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Featured Article

Addressing hesitancy to COVID-19 vaccines in healthcare assistants

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ABSTRACT

COVID-19 vaccination rates have been suboptimal in frontline healthcare assistants (HCAs). We sought to characterize contributors to COVID-19 vaccine hesitancy among HCAs. We conducted an analysis of online survey responses from members of the National Association of Health Care Assistants from December 2020–January 2021. Respondents were asked what it would take for them to be vaccinated against COVID-19. Responses from 309 HCAs were coded to characterize respondents' willingness to be vaccinated and identify contributors to vaccine hesitancy. Approximately 60% ($n = 185$) of HCAs expressed hesitancy but would consider getting vaccinated under certain circumstances. We identified 8 overarching themes for contributors to COVID-19 vaccine hesitancy, the most common being safety concerns (70% of respondents). Others included efficacy (11.4%), workplace requirements (9.7%), societal influence (9.2%), and compensation (8.1%). Interventions to increase vaccine uptake among HCAs may be most effective by addressing concerns regarding the short-term and long-term safety implications of COVID-19 vaccines.

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Introduction

Since the onset of the COVID-19 pandemic, vaccine uptake among frontline healthcare workers in the long-term care setting has been suboptimal. Vaccine hesitancy has been described in several studies conducted among U.S. healthcare workers, with at least 30% reporting some uncertainty regarding vaccination against COVID-19, following the approval of the first vaccines.^{1–6} Healthcare workers who were more likely to be willing to be vaccinated included those who were older, male, Asian or White, and had more education.^{3–5} Similar findings have been observed for healthcare assistants (HCAs), certified nursing assistants, and similarly credentialed frontline caregivers, who are arguably among those with the highest risk of COVID-19 exposure.^{7,8}

The Centers for Medicare and Medicaid Services (CMS) issued a ruling in late summer 2021 that would require HCAs and other workers in nursing homes, hospitals, and other healthcare facilities participating in the Medicare and Medicaid programs to be vaccinated

against COVID-19. Although the intent of such mandates is to protect patients and healthcare workers, these mandates have not been universally popular given concerns they may exacerbate the existing shortage of frontline HCAs, particularly for the long-term care setting.⁹ Further, the mandates do not require that staff receive a booster vaccination. Given the recent rise in COVID-19 outbreaks due to the Omicron variant, it is important that frontline healthcare workers also receive a booster vaccination to prevent continued outbreaks.

Low vaccination rates among frontline healthcare workers in the long-term care setting is not a new issue unique to the COVID-19 pandemic. Long-term care facilities remain vulnerable to influenza outbreaks given close habitation and in some cases, inadequate infection control practices, yet fewer than 70% of healthcare workers in the long-term care setting receive influenza vaccines.¹⁰ Contributors to low influenza vaccination rates include concerns related to adverse effects, lack of effectiveness, and lack of trust combined with a strong belief that vaccine mandates are a violation of personal autonomy.^{11,12} It is very likely that the same concerns also contribute to vaccine hesitancy with COVID-19 vaccines.

Although prior studies have reported on potential reasons for vaccine hesitancy among frontline healthcare workers generally,^{2,13} few studies have reported concerns from the perspectives of HCAs,

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specifically who have extensive direct contact with older adults. Research is needed to determine optimal strategies to address concerns about COVID-19 vaccination from frontline HCAs, thereby improving workplace safety and preserving the existing workforce.

The purpose of this study was to: (1) describe patterns of COVID-19 vaccine hesitancy among frontline HCAs overall and across respondent characteristics; and (2) explore reasons for COVID-19 vaccine hesitancy. Responses were taken from a national survey conducted among frontline HCAs at the time of initial COVID-19 vaccine roll out (December 2020–January 2021).

Methods

This study was deemed exempt by the Institutional Review Board, Advarra and the University of North Carolina at Chapel Hill.

Design

This study was a mixed-methods analysis of quantitative survey responses combined with qualitative data analysis of free-text responses. We included all available responses from a national survey of HCAs age 18 and older.¹ To summarize, we developed a survey to evaluate respondents' perceptions of COVID-19 vaccines, based on an environmental scan of the literature and expert opinion of our study team. The survey included questions related to perceptions of COVID-19 vaccine safety and effectiveness, adequate COVID-19 testing, trusted sources of information, and communication preferences. Respondent characteristics, including age, race, ethnicity, job setting, and geographic region were also collected.

Procedure

The survey was distributed to the membership of the National Association of Health Care Assistants (NAHCA), the main professional association for HCAs, through an email distribution and private Facebook page. The NAHCA has a membership of more than 26,000 healthcare assistants, representing over 500 nursing homes across the United States. The association provides opportunities for recognition, training, and mentoring, as well as advocacy efforts for issues important to long-term care and healthcare assistants. Responses were collected through an anonymous Qualtrics survey link from December 20, 2020 through January 15, 2021. No reminders or follow-ups were sent regarding the survey.

Measures

For this study, we conducted a targeted analysis of free-text responses to a question asking, "Briefly, in your own words, what would it take for you to get the COVID-19 vaccine?". We also evaluated responses from a question asking which types of information sources HCAs trusted most for accurate information about COVID-19.

Sample

We collected a total of 442 responses. Among these, the sample was limited to 366 (82.8%) responses from HCAs (certified nursing assistants, home health aides, certified medication technicians). We further restricted our analysis to those who provided a response to the main question of interest (i.e., "What would it take for you to get the COVID-19 vaccine?") ($n = 309$).

Analysis

We used inductive coding to identify potential contributors for vaccine hesitancy. Responses were coded on several levels using

NVivo. The first level of coding classified responses based on the respondent's perceived willingness to receive the COVID-19 vaccine. These were classified into three main categories: (1) definitely will get the vaccine or has already received the vaccine ("yes"); (2) definitely will not get the vaccine ("no"); (3) maybe would get the vaccine ("maybe"). Responses were independently coded by two members of the research team (CJK, JDN) and reviewed by both parties to resolve any discrepancies. Demographic characteristics for the full sample of respondents were summarized and compared across these three response categories.

After the first level of coding was complete, responses from the third category (i.e., those who were hesitant, but may consider getting the vaccine) were coded for specific reasons that may contribute to vaccine hesitancy. A single response could be coded multiple times, depending on the response provided. For example, if a respondent expressed concerns about the efficacy of the vaccine as well as concerns about side effects, both reasons were coded. This second level of coding was again completed independently by two members of the study team (CJK, JDN), and codes were reviewed to resolve potential discrepancies. Individual codes for specific reasons for vaccine hesitancy were grouped into larger themes based on discussion with the larger study team.

Finally, to understand which types of interventions may be successful in addressing vaccine hesitancy, we also evaluated responses from a separate question on the survey, which asked respondents to select which information sources they considered trustworthy for receiving information related to COVID-19.

Frequencies and patterns of coded data were analyzed across respondents using SAS v9.4. Quantitative analyses of sample characteristics and other survey responses were also conducted using SAS v9.4.

Results

Respondent characteristics are presented in Table 1. Sixty percent ($n = 185$) of respondents reported hesitancy in getting vaccinated, but would consider getting the vaccine under certain circumstances. In comparison, 22% of respondents expressed that they would definitely get the vaccine and 18% of respondents expressed that they would definitely not get the vaccine. We noted several observable differences in willingness to be vaccinated across demographic categories. Among participants reporting vaccine hesitancy, more were Black non-Latinx compared to participants willing to be vaccinated. Several differences were noted across job setting. Vaccine hesitancy was more common among those working in nursing homes, whereas vaccine acceptance was more common among those working in hospitals and assisted living. We also observed notable geographic variation, with vaccine hesitancy being most common among respondents from the Midwest and South.

Among those respondents who would consider receiving the vaccine ($n=185$), we identified 8 broad themes that best described potential contributors to vaccine hesitancy (Table 2), including: safety concerns, efficacy, workplace requirements, social influence, compensation, lack of trust, convenience, and misinformation. The frequencies of specific codes corresponding to these themes are presented in Fig. 1.

Potential contributors to COVID-19 vaccine hesitancy

Safety concerns

Overwhelmingly, safety concerns were the most frequently reported contributors to vaccine hesitancy (69.7%). Hesitations regarding the safety of COVID-19 vaccines included concerns about the rapid approval process, immediate side effects, and long-term

Table 1
Respondent characteristics for frontline health care assistants ($n = 309$).

Variable	Definitely will get vaccinated $n = 67$		Definitely will not get vaccinated $n = 57$		May get vaccinated $n = 185$		p-value
	n	%	n	%	n	%	
Age							0.19
18–24	4	6.0	4	7.0	18	9.7	
25–34	13	19.4	15	26.3	44	23.8	
35–44	16	23.9	16	28.1	44	23.8	
45–54	21	31.3	15	26.3	53	28.6	
55+	13	19.4	5	8.8	26	14.1	
Missing	0	0.0	2	3.5	0	0.0	
Race							0.004
American Indian/Alaskan Native	2	3.0	1	1.8	3	1.6	
Asian	6	9.0	0	0.0	3	1.6	
Black	11	16.4	22	38.6	37	20.0	
Native Hawaiian/Pacific Islander	0	0.0	1	1.8	2	1.1	
White	41	61.2	25	43.9	110	59.5	
Multiracial	2	3.0	0	0.0	8	4.3	
Other	2	3.0	0	0.0	8	4.3	
Missing	3	4.5	8	14.0	14	7.6	
Ethnicity							0.063
Latino/a	9	13.4	2	3.5	21	11.4	
Missing	2	3.0	8	14.0	12	6.5	
Job Setting							0.006
Nursing home	32	47.8	34	59.6	115	62.2	
Assisted living community	9	13.4	4	7.0	14	7.6	
Continuing care retirement community	0	0.0	1	1.8	0	0.0	
Group home	2	3.0	0	0.0	3	1.6	
Home care	5	7.5	13	22.8	11	5.9	
VA or Veterans home	0	0.0	1	1.8	4	2.2	
Hospital	13	19.4	4	7.0	26	14.1	
Other	6	9.0	0	0.0	11	5.9	
Missing	0	0.0	0	0.0	1	0.5	
Region							0.033
Northeast	15	22.4	6	10.5	16	8.6	
Midwest	16	23.9	16	28.1	53	28.6	
South	21	31.3	30	52.6	81	43.8	
West	14	20.9	4	7.0	34	18.4	
Missing	1	1.5	1	1.8	1	0.5	

side effects. For example, one respondent stated, “I do not want to get the COVID vaccine for at least a couple of years, when all the “kinks” are worked out. I personally feel that the vaccine hasn’t been around long enough to do adequate testing, therefore we won’t know how it effects people in the long run.” Several respondents also raised personal concerns related to their specific health conditions, for example: “I have multiple health issues and severe allergies to medication. I’m not sure what I would need to get it, I know that my risk of complications from COVID-19 are high, but the vaccine is too new.”

Efficacy

Fewer respondents mentioned efficacy as a potential contributor to their hesitancy (11.4% of respondents). One respondent expressed that seeing a high efficacy rate would be necessary for them to be

Table 2
Major themes identified for potential contributors to vaccine hesitancy ($n = 185$)*.

What would it take for you to get the COVID-19 Vaccine?	n	%
Safety concerns	129	69.7
Efficacy	21	11.4
Workplace requirement	18	9.7
Societal influence	17	9.2
Compensation	15	8.1
Convenience	9	4.9
Lack of trust	8	4.3
Misinformation	7	3.8

* Presented as percent of respondents. Categories are not mutually exclusive.

vaccinated, “90% effective rate of not contracting or spreading with 1 single dose”, while another expressed “I want to see the numbers go low in order for me to believe it works”. A handful of respondents were also concerned about long-term immunity or resistant strains of the COVID-19 virus, for example: “I wish we had more information on how long the vaccine will last or need a booster... There will without question be new strains that develop as time goes on, history shows us this. How does this relate to the vaccine?”.

Workplace requirements

Several respondents (9.7%) mentioned that workplace requirements would influence their decision-making, both positively and negatively. For example, one respondent stated that a mandate would be the only way that they would be vaccinated: “I will not get the COVID vaccine if I can help it unless they force my hand... unless they wouldn’t let me have a job without it.”. Another respondent expressed that a mandate would force them to quit their job: “I will quit my job if they try to mandate it.”.

Social influence

Respondents also mentioned that the influence of others may affect their decision-making in receiving the COVID-19 vaccine (9.2%), including seeing public officials and peers being vaccinated and having endorsement from a healthcare provider. One respondent expressed that public officials should receive the vaccine to build confidence among their constituents: “To see public officials get the

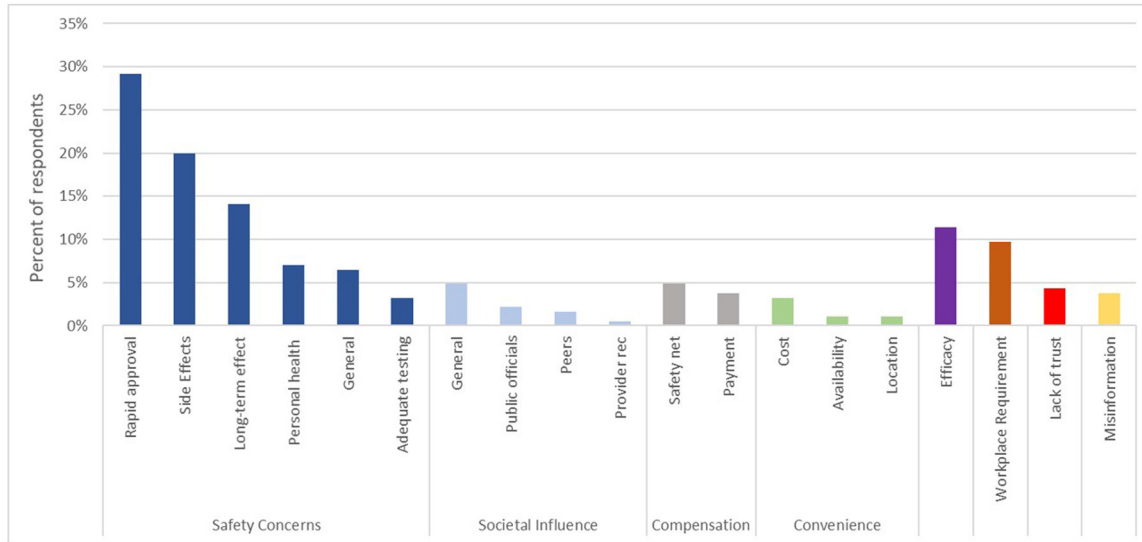


Fig. 1. Specific contributors to vaccine hesitancy in frontline health care assistants.

vaccine and then be exposed to a positive COVID person and see how effective the vaccine is!" Another respondent expressed that seeing how others tolerated the vaccine would help them to decide: "To see more people taking the vaccine and reactions will build my confidence in the future."

Compensation

Compensation was also mentioned as an important influence. This included paid incentives to receive the vaccine as well as assurance that they would receive paid time off if they had a severe reaction to the vaccine. For example: "Knowing my work was behind me with anything I need if something were to happen. I react easy to vaccinations. I get sick and need at least 3 days off. I would have no compensation right now if I were to get it."

Other considerations

Other less common contributors to vaccine hesitancy were convenience (4.9%), lack of trust (4.3%), and misinformation (3.8%). Most responses related to convenience indicated that the availability of the vaccine as free or low-cost as important in decision-making. Several respondents expressed a lack of trust in those who advocate for the benefits of COVID-19 vaccines. One respondent noted a lack of trust in their employer, "Better support from my employer. They don't care about their employees...". Another respondent expressed a lack of trust in government leaders, "More research and less influence from government officials and the elite pushing it." Finally, there were several instances for which potential misinformation. For example, one respondent stated, "Proof that it doesn't alter my DNA, proof it doesn't affect my mind." while another noted, "A guarantee that there is no chip in it."

Trusted information sources

Among respondents who would consider getting vaccinated against COVID-19, only half (48.6%) indicated that their doctor or healthcare provider was someone they would trust for accurate information about COVID-19. Employers were identified as a trusted information source by just 24.9% of respondents, with even fewer identifying state/local government (21.1%) or the federal government (20.0%).

Discussion

In a sample of frontline HCAs, the most common contributors to vaccine hesitancy were concerns related to the safety of COVID-19 vaccines. Several respondents noted that workplace requirements could also be influential in their decision to be vaccinated. Less common contributors included social influence, compensation, convenience, lack of trust in leadership, and misinformation.

Our findings highlight that vaccine hesitancy in the early stages of the pandemic was primarily driven by a rational fear for personal health and safety, as opposed to misinformation. This is in alignment with the findings of a recent study summarizing concerns expressed during town hall meetings with long-term care staff.⁶ Low rates of vaccination and low confidence in the safety of vaccines among HCAs may also be influenced by feelings of exploitation by a healthcare system that continues to overwork¹⁴ and underpay¹⁵ these disenfranchised individuals. Vaccine hesitancy was shown to be influenced by a lack of trust in organizational leadership in our prior work.¹ However in the present study, just a handful of respondents specifically mentioned a lack of trust in their workplace or public leaders. Relatedly, just one in four respondents believed their employer to be a trusted source for information related to COVID-19, suggesting opportunities to improve organizational culture and bring staff together with the common goal of ending the pandemic.

Another interesting observation was that few responses mentioned vaccine effectiveness. This may be at least partially attributable to the influence of social media¹⁶ and media coverage highlighting rare cases of severe adverse reactions. It is critical to ask and address individual concerns of safety when addressing vaccine hesitancy in HCAs.

It was interesting that mandates were mentioned by 10% of respondents, given that this survey was conducted shortly after the approval of the first COVID-19 vaccines and prior to any public discussions of mandates. Although the aim of the CMS mandate is to increase vaccine rates in this critical group, details, including whether it will allow a test-out option, have not been released. It is unclear whether such a mandate would have the intended effect of increased vaccine uptake or if it would simply exacerbate the existing shortage of frontline healthcare workers across care settings.¹⁷ A report from the Kaiser Family Foundation¹⁸ found that more than half of unvaccinated American workers were opposed to COVID-19 vaccine mandates and more than one third would likely leave their job in the face

of an employer requirement. Additionally, data from prior studies on influenza vaccine uptake suggests that vaccine mandates may be perceived as a violation of personal autonomy.¹¹ We acknowledge that surveys, including ours, are limited to evaluating perceptions only, which may not accurately translate to real-world behavior in the face of such a mandate. However, these findings do suggest that mandates and similar punitive actions may not be sufficient to overcome the concerns of HCAs for being vaccinated against COVID-19.

Our study highlights that targeted interventions addressing the specific concerns of HCAs, namely safety, may be more effective in addressing vaccine hesitancy. A recent analysis of COVID-19 vaccine uptake in long-term care facilities found that facilities using multi-pronged strategies that included frontline staff champions, vaccination goals, and non-monetary incentives (e.g., t-shirts) were able to achieve significantly higher rates of vaccination.¹³ Individualized discussions that allow HCAs to express their viewpoints and perceptions may also help organizational leaders to better understand and address the specific reasons for low confidence in the safety of COVID-19 vaccines. Future research should continue to evaluate which types of strategies may be most effective for increasing HCA's willingness to be vaccinated without compromising staff retention.

Several limitations should be noted. Our survey was not based on a previously validated instrument, since none exists for this topic. It was developed based on a comprehensive literature scan and expert review from our multidisciplinary team, but lack of psychometric validation may limit results. We used a convenience sample of HCAs who responded to an anonymous survey link distributed through a national organization. Thus, our findings may not be generalizable to all HCAs. Our findings should also be interpreted carefully, given that this survey was administered in the early period of the pandemic, shortly after the first COVID-19 vaccines were approved, and perceptions may have changed in the time since. Nevertheless, our study speaks to the importance of addressing vaccine hesitancy in the face of workplace mandates as well as the inevitability of requirements for booster vaccinations in the near future.

Conclusions and implications

COVID-19 vaccine hesitancy among frontline HCAs was primarily driven by rational concerns related to safety and adverse effects. Although federal vaccine mandates should increase vaccination rates among frontline healthcare workers, our findings suggest that targeted educational messaging and testimonials from healthcare providers, workplace and community peers, and public figures with similar concerns may be effective to promote staff retention through bolstered confidence in vaccine safety.

Disclosures

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populations disproportionately affected by the pandemic. Dr. Berry receives funds to mentor through a grant from the NIA (K24 AG070106). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Brief summary

Among frontline healthcare assistants, safety concerns were the most frequently cited reason for hesitancy to be vaccinated against COVID-19.

What would it take for healthcare assistants to get the COVID-19 vaccine?

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References

- Niznik JD, Harrison J, White EM, et al. Perceptions of COVID-19 vaccines among healthcare assistants: a national survey. *J Am Geriatr Soc.* 2021.
- Unroe KT, Evans R, Weaver L, et al. Willingness of long-term care staff to receive a COVID-19 vaccine: a single state survey. *J Am Geriatr Soc.* 2020.
- Kuter BJ, Browne S, Momplaisir FM, et al. Perspectives on the receipt of a COVID-19 vaccine: a survey of employees in two large hospitals in Philadelphia. *Vaccine.* 2021;39(12):1693–1700.
- Famuyiro TB, Ogunwale A, des Bordes J, et al. COVID-19: perceived infection risk and barriers to uptake of pfizer-BioNTech and moderna vaccines among community healthcare workers. *J Racial Ethn Health Disparities.* 2021.
- Shaw J, Stewart T, Anderson KB, et al. Assessment of U.S. health care personnel (HCP) attitudes towards COVID-19 vaccination in a large university health care system. *Clin Infect Dis.* 2021.
- Berry SD, Johnson KS, Myles L, et al. Lessons learned from frontline skilled nursing facility staff regarding COVID-19 vaccine hesitancy. *J Am Geriatr Soc.* 2021;69(5):1140–1146.
- Lee JT, Althomsons SP, Wu H, et al. Disparities in COVID-19 vaccination coverage among health care personnel working in long-term care facilities, by job category, national healthcare safety network - United States, March 2021. *MMWR Morb Mortal Wkly Rep.* 2021;70(30):1036–1039.
- McGarry BE, Shen K, Barnett ML, et al. Association of nursing home characteristics with staff and resident COVID-19 vaccination coverage. *JAMA Intern Med.* 2021.
- White EM, Wetle TF, Reddy A, Baier RR. Front-line nursing home staff experiences during the COVID-19 pandemic. [published correction appears in *J Am Med Dir Assoc.* 2021 May;22(5):1123] *J Am Med Dir Assoc.* 2021;22(1):199–203.
- Frentzel E, Jump RLP, Archbald-Pannone L, et al. Recommendations for mandatory influenza vaccinations for health care personnel from AMDA's infection advisory subcommittee. *J Am Med Dir Assoc.* 2020;21(1):25–28. e2.
- Pless A, McLennan SR, Nicca D, et al. Reasons why nurses decline influenza vaccination: a qualitative study. *BMC Nurs.* 2017;16:20.
- Daugherty JD, Blake SC, Grosholz JM, et al. Influenza vaccination rates and beliefs about vaccination among nursing home employees. *Am J Infect Control.* 2015;43(2):100–106.
- Berry SD, Baier RR, Syme M, et al. Strategies associated with COVID-19 vaccine coverage among nursing home staff. *J Am Geriatr Soc.* 2021.
- White EM, Aiken LH, McHugh MD. Registered nurse burnout, job dissatisfaction, and missed care in nursing homes. *J Am Geriatr Soc.* 2019;67(10):2065–2071.
- Van Houtven CH, DePasquale N, Coe NB. Essential long-term care workers commonly hold second jobs and double- or triple-duty caregiving roles. *J Am Geriatr Soc.* 2020;68(8):1657–1660. <https://doi.org/10.1111/jgs.16509>.
- Wilson SL, Wiysonge C. Social media and vaccine hesitancy. *BMJ Glob Health.* 2020;5(10).
- White EM, Wetle TF, Reddy A, et al. Front-line nursing home staff experiences during the COVID-19 pandemic. [published correction appears in *J Am Med Dir Assoc.* 2021;22(5):1123] *J Am Med Dir Assoc.* 2021;22(1):199–203.
- Kaiser Family Foundation. KFF COVID-19 Vaccine Monitor: October 2021. Accessed: November 15, 2021. Accessible at: https://www.kff.org/coronavirus-covid-19/poll-finding/kff-covid-19-vaccine-monitor-october-2021/?utm_campaign=KFF-2021-polling-surveys&utm_medium=email&_hsmt=2&_hsenc=p2ANqtz-97xmygFx50t3iTx8T72QUjKY4TZ4wvwtY1o2MpekU50ZNXON4HX_VwOg27CG9-4R15Qo-VeG9dOF6IAaXrDA5s70Xg&utm_content=2&utm_source=hs_email.