Motivations for Vaccine Hesitancy Among EMS Providers in the United States who Declined the COVID-19 Vaccine

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COVID-19: coronavirus disease 2019
EMS: Emergency Medical Services

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Abstract

Background: Hesitancy towards the coronavirus disease 2019 (COVID-19) vaccine has been a topic of considerable concern in recent months. Studies have reported hesitancy within the general population and specific facets of the health care system. Little evidence has been published about vaccine hesitancy among Emergency Medical Services (EMS) providers despite them having played a frontline role throughout the pandemic.

Methods: A 27-question survey examining vaccination decisions and potential influencing factors among EMS providers was created and disseminated. Responses from providers who declined a COVID-19 vaccine were compared with responses from providers who did not decline a COVID-19 vaccine.

Results: Across 166 respondents, 16% reported declining a COVID-19 vaccine. Providers who self-identified as men, providers who reported conservative or conservative-leaning beliefs, and providers surrounded by environments where the vaccine was discussed negatively or not encouraged are significantly more likely to decline a vaccine ($P < .01$). Providers who have declined a vaccine reported significantly greater levels of concern about its safety, effectiveness, and development ($P < .01$).

Conclusion: This study answers key questions about why some EMS providers might be declining COVID-19 vaccinations. Initiatives to improve vaccination among EMS providers should focus on the areas highlighted, and further studies should continue to examine vaccine hesitancy among EMS providers as well as in other populations.

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Introduction

In the United States, the first vaccines specifically designed for Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-COV-2)/coronavirus disease 2019 (COVID-19) were authorized and first administered in therapeutic settings beginning in December 2020.[1] Early vaccine doses were prioritized for health care workers, and this allocation strategy has epidemiological and ethical support.[2–4] Despite this, vaccine hesitancy has been widely reported among the general public and health care workers, including Emergency Medical Services (EMS) providers.[5–8] Experts suggest minimal vaccine hesitancy will yield the greatest chance of ending the pandemic.[9] Studies examining attitudes towards vaccines within the general population have reported concerns about the effectiveness of COVID-19 vaccines and the speed of vaccine development.[10] Understanding EMS providers' motivations for declining the vaccine will be essential to improving vaccination rates and decreasing the intensity of the COVID-19 pandemic, as well as supporting future pandemic preparedness. This study aims to explore the sociological, psychological, and environmental factors influencing vaccine hesitancy among EMS providers.

Methods

To analyze EMS provider motivations and attitudes towards COVID-19 vaccines, a 27-question online survey was constructed and shared by email and through social media to active EMS providers. Questions asked participants about demographic information, information about the type of department they work for, their political beliefs, their attitudes towards COVID-19 vaccines, and how the vaccine was talked about by their colleagues and family.

Before starting the survey, respondents provided informed consent. Not all questions were required, and participants were advised they could withdraw from the survey at any time. The survey was determined to be minimal risk and was approved by members of the Ossining Science Research Program institutional review board on March 18, 2021 (Ossining, New York USA; 20210323-215737). Survey attempts considered by multiple investigators to be disingenuous based on responses that were off-topic were excluded from the final analysis. One of the specific aims of this research study was to compare the motivations of EMS providers who accepted the COVID-19 vaccine with the motivations of EMS providers who declined the COVID-19 vaccine. Therefore, the perspectives of respondents who declined a COVID-19 vaccine were compared with the perspectives of respondents who did not decline a COVID-19 vaccination. One way this was achieved was by numerically coding responses to questions where respondents were asked to what extent a given factor (eg, vaccine safety or vaccine effectiveness) affected their vaccination decision. Available answers included: "Not At All," "Mildly," "Moderately," or "Significantly." Responses were coded on a one-to-four scale, where one equated to "Not At All" and four equated to "Significantly." It then became possible to compare average scores for respondents across both groups using two-tailed t-tests. Differences in percentages between groups were analyzed using two-tailed two-proportion z-tests.

Results

A total of 166 respondents submitted answers to the survey; the first response was received on April 3, 2021 and the last response was received on August 8, 2021. The average age of respondents was around 38 years of age; the youngest respondent was 18 years old and the oldest respondent was 80 years old. Sixteen percent of respondents indicated they had declined a COVID-19 vaccine and 84% of respondents reported either being fully-vaccinated or having received at least one dose of the COVID-19 vaccine when they completed the survey.

Respondents Who Declined a COVID-19 Vaccine

Eighty-five percent of respondents who declined a COVID-19 vaccine self-identified as men and 81% self-identified as White. The average age in this cohort was 35.5 years old. Forty-two percent worked in urban settings, 38% worked in suburban settings, and 19% worked in rural settings. Thirty-one percent worked for large departments (>500 members), 27% worked for departments with between 101 and 500 members, 23% worked for departments with between 51 and 100 members, and 19% worked for small departments (<50 members). Seventy-six percent indicated they held either conservative or conservative-leaning beliefs, and the remaining 13% considered themselves centrists; no respondents who declined a COVID-19 vaccine and disclosed their political beliefs indicated they held liberal or liberal-leaning beliefs.

When asked about the concerns involved with their decision, 73% reported significant concerns about the safety of the vaccines, 62% reported significant concerns with the effectiveness of the vaccines, 73% reported significant concerns about the speed of vaccine development, eight percent reported significant concerns about prioritizing vaccine doses for others, 35% reported significant concerns about the political environment surrounding COVID-19 vaccines, and 54% reported significant concerns about government involvement in COVID-19 vaccines. Seventy-three percent of respondents reported vaccine safety or personal safety being the biggest factor influencing their decision. Seventy-seven percent reported wanting to wait to see how the vaccine affected others and 38% of respondents reported having tested positive for COVID-19 before. When considering environmental factors, 42% reported their colleagues talked negatively about the vaccine. Most reported not being strongly encouraged or discouraged to receive the vaccine by their supervisor(s) (65%) or family (62%).

Twenty-three percent reported later receiving a COVID-19 vaccine after declining an earlier dose, 15% reported being undecided about whether they would eventually accept a COVID-19 vaccine when they completed the survey, and 62% reported they were not planning on receiving a COVID-19 vaccine at the time they completed the survey.

Respondents Who Did Not Decline a COVID-19 Vaccine

Fifty-seven percent of respondents who did not decline a COVID-19 vaccine self-identified as men and 41% self-identified as women. Seventy-three percent identified as White. The average age was 38.7 years old. Twenty-seven percent worked in urban settings, 66% worked in suburban settings, and six percent worked in rural settings. Nine percent worked for large departments (>500 members), 31% worked for departments with between 101 and 500 members, 46% worked for departments with between 51 and 100 members, and 13% worked for small departments (<50 members). Twenty percent reported holding either conservative or conservative-leaning beliefs, 46% reported holding liberal or liberal-leaning beliefs, and 16% identified as centrists.

Just two percent reported significant concerns about the safety of the COVID-19 vaccine, nine percent reported significant concerns with the effectiveness of the vaccines, 0.7% reported significant concerns about the speed of vaccine development, nine percent reported significant concerns about prioritizing vaccine doses for others, 0.7% reported significant concerns about the political environment surrounding COVID-19 vaccines, and 13% reported significant concerns about government involvement in COVID-19 vaccines. Only 15% reported wanting to wait to see how the vaccine affected others. When considering environmental factors, 67% reported colleagues spoke positively about the vaccine, 79% were either strongly or slightly encouraged by their supervisor(s) to get vaccinated, and 81% were either strongly or slightly encouraged by their families to get vaccinated.

Between Groups Comparison

When comparing the answers of respondents who declined a COVID-19 vaccine with respondents who did not decline a COVID-19 vaccine, notable differences became apparent (Table 1). For instance, respondents who declined a COVID-19 vaccine were significantly more likely to self-identify as men (85% versus 57%; $z = 2.6931$; $P < .01$) and were significantly more likely to hold conservative or conservative-leaning beliefs (77% versus 20%; $z = 5.8866$; $P < .01$). Respondents who reported declining a COVID-19 vaccine were more likely to work in rural communities than respondents who reported not declining a COVID-19 vaccine (19% versus 6%; $z = 2.2393$; $P < .05$). Respondents who declined a COVID-19 vaccine were significantly more likely to agree to the statement "I wanted to wait and see how the vaccine affected others before I got vaccinated" than respondents who did not deny a COVID-19 vaccine (77% versus 15%; $z = 6.731$; $P < .01$).

After coding responses to questions about concerns and averaging the scores within both groups, two-tailed t-tests were performed on the average scores for each question. Results showed

Parameter	Respondents Who Declined a COVID-19 Vaccine Dose (n = 26)	Respondents Who Did Not Decline a COVID-19 Vaccine Dose (n = 140)	Significance
Male-Identifying (%)	85%	57%	$z = 2.6931$, $P < .01$
Work in Rural Settings (%)	19%	6%	$z = 2.2393$, $P < .05$
Self-Reported Conservative or Conservative-Leaning Beliefs (%)	77%	20%	$z = 5.8866$, $P < .01$
Colleagues Spoke Negatively About Vaccine (%)	42%	8%	$z = 4.6848$, $P < .01$
Colleagues Spoke Positively About Vaccine (%)	12%	67%	$z = -5.225$, $P < .01$
Respondents' Supervisor(s) Encouraged Vaccination (%)	31%	79%	$z = -4.9783$, $P < .01$
Respondents' Families Encouraged Vaccination (%)	19%	81%	$z = -6.4173$, $P < .01$
Significant Concerns About Vaccine Safety (%)	73%	2%	$z = 9.8474$, $P < .01$
Significant Concerns About Vaccine Effectiveness (%)	62%	9%	$z = 6.5612$, $P < .01$
Significant Concerns About Speed of Vaccine Development (%)	73%	0.7%	$z = 10.4094$, $P < .01$
Significant Concerns About Political Environment Surrounding Vaccines (%)	35%	0.7%	$z = 6.7254$, $P < .01$
Significant Concerns About Government Involvement in Vaccine Development (%)	54%	13%	$z = 4.8532$, $P < .01$

Table 1. Significant Differences Between Respondents Who Declined a COVID-19 Vaccine Dose and Respondents Who Did Not
Abbreviation: COVID-19, coronavirus disease 2019.

respondents who declined a COVID-19 vaccine were significantly more likely to be concerned with the safety of the vaccine, effectiveness of the vaccine, vaccine development speed, the political environment surrounding vaccine development, and government involvement in vaccine development than respondents who did not decline a COVID-19 vaccine ($P < .01$).

The environments surrounding respondents who declined a COVID-19 vaccine differed significantly from the environments surrounding respondents who did not decline a COVID-19 vaccine. For instance, respondents who declined a COVID-19 vaccine reported their colleagues spoke negatively about the vaccine significantly more than respondents who did not decline a COVID-19 vaccine (42% versus 8%; $z = 4.6848$; $P < .01$). The opposite is also true: respondents who declined a COVID-19 vaccine reported their colleagues spoke positively about the vaccine significantly less than respondents who did not decline a COVID-19 vaccine (12% versus 67%; $z = -5.225$; $P < .01$). Lastly, respondents who declined a COVID-19 vaccine reported their supervisor(s) and families were significantly less likely to encourage them to get the vaccine than respondents who did not decline a COVID-19 vaccine: for supervisor(s) 31% versus 79% ($z = -4.9783$; $P < .01$) and for families 19% versus 81% ($z = -6.4173$; $P < .01$).

Discussion

Notably, these data show interesting differences in the demographics, motivations/attitudes, and environments of EMS providers who declined a COVID-19 vaccine and providers who did not decline a COVID-19 vaccine. For instance, respondents who declined a COVID-19 vaccine were much more likely to be men and hold conservative or conservative-leaning beliefs. Interestingly, some other studies have reported women may be more likely to display hesitancy towards COVID-19 vaccines than men.[8,11,12] However, the finding that individuals with conservative beliefs display greater hesitancy towards COVID-19 vaccines has been replicated by other studies.[11,13] The idea that EMS providers who declined a COVID-19 vaccine are significantly more concerned about safety, efficacy, and vaccine development seems intuitive – after all, these individuals likely utilized these concerns when they made the decision to decline a vaccine. Other studies have identified similar concerns in other populations.[8,10,14] It was interesting that neither group was strongly affected by the potential need to prioritize vaccine doses for others. Many studies point towards the impact culture and environmental factors have on medical decision making and even the decision whether to get a certain vaccine.[15–17] This emphasizes the findings that individuals who declined a COVID-19 vaccine were more likely to experience anti-vaccine sentiment by their coworkers and less likely to be encouraged to get vaccinated by their supervisors or family members. When discussing the issue of supervisors advocating for vaccination, two potential ideas could be at play. The case might be that supervisors are not always encouraging vaccination among their personnel, leading to vaccine hesitancy within those departments. Alternatively, it could be possible that supervisors in departments where frontline providers already view the vaccine in a negative light are not advocating for vaccination because they fear doing so will reduce morale. Finally, the finding that respondents

who declined a COVID-19 vaccine were more likely to work in rural communities than respondents who did not decline a COVID-19 vaccine is supported by evidence suggesting greater magnitudes of vaccine hesitancy in rural communities.[18]

Salient differences in respondent race/ethnicity, department size, affiliation with the United States military, and department status (eg, all-volunteer staff, combination of volunteer/paid staff, all-paid staff) across respondents who declined a COVID-19 vaccine and respondents who did not decline a COVID-19 vaccine were not seen within the survey. Having said that, the lack of significant differences across these variables does not automatically mean such differences do not exist. These data do indicate that vaccine hesitancy is present to some degrees: in large, medium, and small-sized departments; and in all-volunteer departments, all-paid departments, and departments with a mixture of volunteer and paid members.

Limitations

This present study is limited by the small sample size and the potential for selection bias arising from the recruitment methods used.

Conclusions

This study answers key questions about why some EMS providers might be declining COVID-19 vaccinations. Providers who self-identify as men, providers with conservative or conservative-leaning beliefs, and providers in environments where COVID-19 vaccines are discussed negatively or not encouraged are more likely to decline a vaccine. Providers who have declined a vaccine report greater levels of concern about its safety, effectiveness, and development. Initiatives to improve vaccination among EMS providers should focus on the areas highlighted, and further studies should continue to examine vaccine hesitancy among EMS providers as well as in other populations.

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