



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Understanding racial differences in attitudes about public health efforts during COVID-19 using an explanatory mixed methods design

Paige Nong^{a,*}, Minakshi Raj^b, Marie Grace Trinidad^d, Zachary Rowe^c, Jody Platt^d

^a University of Michigan School of Public Health, 1415 Washington Heights, Ann Arbor, MI, 48109, USA

^b University of Illinois Department of Kinesiology and Community Health, USA

^c Friends of Parkside, 5000 Connor St, Detroit, MI, 48213, USA

^d University of Michigan Department of Learning Health Sciences, 300 N Ingalls St, Ann Arbor, MI, 48109, USA

ARTICLE INFO

Keywords:

Trust
Race
COVID-19
Public health
USA

ABSTRACT

Efforts to mitigate the spread of COVID-19 rely on trust in public health organizations and practices. These practices include contact tracing, which requires people to share personal information with public health organizations. The central role of trust in these practices has gained more attention during the pandemic, resurfacing endemic questions about public trust and potential racial trust disparities, especially as they relate to participation in public health efforts.

Using an explanatory mixed methods design, we conducted quantitative analysis of state-level survey data in the United States from a representative sample of Michigan residents ($n = 1000$) in May 2020. We used unadjusted and adjusted linear regressions to examine differences in trust in public health information and willingness to participate in public health efforts by race. From July to September 2020, we conducted qualitative interviews ($n = 26$) to further explain quantitative results.

Using unadjusted linear regression, we observed higher willingness to participate in COVID-19 public health efforts among Black survey respondents compared to White respondents. In adjusted analysis, that difference disappeared, yielding no statistically significant difference between Black and White respondents in either trust in public health information sources or willingness to participate. Qualitative interviews were conducted to explain these findings, considering their contrast with assumptions that Black people would exhibit lower trust in public health organizations during COVID-19.

Altruism, risk acknowledgement, trust in public health organizations during COVID-19, and belief in efficacy of public health efforts contributed to willingness to participate in public health efforts among interviewees. Our findings underscore the contextual nature of trust, and the importance of this context when analyzing protective health behaviors among communities disproportionately affected by COVID-19. Assumptions about mistrust among Black individuals and communities may be inaccurate because they overlook the specific context of the public health crisis. These findings are important because they indicate that Black respondents are exhibiting strategic trust during COVID-19 despite systemic, contemporary, and historic barriers to trust. Conceptual specificity rather than blanket generalizations is warranted, especially given the harms of stereotyping and discrimination.

1. Introduction

The COVID-19 pandemic has challenged the public's trust in medicine, science, and public health. Rapidly changing advice from public health experts and leadership was accompanied by a deluge of misinformation and conspiracy theories, leading the World Health Organization to develop an "infodemic" mitigation platform as a part of its

overall strategy (Zarocostas, 2020). The information environment in flux has contributed to mistrust and raised questions about the effectiveness of public health campaigns promoting, for example, wearing masks and maintaining social distance.

What is more, the health disparities in the impact of COVID-19 on minoritized communities has renewed focus on the role of trust in the relationship between these communities and public health institutions.

* Corresponding author. 1415 Washington Heights, Ann Arbor, MI, 48109, USA.

E-mail addresses: ptassie@umich.edu (P. Nong), mraj@illinois.edu (M. Raj), mgracet@umich.edu (M.G. Trinidad), jelplatt@umich.edu (J. Platt).

<https://doi.org/10.1016/j.socscimed.2021.114379>

Received 2 March 2021; Received in revised form 29 August 2021; Accepted 4 September 2021

Available online 8 September 2021

0277-9536/© 2021 Elsevier Ltd. All rights reserved.

Black communities in particular have faced inadequate testing, barriers to care, and higher rates of COVID-19 cases and deaths, with 52% of COVID-19 diagnoses and 58% of COVID-19 deaths occurring in disproportionately Black counties. This was the case even after controlling for potentially confounding factors like socioeconomic status and comorbidities (Millett et al., 2020). Recent literature and public commentary have expressed concern that low trust among racial and ethnic minority communities disproportionately impacted by COVID-19 could threaten efforts to contain the virus (Malik et al., 2020; Weiss and Paasche-Orlow, 2020).

However, there are two key oversights in this literature that subsequently drive harmful public discussions about relationships between race and trust. First, this literature tends to oversimplify the complex natures of both race and trust, ignoring the variation in findings on racial differences in trust. Second, this discourse reflects a trend of misattribution where low trust is attributed to individuals' attitudes or racial identities (Schwei et al., 2014), instead of the social contexts of oppression and racism in which low trust manifests. It is necessary to clarify the existing evidence on racial differences in trust and apply these insights to critical analysis of race and trust during a global pandemic, rather than treating racial identity as causal (Zuberi and Bonilla-Silva, 2008), reducing trust to a static individual attribute (Schoorman et al., 2007), or overlooking the role of institutional trustworthiness (Goold, 2002; Warren et al., 2020).

In this paper, we consider the implications of how trust is understood in the context of a public health crisis and how that understanding is applied to communities disproportionately harmed by that crisis. Based on a mixed methods study of experiences, attitudes, and beliefs about sources of information and willingness to participate in public health interventions, we explore how notions of trust can be better conceptualized in research and practice moving forward.

1.1. Strategic trust in the US healthcare system

Trust in the US healthcare system has been analyzed in a variety of contexts including patient-provider relationships, medical research, public health functions, and specific health services (Thompson et al., 2004; Hall et al., 2006; Eisenman et al., 2012; Ozawa and Sripad, 2013; Platt et al., 2019). In each of these contexts, trust is predominantly characterized as strategic, i.e. the belief that a given entity will act in one's best interest for a particular purpose (Mechanic, 1998; Smith, 2010). It is often described as A (trustor) trusts B (trustee, or object of trust) to do X (Hardin, 2001). This kind of trust is considered *strategic* as it stems from an expectation based on past experiences with a trustee or the perception that a trustee's motivations and intentions align with those of the trustor (Smith, 2010). Notably, strategic trust may function differently when it is placed in different trustees. It has been noted that trust in hospitals or providers, for example, operates differently than trust in health systems (Goold and Klipp, 2002; Sewell, 2015) or public health institutions (Musa et al., 2009).

Strategic trust has been analyzed in the relationship between patients (trustors) on the one hand, and providers, hospitals, or health systems (trustees) on the other (Anderson and Dedrick, 1990; Hall et al., 2002; Boulware et al., 2003; Armstrong et al., 2006; LaVeist et al., 2009; Benkert et al., 2019). Strategic trust is highly relevant to perceptions of and willingness to participate or comply with institutional policy, which is especially true when participation involves risk to the trustor who is undertaking certain actions without a guarantee of reciprocity or appropriate action by the trustee, or object of trust (Citrin and Stoker, 2018). In short, if a member of the public trusts and believes an institution's policies align with their own interests, they are more likely to exhibit strategic trust and follow the advice of that institution.

During a global pandemic, strategic trust is a critical object of analysis because of its relationship to participation in public health efforts. Prior work has shown that confidence in health authorities is related to protective health behaviors such as vaccination and contact

tracing (Plough et al., 2011; Eisenman et al., 2012; Udow-Phillips and Lantz, 2020; Megnin-Viggars et al., 2020). Individuals are more likely to adopt such behaviors when perceived risk is high and the object of trust is deemed competent or trustworthy (Balog-Way and McComas, 2020; Qazi et al., 2020). In these situations, the trustor is relying on the trustee (i.e., healthcare or public health organization) to act in their best interest by providing accurate information, and subsequently following those recommendations to participate in public health efforts. In the case of COVID-19, the public is relying on public health organizations to provide accurate information and guidance on protective health behaviors.

1.2. Trust and race situated in the COVID-19 pandemic

Existing evidence on trust in health institutions among marginalized, racialized communities is mixed and has evolved over the previous 20 years (Armstrong et al., 2008). Although some literature includes analysis of system trust among Hispanic or Latino respondents, comparisons between Black respondents and White respondents are predominant (Smith, 2010). While statistically significant racial differences have been identified in some studies on system trust, this is not consistently the case throughout the literature. For example, some analysis finds that Black respondents report lower trust in hospitals than White respondents (LaVeist et al., 2000) while others find no such difference (Boulware et al., 2003). Significant racial differences in trust are not identified in other work on system trust (Armstrong et al., 2006; Stanikova et al., 2006; Platt et al., 2019). Accounting for mediators like socioeconomic status (Sewell, 2015) and experiences of discrimination has been found to either weaken or reverse some observed relationships between race and low trust (Armstrong et al., 2013; LaVeist et al., 2000). Similarly, there is some evidence that racial differences in trust of public health or government sources of information (Musa et al., 2009) during a pandemic (Quinn et al., 2009) are not significant. This suggests that in the context of crisis, higher risk of harm for Black individuals and communities, and a more visible role for public health organizations, strategic trust may be operating differently than it has in other contexts.

Based on these varied findings regarding race and strategic trust, it is possible that overly broad extrapolation of the literature is guiding current discourse on the role of trust for Black people and communities during COVID-19. This is particularly concerning given the implications of those assumptions. Potential stigmatization or stereotyping of Black people as less trusting can compound the harm of the pandemic and inappropriately inform public health efforts, making those efforts ineffective.

To better understand engagement with public health efforts during COVID-19, it is necessary to analyze trust in the unique circumstance of a global pandemic. The purpose of this explanatory sequential mixed methods study is to analyze trust in public health sources of information and willingness to participate in public health efforts by race. This analysis focuses specifically on Black-White racial differences, measured by self-reported racial and ethnic identity. We first conducted a statewide survey and sought to further understand the quantitative findings through subsequent qualitative interviews.

2. Methods

This project employed an explanatory sequential mixed methods design with a statewide survey followed by qualitative interviews (Creswell, 2014; Curry and Nunez-Smith, 2015). In this design, quantitative data are collected and analyzed. Qualitative research is then conducted to explain quantitative findings. This approach was used to gain understanding of reasons for willingness to participate in public health efforts analyzed in the statewide survey. In particular, our findings on race and trust in public health sources of information and willingness to contact trace (described below) required additional exploration.

2.1. Survey

We analyzed quantitative data from the State of the State Survey (SOSS), a quarterly statewide survey of the non-institutionalized, English-speaking adult population of the state of Michigan. The survey is conducted by the Institute for Public Policy and Social Research (IPPSR), which uses a stratified random sample of adults aged 18 and older with access to either a landline or cell phone. The sample (n = 1,000) was weighted to the sampling frame of the 2016 American Community Survey (ACS).

2.1.1. Survey instrument

The survey was fielded from May 8 to May 25, 2020. The survey instrument included questions about comfort with and willingness to participate in public health efforts related to COVID-19. Public health efforts included in the survey were contact tracing, sharing personal information with a state or local health department, and using an app to report symptoms. Comfort with and willingness to participate in these public health efforts were measured using the following survey items: 1) *I would feel comfortable reporting people I've been in contact with to the local or state health department if I had symptoms of COVID-19*; 2) *I am willing to give my local or state health department personal information to help limit the spread of COVID 19*; 3) *I would be comfortable using a computer or phone app that shares my symptom information with my local or state health department*. Responses were on a seven-point scale from 1) not true at all to 7) very true. These three measures were used to create an index (Cronbach's $\alpha = 0.86$) of comfort and willingness to participate in public health efforts (Table S-1a). Respondents also answered questions about their trust in public health sources of information: *Regardless of how often you get information from these sources, how much do you trust information provided about the coronavirus outbreak by each of the following: 1) the Centers for Disease Control and Prevention (CDC), 2) the state health department, and 3) the county health department*. Responses were on a five-point scale from 1) not at all to 5) a great deal. These three measures were used to create an index (Cronbach's $\alpha = 0.87$) of trust in public health sources of information (Table S-1b).

Concern about privacy was measured on the seven-point scale of trust in response to the statement: *I worry that private information about my health could be used against me*. Trust in health system confidentiality (*The organization where I typically get health care can be trusted to use my information responsibly*) was measured on the same scale.

2.1.2. Survey analysis

Weighted OLS regression was used to analyze the relationships between comfort with public health efforts related to COVID-19 and trust in public health sources of information. We conducted bivariable and multivariable analyses to produce unadjusted and adjusted estimates of the associations between public health efforts, trust in public health sources of information, and trust in the healthcare system. Covariates included demographic variables (sex, age, race/ethnicity, income, education, rural/urban residence, political ideology), perception of the seriousness of COVID-19, and concerns about personal privacy. Table 1 includes significant predictors of willingness to participate identified in the survey analysis with the corresponding topics discussed in subsequent qualitative interviews.

2.2. Interviews

After survey analysis revealed higher trust in public health sources of information and willingness to participate among Black respondents in unadjusted analysis, and a null finding regarding racial differences in adjusted analysis, we sought to further explore how trust was functioning during the COVID-19 pandemic. We worked with community partners to develop an interview protocol focused on participant perspectives, beliefs, and comfort with public health efforts.

The qualitative interviews followed a community-engaged research

Table 1

Explanatory sequential mixed methods: Linking quantitative findings to explanatory qualitative interview questions.

	Quantitative	Qualitative
	Factors associated with willingness to participate in public health efforts ^a	Corresponding interview topic
Positive^a	Perception of the seriousness of COVID-19	Challenges and changes to daily life related to COVID-19 Opinions about symptom reporting, contact tracing, and sharing information with the health department
	Personal diagnosis or diagnosis of a close relation with COVID-19	Who is most affected by COVID-19 Direct/personal experiences with COVID-19 Community experiences with COVID-19
	Trust in health system confidentiality	Experiences with providers Concerns about privacy/personal information
	Trust in public health sources of information	Typical sources of COVID-19 information Most trusted sources of information What makes information trustworthy and sufficient
Negative^a	Concerns about privacy	Concerns about symptom reporting, contact tracing, and sharing information with the health department Trust in the health system, providers, and health departments prior to and during COVID-19 Experiences of discrimination in healthcare

^a As identified in adjusted model; p < 0.05.

approach and used a semi-structured interview protocol. Our two community partners in southeast Michigan serve predominantly Black neighborhoods in zip codes experiencing disproportionately high burdens of COVID-19. Community organization leadership teams helped design the interview protocols and advise on recruitment of participants. The two organizations were selected for participation in order to include perspectives from multiple contexts. Each neighborhood is located in a different zip code and varies in terms of county, housing type, and average household income. One community is comprised of mostly single-family, detached homes with a mix of owned and rented properties. The other is a low-income housing development of apartment complexes. The purpose of inclusion of two communities was not to compare across them, but rather to increase the diversity of perspectives included in analysis.

2.2.1. Interview protocol

We developed the interview protocol iteratively, guided both by discussions with representatives from each community organization and findings from the statewide survey. Representatives of each community organization contributed their priorities, concerns, and goals to the interview protocol. The protocol also included questions that reflected key questions from the survey regarding trust in public health sources of information, contact tracing, sharing personal information with the state or local health department, and using an app to report symptoms.

2.2.2. Interview sample

Following community partner preferences and guidance, the research team used multiple methods to post and send invitations to participate in the project, including social media posts and text messages. Interested participants completed a brief online recruitment questionnaire. We included participants of different ages, parental statuses, and genders to encourage a broad range of experiences. The final

sample included 15 participants from the first neighborhood and 11 participants from the second neighborhood for a total sample of 26 participants, most of whom identified as female. Participants ranged from 18 to over 60 years of age, with approximately half of participants between 30 and 59 years old. The majority of participants were Black (19 Black participants, 2 multi-racial participants, 2 white participants, and 3 did not report race/ethnicity). Most participants had children under the age of 18 (n = 16). Long-term community residents who had lived in their neighborhoods for at least 10 years were represented in the sample (n = 10). Each hour-long interview was conducted by phone between July and September 2020, when saturation was reached. Participants were compensated with \$50. All interviews were recorded and professionally transcribed by the audio transcription service Rev.

2.2.3. Interview analysis

Interview transcripts were imported to MaxQDA 2020 (VERBI software) for analysis. Three team members conducted open coding of a random selection of 6 interview transcripts. These initial codes were discussed and reconciled by all three team members. Codes were iteratively modified, applied, and reconciled by two team members who coded all of the interview transcripts (Charmaz, 2006). Once all transcripts were coded, themes and sub-themes were identified using memos, important quotes, and MaxQDA visualizations (Bourgeault et al., 2010; Creswell and Poth, 2016).

3. Ethical Considerations

The study was reviewed and approved by the Institutional Review Board at the University of Michigan. Interview participants received written and verbal descriptions of the research study and verbal informed consent was obtained at the beginning of each phone interview.

4. Results

4.1. Quantitative findings

Table 2 includes the characteristics of the sample of survey respondents with weighted frequencies (n = 1000). Over half the sample identified as female (57.17%) and the average age of respondents was 52.29 years (SD = 17.49). Approximately half (50.55%) of respondents reported household income under \$50,000. The majority of respondents were non-Hispanic White (77.48%). Non-Hispanic Black respondents were 11.81% of the sample and Hispanic respondents were 4.80% of the sample. Respondents reporting other and multi-racial or multi-ethnic identities comprised 5.91% of the sample, which is consistent with the 2019 Michigan census (U.S. Census Bureau, 2019).

In adjusted OLS regression, age, political ideology, personal diagnosis or diagnosis of a close relation with COVID-19, trust in the healthcare system, concerns about privacy, and trust in public health sources were significantly (p < 0.05) associated with willingness to participate in public health efforts (Table 3). The same predictors, with the exceptions of privacy concerns and personal diagnosis of COVID-19, were significantly associated with trust in public health sources of information.

In unadjusted analysis, Black respondents reported higher trust in public health information sources (b = 0.38, p = 0.001) and willingness to participate in public health efforts (b = 0.62, p < 0.001) than White respondents. In adjusted analysis, these relationships were no longer statistically significant. These differences and the null finding in adjusted analysis required qualitative interviews to better understand how trust was operating during the COVID-19 crisis.

4.2. Qualitative findings

Our qualitative analysis revealed three broad primary motivations

Table 2
Descriptive statistics with weighted frequencies (n = 1000).

	%/Mean (SD)
Sex	
Female	57.17
Male	42.23
Other	0.60
Age	52.29 (17.49)
Race/Ethnicity	
White, non-Hispanic	77.48
Black, non-Hispanic	11.81
Other, non-Hispanic ^a	5.91
Hispanic	4.80
Income	
\$50,000 or less	50.55
Greater than \$50,000	49.45
Education	
Less than high school	2.60
High school	31.03
Some college	29.13
College and above	37.24
Residence	
Rural	21.82
Small city, town, village	25.25
Suburban	39.39
Urban	13.54
Political Ideology	
Moderate	33.67
Liberal	33.37
Conservative	26.35
Other	6.61
Thinking about what is said in the news, in your view is the seriousness of coronavirus generally exaggerated, generally correct, or is it generally underestimated?	
Generally exaggerated	30.12
Generally correct	44.98
Generally underestimated	24.90
Have you or anyone you know personally been diagnosed with COVID-19?	
Yes	31.22
No	68.78
I worry that private information about my health could be used against me (Range: 1 = not true at all, 7 = very true)	4.16 (1.79)
The organization where I typically get health care can be trusted to use my information responsibly (Range: 1 = not true at all, 7 = very true)	5.22 (1.38)
Trust in public health sources of information (Range: 1 to 5)	3.42 (1.10)
Willingness to participate in public health efforts (Range: 1 to 7)	4.71 (1.79)

^a Includes Asian (n = 18), American Indian or Alaskan Native (n = 2), multi-racial (n = 20), and self-identified other (15).

Table 3
Ordinary Least Squares regression of trust in information from public health sources and willingness to participate in public health efforts (n = 1000).

Trust in public health sources of information	Unadjusted linear regression		Adjusted linear regression (R ² = 0.41)	
	B	p-value	b	p-value
	Race/Ethnicity			
White, non-Hispanic	ref	ref	ref	ref
Black, non-Hispanic	0.38	0.001	0.07	0.48
Other, non-Hispanic	0.27	0.08	0.01	0.92
Hispanic	0.15	0.42	-0.10	0.55
Willingness to participate in public health efforts				
	Unadjusted linear regression		Adjusted linear regression (R ² = 0.48)	
	b	p-value	b	p-value
Race/Ethnicity				
White, non-Hispanic	ref	ref	ref	ref
Black, non-Hispanic	0.62	< 0.001	0.16	0.21
Other, non-Hispanic	-0.02	0.92	-0.14	0.45
Hispanic	-0.03	0.92	-0.21	0.31

for willingness to participate in public health efforts in the disproportionately impacted communities we engaged: altruism, risk acknowledgement, and confidence that public health efforts would effectively slow the spread of COVID-19. This confidence stemmed from both trust in public health institutions during COVID-19 and understanding of the effectiveness of public health efforts like contact tracing or symptom reporting.

4.2.1. Altruism

The most common reason participants reported for their willingness to participate in public health efforts was altruism. Fundamental to altruism is the sense of obligation to sacrifice for others without expectation of reward or benefit in return (Pellegrino, 1987; Batson, 2010). Participants expressed altruism as concern for community members or family, a willingness to contribute to the wellbeing of others, or a desire to protect other people regardless of benefit to self. This was often true even when individuals did not describe an awareness of disproportionate impacts of COVID-19 on their own community. Participants regularly expressed how concern for their family, friends, neighborhood, and larger community drove their opinions about public health engagement:

'So I think [contact tracing]'s a very good thing. If you get sick, you tell them, "Okay. I've been around all these people". At least they could get tested so if they do have it, they can get the proper care that they need.' Participant 5.

'I would have no problem reporting [contacts] because I want them to be taken care of ... I want them to live just as much as I do.' Participant 23.

'I'm 100% willing to do it. I'm not afraid to give my information to anyone, especially when it's during COVID to save someone's life. If I have it, I will tell the health department that I have it.' Participant 15.

Most participants regarded contact tracing and symptom reporting, despite potential concerns like stigma or technological challenges, as actions they should take in order to keep their family or community safe. These actions were not perceived as personally beneficial, but as serving the interests and needs of others.

4.2.2. Risk Acknowledgement

Many participants described their awareness of high mortality and the rapid spread of COVID-19. Although less than half reported that their community was disproportionately impacted, most participants described the general risks of COVID-19 and reported feeling personally vulnerable to infection and illness. They also described how the virus spread and the severe symptoms they found particularly concerning. This risk acknowledgement made contact tracing and other public health efforts reasonable or important for participants. For example, one participant described the deadliness of COVID-19 as a reason why people should participate in contact tracing:

'I feel that [contact tracing is] okay because I feel you're saving someone else's life ... This virus is really serious and dangerous. It's deadly. So, everyone should tell if they have [it].' Participant 15.

Over one third of participants mentioned that they personally knew someone who either died from COVID-19 or had been infected, and some participants knew multiple friends or family members for whom this was true. Participants expressed fear associated with losing family, friends, and acquaintances to the virus. For example, one participant explained:

'I know a lot of people that died from it. So it's kind of scary.' Participant 7.

Another participant described a similar experience:

'I know of quite a few people that have tested positive outside of my family. Some are still here and some are not here anymore.' Participant 13.

The experiences of seeking care and relying on a healthcare system in crisis were also salient for respondents in their descriptions of risks they faced. This assessment of risk often drove participants' willingness and

even active desire to participate in public health efforts like contact tracing and sharing personal information with the health department.

4.2.3. Trust in public health organizations

More than one third of participants specifically described trust in the local or state health department, especially in their role as sources of information. In terms of strategic trust, the specific action they expected the health department to perform was providing reliable information about COVID-19. A small group of these participants trusted their local or state health department based on previous experiences. For instance, one participant explained:

'I would say [my trust] was pretty fair. Before the COVID-19, they had a lot of programs, stuff to help people. They had condoms and stuff to give out to people to protect themselves. So they had classes and programs. I generally trust them, too.' Participant 11.

For others, trust was a default orientation. These participants did not necessarily have extensive prior contact with public health organizations but were aware of their roles, especially during the pandemic. They described how a lack of negative experiences meant they had no reason not to trust these institutions:

'I never had any problems with them, so I just figured they were doing what they're supposed to do.' Participant 21.

'I didn't really have a lot of interaction with the health department. But I feel like I would generally trust them if something were to come up.' Participant 17.

Public health efforts to combat COVID-19 specifically earned trust for some participants. They appreciated the visible work public health organizations were doing, which made them see those organizations as trustworthy:

'I think that seeing the commitment it seems that they've had to informing people, and having these education awareness campaigns around COVID or anything else. I feel like that has been positive for me.' Participant 22.

Four respondents described low trust in public health organizations. For some, this was connected to a lack of transparency and poor communication.

Underlying participants' willingness to participate and their described motivations for engaging in public health efforts was an understanding of the effectiveness of these efforts. Even for those who were not familiar with certain components of contact tracing or who worried about their ability to use technology to report their symptoms to the health department, participants did not express skepticism about the efficacy of such efforts. This indicates public health knowledge among participants, as well as trust and confidence in the expertise of public health organizations broadly. Multiple participants described how contact tracing could halt a potential domino effect of infections, crossing social boundaries and familial relationships. Others described how reporting hypothetical symptoms to the health department could contribute to scientific knowledge about COVID-19. This perception of the effectiveness of public health efforts drove comfort with participation.

5. Discussion

5.1. Importance

This analysis provides insight on trust and willingness to participate in public health efforts aimed at containing the spread of COVID-19. Based on our quantitative study of trust in public health sources of information and interventions, we find that there are not statistically significant racial differences after controlling for factors such as concerns about privacy and political ideology. These findings, along with the qualitative interviews, contextualize the concept of strategic trust during a public health crisis disproportionately impacting Black communities, currently lacking in the literature and public discourse.

Our findings contribute to a larger effort to better understand how

trust is related to public health efforts, especially for Black individuals and communities who are often assumed to have a particular distrust in the healthcare system and public health organizations. While these assumptions sometimes reflect an understanding that mistreatment of Black people by public health organizations and the healthcare system would logically warrant distrust, they lack adequate attention to the specific context in which trust is operating, relying on literature that analyzes multiple objects of trust in different contexts for various ends or goals. Applying prior findings on distrust in clinical research or specific dimensions of trust in providers to participation in public health efforts during the COVID-19 pandemic may not be appropriate. For example, our findings suggest that trust during a pandemic may operate differently than trust generally.

5.2. Temporality, context, and limitations

One potential contributing factor to trust during the pandemic is the role of risk perception, especially since COVID-19 disproportionately harms Black communities. Our findings on this topic reflect prior literature identifying a significant role for risk perception in predicting trust (Freimuth et al., 2017). Perceptions of the seriousness of COVID-19 in the news differ significantly between Black and White survey respondents, with Black respondents reporting greater concern than White respondents ($b = 0.34$, $p < 0.001$, White as reference group). The timing of the survey and interviews is potentially important due to the risk of COVID-19 at the time, prior to the availability of vaccines (May to September 2020). Because risk perception, public health efforts, and perceived threat of COVID-19 evolve, longitudinal analysis would be an ideal method of validation and expansion of our findings.

Interpretation of these findings should be informed by the limitations of survey data, including selection bias. It is possible that willingness to respond to a survey is related to trust and willingness to participate in public health efforts. This could mean that the analytic sample here is more trusting of institutions than the general public. However, it is not clear that this would be true of only one racial group compared to another, and thus may not be particularly significant in relation to our key findings. We conducted model specification tests with and without the independent variables related to trust like privacy concerns, trust in public health, and trust in health system confidentiality (analysis not shown) and found that the primary relationship of interest was unaffected by alterations to the model.

Additionally, because this analysis was conducted with a state-level representative sample, quantitative findings may not generalize across the country. National replication of the study would provide helpful insight on this topic.

6. Conclusion

In this state-level analysis, Black survey respondents reported higher willingness to participate in public health efforts related to COVID-19 than White respondents in unadjusted analysis. In adjusted analysis, there was no statistically significant difference between Black and White respondents' willingness to participate. Although not entirely unprecedented (Freimuth et al., 2017), these findings were relatively counter-intuitive in the context of recently published work assuming or anticipating disproportionately low trust in Black communities related to COVID-19 and the subsequent implications for adoption of preventive measures. The lack of significant difference identified in this analysis counters this narrative of distrust in a state-level sample and points to a need for conceptual clarity and context when trust is analyzed or discussed.

That Black respondents whose communities have experienced repeated violations of trust over generations (Washington, 2006) demonstrate similarly high willingness to participate in public health efforts as White individuals who have not experienced those disadvantages deserves attention. When put in context, this null finding is

important because it indicates that Black respondents are exhibiting strategic trust during COVID-19 despite systemic, contemporary, and historic barriers to trust. Together with the explanatory qualitative results, this suggests that the roles of altruism, risk perception, and trust in the efficacy of public health efforts are underappreciated in existing literature. It also highlights a need for explicit analysis of contextual factors impacting both reported trust and behaviors that reflect strategic trust.

Analysis of trust should be more precise in assessing and responding to the needs of Black individuals and predominantly Black communities, their perspectives, and their willingness to participate in public health efforts. Strategic trust and mistrust are not static, permanent states to which populations can be assigned. They are temporary, contingent, situational, and impacted by circumstances. Based on our findings, and in the context of a vast literature on both trust and health inequality, it is not appropriate to broadly assert that low trust in Black communities contributes to automatic mistrust of public health efforts or affects participation in mitigation efforts. Future work should expand on the findings presented here by using a situational trust perspective.

Declaration of competing interest

None.

Acknowledgments

Grant number AWD12637: The Knowledge-to-Treatment Optimization Program (KTOP) through the Michigan Department of Health and Human Services/McNerney Endowment Fund, University of Michigan School of Public Health.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.socscimed.2021.114379>.

Credit author statement

PN: Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Funding acquisition, Supervision. MR: Formal analysis, Investigation, Writing – review & editing. MGT: Formal analysis, Investigation, Writing – review & editing, Visualization. ZR: Investigation, Resources, Writing – review & editing. JP: Methodology, Formal analysis, Supervision, Writing – review & editing.

Adjusted analysis covariates include sex, education, income, residential area, age, political ideology, personal relationship with someone who has been diagnosed with COVID-19, trust in the healthcare system, and privacy concerns. Full results are presented in [Supplementary Tables S-2 and S-3](#).

References

- Anderson, Lynda A., Dedrick, Robert F., 1990. Development of the trust in Physician scale: a measure to assess Interpersonal trust in patient-Physician relationships. *Psychol. Rep.* 67 (3, Suppl. 1), 1091–1100. <https://doi.org/10.2466/pr0.1990.67.3f.1091>.
- Armstrong, Katrina, McMurphy, Suzanne, Dean, Lorraine T., Micco, Ellyn, Putt, Mary, Hughes Halbert, Chanita, Schwartz, J. Sanford, Sankar, Pamela, Pyeritz, Reed E., Bernhardt, Barbara, Shea, Judy A., 2008. Differences in the Patterns of health care system distrust between Blacks and whites. *J. Gen. Intern. Med.* 23 (6), 827–833. <https://doi.org/10.1007/s11606-008-0561-9>.
- Armstrong, Katrina, Putt, Mary, Hughes Halbert, Chanita, Grande, David, Sanford Schwartz, J., Liao, Kaijun, Marcus, Noora, Bristol Demeter, Mirar, Judy, A., Shea, 2013. Prior experiences of racial discrimination and racial differences in health care system distrust. *Med. Care* 51 (2), 144–150. <https://doi.org/10.1097/MLR.0b013e31827310a1>.
- Armstrong, Katrina, Rose, Abigail, Peters, Nikki, Long, Judith A., McMurphy, Suzanne, Judy, A., Shea, 2006. Distrust of the health care system and self-reported health in the United States. *J. Gen. Intern. Med.* 21 (4), 292–297. <https://doi.org/10.1111/j.1525-1497.2006.00396.x>.

- Balog-Way, Dominic, H.P., McComas, Katherine A., 2020. COVID-19: Reflections on trust, Tradeoffs, and Preparedness, 0(0). *J. Risk Res.* 1–11. <https://doi.org/10.1080/13669877.2020.1758192>.
- Batson, C. Daniel, 2010. "Empathy-Induced Altruistic motivation." Pp. 15–34. In: Mikulincer, M., Shaver, P.R. (Eds.), *Prosocial Motives, Emotions, and Behavior: the Better Angels of Our Nature*. American Psychological Association, Washington.
- Benkert, Ramona, Cuevas, Adolfo, Thompson, Hayley S., Dove-Meadows, Emily, Knuckles, Donulaa, 2019. Ubiquitous yet Unclear: a Systematic review of medical mistrust. *Behav. Med.* 45 (2), 86–101. <https://doi.org/10.1080/08964289.2019.1588220>.
- Boulware, L. Ebony, Lisa, A., Cooper, Ratner, Lloyd E., Thomas, A., LaVeist, Powe, Neil R., 2003. Race and trust in the health care system. *Publ. Health Rep.* 118, 8.
- Bourgeault, Ivy, Robert Dingwall, Ray de Vries, 2010. *The SAGE Handbook of Qualitative Methods in Health Research*. SAGE.
- Charmaz, Kathy, 2006. *Constructing Grounded Theory*. London. Sage Publications, Thousand Oaks, Calif.
- Citrin, Jack, Stoker, Laura, 2018. Political trust in a Cynical age. *Annu. Rev. Polit. Sci.* 21 (1), 49–70. <https://doi.org/10.1146/annurev-polisci-050316-092550>.
- Creswell, John W., 2014. *A Concise Introduction to Mixed Methods Research*. SAGE Publications.
- Creswell, John W., Poth, Cheryl N., 2016. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. SAGE Publications.
- Curry, Leslie, Nunez-Smith, Marcella, 2015. *Mixed Methods In Health Sciences Research: A Practical Primer*. 2455 Teller Road. SAGE Publications, Inc, Thousand Oaks California 91320.
- Eisenman, David P., Williams, Malcolm V., Glik, Deborah, Long, Anna, Plough, Alonzo L., Ong, Michael, 2012. The public health Disaster trust scale: validation of a brief measure. *J. Publ. Health Manag. Pract.* 18 (4), E11. <https://doi.org/10.1097/PHH.0b013e31823991e8>.
- Freimuth, Vicki S., Jamison, Amelia M., An, Ji, Hancock, Gregory R., Quinn, Sandra Crouse, 2017. Determinants of trust in the Flu vaccine for African Americans and whites. *Soc. Sci. Med.* 193, 70–79. <https://doi.org/10.1016/j.socscimed.2017.10.001>.
- Goold, Susan Dorr, 2002. Trust, distrust and trustworthiness. *J. Gen. Intern. Med.* 17 (1), 79–81. <https://doi.org/10.1046/j.1525-1497.2002.11132.x>.
- Goold, Susan Dorr, Klipp, Glenn, 2002. Managed care members Talk about trust. *Soc. Sci. Med.* 54 (6), 879–888. [https://doi.org/10.1016/S0277-9536\(01\)00070-3](https://doi.org/10.1016/S0277-9536(01)00070-3).
- Hall, M.A., Zheng, B., Dugan, E., Camacho, F., Kidd, K.E., Mishra, A., Balkrishnan, R., 2002. "Measuring patients' trust in their primary care providers. *Med. Care Res. Rev.* 59 (3), 293–318. <https://doi.org/10.1177/1077558702059003004>.
- Hall, Mark A., Camacho, Fabian, Lawlor, Janice S., DePuy, Venita, Sugarman, Jeremy, Kevin, Weinfurt, 2006. Measuring trust in medical Researchers. *Med. Care* 44 (11), 1048–1053.
- Hardin, Russell, 2001. Conceptions and Explanations of trust. In: *Trust in Society*. Russell Sage Foundation.
- LaVeist, Thomas A., Isaac, Lydia A., Williams, Karen Patricia, 2009. Mistrust of health care organizations is associated with Underutilization of health services. *Health Serv. Res.* 44 (6), 2093–2105. <https://doi.org/10.1111/j.1475-6773.2009.01017.x>.
- LaVeist, Thomas A., Nickerson, Kim J., Bowie, Janice V., 2000. Attitudes about racism, medical mistrust, and Satisfaction with care among African American and white Cardiac patients. *Med. Care Res. Rev.* (57), 146–161.
- Malik, Aryn A., McFadden, SarahAnn M., Elharake, Jad, Omer, Saad B., 2020. Determinants of COVID-19 vaccine acceptance in the US. *EclinicalMedicine* 26, 100495. <https://doi.org/10.1016/j.eclinm.2020.100495>.
- Mechanic, David, 1998. The functions and limitations of trust in the Provision of medical care. *J. Health Polit. Pol. Law* 23 (4), 661–686. <https://doi.org/10.1215/03616878-23-4-661>.
- Megnig-Viggars, Odette, Carter, Patrice, Melendez-Torres, G.J., Weston, Dale, James Rubin, G., 2020. Facilitators and barriers to engagement with contact tracing during infectious Disease outbreaks: a rapid review of the evidence. *PLoS One* 15 (10), e0241473. <https://doi.org/10.1371/journal.pone.0241473>.
- Millett, Gregorio A., Jones, Austin T., Benkeser, David, Baral, Stefan, Mercer, Laina, Beyrer, Chris, Honeremann, Brian, Lankiewicz, Elise, Mena, Leandro, Crowley, Jeffrey S., Sherwood, Jennifer, Sullivan, Patrick S., 2020. Assessing Differential impacts of COVID-19 on Black communities. *Ann. Epidemiol.* 47, 37–44. <https://doi.org/10.1016/j.annepidem.2020.05.003>.
- Musa, D., Schulz, R., Harris, R., Silverman, M., Thomas, S.B., 2009. Trust in the health care system and the Use of preventive health services by older Black and white adults. *Am. J. Publ. Health* 99 (7), 1293–1299. <https://doi.org/10.2105/AJPH.2007.123927>.
- Ozawa, Sachiko, Sripad, Pooja, 2013. How do you measure trust in the health system? A Systematic review of the literature. *Soc. Sci. Med.* 91, 10–14. <https://doi.org/10.1016/j.socscimed.2013.05.005>.
- Pellegrino, Edmund, 1987. Altruism, self-interest, and medical Ethics. *J. Am. Med. Assoc.* 258 (14), 1939–1940.
- Platt, Jody, Raj, Minakshi, Sharon, L., Kardia, R., 2019. "The public's trust and information Brokers in health care, public health and research. *J. Health Organisat. Manag.* 33 (7/8), 929–948. <https://doi.org/10.1108/JHOM-11-2018-0332>.
- Plough, Alonzo, Bristow, Benjamin, Fielding, Jonathan, Caldwell, Stephanie, Khan, Sinan, 2011. Pandemics and health Equity: Lessons Learned from the H1N1 response in Los Angeles county. *J. Publ. Health Manag. Pract.* 17 (1), 20–27. <https://doi.org/10.1097/PHH.0b013e3181ff2ad7>.
- Qazi, Atika, Qazi, Javaria, Naseer, Khulla, Zeeshan, Muhammad, Hardaker, Glenn, Jaafar Zubairu, Maitama, Haruna, Khalid, 2020. "Analyzing situational awareness through public opinion to Predict adoption of social distancing amid pandemic COVID-19. *J. Med. Virol.* <https://doi.org/10.1002/jmv.25840>.
- Quinn, Sandra Crouse, Kumar, Supriya, Freimuth, Vicki S., Kelley, Kidwell, Musa, Donald, 2009. Public willingness to take a vaccine or Drug under Emergency Use authorization during the 2009 H1N1 pandemic. *Biosecur. Bioterrorism Biodefense Strategy, Pract. Sci.* 7 (3), 275–290. <https://doi.org/10.1089/bsp.2009.0041>.
- Schoorman, F. David, Mayer, Roger C., Davis, James H., 2007. An Integrative model of organizational trust: past, present, and Future. *Acad. Manag. Rev.* 32 (2), 344–354. <https://doi.org/10.2307/20159304>.
- Schwei, Rebecca J., Kelley, Kadunc, Nguyen, Anthony L., Jacobs, Elizabeth A., 2014. Impact of Sociodemographic factors and previous interactions with the health care system on institutional trust in three racial/ethnic groups. *Patient Educ. Counsel.* 96 (3), 333–338. <https://doi.org/10.1016/j.pec.2014.06.003>.
- Sewell, Abigail A., 2015. Disaggregating Ethnoracial disparities in Physician trust. *Soc. Sci. Res.* 54, 1–20. <https://doi.org/10.1016/j.ssresearch.2015.06.020>.
- Smith, Sandra Susan, 2010. Race and trust. *Annu. Rev. Sociol.* 36 (1), 453–475. <https://doi.org/10.1146/annurev.soc.012809.102526>.
- Stepanikova, Irena, Mollborn, Stefanie, Karen, S., Cook, David H. Thom, Kramer, Roderick M., 2006. "Patients' race, ethnicity, language, and trust in a Physician. *J. Health Soc. Behav.* 47 (4), 390–405. <https://doi.org/10.1177/002214650604700406>.
- Thompson, Hayley S., Valdimarsdottir, Heiddis B., Winkel, Gary, Jandorf, Lina, Redd, William, 2004. The group-based medical mistrust scale: Psychometric Properties and association with Breast Cancer Screening. *Prev. Med.* 38 (2), 209–218. <https://doi.org/10.1016/j.ypmed.2003.09.041>.
- Udow-Phillips, Marianne, Lantz, Paula M., 2020. Trust in public health is Essential amid the COVID-19 pandemic. *J. Hosp. Med.* 15 (7), 431–433. <https://doi.org/10.12788/jhm.3474>.
- U.S. Census Bureau, 2019. *U.S. Census Bureau QuickFacts, Michigan*.
- Warren, Rueben C., Forrow, Lachlan, Augustin Hodge, Sr David, Truog, Robert D., 2020. "Trustworthiness before trust — Covid-19 vaccine Trials and the Black community. *N. Engl. J. Med.* <https://doi.org/10.1056/NEJMp2030033>.
- Washington, Harriet A., 2006. *Medical Apartheid: the Dark History of Medical Experimentation on Black Americans from Colonial Times to the Present*. Doubleday.
- Weiss, Barry D., Paasche-Orlow, Michael K., 2020. Disparities in adherence to COVID-19 public health recommendations. *HLRP: Health Lit. Res. Pract.* 4 (3), e171–e173. <https://doi.org/10.3928/24748307-20200723-01>.
- Zarocostas, John, 2020. How to Fight an infodemic. *Lancet* 395 (10225), 676. [https://doi.org/10.1016/S0140-6736\(20\)30461-X](https://doi.org/10.1016/S0140-6736(20)30461-X).
- Zuberi, Tukufu, Bonilla-Silva, Eduardo (Eds.), 2008. *White Logic, White Methods: Racism and Methodology*. Rowman & Littlefield Publishers, Lanham.