

# Predictors of medical mistrust among urban youth of color during the COVID-19 pandemic

Marcia J. Ash,<sup>1,✉</sup> Jannette Berkley-Patton,<sup>2</sup> Kelsey Christensen,<sup>2</sup> Regine Haardörfer,<sup>1,✉</sup> Melvin D. Livingston,<sup>1</sup> Teesha Miller,<sup>3</sup> Briana Woods-Jaeger,<sup>1</sup>

<sup>1</sup>Rollins School of Public Health, Emory University, Atlanta, GA, USA

<sup>2</sup>University of Missouri-Kansas City, Kansas City, MO, USA

<sup>3</sup>Youth Ambassadors, Inc., Kansas City, MO, USA

Correspondence to: Marcia J. Ash, [mjash@emory.edu](mailto:mjash@emory.edu)

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## Abstract

The COVID-19 pandemic has disproportionately impacted communities of color and highlighted longstanding racial health inequities. Communities of color also report higher rates of medical mistrust driven by histories of medical mistreatment and continued experiences of discrimination and systemic racism. Medical mistrust may exacerbate COVID-19 disparities. This study utilizes the Behavior Model for Vulnerable Populations to investigate predictors of medical mistrust during the COVID-19 pandemic among urban youth of color. Minority youth ( $N = 105$ ) were recruited from community organizations in Kansas City, Missouri to complete an online survey between May and June 2020. Multiple linear regressions were performed to estimate the effect of personal characteristics, family and community resources, and COVID-19 need-based factors on medical mistrust. Results indicated that loneliness, financial insecurity (e.g., job loss, loss of income) due to the COVID-19 pandemic, and eligibility for free or reduced lunch predicted medical mistrust. Insurance status, neighborhood median household income, social support, and perceived COVID-19 risk were not significantly associated with medical mistrust. Future research and policies are necessary to address systemic factors that perpetuate medical mistrust among youth of color.

## Keywords

Medical Mistrust, COVID-19, Loneliness, Youth, Minority Health

## INTRODUCTION

The novel coronavirus SARS-CoV-2 (COVID-19) pandemic has disproportionately impacted communities of color [1, 2]. In the United States, Black people are at increased risk for COVID-19 incidence, hospitalization, and death compared to Whites [3–5]. Racial disparities in COVID-19 related outcomes are driven by a variety of intersecting factors rooted in institutionalized racism including discrimination, access to quality healthcare, financial inequities, and characteristics related to occupation and housing (e.g., essential work, crowded or unstable living conditions) [5–8]. In addition, communities of color have also been shown to experience higher rates of medical mistrust compared to White communities [9]. Previous research has found that medical mistrust is linked to lower healthcare utilization and poor health outcomes [10–12]. As such, medical mistrust may deter people of color from accessing

## Implications

**Practice:** Trusted community-based organizations can play an important role in addressing loneliness among youth of color by providing virtual and socially distanced opportunities to connect during the COVID-19 pandemic.

**Policy:** Policies to mitigate financial hardships among communities of color during the COVID-19 pandemic are crucial to reduce economic disparities which contribute to increased medical mistrust.

**Research:** Future research is critically needed to develop and evaluate effective and sustainable interventions and policies to dismantle systemic racism and promote health equity.

COVID-19 testing and receipt of adequate medical care. Additionally, a recent study found that Black adults reported greater hesitancy to get vaccinated for COVID-19 compared to non-Hispanic Whites [13]. This is consistent with research showing lower rates of vaccine uptake among racial and ethnic minorities [14, 15]. In order to address the continued disproportionate burden of COVID-19 on communities of color, greater attention and appropriate strategies to mitigate barriers to care, such as medical mistrust, are needed.

Medical mistrust has been defined as “the tendency to distrust medical systems and personnel believed to represent the dominant culture in a given society” [9]. Medical mistrust is distinct from merely a lack of trust between a patient and provider [9, 16]. Instead, medical mistrust is inclusive of broader, often group-based, attitudes and beliefs about health systems. To date, the majority of research on medical mistrust has examined its impacts on health behaviors and outcomes [9, 12]. Previous research has found a strong relationship between demographic factors related to race, ethnicity, and social-economic status and medical mistrust, but the mechanisms and experiences which underly medical mistrust are still

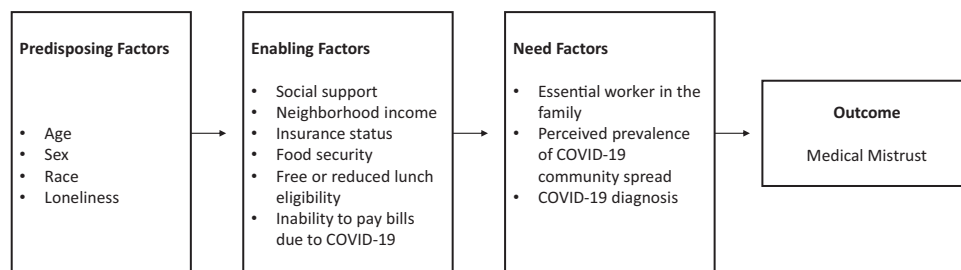
relatively understudied [9]. In the United States, experiences of medical mistrust among people of color, particularly among African Americans, are rooted in histories of medical experimentation and mistreatment [17]. The Tuskegee Syphilis Study, in which African American participants were deprived of effective treatment for syphilis, is the most cited historical cause of medical mistrust [18]. However, medical abuses towards African Americans predates the Tuskegee study and can be traced to medical experimentation on slaves in the early 1800s [18, 19]. Historical traumas passed down through generations provide crucial context for understanding medical mistrust among communities of color [20]. Moreover, modern day experiences of discrimination and institutionalized racism continue to cause and perpetuate experiences of medical mistrust among communities of color [21–24]. Prior research has shown patients of color are less likely to be admitted to the hospital after an emergency department visit [25, 26], classified as an immediate/urgent case [25, 26], and treated for pain [27, 28]. Additionally, studies have demonstrated that physician implicit bias impacts clinic decision-making [29, 30]. As such, it is unsurprising that communities of color report high rates of medical mistrust [9]. In addition, institutional factors, including experiences outside of the context of healthcare, such as negative experiences with law enforcement, have also been found to influence medical mistrust. For instance, one study found that experiences of police brutality were predictive of increased medical mistrust [31], suggesting the impact of higher-order, systemic factors on medical mistrust. As such, many scholars have positioned medical mistrust as a crucial social determinant of health which should be studied through a social-ecological lens [32, 33].

The Behavioral Model for Vulnerable Populations offers a theoretical framework to consider how individual-level factors, social determinants of health, and characteristics of health systems influence healthcare utilization [34]. This model, adapted from the Andersen Behavior Model of Health Services Utilization [35], posits that health behaviors are influenced by factors in three domains: (1) predisposing characteristics of individuals, including demographics such as age, sex, and race; (2) enabling factors which influence access

to healthcare including family and community resources; and (3) need-based factors which include perceived health status and health risks [35]. The Behavioral Model for Vulnerable Populations builds on the Andersen model by also including specific constructs across each domain that are pertinent to the health of vulnerable populations. For example, the adapted model includes predisposing factors such as childhood characteristics including history of mental illness and substance abuse, and additional enabling factors such as family and community resources related to hunger, transportation, and social services [34]. This model has been previously applied in research with a variety of populations including communities experiencing homelessness [36, 37], co-occurring mental illnesses [38], and previous incarceration [39].

The purpose of the current study is to utilize the Behavioral Model for Vulnerable Populations to examine factors that predict medical mistrust among youth of color during the COVID-19 pandemic. We selected factors in each domain of the model that we thought were relevant to our priority population, urban youth of color, during the COVID-19 pandemic. Our conceptual model is depicted in Figure 1. While this model has been traditionally applied to outcomes such as healthcare utilization, medical mistrust was chosen as the primary proximal outcome of interest not only because it has been shown to be predictive of healthcare utilization [10–12], but also because there is an increasing call to better understand experiences and social determinants of health which influence medical mistrust [9, 31]. We specifically selected factors expected to be pertinent to COVID-19. For example, the Behavioral Model for Vulnerable Populations includes not only demographic characteristics but also factors such as mental illness and psychological resources in the predisposing domain [34]. As such, we specifically selected loneliness as an indicator of mental health to model, given the rise in isolation due to COVID-19. Similarly, for the need-based domain, we selected factors relevant to perceived risk for COVID-19, such as if a family member were an essential worker.

Urban youth of color were the priority population for this study, because few studies have examined medical mistrust among youth [40, 41]. The



**Fig 1** | Conceptual model adapted from the behavioral model for vulnerable populations.

majority of research focused on medical mistrust has been conducted among adult populations, despite the fact that youth of color report additional barriers to accessing quality healthcare [42, 43]. The COVID-19 pandemic has also led to unique stressors for youth including social distancing practices and remote education [44]. Given the established importance of peer social connections for youth mental health, COVID-19 related isolation may have particularly harmful effects on youth mental health due to their development stage [44, 45]. Furthermore, the shift to remote education has affected the delivery of services normally provided by schools, including food and mental health services [46, 47]. As such, the aim of this study is to utilize the Behavioral Model for Vulnerable Populations to estimate the relationship between predisposing characteristics, enabling factors including social determinants of health, and COVID-19-specific need factors and medical mistrust among urban youth of color.

## METHODS

### Procedures and Participants

A convenience sample of racial and ethnic minority youth were recruited from community organizations in Kansas City, Missouri to complete an online survey about their experience coping with the COVID-19 pandemic. Survey data collection took place between May and June 2020. We contacted our community partners that serve urban youth regarding an anonymous survey opportunity and provided general background on the purpose of the study. Email addresses of youth were provided to the researchers and interested participants were screened for eligibility using a brief online survey via REDCap. Eligibility criteria required that youth be aged 13–21, identify as a racial or ethnic minority, and be able to read and complete a survey in English. Youth participants then provided consent to participate (parental permission was not necessary per IRB determined minimal risk of the study) and completed all survey questions via REDCap. To keep surveys anonymous and due to IRB determination of minimal risk, parents/guardians were not informed whether their child participated in the survey. Participants were compensated with a \$25 gift card. All study procedures were approved by the University of Missouri, Kansas City Institutional Review Board.

### Measures

#### *Medical Mistrust*

Medical mistrust was measured by the Medical Mistrust Index (MMI), a 7-item self-report scale [48]. This scale has been previously used with diverse populations including with Black and Hispanic adult participants [12, 48, 49]. However, to our knowledge the MMI has not been previously

validated with youth of color. Items were measured on a 4-point Likert scale, where higher scores indicated higher levels of mistrust. Cronbach's alpha in our sample = 0.75.

#### *Predisposing Factors*

Predisposing factors measured in this study included age, sex, and loneliness. Loneliness was measured by the UCLA Loneliness Scale, a 20-item self-report measure [50]. This scale has been previously validated for an adolescent population that included minority youth [51]. Items were assessed on a 4-point Likert scale, where higher scores indicated higher levels of loneliness. Cronbach's alpha in our sample = 0.96.

#### *Enabling Factors*

Enabling factors measured in this study included social support, insurance status, free or reduced lunch eligibility, food insecurity, neighborhood income, and inability to pay bills due to COVID-19. Social support was measured by the Multidimensional Perceived Support Scale, a 12-item self-report measure [52]. This scale has been previously validated among a population of urban adolescents who were primarily Black. [53] Items were assessed on a 7-point Likert scale, where higher scores indicated higher levels of social support. Cronbach's alpha in our sample = 0.95. Neighborhood income was based on median household income by zip code. Zip codes with a household mean income below \$43,000 were categorized as low-income, and those above the \$43,000 threshold were categorized as high-income. The \$43,000 cut-point was chosen because it approximated the median neighborhood income in our sample. All other enabling variables were single-item measures. Financial insecurity due to COVID-19 was measured by the following question drawn from the Centers for Disease Control and Prevention (CDC) COVID-19 Community Survey Question Bank [54]: "In the past two weeks, has your family experienced the following as a result of COVID-19?" Answer options included, "Not enough money to pay rent," "Not enough money to pay for gas," and "Not enough money to pay for food." If participants answered "yes" to any of these three questions, they were categorized as reporting financial insecurity due to COVID-19.

#### *COVID-19 Need-Based Factors*

COVID-19 need-based factors were measured by single-items also drawn from the CDC COVID-19 Community Survey Question Bank [54]. Variables included reporting if a family member was an essential worker, if a family member had been diagnosed with COVID-19, and perceived COVID-19 community spread in the participant's area.

### Statistical Analyses

Descriptive analyses (means, standard deviations, and frequencies) were performed to characterize the sample. Histograms were created for all continuous variables to examine distributions. All models were assessed for missing data. Missingness rates varied across sets of models: less than 4% for all predisposing models, 3.8%–11.4% for enabling models, and 16.3%–20% for models including both enabling and need-based factors. No individual item was missing more than 8.6%. The higher level of missingness for the two need-based models is primarily driven by the following variables: worry over food insecurity (N-missing = 9), neighborhood median income (N-missing = 7), and essential worker status (N-missing = 5). Given the relatively low missingness across the majority of models, complete case analyses were performed. The aim of this study was to estimate if personal characteristics, social determinants of health, and COVID-19 related need-based factors predicted medical mistrust. Analyses followed the study's conceptual model (see Figure 1) which was adapted from the Behavioral Model for Vulnerable Populations [34]. Due to limited variance, variables for race and COVID-19 diagnosis were excluded from models. Simple linear regressions were conducted to assess the crude association between predisposing, enabling and COVID-19 need-based variables with medical mistrust. To minimize potential bias due to the study's small sample size, adjusted models were sequentially developed in which we controlled for the theoretically most proximal layer (*e.g.*, the association between enabling factors and medical mistrust was assessed, controlling for all predisposing factors, and the association between need factors and medical mistrust was assessed, controlling for all enabling factors). All models were estimated with SAS version 9.4.

### RESULTS

One hundred five participants completed the survey. Respondents were primarily African American ( $n = 87$ , 83.7%), and the majority of respondents were female ( $n = 69$ , 65.7%). Of the enabling factors examined, half of the sample was eligible for free or reduced lunch, and 27% of participants reported food insecurity in last the 12 months. One third of the sample (34.3%) reported that they either did not have health insurance or did not know if they had health insurance. Approximately 20% of participants reported family financial strain due to the pandemic including the inability to pay rent, gas, or food bills in the previous two weeks. With respect to COVID-19 need-based characteristics, the majority of participants (59.0%) reported that they had at least one family member employed as an essential worker (*e.g.*, healthcare employee, grocery store worker, postal service). Only three participants (3.0%) reported that they had a family member who

had been diagnosed with COVID-19. About half of the sample (49.5%) reported that they “didn't know” if there was COVID-19 community spread in their area. See complete summary of descriptive statistics in Table 1.

For the study's main analyses, crude and adjusted model estimates are reported in Tables 2 & 3. Loneliness was the only predisposing factor significantly associated with medical mistrust in the crude model ( $\beta = 0.04$ , SE = 0.02, 95% CI [0.001, 0.08]). However, when controlling for age and gender, the effect of loneliness was no longer statistically significant ( $p = .054$ ), though, the effect size and standard error remained the same in the adjusted model. With respect to enabling factors, inability to pay bills due to the COVID-19 pandemic was significantly associated with medical mistrust in both the crude model ( $\beta = 1.713$ , SE = 0.72, 95% CI [0.31, 3.12]) and adjusted model ( $\beta = 1.337$ , SE = 0.62, 95% CI [0.11, 2.40]). Free and reduced lunch eligibility was also significantly associated with medical mistrust in the adjusted model ( $\beta = 1.63$ , SE = 0.76, 95% CI [0.15, 3.12]) when controlling for predisposing factors. No additional enabling factors or any need-based factors were significantly associated with medical mistrust in any of the models reported in Tables 2 & 3.

### DISCUSSION

The COVID-19 pandemic has not only led to increased morbidity and mortality, but also financial hardships and increased isolation resulting from social distancing recommendations. Our study found that unique stressors from the COVID-19 pandemic are associated with medical mistrust among urban youth of color. Loneliness was the only predisposing factor significantly positively associated with medical mistrust in our crude model. This effect lost statistical significance ( $p = .054$ ) when controlling for gender and age, but this is likely due to limited power as a result of the study sample size. While the effect of loneliness should be interpreted with caution, it may still have meaningful implications. There is prior evidence that loneliness has increased more among adolescents relative to other age groups during the COVID-19 pandemic [55], and it appears that increased loneliness may be associated with greater medical mistrust. Prior research has shown that those who have others in their support network who engage in a medical treatment or health behavior (*e.g.*, uptake of pre-exposure prophylaxis [PrEP]) tend to have less hesitancy in engaging in the health-related behavior themselves [56]. As such, if youth of color feel isolated from their social network during the COVID-19 pandemic, they are presumably less likely to share information and support related to medical care access and decision making.

Two of the measured enabling factors – the inability to pay bills due to COVID-19 and free or reduced lunch eligibility – were also significantly

Table 1 | Participant characteristics

	Total (N = 105)
<b>Predisposing Factors</b>	
<b>Gender, n (%)</b>	
Female	69 (65.7%)
Male	36 (34.3%)
Age, mean (SD)	16.47 (1.60)
<b>Race, n (%)</b>	
African American/Black	87 (83.7%)
Hispanic American	7 (6.7%)
Asian American	3 (2.9%)
Native Hawaiian/Other Pacific Islander	3 (2.9%)
White	3 (2.9%)
Other	1 (1.0%)
<b>Ethnicity, n (%)</b>	
Non-Hispanic	90 (86.5%)
Hispanic or Latino Origin	14 (13.5%)
Loneliness, mean (SD)	20.54 (15.01)
<b>Enabling Factors</b>	
<b>Insurance status, n (%)</b>	
No Insurance/Don't Know	36 (34.3%)
Public Health Insurance	38 (36.2%)
Private Insurance	31 (29.5%)
<b>Zip code, n (%)</b>	
Low Income (Household income, \$43,000)	49 (50.0%)
High Income	49 (50.0%)
<b>Worry of possible food insecurity (in past 12 months), n (%)</b>	
Never True	62 (64.6%)
Sometimes/Always True	34 (35.4%)
<b>Food insecurity (in past 12 months), n (%)</b>	
Never True	73 (73.0%)
Sometimes/Always True	27 (27.0%)
<b>Free and reduced lunch, n (%)</b>	
No	50 (50.0%)
Yes	50 (50.0%)
<b>Inability to pay rent/gas/food in the last 2 weeks as a result of COVID-19, n (%)</b>	
No	83 (79.1%)
Yes	22 (21.0%)
Social support, mean (SD)	63.21 (14.70)
<b>Need Factors</b>	
<b>Family member who is an essential worker, n (%)</b>	
No	41 (41.0%)
Yes	59 (59.0%)
<b>Family member who has been diagnosed with COVID-19, n (%)</b>	
No	93 (92.1%)
Yes	3 (3.0%)
Don't Know	5 (5.0%)
<b>Perception of community COVID-19 spread</b>	
No	40 (38.1%)
Yes	13 (12.4%)
Don't Know	52 (49.5%)
<b>Outcome</b>	
Medical mistrust, mean (SD)	19.42 (3.08)

Categories that do not add up to N = 105 indicate that missing values have been omitted.

Possible scores for loneliness range from 0 to 60, where higher scores indicate higher levels of loneliness. Possible scores for social support range from 12 to 84, where higher scores indicate higher levels of social support. Possible scores for medical mistrust range from 7 to 28 where higher scores indicate higher levels of mistrust.

Table 2 | Crude models indicating the association between predisposing, enabling, and need-based factors and medical mistrust

	Medical Mistrust		
	$\beta$	SE	95% CI
<b>Predisposing</b>			
Gender	-0.215	0.63	[-1.45,1.02]
Age	0.181	0.19	[-0.19,0.55]
Loneliness	0.040	0.02	[0.001,0.08]
Depression	-0.048	0.05	[-0.15,0.05]
<b>Enabling</b>			
Insurance status	-0.25	0.63	[-1.48,0.98]
Zip code	-1.082	0.62	[-2.30,0.14]
Worry of food insecurity	-0.047	0.58	[-1.19,1.10]
Food insecurity	0.313	0.67	[-0.99,1.62]
Free and reduced lunch	1.040	0.60	[-0.13,2.21]
Inability to pay bills due to COVID-19	1.713	0.72	[0.31,3.12]
Social support	-0.026	0.02	[-0.07,0.01]
<b>Need</b>			
Essential worker	0.788	0.63	[-0.44,2.02]
<b>Prevalence of community spread</b>			
Yes	1.715	0.96	[-0.17,3.61]
Don't know	0.619	0.64	[-0.63,1.86]

positively associated with medical mistrust when controlling for predisposing factors, indicating the influence of family social economic status on medical mistrust. The COVID-19 pandemic has led to increased financial insecurity due to increased rates of unemployment, and there is evidence that COVID-19 has disproportionately impacted minority unemployment [57]. Previous research suggests that job loss and financial insecurity during the COVID-19 pandemic is associated with greater risk for depression [58]. Our study results add to this literature by indicating that COVID-19-related financial hardships are associated with medical mistrust. Prior research has found that distrust in one institution, such as experiences with police, breeds distrust in other institutions including healthcare [23, 31, 59]. As such, one possible explanation for our finding is that financial hardships due to COVID-19 may well impact trust in government, employers, or schools to provide equitable educational and economic opportunities, and distrust in these institutions could carry over to increased distrust of healthcare institutions.

Furthermore, the finding regarding free or reduced lunch eligibility is also potentially of particular importance for youth during the COVID-19 pandemic, because youth are frequently unable to attend in-person school where they may receive services such as free or reduced lunch [47]. There are examples of many school systems and organizations that have developed programs during the

**Table 3** | Adjusted models indicating the association between predisposing, enabling, and need-based factors and medical mistrust

	Medical Mistrust		
	$\beta$	SE	95% CI
<b>Predisposing adjusting for other predisposing factors</b>			
Gender	-0.124	-1.37	[-1.37, 1.12]
Age	0.084	0.29	[-0.30, 0.46]
Loneliness	0.040	0.02	[-0.0008, 0.12]
<b>Enabling factors adjusting for predisposing factors (gender, age, loneliness)</b>			
Insurance status	-0.330	0.65	[-1.60, 0.94]
Zip code	-1.023	0.63	[-2.26, 0.21]
Worry of food insecurity	-0.032	0.62	[-1.24, 1.18]
Food insecurity	0.295	0.70	[-1.09, 1.67]
Free and reduced lunch	1.337	0.62	[0.11, 2.40]
Inability to pay bills due to COVID-19	1.636	0.76	[0.15, 3.12]
Social support	-0.007	0.02	[-0.05, 0.04]
<b>Need-factors adjusting for enabling factors</b>			
Essential worker	0.569	0.60	[-0.60, 1.74]
<b>Prevalence of community spread</b>			
Yes	1.243	1.09	[-0.89, 3.37]
Don't know	0.360	0.63	[-0.87, 1.59]

COVID-19 pandemic to ensure continued services such as pick-up and delivery meal options [60]. Innovations such as these are critical to support the nutritional needs of youth and families during the COVID-19 pandemic, and may potentially offer broader benefit including mitigating mistrust of public institutions.

Contrary to the study hypotheses, none of the COVID-19 need-based factors (e.g., family measures of who is an essential worker, perception of community spread) measured in our study were significantly associated with medical mistrust. However, there was too little variance in our sample to estimate the effect of having a family member diagnosed with COVID-19. Future research should examine the impact of COVID-19 diagnosis on medical mistrust. While not significantly associated with medical mistrust, it was of note that almost half the sample reported that they did not know if there was COVID-19 community spread in their area. This finding is consistent with another nationally representative survey which found racial disparities in knowledge about COVID-19 risk and transmission, with African American participants reporting significantly lower knowledge compared to non-Hispanic White participants [61]. A recent randomized control trial did find, however, that physician-delivered prevention messaging led to increased COVID-19 knowledge among Black and Latinx participants.

For Black participants, information seeking behaviors increased when the messaging had come from a racial/ethnically concordant physician [62]. This research underscores the importance of diversifying the healthcare work force as a long-term strategy toward mitigating medical mistrust and promoting health equity.

To our knowledge, this is the first paper to examine predictors of medical mistrust among youth during the COVID-19 pandemic. This paper is subject to notable strengths and limitations. The study is enhanced by the use of Behavioral Model for Vulnerable Populations to guide study analyses, especially given the novel and exploratory nature of the data. This study was limited, however, by the small sample size. Future research should examine predictors of medical mistrust during the ongoing COVID-19 pandemic among a larger sample of youth of color. Missing data could have led to increased bias in our estimates, though, the two models with the highest degree of missingness were the need-based models which were not the primary focus of this study. This study was also limited by the cross-sectional design wherein we were unable to investigate temporal changes due to the onset of the COVID-19 pandemic. In an effort to reduce participant burden, many of the enabling and need-based factors were assessed by single-item measures which are inherently subject to lower validity and reliability compared to a validated scale. In addition, adolescents may be less likely to accurately report on family economic status compared with adults [63, 64]. Prior research finds that adolescents may under-report characteristics like food insecurity due to parental buffering [65]. Nevertheless, when trying to understand indicators of medical mistrust among youth, perceptions of financial insecurity are likely an important stressor in and of itself. Lastly, the relationship between factors in each domain (e.g., predisposing, enabling, and need-based factors) may be more nuanced than we were able to capture through our modeling. Future research should examine issues of cumulative risk between factors in each domain, as well as consider additional factors pertinent to these domains such as housing insecurity. In addition, it would be useful for future research to examine predictors of medical mistrust among youth of color living in rural areas, who have been found to have higher rates of poverty compared to national rates [66, 67].

We cannot underestimate the importance of mitigating medical mistrust during the ongoing COVID-19 pandemic. Medical mistrust among people of color is rooted in longstanding histories of medical abuse and poor-quality medical care [17], and it is more important than ever to address the systemic factors which continue to perpetuate mistrust. Medical mistrust may impact individuals' willingness to adhere to evidence-based public health

guidelines to reduce risk of COVID-19 exposure and access to COVID-19 testing and medical care [33]. There is evidence from the HIV epidemic that mistrust among social networks was associated with a decrease in HIV antiretroviral adherence among African American men [68]. Though, some research has found that while Black people have significantly higher fear around participating in biomedical research compared to Whites, that they are just as likely to ultimately participate in biomedical research [69]. Emerging data does indicate, however, that young adults, Black adults, Hispanic adults, and those living in urban areas are the most likely groups to report that they want to “wait and see” how the COVID-19 vaccine works for others before getting vaccinated themselves [70]. As such, efforts to mitigate medical mistrust among youth of color is especially critical to promote uptake of the COVID-19 vaccine. There is prior evidence indicating that partnering with community-based or faith-based organizations to provide vaccinations and other health services is effective in improving knowledge and utilization among minority communities [71–75]. More work on this front is critically needed, however, as current national data shows that the COVID-19 vaccination rate among White people is significantly higher than rates for Hispanic and Black people [76]. Therefore, we recommend integrating COVID-19 testing and vaccination services in community-based settings that have already established trusting relationships with communities of color.

In conclusion, our study found that loneliness, financial insecurity, and free or reduced lunch eligibility are associated with increased medical mistrust. In the short term, steps should be taken to promote social connections among youth of color in ways that are in keeping with COVID-19 public health guidelines. Prior research indicates that youth participation in out-of-school programs leads to improvement in a host of wellbeing indicators, including social cohesion and prosocial behavior [77]. As such, efforts by community-based organizations to support youth social engagement through virtual or socially-distanced means may be especially useful at this time. Our study findings also contribute to the literature highlighting the crucial role systemic and economic-driven inequalities have on medical mistrust perspectives among youth of color. Given the wealth of prior evidence indicating that systemic racism is a driver of racial economic inequality and disproportionate COVID-19 burden, we conclude that to address determinants of medical mistrust, public health research, practice, and policy must do a better job in addressing factors which perpetuate poverty and systemic racism [33, 78–80].

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#### Compliance with Ethical Standards

**Conflicts of Interest:** The authors declare that they have no conflicts of interest.

**Human Rights:** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. All procedures performed were approved by the Institutional Review Board at the University of Missouri-Kansas City.

**Informed Consent:** Informed consent was obtained from all individual participants included in the study.

**Welfare of Animals:** This article does not contain any studies with animals performed by any of the authors.

#### Transparency Statement

1. **Study registration.** This study was not formally registered.
2. **Analytic plan pre-registration.** The analysis plan was not formally pre-registered.
3. **Data availability.** De-identified data from this study are not available in a public archive. Requests to access de-identified data can be sent to the corresponding author, but will require approval from IRB and community partners.
4. **Analytic Code.** Analytic code used to conduct the analyses presented in this study are not available in a public archive. They may be available by emailing the corresponding author.
5. **Materials availability.** Materials used to conduct the study are not publicly available.

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