

## COVID-19 Vaccination Among Environmental Service Workers Using Agents of Change

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PRiMER. 2022;6:23.

Published: 7/22/2022 | DOI: 10.22454/PRiMER.2022.185423

### Abstract

**Introduction:** Vaccine hesitancy remains a barrier to community immunity against SARS-CoV-2 infection. Health care workers are at risk both of infection and for nosocomial transmission, but have low rates of vaccine uptake due to hesitancy. This project sought to improve the SARS-CoV-2 vaccine uptake among environmental services (EVS) workers at a large academic regional medical center using a community-based participatory approach (CBPA).

**Methods:** The CBPA engaged environmental service workers from January 2021 to March 2021. Public health experts and environmental services department leaders developed a 1-hour training for peer lay health educators (N=29), referred to as agents of change (AOC). AOC were trained on COVID-19 infection, benefits of SARS-CoV-2 vaccination, and techniques to address vaccine misinformation among their peers. Following the program, we conducted semistructured interviews with the AOC to document their experiences.

**Results:** Analysis of the semistructured interviews shows that 89.6% of participants (N=26) felt the training was informative; 79.3% of participants (N=23) reported using personal testimony while engaging in discussions about vaccination with their peers, and the majority of participants (N=26, 89.6%) discussed vaccination outside of the workplace in other community settings. During the 2-month time span of the program, mRNA COVID-19 vaccination rates among the EVS staff increased by 21% (N=126 to N=189).

**Conclusion:** Our CBPA program demonstrated an increase in mRNA COVID-19 vaccine uptake through using an AOC lay health educator model. As the need for COVID-19 vaccination continues, we must continue to investigate barriers and sources of hesitancy in order to address these through tailored interventions.

## Introduction

Vaccinations are one of the best public health tools to reduce infection and are key to ending the COVID-19 pandemic. In order to achieve herd immunity against SARS-CoV-2, at least 80% of the population needs to be vaccinated,<sup>1</sup> a milestone that has proven difficult due to hesitancy. Despite being at increased risk of becoming

infected with SARS-CoV-2,<sup>2-4</sup> health care workers (HCW) including environmental service (EVS) workers, also have misconceptions about vaccines. When vaccines first became available, roughly one in three HCW (29%) said they “probably or definitely would not get vaccinated,” comparable with 27% of the general public that were hesitant.<sup>5,6</sup>

HCW are also important to the success of COVID-19 vaccination efforts, as they can serve as a communication network with the public about the risks of COVID-19, as well as the personal benefits of vaccination. Word of mouth can be effective in changing health behaviors.<sup>7</sup> Peer-to-peer support through the use of lay health educators has been shown to improve health behaviors through providing social support while relaying information. EVS workers can serve as lay health educators, referred to in this program as agents of change (AOC), and are defined as health care workers carrying out functions related to health care delivery.<sup>8</sup> AOC are individuals already familiar with the department culture who can spread awareness and information about the COVID-19 vaccine to their colleagues in order to promote vaccination.<sup>9-11</sup> The AOC selected to disseminate information via word of mouth are considered influencers and are trusted community members, which gives them access to address vaccine hesitancy with their peers. Peer support community-based participatory approach (CBPA) programs have been implemented in the past to help mitigate health disparities through building on strengths of the community. They allow for creative solutions to ongoing problems within a community where public health professionals can join members of the community as equal partners.<sup>12</sup> CBPA programs recognize the importance of involving the population as active participants as a means to facilitate social change.<sup>12-17</sup>

## Methods

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This peer-support CBPA program sought to explore attitudes toward SARS-CoV-2 vaccination among EVS workers at Upstate Medical University, a department previously identified by leadership as having low rates of vaccination uptake. EVS department leaders selected the employees as agents of change (N=29) based on their history of being well respected among their peers. A 1-hour training session was developed by public health experts where AOC received information on COVID-19 infection, the benefits of SARS-CoV-2 vaccination, and addressing vaccine misinformation among peers. After the training and following 2 months of the program, semistructured interviews were conducted on Zoom with each AOC to document their experiences. Interview audio files were transcribed using Otter.ai software (Otter.ai, Inc, Los Altos, CA). We identified themes by searching for common responses in the deidentified interview text using Atlas.TI qualitative analysis software (ATLAS.ti Scientific Software Development GmbH, Berlin, Germany). We grouped common responses to questions to determine reoccurring themes. An interview guide with questions and keywords used during analysis is available on the STFM Resource Library.<sup>18</sup>

The SUNY Upstate Institutional Review Board determined this project (1785663-1) does not meet the definition of human subjects research. This project was developed in order to improve institutional efforts and increase vaccination uptake using a lay health education program planning model. The program plan in real-time included improvements such as a visual vaccine counter in the department, posting support for EVS workers to vaccinate, one-on-one support for vaccine enrollment, and targeted messaging on EVS equipment.

Postprogram changes includes celebrations and food vouchers for high vaccine uptake, as well as one-on-one conversation with leadership for vaccine hesitant employees. The information and evaluation generated from this program was used to create internal system improvements to support EVS vaccination. The project was not generalizable; the program was specific to the system and EVS department of Upstate Medical University.

## Results

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The mRNA COVID-19 vaccination coverage among the EVS department staff increased by 21% (N=126 to N=189) among the 310 total employees in the EVS department throughout the 2 months of the program. A total of 35 staff were initially approached and asked to be an AOC by leadership. Six EVS workers declined the opportunity for undisclosed reasons. The demographic characteristics for AOC including sex, age, race/ethnicity, and time spent working at the EVS department at Upstate Medical University are displayed in Table 1.

The AOC (N=29) participated in the semistructured interviews about their experiences. The high-level themes and subthemes in the interview responses, frequencies, percentages, as well as example responses are displayed in Table 2. Analysis determined that all of the AOC interviewed engaged in and lead discussions about vaccination with their peers after the training. Analysis also shows that 89.6% of participants (N=26) felt the training was informative; 79.3% of participants (N=23) used personal testimony while engaging in discussions about vaccination with their peers and the majority of participants (N=26, 89.6%) discussed vaccination outside of the workplace in other community settings. Approximately 80% of the AOC mentioned misinformation about the vaccine as a barrier and reason for hesitancy among their peers.

## Conclusions

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This CBPA program was composed of a training session that built on the lay health educators' personality traits as leaders and provided them with a skill set that enabled them to speak to their peers about COVID-19 vaccination. By word of mouth, the AOC obtained information from their peer EVS staff members about their attitudes on the COVID-19 vaccine through informal conversations. The aims of the CBPA program include determining barriers to vaccination and overall reducing vaccine hesitancy in the EVS department through the use of a program planning and evaluation model and through collaboration with the EVS department as stakeholders. Additionally, the project sought to improve both access to COVID-19 vaccines and the rates of vaccine uptake, as well as lead action and inform future interventions for vaccine hesitancy.

Qualitative analysis of the interviews provided insight into why participants became an AOC. Most participants described wanting to see things "go back to normal" and get to the end of the pandemic. The AOC all reported positively on the 1-hour training experience and commonly mentioned the training was informative, helpful, and they were able to confidently speak with their peers about SARS-CoV-2 vaccination after the training. AOCs commented on barriers that included COVID-19 misinformation and lack of receptivity from their peers when they approached them with information. The AOCs also described the receptivity of COVID-19 vaccination information from their peers. Some described personalizing the vaccine information, and discussed facts specific to their coworkers' concerns. The majority of AOC were able to hold conversations about COVID-19 vaccines outside of the workplace, showing that their roles as AOC did not end at the end of their workday.

An increase in vaccine uptake was demonstrated during the program; 63 EVS workers received vaccinations against SARS-CoV-2 from January 2021 to March 2021. Limitations include other vaccine initiatives taking place during the AOC project that may have also improved vaccination rates. This project would have benefited from documenting the EVS staff's ultimate reason in getting vaccinated, whether discussion with AOC influenced their decisions, and the vaccination rates months following the program to assess long-term effects. Another limitation includes the AOC's positive biases toward the project because of the scheduled semistructured interviews where they discussed their experiences. AOC also may have had positive bias towards the CBPA program based on their willingness to participate. Lastly, our study limitations include the timing of the project as rates of vaccination uptake were likely affected by vaccine availability in early 2021. In conclusion, this CBPA program can be an effective tool to influence health behaviors including the reduction of vaccine hesitancy in employees. CBPAs can improve health behaviors for vulnerable populations and can inform additional research and future interventions.

## Tables and Figures

**Table 1: Frequencies and Descriptive Statistics of Demographic Data**

	Frequency	%
<b>Sex</b>	Total (N=29)	100
Male	18	62
Female	11	38
<b>Race</b>		
White	15	51.7
Black	10	34.5
Asian	3	10.3
Other	1	3.4
<b>Ethnicity</b>		
Hispanic/Latino	3	10.3
Other	1	3.4
	<b>Mean</b>	<b>Range</b>
Age (in years)	47.7	30 to 67
Length of time with EVS Department at Upstate (in years)	8.79	1 to 30

Abbreviation: EVS, environmental services workers.

**Table 2: High-Level Themes, Frequencies, and Quotations From AOC Interview Responses**

Main Themes	Subtheme	n, %	Examples of Responses
<b>Question 1: Why did you agree to become an agent of change?</b>			
<b>Back to Normal</b>		n=12, 41.4%	<p>“And I like to help them you know, because if everyone get the vaccine, we’ll get the same kind of world later.” – AOC 5</p> <p>“I’m a grandma now, I want to see my grandkids ... I want I want to see the world.” – AOC 13</p> <p>“It’s extremely important to get rid of [COVID] ... Let’s get this over with.” – AOC 27</p> <p>“We want everything to clear, so that they can do normal things they used to do.” – AOC 22</p>
<b>Personality</b>	Agent wants to help others	n=15, 51.7%	<p>“When I heard how many people initially in our department were turning down vaccinations, it was kind of mind blowing. I think this was the opportunity to help educate people to try and get them to change their mind and get vaccinated.” – AOC 6</p> <p>“to just help others understand the importance of the vaccine and the importance of protecting each other”- AOC 8</p> <p>“I understand in the black community, the hesitancy, the mistrust ... anything I could do to try to alleviate that will be helpful.” – AOC 26</p> <p>“Because I want, I like to help people and I know what is happening in the world right now.” - AOC 28</p>
	Agent is a people person	n=14, 48.3%	<p>“I am able to communicate with my coworker, my family. So that’s why I took [the role] as an Agent of Change.” – AOC 7</p> <p>“I’m a normal people person ... I didn’t have to do a lot of approaching” – AOC 11</p>
<b>Question 2: What was the training like for you?</b>			
<b>Skill Set Learned From Training</b>	Agent used personal testimony	n=23, 79.3%	<p>“My parents are older, and it was hard for a long time not being able to see them ... so it was speaking from experience, but not giving my opinion.” – AOC 4</p> <p>“I said, those are not true, I’ve gotten the vaccine. I said ... it’s a little achy but it is it’s nothing that you haven’t experienced before.” – AOC 9</p> <p>“and I told them, you know, the President got the vaccine, the Queen of England got the vaccine, I got the vaccine, ... it’s fine, you have nothing to be scared of.” – AOC 14</p>
	Agent used information learned in training	n=18, 62.1%	<p>“I get more information. Like about what the ingredients inside the vaccine ... I grabbed this paper with all the information, so I usually put it in my pocket with me if somebody asks me then ... I show them those things.” – AOC 10</p> <p>“They learned a lot from it, it was very informative. And it really set them up to have successful conversations with their peers.” - AOC 17</p> <p>“So, while Dr. Shaw and all of us met up the first time, we understood and learned a little bit more about it instead of outside news, you know, learn it from the source. So, you know, trying to tell people, this is what it is, you know, it’s 95% effective...” – AOC 24</p>
<b>Training Content</b>	‘Training was Informative’	n=18, 62.1%	<p>“I thought it was very informational. I liked it, that we were able to ask a lot of different questions that pertain personally to us.” – AOC 1</p> <p>“For me [the training] was great, because getting information from the doctor helped me to understand better to help me to have the knowledge to explain to our coworkers about the vaccine, the benefit of the vaccine.” – AOC 18</p> <p>“Very informative ... And I don’t know if I change their mind or not. But I gave them information that I got and hopefully they made an informed decision.” – AOC 21</p>
	‘Training was helpful/good’	n=10, 34.5%	<p>“There were some ways that they explained things that made it easier to explain to some of our people, just to put it in ... small little things that make more sense to people.” – AOC 3</p> <p>“You know, with that information and the training that we had, it was a lot easier for me because I was able to answer more questions and, you know, and provide them with more answers with about the vaccine. So, it was very good.” – AOC 11</p> <p>“It really set them up to have successful conversations with their peers. I think they did a really good job with that meeting.” – AOC 17</p>

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**Table 2: Continued**

Main Themes	Subtheme	n, %	Examples of Responses
<b>Question 3: What was the experience of being an agent of change like?</b>			
<b>Barriers</b>	COVID-19 Vaccine Misinformation	n=23, 79.3%	<p>“Everybody hearing the news and the tabloids, everybody here and there, you don’t know really what to believe.” – AOC 7</p> <p>“It seems it is this internet going on people being hearing a lot of things, so everybody seems confused.” – AOC 20</p> <p>“A lot of them were not getting the full information of things ... they had a lot of fears of what the vaccine was going to do ...” – AOC 29</p>
	Lack of receptivity	n=13, 44.8%	<p>“At some point we say alright, so I spoke to that person a couple times, he knows what he need to know, it’s just his decision. And, you know, we will move forward to another person.” – AOC 15</p> <p>“It was a little challenging ... like you know something is right ... and the person is refusing, not listening or stating whatever idea he or she has is better than yours. So, he doesn’t want to understand it.” – AOC 19</p> <p>“Some people might listen to you ... some people might not.” – AOC 25</p>
<b>Positive Experience</b>	Receptivity	n=13, 44.8%	<p>“Some people were easier to talk to than others.” – AOC 16</p> <p>“Sometimes ... they have their own ... reason why they don’t want to take [the vaccine] ... but when you talk to them ... they understand it and they change their mind, they want to take it now.” – AOC 20</p>
<b>Methods of Communication</b>	Meeting peers where they are	n=12, 41.3%	<p>“trying to portray the positivity and how hopefully, that doing what we’re doing is like a light at the end of the tunnel.” – AOC 4</p> <p>“...just to understand people even they say no, they don’t agree, but be with them, with kindness”. – AOC 12</p>
	Personalize information	n=8, 27.6%	<p>“And like I said, it depends on who you’re talking to and how they feel ... but you have to be able to understand how they feel.” -AOC 2</p>
<b>Question 4: Did you speak to anyone outside of work about the COVID-19 vaccine?</b>			
Yes		n=26, 89.6%	<p>“Oh, tons. I think we talk about it almost everywhere I go, whether we’re out to eat, or someone’s house ... So, I’ve actually signed up like seven or eight of my friends and friend’s parents and ... I’ll be like, Well, let me check, there’s appointments ... I can do it right now. Send me their information.” – AOC 6</p> <p>“So, it was really nice to have the facts. And, you know, something we could use, not only for us, for ourselves and as agents of change here, but also with our families.” – AOC 23</p>
No		n=3, 10.3%	<p>“Not really, because my family and friends are just waiting the opportunity to get the vaccine.” – AOC 18</p>

Abbreviation: AOC, agent of change.

## Acknowledgments

The authors especially thank the SUNY Upstate Medical University Environmental Services Department Staff for their contributions to the program including Susan Murphy, Director and Brennan Laque, Manager; as well as Keith Adams, Joyce Appiah-Asare, Stephen B. Appiah-Asare, Al Brynien, Olivia Cheung, Bhim Chimoriya, Clark Cutri, Sherry Flansburg, Yobel Gonzalez Milian, Karen Hurtado-Hernandez, Bhola Khadka, John Kolh, Ziv Konsens, Lori Krause, Timothy A. Lawrence, Kelvin T. Little, Myron Martin, Younis Mosleh, Kenzo Mukendi, Magalie Norcilus, Loren Oatman, Yashira Romero, Anita Rouse, Jason Rupert, Moustapha Salawu, Steven Seeley, Stacey Todd, Jennifer Tyson, and Yetta Williams, their wonderful Agents of Change.

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