

# The COVID-19 Vaccine Conundrum: An Assessment of Vaccine Hesitancy Amongst Patients at a Federally Qualified Health Center

Journal of Pharmacy Practice  
2022, Vol. 0(0) 1–6  
© The Author(s) 2022  
Article reuse guidelines:  
[sagepub.com/journals-permissions](https://sagepub.com/journals-permissions)  
DOI: 10.1177/08971900221116193  
[journals.sagepub.com/home/jpp](https://journals.sagepub.com/home/jpp)  
SAGE

Letoia R. Clark, PharmD<sup>1</sup> , Mark Thomas Sawkin, PharmD<sup>1</sup> ,  
Brittany Lee Melton, PhD, PharmD<sup>2</sup>  and Emma Grace Meyer, PharmD<sup>1</sup>

## Abstract

**Background:** With three COVID-19 vaccines currently authorized for use in the US, vaccine hesitancy has the potential to sabotage COVID-19 vaccination efforts and be detrimental to overall health outcomes. In order to realize the extent of vaccine hesitancy, an adequate understanding of the role that self-identified barriers and epidemiologic factors may play is timely and important.

**Objectives:** The objectives of this study were to 1) determine if there is a relationship between vaccine hesitancy and epidemiologic factors, and 2) identify perceived patient-reported barriers associated with receiving a COVID-19 vaccine.

**Methods:** A written questionnaire was utilized to collect data from eligible patients over a 15-week period between October 2020 and February 2021. A combination of non-parametric tests and descriptive statistics were used to analyze this data.

**Results:** A majority of patients were either very strongly in support of (28.2%) or very strongly against (29.7%) receiving a COVID-19 vaccine. Notable findings included the comparison of patients with advanced degrees being more likely to get vaccinated (48.1%) to those without advanced degrees (38.8%) ( $P = .032$ ). There was also a significant difference between races regarding their interest in receiving a COVID-19 vaccine. Blacks were much more likely to answer very strongly against receiving the vaccine (60.9%) compared to Caucasians (22.1%) and Hispanics (30.4%) ( $P < .001$ ). The most reported barrier to receiving a COVID-19 vaccine was concern for side effects.

**Conclusion:** This study provides a glimpse into possible correlations between vaccine hesitancy and epidemiologic factors as well as patient-reported barriers to receiving a COVID-19 vaccine. With widespread vaccination underway, it is imperative that we learn about and address concerns about receiving the COVID-19 vaccine to ensure community protection against this serious life-threatening infectious disease.

## Keywords

COVID, vaccine, vaccine hesitancy, public health, federally qualified health center

## Background

Coronavirus disease-19 (COVID-19), a global pandemic turned national emergency, has spread quickly across the world. By May of 2021, more than 30 million people have been infected and more than half a million people have died of COVID-19 in the US.<sup>1</sup> With the potential to eradicate or control a number of serious or life-threatening infectious diseases, immunization should be recognized as an individual, community and governmental responsibility.<sup>2</sup> Great advances have been made in developing and introducing new vaccines; and there are currently three COVID-19 vaccines that have been granted authorization for immunization in the US.<sup>2,3</sup>

While it is necessary for patients to get the COVID-19 vaccine to protect themselves and the community, some parents and adults are hesitant to immunize their children and/or themselves.<sup>4</sup> Vaccine hesitancy is a complex and context specific issue; and attitudes about vaccination are often influenced by a majority of factors including scientific,

<sup>1</sup>School of Pharmacy, University of Missouri-Kansas City, Kansas City, MO, USA

<sup>2</sup>School of Pharmacy, University of Kansas, Kansas City, KS, USA  
Mark T. Sawkin, PharmD, School of Pharmacy, University of Missouri-Kansas City, Health Sciences Building, 2464 Charlotte Street, Suite 4250, Kansas City, MO 64108, USA.

Email: [sawkinm@umkc.edu](mailto:sawkinm@umkc.edu)

political, social, cultural, and personal varying across time, place, and vaccine.<sup>5-7</sup> Skepticism about vaccination in racial and ethnic minority populations can be attributed to a history of racial discrimination, lower income, lower education, and concerns about the safety, efficacy, and side effects from vaccines.<sup>8,9</sup> A 2004 ConsumerStyles survey found that 40% of Black and 32% of Hispanic parents were very concerned with immunization safety compared to only 15% of Caucasian parents.<sup>9</sup>

According to the World Health Organization (WHO), vaccine hesitancy – the reluctance or refusal to vaccinate despite the availability of vaccines – is one of the top ten threats to global health.<sup>10</sup>

While vaccine hesitancy is a widely studied phenomenon, there is minimal data to evaluate the hesitancy the public may have to receiving one of the three novel COVID-19 vaccines. In order to assess COVID-19 vaccine hesitancy specifically, an adequate understanding of self-identified barriers and epidemiologic factors may be imperative to improve patient care and overall health outcomes.

## Objectives

The objectives of this study were to 1) determine if there is a relationship between vaccine hesitancy and epidemiologic factors, and 2) identify perceived patient-reported barriers associated with receiving a COVID-19 vaccine.

## Methods

### Study Design

This descriptive cross-sectional study occurred over a period of 15 weeks between October 2020 and February 2021. This study was approved by the University of Missouri Kansas City Institutional Review Board (IRB) (Protocol #: 2034362).

### Setting

Research was conducted at KC CARE Health Center, a Federally Qualified Health Center (FQHC) located in Kansas City, MO. Although KC CARE has four locations, the questionnaire was only offered at the main location in Midtown Kansas City. KC CARE is dedicated to vaccinating its community and works closely with federal, state and local health departments to help distribute the COVID-19 vaccine.<sup>11</sup>

Clinical pharmacists and pharmacy residents at KC CARE operate through a written protocol with an authorizing physician to perform “Medication Therapy Services” pursuant to the Pharmaceutical Care Standards maintained by the Missouri State Board of Pharmacy in order to manage the medication therapy for a variety of chronic disease states for their patients. Roughly 60% of KC CARE’s patient population is under- or uninsured, and come from a wide variety of

socioeconomic backgrounds. The intention of this project was to determine the prevalence of COVID-19 vaccine hesitancy among clinic patients and educate them about the COVID-19 vaccine in order to better serve their needs.

### Inclusion/Exclusion Criteria

Patients were included in this study if they were at least 18 years of age with an ability to speak and read the English language, who may or may not have already received a COVID-19 vaccine. All KC CARE medical staff and personnel were excluded. A written questionnaire ([Appendix 1, Supplemental Material](#)) was utilized to collect data from eligible patients. Participation in this study was voluntary and anonymous.

### Recruitment Strategy

Members of the patient services department were asked to offer questionnaires to all patients presenting to the health center between October 30th, 2020 and February 12th, 2021. The clinic staff received training regarding the handling of questionnaires and were informed of the inclusion and exclusion criteria. They were also provided a script with recommended talking points to aid in questionnaire distribution. To increase the likelihood of distribution and decrease the duplication of data, questionnaires were attached to patient intake forms, which are completed annually for KC CARE patients. Upon completion, questionnaires were placed in a secure key-locked drop box only to be accessed by the primary investigator.

### Questionnaire Tool

The purpose of the questionnaire was to gather basic demographic information, assess the patient’s visit type, determine exposure to and testing for COVID-19, and then assess the patient’s vaccine hesitancy about receiving the COVID-19 vaccine. The questionnaire consisted of 16 questions, of which six multiple-choice questions served to obtain demographic data relating to age, gender, race/ethnicity, education, household income, and health insurance. A single multiple-choice question was used to determine the nature of the patient’s visit. There were two ‘Yes/No’ questions to determine if a patient had been previously exposed to or tested for SARS-CoV-2. Patients were asked to answer five questions concerning vaccine hesitancy, which were measured on a Likert Scale (1 – Highly Unlikely, 5 – Highly Likely). The final question (select all that apply) served to help identify perceived patient-reported barriers associated with receiving a COVID-19 vaccine.

The authors developed this questionnaire out of their collective understanding of vaccine hesitancy and did not knowingly base it on any existing survey, validated or otherwise. The questionnaire was created with a readability of

64.5% (Flesch-Kincaid Grade Level = 6.7) to ensure the content would be understood by the general population. It was also pilot tested by 10 patients during the month of October to ensure patients were responding appropriately and in a consistent manner. No patient feedback was solicited, but based on the trend of responses from the piloted questionnaires, no revisions were made.

### Statistical Analysis

A combination of descriptive statistics and non-parametric tests were used to analyze this data. Descriptive statistics were used to summarize demographics in addition to the perceived barriers to receiving a COVID-19 vaccine. A Chi-square test was performed to detect a difference between Blacks, Hispanics, and Caucasians regarding their likelihood of receiving a COVID-19 vaccine. To evaluate COVID-19 exposure vs vaccine intention and COVID-19 test result vs vaccine intention, a two-group comparison was completed via Chi-square. This test was also used in an effort to detect any differences between the likelihood of vaccine administration for those with reduced levels of education compared to those with higher academic achievements. The 5-point Likert-type responses were collapsed to likely/neutral/unlikely for the chi-square analyses. Analyses were accomplished using SPSS v. 27 and an a-priori alpha of .05.

### Results

A total of 224 questionnaires were collected. Because a method to track total number of surveys given to patients was not in place, the investigators cannot conclude a response rate. One participant did not meet the eligibility criteria (age <18 years) and was excluded from data analysis.

### Patient Demographics

The plurality of patients identified as male (49.8%), between the ages of 25 to 39 (43.6%) and reported having an associate degree or higher (35.7%). Over 80% of the patients identified as either Black or Caucasian (40.4% and 41.7%, respectively), while only 13.9% identified as Hispanic. Many of the patients reported being uninsured (39.9%) and almost half had an annual household income of less than \$25,000 (48.9%). A large number of patients presented to the health center for a provider visit (66.5%), and other reasons included pharmacy or lab visits (2.6% and 13.4%, respectively). A very small proportion of patients presented to the clinic for COVID-19 testing (2.1%); notably, more than half of patients said they had been tested for COVID-19 at least once since the start of the pandemic (52.6%). Of those tested, 11.4% reported a positive result. When asked about potential exposure to the virus, an overwhelming majority felt as if they had never been exposed at all (83%). A complete list of demographics can be found in [Table 1](#).

More than a third of patients were likely (8.4%) or highly likely (28.2%) to receive a COVID-19 vaccine. Similar results were found when asked if they would return for a second dose of the vaccine. Approximately 70% of this patient population (n = 138/197) reportedly have children and of those, 59.4% said that it was either highly unlikely (47.8%) or unlikely (11.6%) for them to forbid their children from receiving a COVID-19 vaccine. Of the remaining 40.6% reported to have children, 15.2% said they were highly likely, 2.9% said they were likely, and 22.5% said they were neither unlikely nor likely to forbid the vaccination of their children. Additionally, patients were more likely to recommend the vaccine to their friends and family. Roughly one-quarter of patients felt impartial to making this recommendation altogether (neutral: 23.8%). When asked about mask use, nearly 70% of patients said it was either highly unlikely (59.3%) or unlikely (8.5%) for them to stop wearing one post-vaccination. [Table 2](#) shows responses to all Likert-type questions regarding vaccine hesitancy.

### Perceived Barriers

To assess potential barriers to receiving a COVID-19 vaccine, patients were asked to choose from a selection of postulated concerns. Patients were predominantly concerned about the potential side effects after vaccine administration (43%) ([Figure 1](#)). Even though immediate side effects were the most reported concern, four percent expressed concern about the long-term implications of a COVID-19 vaccine. Close to 40% were concerned about the novelty of the vaccines, and 38.1% felt as if they did not know enough about how the vaccines work. Eighteen percent of patients simply felt that the vaccines would not work at all and 15.2% thought the vaccines would give them COVID-19. Cost was a concern for 19.7% of patients, while 1.8% were worried about transportation to/from vaccination location. Almost eight percent of the patients who responded ‘other’ manually listed not having any concerns at all.

Differences were found between education and likelihood of getting a COVID-19 vaccine. Patients with an associate degree or higher were significantly more likely to get vaccinated compared to those with less than an associate degree (48.1% vs 38.8%, respectively) ( $P = .032$ ). There was also a significant difference between races regarding their interest in receiving a COVID-19 vaccine. Differences were found across the three analyzed races/ethnicities, Caucasian, black, and Hispanic, with 60.9% of black patients being against the vaccine compared to 22.1% of Caucasians and 30.4% of Hispanics ( $P < .001$ ).

Many of the patients in this study population reported they had been tested for COVID-19 despite, to the best of their knowledge, never having been exposed to the virus. Those who reported being tested for COVID-19 were significantly more likely to get a COVID-19 vaccination regardless of their perceived exposure to the virus ( $P = .002$ ) ([Supplemental Figure 1](#)). Fifty percent (n = 6) of those who tested positive for COVID-19 said that they were highly likely to receive a COVID-19 vaccine; however, a quarter

**Table 1.** (continued)

Patient Demographics	n (%) <sup>*</sup>
Transgender male	4 (1.8)
Transgender female	3 (1.4)
Gender Variant/Non-Conforming	2 (.9)
Prefer not to answer	1 (.5)
Race/Ethnicity <sup>**</sup> (n = 223)	
African American/Black/Caribbean	90 (40.4)
Asian/Pacific Islander	7 (3.1)
Caucasian	93 (41.7)
Hispanic/LatinX	31 (13.9)
Native American	4 (1.8)
Prefer not to answer	8 (3.6)
Highest level of education (n = 222)	
Less than high school diploma	14 (6.3)
High school diploma or GED	60 (27.0)
Some college, but no degree	64 (28.8)
Associate degree	23 (10.4)
Bachelor degree	39 (17.6)
Post-graduate degree	17 (7.7)
Prefer not to answer	5 (2.3)
Annual household income (n = 219)	
Less than \$25,000	107 (48.9)
\$25,000 - \$50,000	50 (22.8)
\$50,000 - \$100,000	36 (16.4)
More than \$200,000	1 (.5)
Prefer not to answer	25 (11.4)
Healthcare Insurance <sup>***</sup> (n = 215)	
Uninsured	89 (39.9)
Medicaid	21 (9.4)
Medicare	19 (8.5)
Other state-sponsored program	13 (5.8)
Private health insurance	62 (27.8)
Prefer not to answer	17 (7.6)
Purpose of visit (n = 194)	
COVID-19 testing	4 (2.1)
Provider visit	129 (66.5)
Pharmacy only	5 (2.6)
Lab only	26 (13.4)
Prefer not to answer	30 (15.5)
Do you think you have been exposed to COVID-19? (n= 206)	
Yes	29 (14.1)
No	171 (83.0)
Prefer not to answer	6 (2.9)
Have you been tested for COVID-19? (n = 209)	
Yes	110 (52.6)
No	92 (44.0)
Prefer not to answer	7 (3.3)
If so, what was your test result? (n = 114)	
Positive	13 (11.4)
Negative	96 (84.2)
Prefer not to answer	5 (4.4)

\*Percentages may not add up to 100% due to rounding.

\*\*Patients were allowed to select all that applied.

\*\*\*Six patients reported having secondary insurance: Medicaid (1), Medicare (3), Private (2).

**Table 1.** Patient Demographics.

Patient Demographics	n (%) <sup>*</sup>
Age group (n = 218)	
18-24 years old	28 (12.8)
25-39 years old	95 (43.6)
40-59 years old	70 (32.1)
60-74 years old	25 (11.5)
Gender (n = 221)	
Male	110 (49.8)
Female	101 (45.7)

(continued)

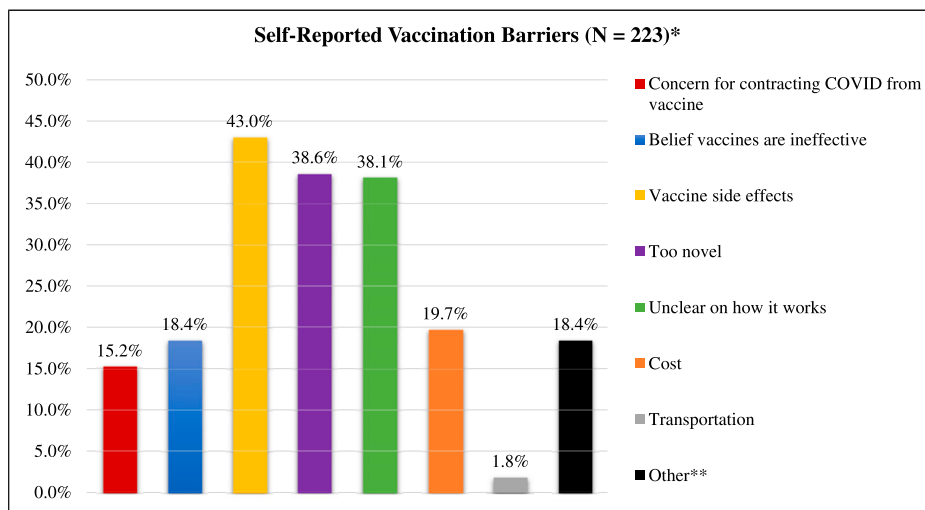
of patients (n = 3) said they were highly unlikely to get vaccinated despite their positive COVID-19 test result.

## Discussion

Lack of trust underlies vaccine hesitancy; if more patients trusted in the usefulness and safety of vaccines and in the system that delivers them, there would be a positive influence on vaccine decision-making.<sup>2,7</sup> Mistrust may be vaccine-related or related more broadly to health professionals, health systems, or the government.<sup>7</sup> Compared to other races, medical mistrust tends to affect a disproportionate amount of Blacks, which is in line with this study's finding that Blacks were reportedly more unlikely to get vaccinated compared to both Caucasians and Hispanics ( $P < .001$ ).<sup>12</sup> To garner trust, it's important to engage in immunization communication with the community and share key messages that promote action through multiple trusted channels.<sup>7,13</sup> Targeted interventions might be more effective in addressing vaccine hesitancy, and messages should be tailored to fit the values and norms of the targeted subgroup.<sup>4,7</sup>

According to this study, more patients were likely to receive a COVID-19 vaccine if they had been tested for the disease ( $P = .002$ ). The decision to vaccinate by someone who has suffered from COVID-19 may have a positive influence on the vaccination decisions of their family and friends. It is recommended that individuals have discussions with their loved ones about vaccination to encourage their decision to vaccinate.<sup>13</sup> Celebrating the decision to get vaccinated and making that decision visible to others can help decrease vaccine hesitancy.

Lower education has been associated with vaccine hesitancy and the refusal to get vaccinated, which supports our finding that patients with an associate degree or higher were more likely to get vaccinated ( $P = .032$ ).<sup>14,15</sup> This data suggests educating the public about vaccines is crucial to ensure public acceptance and widespread administration. While providing education is imperative for providers, the focus should not be on intimidating patients to receive the COVID-19 vaccine, but on dedicating time to listen to the thoughts, fears, and opinions of their patients so that they can be thoughtfully addressed at an appropriate level for the patient.<sup>16</sup> This allows patients to have adequate knowledge



**Figure 1.** Self-reported patient barriers to receiving a COVID-19 vaccination.

**Table 2.** Likert-Type Responses to Questions Regarding Vaccine Hesitancy.

Question(s)	Highly Unlikely n (%)*	Unlikely n (%)*	Neutral n (%)*	Likely n (%)*	Highly Likely n (%)*	N/A n (%)*
How likely are you to receive a COVID-19 vaccination? (N = 202)	60 (29.7)	15 (7.4)	42 (20.8)	17 (8.4)	57 (28.2)	11 (5.4)
How likely are you to return for another dose of the COVID-19 vaccine? (N = 201)	57 (28.4)	15 (7.5)	36 (17.9)	16 (8.0)	53 (26.4)	24 (11.9)
How likely are you to forbid your children from receiving a COVID-19 vaccination? (N = 138)**	66 (47.8)	16 (11.6)	31 (22.5)	4 (2.9)	21 (15.2)	—
How likely are you to recommend the COVID-19 vaccine to your friends/family? (N = 202)	52 (25.7)	12 (5.9)	48 (23.8)	21 (10.4)	52 (25.7)	17 (8.4)
How likely are you to avoid wearing a mask after receiving the COVID-19 vaccine? (N = 199)	118 (59.3)	17 (8.5)	21 (10.6)	3 (1.5)	15 (7.5)	25 (12.6)

\*Percentages may not add up to 100% due to rounding.

\*\*A denominator of 138 was used to represent the number of patients who had children. A total of 197 patients answered this question and 59 responded as 'N/A'.

of the benefits and risks associated with COVID-19 vaccination, so patients can make their own informed decision. Taking the time to listen to hesitant patients has been supported by other studies which found that immediately addressing patient questions with an overwhelming amount of information has the potential to actually heighten medical mistrust and therefore, increase vaccine hesitancy.<sup>16,17</sup>

Patients in this study indicated their largest concern with receiving a COVID-19 vaccine was the associated side effects. Additionally, patients mentioned feeling uninformed about the vaccine in relation to its mechanism of action. These concerns are common and are not just limited to novel vaccine therapies.<sup>18</sup> While cost was not the most commonly reported concern, it was still mentioned as a barrier to receiving a COVID-19 vaccine. Currently in the US, vaccine doses are purchased with taxpayer dollars and available to everyone at no cost regardless of their immigration or health insurance status.<sup>19</sup>

As we continue our efforts of widespread immunization, the WHO encourages the continued use of masks, and patients in this study indicated they were highly likely to continue wearing their masks even after vaccination (59.3%). This is encouraging information; showing that the public does take COVID-19 seriously and wants to avoid either contracting or spreading the virus, even if they opt out of receiving a vaccine.

## Limitations

The study had limitations. It was conducted at a single site, and the questionnaire was not validated. Due to the anonymity of the study, it is possible that patients may have filled out more than one questionnaire. Appointment spacing, however, reduced the likelihood of this occurring as patients were usually seen once every 3 to 6 months. Additionally, questionnaires were attached to patient intake forms which are only

completed once per calendar year. As is common with Likert-type questions, it is possible that patients were biased in selecting all highly unlikely since it was the first available value under these questions. Although questions were written in a way to reduce selection bias, evidence of this was seen during data analysis. Additionally, there was no way to determine a response rate or to account for nonresponse bias. Furthermore, KC CARE has a large population of Spanish speaking patients. Since materials were only available in English, our sample size was limited. While the investigators took steps to ensure the staff was properly trained and aware of the inclusion criteria, it is possible questionnaires were filled out by patients who cannot read or write English proficiently.

## Conclusion

Vaccine hesitancy is still a threat to vaccination efforts against COVID-19 and medical mistrust, especially in the Black population, is still prevalent despite the advancements in science and technology. This study showed that there was a correlation between vaccine hesitancy and epidemiologic factors. While this is not a problem to be tackled overnight, educating vulnerable or mistrusting populations and being empathic to their viewpoints are possible means of addressing vaccine hesitancy.

## Authors' Note

This descriptive cross-sectional study occurred over a period of 15 weeks between October 2020 and February 2021. This study was approved by the University of Missouri Kansas City Institutional Review Board (IRB) (Protocol #: 2034362).

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

## ORCID iDs

Letoia R. Clark  <https://orcid.org/0000-0001-6510-9531>  
 Mark Thomas Sawkin  <https://orcid.org/0000-0002-9446-007X>  
 Brittany Lee Melton  <https://orcid.org/0000-0002-6994-753X>

## Supplemental Material

Supplemental material for this article is available online.

## References

1. CDC COVID data tracker. <https://covid.cdc.gov/covid-data-tracker/#datatracker-home>. Accessed February 8, 2021.
2. Global vaccine action plan 2011-2020. <https://www.who.int/publications/i/item/global-vaccine-action-plan-2011-2020>. Accessed July 31, 2021.
3. U.S. COVID-19 Vaccine Product Information | CDC. <https://www.cdc.gov/vaccines/covid-19/info-by-product/index.html>. Accessed February 8, 2021.
4. MacDonald NE, Butler R, Dubé E. Addressing barriers to vaccine acceptance: an overview. *Hum Vaccin Immunother*. 2018;14(1):218-224. doi:10.1080/21645515.2017.1394533.
5. Larson HJ, Jarrett C, Eckersberger E, Smith DMD, Paterson P. Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: A systematic review of published literature. *Vaccine*. 2007–2012;32(19):2150-2159. doi:10.1016/J.VACCINE.2014.01.081.
6. Dubé E, Laberge C, Guay M, et al. Vaccine hesitancy: An overview. *Hum Vaccin Immunother*. 2013;9(8):1763-1773. doi:10.4161/HV.24657.
7. Report of the sage working group on vaccine hesitancy. Published online 2014.
8. Khubchandani J, Macias Y. COVID-19 vaccination hesitancy in Hispanics and African-Americans: A review and recommendations for practice. *Brain, Behav Immun - Heal*. 2021;15:100277. doi:10.1016/J.BBIH.2021.100277.
9. Shui IM, Weintraub ES, Gust DA. Parents concerned about vaccine safety: Differences in race/ethnicity and attitudes. *Am J Prev Med*. 2006;31(3):244-251. doi:10.1016/J.AMEPRE.2006.04.006.
10. Ten threats to global health in 2019. <https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019>. Accessed April 5, 2021.
11. COVID-19 Vaccinations | KC Care Health Center. <https://kccare.org/covidvaccine/>. Accessed March 22, 2021.
12. Sullivan LS. Trust, risk, and race in American medicine. *Hastings Cent Rep*. 2020;50(1):18-26. doi:10.1002/hast.1080.
13. Building confidence in COVID-19 vaccines | CDC. <https://www.cdc.gov/vaccines/covid-19/vaccinate-with-confidence.html>. Accessed July 31, 2021.
14. Bertonecello C, Ferro A, Fonzo M, et al. Socioeconomic determinants in vaccine hesitancy and vaccine refusal in Italy. *Vaccines*. 2020;8(2):1-9. doi:10.3390/vaccines8020276.
15. Freeman D, Loe BS, Chadwick A et al. COVID-19 vaccine hesitancy in the UK: The Oxford coronavirus explanations, attitudes, and narratives survey (Oceans) II. *Psychol Med* 2020; Dec 11:1-15. doi:10.1017/S0033291720005188.
16. Using care and compassion to respond to vaccine hesitancy. <https://www.linkedin.com/pulse/using-care-compassion-respond-vaccine-hesitancy-bruce-berger/>. Accessed March 22, 2021.
17. Choy HH, Ismail A. Indicators for medical mistrust in healthcare—A review and standpoint from southeast Asia. *Malaysian J Med Sci*. 2017;24(6):5-20. doi:10.21315/mjms2017.24.6.2.
18. Salmon DA, Dudley MZ, Glanz JM, Omer SB. Vaccine hesitancy: Causes, consequences, and a call to action. *Vaccine*. 2015; 33:D66-D71. doi:10.1016/j.vaccine.2015.09.035.
19. Key Things to Know About COVID-19 Vaccines. [https://www.cdc.gov/coronavirus/2019-ncov/vaccines/keythingstoknow.html?s\\_cid=10490:covidvaccinations:sem.ga:p:RG:GM:gen:PTN:FY21](https://www.cdc.gov/coronavirus/2019-ncov/vaccines/keythingstoknow.html?s_cid=10490:covidvaccinations:sem.ga:p:RG:GM:gen:PTN:FY21). Accessed April 5, 2021.