or the results
           ☐   I'll get a gift card or other incentive
           ☐   Other:
☐   I don't really think I need the testing due to the following (check all that apply)
           ☐   I am afraid it may hurt
           ☐   I am already isolated from society
           ☐   My faith will protect me from the virus
           ☐   I'm worried about what will be done with my information
           ☐   I don't really want to know
           ☐   I don't really care - there are other things that worry me more
           ☐   Other: _____

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predicted future waves or new pandemics.

Methods

The Sulzbacher QI Committee approved this project in consultation with Dr. Michael Flynn, HCA South Atlantic Division Director of Research. Nasopharyngeal swabs for SARS-CoV-2 were donated to Sulzbacher Center by Quest Laboratories as part of a clinical initiative to learn the point prevalence of COVID-19 in the Duval County, Jacksonville, FL homeless population. The NPS testing was done in partnership with other local homeless shelters and drop-in centers, and was available to all who wanted it, including shelter residents and staff. NPS testing was performed on May 1, 4, 5, 6 and 7, 2020. The City of Jacksonville provided funds for $10 grocery gift cards to encourage participation.

To coordinate the testing, Sulzbacher Center teamed with Changing Homelessness (a Housing and Urban Development (HUD) grant-funded social service umbrella agency dedicated to advocacy, training, education and communication linkage) and the University of Florida Health-Jacksonville (UF Health; an academic health center located in areas of need in Duval County). The Sulzbacher Center and UF Health performed testing and data collection. Both Sulzbacher and UF Health used their mobile medical bus for the outreach. UF Health also conducted a simultaneous research project collecting clinical data about current health status and medical comorbidities, approved

by their Institutional Review Board. A total of 8 testing sites, local shelters and drop-in sites within Duval County, Jacksonville, FL were included: Sulzbacher Center Downtown, Sulzbacher Village, Salvation Army Downtown, City Rescue Mission-McDuff Avenue, City Rescue Mission-Downtown, Trinity/Clara White Missions, Urban Rest Stop-Church Street and Urban Rest Stop-Downtown.

The Bell Homeless Perceptions of COVID-19 Checklist (**Figure 1**) was given to the shelters and drop-in centers ahead of the testing dates. Those aged 18 years or older, who were homeless residents of the shelters, walk-in homeless or homeless center staff members were asked to participate. Staff members gave a paper form of the Bell Checklist to those who were interested in being tested for COVID-19 before the NPS testing. The form also included non-identifiable demographic information and reasons why they may be agreeing to testing. Clinical staff then reviewed key points of the CDC education form about the COVID virus (see Appendix A) or gave out the CDC education form about the COVID virus. Those who were not considered a staff member were provided with a $10 gift card at the end of the data collection.

Testing and survey collections were performed by staff from Sulzbacher Center, Changing Homelessness, UF Health (including paid, previously furloughed, physical therapists) and Or-

ange Park Medical Center Psychiatry Program residents. Demographic data was collected so testing results could be reported to the individual; also, so they could be notified of testing results by the Duval County Department of Health (as required by law if positive) and the individual's insurance company billed for the analysis, if applicable. The QI component was not linked to any personal health information (PHI). Each individual was given a unique identifier. Paper data was entered without PHI into an Excel spreadsheet by Dr. Bell. Hard copies of the data were kept in a locked file cabinet in a locked office at Sulzbacher Center. To tabulate and understand the results, hypotheses, percentage data, crosstab and chi-square tests were completed using IBM SPSS Statistics 24.[18] Data that was unknown was left as missing but if a checklist form was completed before or after testing, or without testing, the individual was counted as an active participant.

Results

Demographics

Demographic data are presented in **Table 1** by total group and by site. Homeless participants (N=764) in this QI project had a mean age of 48 years with the bulk of participants over age 50 (46.9%). The mean age varied based on location, with the lowest mean age of 39.5 years at Sulzbacher Village, which houses families, and the highest being at CRM McDuff (52.4 years). The majority of participants did not have insurance (66.9%), which again varied based on location (the Salvation Army showed the highest insured rate at 51%). The majority of participants were male (66.0%) with the highest percentage of females being at the Sulzbacher Village (50.0%), and no females being at Sulzbacher Downtown (a men-only campus).

Black/African American was the predominant race identified (51%) with Trinity/Clara White showing the highest percentage of Black/African Americans (59%). Non-Hispanic was the most common ethnicity (89%) with the highest percentage (96%) of non-Hispanic participants tested at the Urban Rest Stop Downtown. (**Table 1**) Ethnicity is reported separate from race as per 1997 U.S. Office of Management and Budget Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity (https://obamawhitehouse.archives.gov/omb/fedreg_1997standards).

Test Acceptance
(N=679; 88.9% of the 764 who completed a Bell Checklist)

Attitudes toward testing

Pre-NPS test attitudes demonstrated that the majority (59.2%) wanted to be tested; 24.7% did not answer; 10.1% did not think they needed to be tested but agreed to it, and 4.6% did not want to be tested and declined testing, with 0.3% tested but declining to answer the Bell Checklist. Post-NPS testing, 53.1% wanted testing, with 20.3% stating they did not want it (though still got it) and 19.6% did not answer (unknown). Sulzbacher Downtown had the most (90.5%) participants wanting the NPS test on the Bell Checklist pre-NPS test, which dropped to 53.6% post-NPS testing (**Table 2**).

The top reasons all participants as a group wanted to get the NPS testing (beyond believing it would help them or others, which was endorsed when stating a desire to be tested) (**Table 2**) were: 1) "I'm curious about the test and/or the results" (47.8%), 2) "The shelter encouraged me to go" (37.6%), 3) "My faith will protect me from the virus" (31.3%), 4) "I'll get a gift card" (24.2%), 5) "My family and/or friends have said I should" (14.1%), and 6) "My healthcare team said I should" (8.1%). Reasons to not be tested included: 1) "I am already isolated from society" (20.3%), 2) "I am afraid it may hurt" (14.8%), 3) "I'm worried about what will be done with my information" (3.3%), 4) "I don't really care - there are other things that worry me more" (2.9%), and 5) "I don't really want to know" (0.4%). Of note, at the Urban Rest Stop Downtown location, the number one reason to be tested was the gift card (63.1%), while at CRM McDuff, Trinity/Clara White and CRM State the number one reason was that the "The shelter encouraged me to go" (73.7%, 44.8% and 58.9%, vs. 10.5%, 12.7%, and 18.5% for the gift card, respectively).

For those who wanted testing, the most endorsed attitudes were: 1) "I'm curious about the test and/or the results"; 2) "My faith will protect me from the virus"; and 3) "The shelter encouraged me to go." (**Table 3**) For those who didn't want testing, the top attitudes were: 1) "The shelter encouraged me to go"; 2) "I'm curious about the test and/or the results"; and 3) "I'll get a gift card." All the attitude respons-

Table 1. Demographics of Homeless Participants in SARS-CoV-2 Testing in the Jacksonville Community

Demographics	Total N	Total %	SA N	SA %	USRD N	USRD %	URSC N	URSC %	Village N	Village %	Downtown N	Downtown %	CRM McDuff N	CRM McDuff %	Trinity Clara White N	Trinity Clara White %	CRM State N	CRM State %
Total	741		41		84		128		52		75		95		165		124	
Age, mean	49.79		51.08		48.4		51.22		39.73		51.72		52.7		44.94		45.92	
18-34	114	15.4%	7	17.1%	11	13.1%	18	14.1%	4	7.7%	10	13.3%	9	9.5%	27	16.4%	28	22.6%
35-49	213	28.8%	7	17.1%	31	36.9%	34	26.6%	7	13.5%	19	25.3%	21	22.1%	40	24.2%	37	29.8%
>50	365	49.4%	23	56.1%	40	47.6%	70	54.7%	13	25.0%	45	60.0%	60	63.2%	78	47.3%	52	41.9%
Unknown	47	6.4%							22	42.3%	1	1.3%	5	5.3%			6	4.8%
Insurance																		
No	498	67.4%	17	41.5%	72	85.7%	84	65.6%	17	32.7%	56	74.7%	66	69.5%	107	64.8%	93	75.0%
Yes	194	26.3%	21	51.2%	10	11.9%	39	30.5%	13	25.0%	18	24.0%	24	25.3%	55	33.3%	25	20.2%
Declined	1	0.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.6%	0	0.0%
Unknown	46	6.2%	3	7.3%	2	2.4%	5	3.9%	22	42.3%	1	1.3%	5	5.3%	2	1.2%	6	4.8%
Sex																		
Men	495	67.0%	22	53.7%	68	81.0%	95	74.2%	4	7.7%	73	97.3%	63	66.3%	95	57.6%	84	67.7%
Women	194	26.3%	16	39.0%	14	16.7%	26	20.3%	26	50.0%	0	0.0%	27	28.4%	65	39.4%	33	26.6%
Transgender	2	0.3%	0	0.0%	0	0.0%	1	0.8%	0	0.0%	0	0.0%	0	0.0%	0		1	0.8%
Declined	2	0.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	1.3%	0	0.0%	2	1.2%	0	0.0%
Unknown	47	6.4%	3	7.3%	2	2.4%	6	4.7%	22	42.3%	1	1.3%	5	5.3%	3	1.8%	6	4.8%
Race																		
White	255	34.5%	21	51.2%	39	46.4%	47	36.7%	4	7.7%	17	22.7%	33	34.7%	47	28.5%	52	41.9%
Black	376	50.9%	13	31.7%	42	50.0%	68	53.1%	24	46.2%	42	56.0%	47	49.5%	98	59.4%	57	46.0%
Asian	6	0.8%	0	0.0%	0	0.0%	1	0.8%	0	0.0%	0	0.0%	3	3.2%	1	0.6%	1	0.8%
Native American Alaskan Native	19	2.6%	2	4.9%	0	0.0%	2	1.6%	1	1.9%	3	4.0%	4	4.2%	4	2.4%	3	2.4%
Pacific Islander	4	0.5%	0	0.0%	1	1.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	1.2%	2	1.6%
Multiple	6	0.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	1.3%	2	2.1%	3	1.8%	2	1.6%
Declined	23	3.1%	2	4.9%	0	0.0%	1	0.8%	1	1.9%	11	14.7%	1	1.1%	8	4.8%	1	0.8%
Unknown	47	6.4%	3	7.3%	2	2.4%	6	4.7%	22	42.3%	1	1.3%	5	5.3%	2	1.2%	6	4.8%
Ethnicity																		
Hispanic	15	2.0%	1	2.4%	1	1.2%	4	3.1%	0	0.0%	1	1.3%	2	2.1%	4	2.4%	2	1.6%
Non-Hispanic	654	88.5%	35	85.4%	81	96.4%	117	91.4%	28	53.8%	62	82.7%	87	91.6%	151	91.5%	115	92.7%
Declined	21	2.8%	0	0.0%	0	0.0%	1	0.8%	1	1.9%	11	14.7%	1	1.1%	8	4.8%	1	0.8%
Unknown	50	6.8%	5	12.2%	2	2.4%	6	4.7%	23	44.2%	1	1.3%	5	5.3%	2	1.2%	6	4.8%

Table 2. Attitudes of Homeless Participants in SARS-CoV-2 Testing in the Jacksonville Community

	Total		SA		USRD		URSC		Village		Downtown		CRM McDuff		Trinity Clara White		CRM State	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Pre Test attitude																		
Want to be tested	444	58.1%	31	75.6%	76	90.5%	104	81.3%	18	34.6%	51	68.0%	44	46.3%	94	57.0%	34	27.4%
Don't think it's needed	70	9.2%	1	2.4%	3	3.6%	7	5.5%	10	19.2%	11	14.7%	8	8.4%	33	20.0%	4	3.2%
Doesn't want to be tested	27	3.5%	1	2.4%	1	1.2%	0	0.0%	2	3.8%	10	13.3%	0	0.0%	20	12.1%	1	0.8%
Declined to answer	2	0.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	1.3%	1	1.1%	0	0.0%	0	0.0%
Unknown	185	24.2%	3	7.3%	2	2.4%	5	3.9%	22	42.3%	1	1.3%	41	43.2%	4	2.4%	82	66.1%
Post Test attitude																		
Wanted testing																		
Yes	404	52.9%	23	56.1%	45	53.6%	80	62.5%	30	57.7%	37	49.3%	65	68.4%	50	30.3%	76	61.3%
No	154	20.2%	4	9.8%	30	35.7%	25	19.5%	8	15.4%	22	29.3%	21	22.1%	67	40.6%	31	25.0%
Declined	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Unknown	150	19.6%	14	34.1%	9	10.7%	23	18.0%	14	26.9%	16	21.3%	9	9.5%	48	29.1%	17	13.7%
Why/Why not testing																		
Family encouraged me	105	14.1%	3	7.3%	22	26.2%	30	23.4%	8	15.4%	8	10.7%	14	14.7%	13	7.9%	10	8.1%
Healthcare Provider	62	8.1%	4	9.8%	8	9.5%	16	12.5%	6	11.5%	7	9.3%	10	10.5%	4	2.4%	7	5.6%
Personally Curious	363	47.8%	21	51.2%	36	42.9%	75	58.6%	27	51.9%	22	29.3%	47	49.5%	70	42.4%	67	54.0%
Gift Card	185	24.2%	10	24.4%	53	63.1%	47	36.7%	13	25.0%	8	10.7%	10	10.5%	21	12.7%	23	18.5%
Afraid of the test would hurt	112	14.8%	6	14.6%	9	10.7%	26	20.3%	12	23.1%	8	10.7%	13	13.7%	19	11.5%	20	16.1%
Shelter encouraged me	284	37.6%	13	31.7%	9	10.7%	22	17.2%	15	28.8%	11	14.7%	70	73.7%	74	44.8%	73	58.9%
I'm already isolated from society	154	20.3%	7	17.1%	7	8.3%	37	28.9%	18	34.6%	14	18.7%	30	31.6%	19	11.5%	23	18.5%
My Faith will protect me	239	31.3%	9	22.0%	15	17.9%	64	50.0%	24	46.2%	21	28.0%	36	37.9%	31	18.8%	39	31.5%
Privacy worries	25	3.3%	0	0.0%	0	0.0%	9	7.0%	2	3.8%	3	4.0%	2	2.1%	4	2.4%	5	4.0%
Don't care	3	0.4%	0	0.0%	0	0.0%	1	0.8%	1	1.9%	0	0.0%	0	0.0%	0	0.0%	1	0.8%
Better things to worry about	22	2.9%	0	0.0%	0	0.0%	16	12.5%	0	0.0%	1	1.3%	0	0.0%	0	0.0%	3	2.4%

Table 3. Population Attitudes Towards SARS-CoV-2 Community Testing in Jacksonville

| Attitude | Wanted testing? | | | |
| | NO | | YES | |
	N	%	N	%
Family/friends said I should	25	23.4%	82	76.6%
Healthcare team said I should	15	24.6%	46	75.4%
Curious about the test and/or the results	80	22.1%	282	77.9%
Gift card or other incentive	66	36.1%	117	63.9%
Afraid it would hurt	22	19.5%	91	80.5%
Shelter encouraged me to go	108	37.8%	178	62.2%
Already isolated from society	44	29.1%	107	70.9%
Faith will protect me from the virus	50	21.2%	186	78.8%
Worried about what will be done with my information	9	36.0%	16	64.0%
Don't really want to know	2	66.7%	1	33.3%
Don't really care, other things worry me more	12	54.5%	10	45.5%

es differed between those who wanted NPS testing compared to those who did not want the test, based on Pearson Chi-Square Tests (chi-square 130.467, df 11, sig. 0.000; **Table 3**). Further subanalysis teased apart individual differences in attitudes between the two groups. First, whether or not participants wanted the gift card did not influence their desire to get testing (chi-square 0.45, df 1, sig 0.5). Second, people who wanted testing were more likely to believe that faith would protect them from the virus (chi-square 28.558, df 1, sig. 0.000). People who were not faith-influenced were less likely to want testing.

Discussion

This quality improvement project was unique in that it examined perceptions, interest, and motivations of homeless people to seek or receive active viral testing during a pandemic. The Sulzbacher Center undertook this project with the aim not only to test clinically for SARS-CoV-2, but to understand the beliefs and perceptions about why homeless individuals agreed to be tested, with a client-centered, collaborative, quality improvement focus. Too often the homeless population is ignored or directed to comply with edicts. If their attitudes are considered, organizations that serve the homeless will be better informed to approach and partner with homeless individuals on major health crises, such as a pandemic, with true buy-in and informed consent.

The quality improvement study was conducted in Jacksonville, Florida, a state that did not expand Medicaid. It is not surprising therefore that the majority of individuals (66.9%) in this study lacked insurance. Black/African American was the most common race identified in this homeless population, which nationally makes up 40 percent of the homeless population despite representing only 13 percent of the general population, due to factors such as poverty, rental housing discrimination, incarceration and lack of mental health treatment.[19] The percentage of males and females in this study (66.0% and 27.1%, respectively) were in keeping with the annual point-in-time count data for Florida in 2019 (64.8% male and 34.9% female).[19]

Although the top reason for the total number of homeless persons to get the nasopharyngeal swab testing was curiosity, for those not wanting testing, the most common attitude was being encouraged by the shelter to go. Some attitudes varied by site, with some sites taking a more mandatory approach to testing (CRM McDuff, Trinity/Clara White and CRM State),

resulting in a highest value of 73.7% of homeless endorsing shelter encouragementversus a low of 10.7% at the Urban Rest Stop-Downtown. Faith played an important role with the perceptions of the homeless clients, with close to one third (31.3%) of all participants citing it as a factor in their approach to testing in the pandemic. Over 75% of those wanting testing felt faith would protect them. One individual asked a resident volunteer if the question on faith was "a trick question" and stated, "I believe in God but I also believe in science." Homeless individuals also changed their view of the testing at the Sulzbacher downtown site after the NPS, with 90% initially indicating they wanted testing declining to almost half after testing; anecdotal comments included: test discomfort, and invasion of privacy. The time of day the testing occurred may also have played a role in the post-testing decline and responses: often individuals do not stay at the shelter during the day, and the pre-NPS checklists were completed in the evening when more people were on campus. People who only considered testing in response to a paternalistic approach or a gift card are consistent with a pre-conventional moral development level (Kohlberg's Level 1), where they have an obedience and punishment or self-interest orientation. Those homeless who endorsed both faith and a desire to be tested may be more prosocially oriented toward 'the greater good', and may be representative of Kohlberg's post-conventional Level 3. Level 2 (conventional) are the individuals who are conforming to authority.[20]

Limitations

The number of homeless tested at the Sulzbacher Village was lower than expected, as well as least robust in data collection. Also of note, the mobile medical bus and internet were experiencing technical difficulties that day.

Other limitations of this project include real-world behaviors. Different shelter sites had variable approaches toward encouraging testing by staff; this may reflect the reality that some staff and sites have more paternalistic or authoritative attitudes rather than encouraging self-actualizing behavior, or may themselves may be fearful of COVID and its complications for themselves and their clients and understandably want their clients tested. Therefore,

bias in attitudes of those completing testing may be present. The current study did not *a priori* characterize or analyze homeless shelter sites by the subgroups of populations served. Those in a rest stop may be considerably different than those in an overnight shelter. Those in the Sulzbacher Village were by definition more likely to be women. Additionally, the project did not include homeless adolescents. They are another important subgroup whose attitudes often differ from adults. The survey itself was brief and not psychometrically designed or tested for validity or reliability. It also lacked a full range of attitudes to inquire about, including more positive variables, potentially creating a bias in valence of response.

There is little literature with which to compare this project to. The majority of publications about beliefs, attitudes, and perceptions are toward the homeless, rather than of the homeless. The closest comparison is with an influenza mobile outreach immunization program for vulnerable populations in Melbourne, Australia. Although over half the group had at least one risk factor for severe influenza, 60% had not received an influenza vaccine the prior year, with most reporting that they were 'not worried about influenza' as their reason. Those who were pregnant listed a health care provider's recommendation as the most frequently given reason for why they desired immunization.[21] These results for a potentially similar respiratory viral outbreak indicate that paternalism and cultural and educational variables affect health care literacy and promotion and alter perceptions of preventive care in vulnerable populations.

Findings from this quality improvement study support considering a variety of strategies to encourage participation in testing events with large numbers of homeless individuals. These include: education, gift cards, shelter staff encouragement (especially for retesting), local faith leader involvement and increased support from the community, to encourage self-isolation, when necessary, and to help the homeless meet self-care and basic needs. The best strategies may be specific to the shelter and their staff and clients, as some between-group differences are noted for site of participation. Future projects can ideally allow adequate planning time so that focus groups including

homeless persons, shelter staff and health care workers from a variety of settings may together discuss survey items and how to best test strategies to promote compliance with pandemic recommendations for screening, prevention and treatment.

Conflicts of Interest
Dr. Gracious reports personal fees from Novo Nordisk, outside the submitted work. Drs. Bell and Bosi declare they have no conflicts of interest.

The authors are employees of Orange Park Medical Center, a hospital affiliated with the journal's publisher.

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