

## COVID-19 Vaccination in Historically Marginalized Communities: Examining Barriers and Facilitators in a Pediatric Population



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**Introduction:** COVID-19 hospitalization rates among unvaccinated children are double of that of vaccinated children, and this difference is greater among racial and ethnic minority children. Vaccination rates among children remain suboptimal. Few studies have characterized barriers to COVID-19 vaccination among historically marginalized communities.

**Methods:** From January 2022 to May 2022, parents and guardians of children aged 12 months to 18 years presenting for pediatric care at a hospital-based primary care clinic were surveyed about perceptions of COVID-19 vaccines, intentions to vaccinate their child, and trusted sources of information.

**Results:** A total of 113 parents/guardians participated, with 92% self-identifying with a historically marginalized racial/ethnic group. A total of 54% of respondents either did not plan to vaccinate their child against COVID-19 or were unsure. The obstacles to vaccination most frequently cited were related to (1) unknown side effects, (2) the rapid development of the vaccine, and (3) unsafe ingredients. Worries about being used as experimental subjects and potential impacts on fertility were also reported. Parents who planned to vaccinate their child reported higher rates of trust in doctors, local clinics, hospitals, and health departments.

**Conclusions:** High rates of COVID-19 vaccination hesitancy exist among parents/guardians from historically marginalized groups. Barriers to vaccination were frequently related to side effects, whereas a high level of trust in healthcare providers as sources of information may be a facilitator. Strategies to improve health outcomes and boost vaccination rates should focus on equipping pediatric healthcare providers with the knowledge and skills necessary to address these known barriers to COVID-19 vaccination.

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## INTRODUCTION

Coronavirus disease 2019 (COVID-19) has significantly impacted the U.S., including children aged <18 years who make up almost a quarter of the population.<sup>1</sup> COVID-19 has led to significant mortality and morbidity, disproportionately impacting racial and ethnic minority groups. The disproportionate number of COVID-19 cases, hospitalizations, and deaths among racial/ethnic minority groups can be linked to longstanding systemic health and social inequalities.<sup>2</sup> According to the Centers for Disease Control and Prevention, Black non-Hispanic persons are 1.6 times more likely to die and 2.1 times more likely to be hospitalized from COVID-19 than White, non-Hispanic persons.<sup>3</sup> Although the nation strives to address the systemic and social inequalities that contribute to healthcare disparities, the COVID-19 vaccine is well positioned to lessen the morbidity and mortality of disease among all populations, including historically marginalized populations. However, vaccine hesitancy among racial/ethnic minority groups continues to threaten this benefit.

Vaccine hesitancy is defined as delay in acceptance or refusal of vaccines despite the availability of vaccination services.<sup>4–6</sup> Vaccine-hesitant families may delay or space out vaccines or only accept specific vaccines for their children. Although vaccines have improved the health of the pediatric population, primary care clinicians continue to encounter families that refuse and/or delay vaccines.<sup>7,8</sup> According to WHO, vaccine hesitancy is 1 of the 20 largest threats to public health; it has contributed to outbreaks of measles,<sup>9</sup> low rates of influenza vaccination,<sup>10</sup> and now increased morbidity and mortality associated with COVID-19 infection.<sup>11</sup> In a recent study of U.S. parents, respondents reported that routine vaccines are more essential and effective than COVID-19 vaccines.<sup>12</sup> In a 2021 U.S. national survey of parents' intentions and perceptions about COVID-19 vaccination, less than one half of participants reported that they were likely to have their child receive a COVID-19 vaccination.<sup>13</sup> Although COVID-19 vaccination has been widely available to patients aged 6 months to 18 years, as of May 2023, vaccination rates among children and adolescents remain lower than those in older groups, with 61.8% of children aged 12–17 years, 32.9% of children aged 5–11 years, and <10% of children aged <5 years completing the primary vaccination series.<sup>14</sup>

There have been studies related to COVID-19 vaccine hesitancy among adults<sup>15,16</sup>; however, less is understood about COVID-19 vaccine hesitancy among U.S. parents/guardians, particularly those from racial/ethnic minority groups. Although historically, it is known that institutional racism and inequalities in healthcare are at the

root of vaccine hesitancy among racial/ethnic minority groups,<sup>17</sup> less is known about the specific barriers and facilitators that may be drivers of vaccine hesitancy among parents/guardians of racial/ethnic minority children. Studies have shown that to effectively counsel vaccine-hesitant families, the factors underlying uncertainty must be identified and subsequently addressed. Unbiased quantitative and qualitative data are needed to inform strategies to increase vaccination rates among racial/ethnic minority groups who have historical mistrust of immunizations. Misattribution of drivers of COVID-19 vaccine acceptability among these groups may lead to inappropriately tailored strategies and the potential for exacerbation of healthcare inequalities.

This study sought to understand the knowledge, beliefs, and attitudes surrounding COVID-19 and available vaccines in the parents and guardians of children of racial and ethnic minority groups. By elucidating the drivers of vaccine hesitancy, this study aims to inform future COVID-19 vaccine promotion interventions among historically marginalized racial/ethnic pediatric populations.

## METHODS

Using convenience sampling, parents or guardians of all children aged 12 months to 18 years presenting for well child care or acute care visits from January through May 2022 at the Johns Hopkins Children's Center Primary Care Clinic, a large, urban pediatric primary care clinic in Baltimore, Maryland, were invited by the study coordinator to complete an anonymous questionnaire survey to assess their knowledge, beliefs, and attitudes surrounding COVID-19 vaccination for pediatric populations. Informed consent was obtained from those who agreed to participate. Participants were given a link to complete the anonymous online questionnaire and received a \$25 gift card upon survey completion. Surveys were completed either during the clinical visit, or if requested, a survey link was emailed to the parent/guardian to complete the survey at a later time. Reminders were not sent to those requesting to complete the survey at a later time. Once the survey was completed, parents/guardians could not reuse the survey link. Prior to the start of the online questionnaire, parents/guardians were required to read a statement about the purpose of the study, a reminder that participation in the survey was voluntary and that responses and data were anonymous. Respondents were required to answer all questions of the survey. Non-English-speaking parents/guardians and adolescents presenting to care without a parent/guardian were excluded from the study.

## Study Population

The Johns Hopkins Children's Center Primary Care Clinic, located in East Baltimore, provides primary care to approximately 8,500 children and youth aged up to 21 years. In addition, it serves >80% racial-ethnic minority children, of whom about 90% receive Medicaid.

## Measures

The authors conducted a comprehensive review of the literature, which revealed a paucity of existing surveys in pediatrics applicable to the study objective. The authors adapted questions from previous surveys and added new questions to address key themes from prior literature on barriers to vaccination.<sup>10,13,18</sup> Key themes assessed included barriers and facilitators to vaccination such as concern for short- and long-term side effects, perceived severity of COVID-19 infection in children, and trusted sources of information. In addition, the authors also assessed parental COVID-19 vaccination status and the child's influenza vaccination status. To determine the impact that perceived child vulnerability had on vaccination preferences, the authors asked about the presence of chronic medical conditions. Questions regarding parental/guardian intention and plans to vaccinate their child focused on the child presenting for care.

To establish face and content validity, the Johns Hopkins Parent and Family Advisory Council, experts in the field of infectious disease, and a behavioral and implementation scientist reviewed the survey for readability, length, appropriateness, and understanding. Modifications were made according to feedback. For context, the Parent and Family Advisory Council comprises 20 parents, 15 teenagers, and 20 staff advisors whose mission is multifold, including to improve quality, patient safety, and health outcomes. To establish reliability, the final 36-item survey was piloted among parents of the Parent and Family Advisory Council, and feedback was iteratively reviewed by the study team. When no further revisions were suggested, approval from IRB was obtained.

## Statistical Analysis

The authors distributed surveys and collected responses using Qualtrics (Qualtrics, Provo, UT). For analysis, respondents were divided into 3 groups on the basis of their intention to vaccinate their child against COVID-19: yes, plan to vaccinate or already vaccinated; no, not planning to vaccinate; and unsure. Descriptive summary statistics were calculated. Characteristics of the groups were compared using chi-square tests and 1-way ANOVA. Statistical significance was defined as a  $p < 0.05$ . All statistical tests were 2 sided. Analyses were

performed using Stata, Version 15 (Stata Corp., College Station, TX).

## RESULTS

During the study period, the study coordinator invited 124 parent/guardians to participate in the study, of whom 113 agreed to participate. The study overall had a response rate of 91%. Of the 113 parents/guardians who completed the survey, 84% ( $n=95$ ) of primary respondents were African American, with approximately half having a high school education or less (Table 1). A total of 46% ( $n=52$ ) of parents were planning to or had vaccinated their child, 28% ( $n=32$ ) did not plan to vaccinate, and 26% ( $n=29$ ) were unsure. The mean ages of children in these 3 groups were 7.9, 6.5, and 4.4 years, respectively ( $p < 0.05$ ). Parents/guardians planning to vaccinate their child were significantly older than the other 2 groups ( $p < 0.005$ ), more likely to be vaccinated themselves ( $p < 0.001$ ), and more likely to accept an influenza vaccine for their children ( $p < 0.001$ ).

Figure 1 shows trusted sources of information regarding COVID-19 vaccination among parents who have already vaccinated or planned to vaccinate their child. The combined group of parents/guardians including those not planning to vaccinate and unsure reported statistically significantly lower rates of trust (proportion with agreement and strong agreement) in their doctor ( $p < 0.001$ ), the local clinic or hospital ( $p < 0.001$ ), and the local health department ( $p = 0.002$ ). There were no significant differences between the groups in reporting trust in religious leaders, friends/family, the news, or social media.

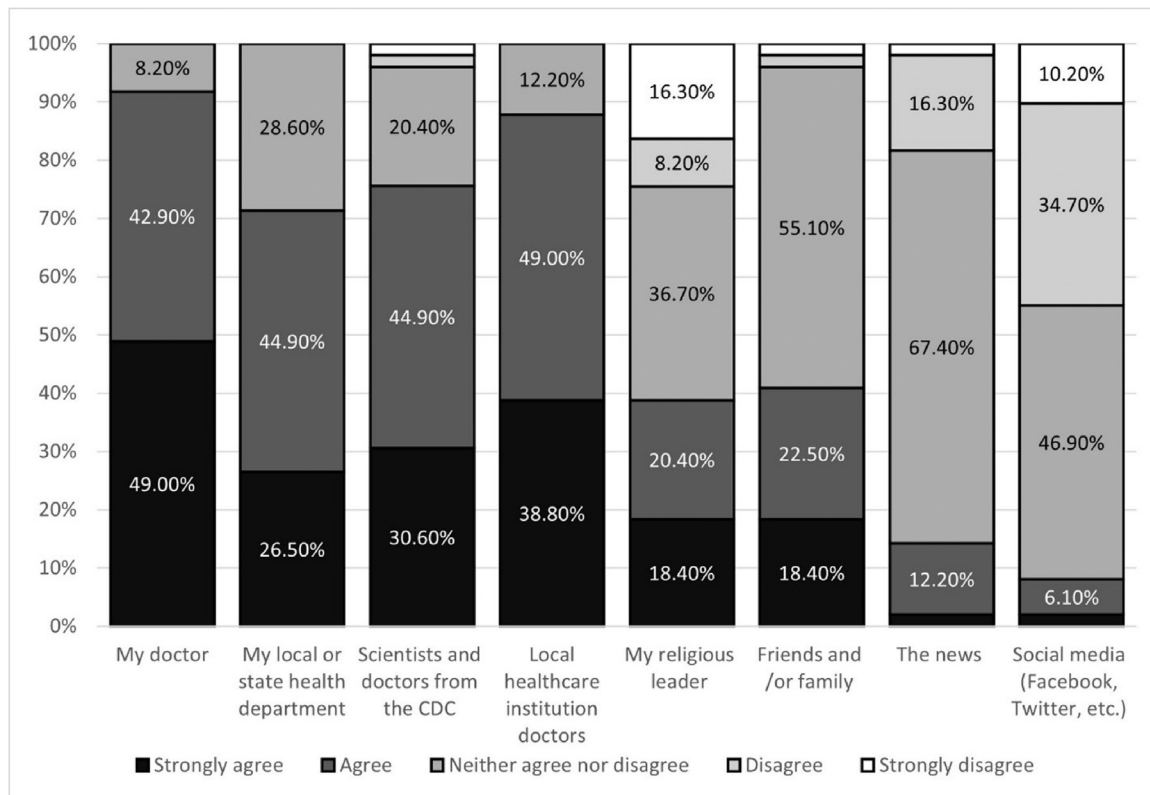
In regards to parental perceived risk of infection and severity, a total of 23.1% of parents/guardians who planned to vaccinate reported that their children were likely or very likely to become infected with COVID-19 in the next 6 months, compared with 9.4% of those who did not plan to vaccinate and 13.8% of those who were unsure. A total of 27.5% of parents/guardians who planned to vaccinate reported likely or very likely for their children to have complications/severe illness from COVID-19, compared with 25% of those who did not plan to vaccinate.

Table 2 shows parental perceptions, both negative and positive, about COVID-19 vaccination stratified by intent to vaccinate. Regarding negative perceptions, those not planning or unsure about vaccination consistently had a higher proportion of participants reporting that they were very or somewhat worried about various negative aspects of the vaccine. Parents were most frequently worried about unknown side effects, about unsafe ingredients, that the vaccines were developed too

**Table 1.** Sample Demographics by Intention to Vaccinate Child (n=113)

Demographics	Yes, plan to vaccinate or already vaccinated (n=52, 46%)	No, does not plan to vaccinate (n=32, 28.3%)	Unsure (n=29, 25.7%)	p-value
Parent sex, female	73.1%	90.6%	89.7%	0.070
Parental age <40 years	51.9%	84.4%	75.9%	0.005
Parental education, HS graduate or less	46.2%	50%	58.6%	0.579
Parental race/ethnicity				0.931
Black or African American	78.9%	87.5%	89.7%	
White	9.6%	6.3%	6.9%	
Hispanic	3.9%	3.1%	0	
Other	7.7%	3.1%	3.5%	
Family income				0.080
\$0–\$15,000	26.7%	8.7%	19.2%	
\$15,001–\$30,000	17.8%	26.1%	46.2%	
\$30,001–\$60,000	35.6%	43.5%	30.8%	
>\$60,000	20.0%	21.7%	3.9%	
Parent received at least 1 COVID-19 vaccine dose	88.5%	31.3%	75.9%	<0.001
Child mean age, years	7.9	6.5	4.4	0.007
Child received flu vaccine (2021–2022)	69.2%	31.3%	69.0%	<0.001

Note: p-values represent comparisons between all 3 groups. HS, high school.



**Figure 1.** Trusted sources of information among parents who have vaccinated or are planning to vaccinate their children (n=49). Unmarked bars are  $\leq 2.0\%$ .

**Table 2.** Parental Perceptions About COVID-19 Vaccination

Negative perceptions of COVID-19 vaccines:	Child vaccinated or planning to vaccinate (n=51)			Not planning to vaccinate (n=32)			Parents unsure about vaccinating (n=29)		
	Very or somewhat			Very or somewhat			Very or somewhat		
	worried	Not worried	Unsure	worried	Not worried	Unsure	worried	Not worried	Unsure
The COVID-19 vaccine was developed too quickly	53.1%	42.9%	4.1%	59.4%	28.2%	12.5%	72.4%	17.2%	10.3%
Some people who get the vaccine feel tired, achy and get headaches and fever the next day	49.0%	49.0%	2.0%	43.8%	37.6%	18.8%	69.0%	24.1%	6.9%
The ingredients in the COVID-19 vaccine are unsafe	51.0%	36.8%	12.2%	62.5%	15.7%	21.9%	64.2%	10.7%	25.0%
COVID-19 vaccine are made from mRNA (messenger ribonucleic acid)	32.7%	44.9%	22.5%	40.6%	25.0%	34.4%	57.1%	10.7%	32.1%
COVID-19 vaccines might change my DNA (deoxyribonucleic acid)	28.6%	51.0%	20.4%	43.8%	28.2%	28.1%	53.6%	25.0%	21.4%
There may be side effects to the COVID-19 vaccine that are unknown	57.1%	34.7%	8.2%	75.0%	12.5%	12.5%	78.6%	7.1%	14.3%
The COVID-19 vaccine may affect my child's fertility	42.9%	38.8%	18.4%	56.2%	15.6%	28.1%	64.3%	17.9%	17.9%
Not enough people of my race/ethnicity have received the vaccine	24.5%	55.1%	20.4%	28.2%	50.0%	21.9%	42.8%	35.8%	21.4%
They are experimenting on people with the COVID-19 vaccine.	32.6%	53.1%	14.3%	65.7%	15.7%	18.8%	67.8%	14.3%	17.9%
My child has a health condition that might make them at increased risk of having an adverse reaction to the COVID-19 vaccine	22.4%	67.4%	10.2%	31.3%	53.1%	15.6%	46.4%	39.3%	14.3%
Positive perceptions of COVID-19 vaccines:	Strongly or somewhat agree	Strongly or somewhat disagree	Unsure	Strongly or somewhat agree	Strongly or somewhat disagree	Unsure	Strongly or somewhat agree	Strongly or somewhat disagree	Unsure
I will be less worried about my child if they receive the COVID-19 vaccine	56.8%	17.6%	25.5%	18.8%	65.6%	15.6%	3.4%	31.0%	65.5%
Getting the COVID-19 vaccine will decrease my child's chance of getting infected or having complications from COVID-19 in the future.	74.5%	5.9%	19.6%	18.8%	46.9%	34.4%	27.6%	20.7%	51.7%

quickly, and/or about concerns of experimentation. Notably, 78% of parents unsure about vaccinating reported that they were worried about unknown side effects.

For both survey questions asking about positive perceptions of COVID-19 vaccination, most parents/guardians who were planning to vaccinate reported that they somewhat or strongly agree that they would worry less if their children were vaccinated and that vaccination would protect their children from getting infected or having serious complications. In contrast, the majority of those who did not plan to vaccinate reported that they somewhat or strongly disagreed with the statements mentioned earlier (Table 2). This trend was overall consistent when survey respondents were grouped by child age under or above 5 years.

## DISCUSSION

The authors found a high level of parental/guardian hesitancy for COVID-19 vaccination in children, with over 54% of the cohort reporting that they did not plan to or were unsure of vaccinating their children against COVID-19. This is consistent with the results of a previously published study on parental intentions and perspectives about the COVID-19 vaccine.<sup>13</sup> Among the parents/guardians in the study sample not planning to vaccinate or unsure about vaccinating their children against COVID-19, about 65% were very or somewhat worried that “they are experimenting on people with the COVID-19 vaccine.” Many parents/guardians were concerned that (1) there may be side effects that are unknown, (2) the vaccine was developed too quickly, and (3) there were unsafe ingredients in the vaccine. Concern about COVID-19 vaccine side effects is common among vaccine-hesitant parents both nationally and internationally.<sup>19–21</sup> In addition, parents who did not plan to or were unsure of vaccinating their child reported less agreement with positive perceptions of vaccination. Among parents who did plan to vaccinate, 75% agreed that the COVID-19 vaccine reduced their children’s chance of infection. These results are in alignment with those of other studies that demonstrate that majority of parents choose to vaccinate their children to protect them from disease acquisition.<sup>19</sup>

Similar to reports after the H1N1 pandemic experience and the few existing studies on COVID-19 vaccination practices, the authors found that perception of vaccine safety continues to be a fundamental determinant for vaccination decision practices.<sup>13,18</sup> Irrespective of pandemic cause, concerns about vaccine safety have been reported as a common barrier to timely immunization practices.<sup>22,23</sup> Similar to other studies of parental

immunization intentions, this study showed that parent/guardians who received at least 1 dose of the vaccination were more likely to have their children immunized.<sup>13,24</sup>

Although the sample size was small, this study shows that parents/guardians aged >40 years were more likely to vaccinate their children and were more likely to be vaccinated themselves. The influence of parental age on COVID-19 vaccination practices is not well described in U.S. populations specifically; however, this age correlation was recognized in the uptake of the H1N1 vaccine<sup>25</sup> and in international studies on parental intention to vaccinate their children against COVID-19.<sup>26,27</sup> Finally, this study showed that the most trusted source of information was the child’s doctor and scientists from the local clinic/hospital and health departments, consistent with other research.<sup>13</sup>

COVID-19 has led to significant morbidity and mortality among racial and ethnic minority groups. In recognition of these groups having suboptimal COVID-19 vaccination uptake, the goal of this study was to determine whether drivers of COVID-19 vaccination hesitancy among historically marginalized racial/ethnic groups are different from those reported in previous studies.<sup>13,28</sup> Studies that have investigated specific barriers and facilitators to vaccine uptake have included samples that were majority (>50%)<sup>13</sup> or even almost entirely (>90%)<sup>28</sup> White race. A total of 92% of the population in this study identified with a historically marginalized racial/ethnic group, with 84% identifying as Black or African American. This allows for a novel and focused picture of the perspectives regarding COVID-19 vaccination in this population.

Although historical mistrust of medical providers, especially among historically marginalized racial/ethnic community members, has been previously noted as a driver of vaccine hesitancy, this study suggests otherwise. In this study, historically marginalized racial/ethnic groups have similar hesitancies as the general population such as concerns about side effects, the rate at which the vaccine was developed, and concerns about the ingredients of the vaccination. Notably, this study showed that the most trusted source of information regarding COVID-19 vaccination was the patient’s doctor. Although further qualitative studies may be necessary to better understand the drivers of these findings, these data suggest that COVID-19 vaccine promotion interventions in minority populations should focus on the drivers of COVID-19 vaccination hesitancy mentioned earlier.

Although many of the parental concerns leading to COVID-19 vaccination hesitancy found in this study and others are nonmodifiable such as the vaccine being made from mRNA and the speed at which the vaccine was developed, many opportunities remain to educate

against misinformation such as the vaccine changing DNA or affecting fertility. Physicians must be able to educate their patients in an accessible and easily understandable way as to the rigorous development and approval process by the U.S. Food and Drug Administration and the Center for Disease Control and Prevention and about the vaccination trials, which support the safety and efficacy of the COVID-19 vaccine. In addition, this study as well as other national and international studies<sup>29,30</sup> have shown that the child's doctor or healthcare provider remains the most trusted source of COVID-19 vaccination information. Therefore, it is important to ensure that healthcare providers are equipped with the knowledge to appropriately counsel families about both the risks and benefits of COVID-19 vaccination. In addition to being equipped with knowledge of COVID-19 vaccination, it is equally important for physicians to have training to utilize evidence-based strategies such as motivational interviewing, presumptive communication, and behavioral change techniques to better partner with families to increase immunization rates among the pediatric population.

### Limitations

This study has strengths and limitations. To the authors' knowledge, there is only 1 national study that aimed to directly evaluate parental COVID-19 vaccine hesitancy among those of various sociodemographic groups in a major metropolitan area.<sup>27</sup> Although this study did show that COVID-19 vaccine hesitancy was highest among non-Hispanic Black parents than among non-Hispanic White parents, it did not evaluate potential drivers of this difference through a comparison between groups. Finally, this study has limitations in generalizability owing to the use of convenience sampling, the relatively small sample size, limited number of Hispanic and exclusion of Spanish-speaking patients in particular, and the focused recruitment of participants at 1 urban academic center whose beliefs and perceptions may differ from those at other geographic or clinical settings.

### CONCLUSIONS

This study found significant parental/guardian hesitancy for COVID-19 vaccination among historically marginalized racial/ethnic populations, with more than half of parents unsure about or not planning to vaccinate their children. Non-Hispanic Black parents have similar concerns about COVID-19 vaccination as non-Hispanic White parents; however, qualitative studies may be beneficial to further understand the drivers of these concerns. Pediatric healthcare providers are the most trusted source of information about COVID-19 vaccines in

children. To improve health outcomes and vaccination rates, there should be increased focus on equipping pediatric providers with the knowledge and skills necessary to promote COVID-19 vaccination among the pediatric population.

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