

# Comparing community-driven COVID-19 vaccine distribution methods: Faith-based organizations vs. outpatient clinics

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## ABSTRACT

**Background:** Minority and low socioeconomic communities may face practical barriers to vaccination, including decreased access to health care and less trust in healthcare organizations; however, few studies have focused on these barriers as the cause of differential vaccine uptake. We worked with community partners to implement and evaluate two community-driven approaches to COVID-19 vaccination distribution—through faith-based organizations (FBOs) and outpatient clinics—with a focus on understanding the differences between the populations who accessed each distribution method. **Methodology:** Participants who came to the vaccination locations were approached and asked to complete a survey during their 15 min post-vaccination observation period. Differences between distribution locations were examined using Chi-square tests. **Results:** The survey rendered 1,476 valid responses, with a total of 927 participants recruited at clinical locations and 519 at FBOs during vaccination events. There were significant differences by race/ethnicity, with distribution methods at FBOs reaching a higher proportion of Hispanic/Latino and Marshallese participants. The proportion of uninsured participants who had lower health literacy and had lower educational attainment was higher with the FBO distribution method. FBO participants were more likely to report “completely” trusting the COVID-19 vaccine. There was no significant difference between FBO and clinic participants with regard to the level of vaccine hesitancy. There were no statistically significant differences with regard to access. **Conclusion:** A higher proportion of Hispanic/Latino and Marshallese participants utilized FBOs for vaccination, suggesting collaborations with FBOs can potentially increase vaccination uptake among minority communities and help mitigate vaccination disparities.

**Keywords:** COVID-19 vaccine, faith-based organizations, low socioeconomic communities, minority communities, outpatient clinics, vaccine uptake

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Received: 08-02-2022

Revised: 29-04-2022

Accepted: 30-04-2022

Published: 31-10-2022

### Access this article online

#### Quick Response Code:



**Website:**  
www.jfmpc.com

**DOI:**  
10.4103/jfmpc.jfmpc\_327\_22

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**How to cite this article:** McElfish PA, Rowland B, Hall S, CarlLee S, Reece S, Macechko MD, *et al.* Comparing community-driven COVID-19 vaccine distribution methods: Faith-based organizations vs. outpatient clinics. *J Family Med Prim Care* 2022;11:6081-6.

## Introduction

The COVID-19 pandemic has created a significant public health burden.<sup>[1]</sup> Vaccinations are a well-established approach to reducing infectious outbreaks.<sup>[2]</sup> However, COVID-19 vaccination uptake in the United States (US) has been constrained by vaccine hesitancy.<sup>[3-5]</sup> Minority and low socioeconomic communities have shown greater hesitancy towards COVID-19 vaccines,<sup>[3-7]</sup> with some minority communities expressing COVID-19 vaccine hesitancy more than twice that of White populations.<sup>[8]</sup>

The increasing vaccination model (IVM) explains how multiple factors can influence vaccine uptake.<sup>[9]</sup> The IVM states that “thoughts and feelings” and “social processes” can either motivate or create hesitancy toward vaccination. The IVM also states that “practical issues” such as convenience play a major role in vaccination uptake.<sup>[9]</sup> Minority and low socioeconomic communities face many practical barriers including decreased access to health care<sup>[10,11]</sup> and less trust in healthcare organizations where vaccines are typically distributed.<sup>[12,13]</sup> Primary care providers are seeking ways to overcome practical issues, a lack of trust in health care, and vaccine hesitancy among minority and low-income community members. To reach minority and low socioeconomic communities, the authors worked with trusted community partners to implement and evaluate two community-driven approaches to COVID-19 vaccination.

## Materials and Methods

### Study aims

The study examined two community-driven COVID-19 vaccine distribution methods, with a focus on understanding the populations who accessed each distribution method and examining differences in those populations. To evaluate this aim, three sub-aims included: 1) examine sociodemographic differences by distribution location; 2) examine vaccine hesitancy by distribution location; 3) examine access by distribution location. All study materials and procedures were approved by the University of Arkansas for Medical Sciences Institutional Review Board (IRB# 262645).

The implementation and evaluation of the two community-driven COVID-19 vaccine distribution methods were part of an ongoing community-based participatory research (CBPR) collaborative between the University of Arkansas for Medical Sciences and the Hispanic/Latino and Marshallese Pacific Islander community in northwest Arkansas, which is described elsewhere.<sup>[14-17]</sup> Hispanic/Latino and Marshallese Pacific Islander individuals make up 18% and 2.4%, respectively, of the total two-county population of northwest Arkansas (Benton and Washington counties) and 8.5% and 0.6%, respectively, of the total population of Arkansas.<sup>[18]</sup> Specific to this study, the CBPR collaborative selected the two distribution methods, reviewed, edited, and approved the survey, developed communications strategies, and helped facilitate the outreach and implementation

of both methods described below. Community-based organizational partners were often on-site to help with vaccine delivery.

The COVID-19 vaccine distribution and study data collection were held at outpatient clinical locations and faith-based organizations (FBOs) in northwest Arkansas. Outreach for both vaccine distribution methods was achieved through community partners, e-mail, and Facebook, and both distribution methods were advertised on English-, Marshallese-, and Spanish-language radio stations. All outreach materials were provided in English, Spanish, and Marshallese. Care was taken to not advertise one method of distribution over the other, and communication materials and advertising discussed both vaccine location options. Those who chose not to participate in the survey were still provided the COVID-19 vaccines. Bilingual vaccination staff were available at both the clinic and FBOs.

Participants were recruited from people who came to the vaccination locations between April 22, 2021 and September 15, 2021. Potential participants had to be 18 or older and be able to read or speak English, Spanish, or Marshallese. Study staff approached potential participants after they had received the vaccination and asked if they would like to participate in a study by completing a survey. This was asked after vaccination so that those who chose not to participate would not be deterred from receiving the vaccine. Study information and consent information were provided in English, Spanish, and Marshallese for both distribution methods. English/Spanish and English/Marshallese bilingual staffs were on site at all vaccination locations to facilitate the survey. For those who agreed to participate in the study, staff provided a sterilized iPad or a study flyer with a QR code link to the survey to complete on their electronic device. Participants completed the survey during the 15 min they were required to wait by medical staff for observation after receiving their COVID-19 vaccine. Participants completed the survey in their preferred language (i.e., English, Spanish, or Marshallese). Survey items were selected from validated sources that are part of the PhenX Toolkit.<sup>[19]</sup> The survey took approximately 10 min to complete. Consent and survey data were captured using REDCap, a widely used software for research data capture.<sup>[20]</sup> Participants who completed the survey and provided contact information were entered into a raffle with an opportunity to win a \$100 gift card.

Participants reporting Hispanic/Latino ethnicities were coded Hispanic/Latino regardless of race chosen. The race was coded as “multiracial” for participants selecting two or more races. Employment status was combined for those reporting full-time employment, part-time employment, or self-employment, and “unemployed” included those out of work, students, retirees, those taking care of family, and those unable to work. “Married/coupled” included those who are married or members of unmarried couples, and “not married” included those who are divorced, never married, separated, or widowed.

Regarding COVID-19 vaccine hesitancy, the following question was used: "Thinking specifically about the COVID-19 vaccine, how hesitant were you about getting vaccinated?" Participants' response options included "Not at all hesitant," "A little hesitant," "Somewhat hesitant," and "Very hesitant." Trust in the COVID-19 vaccine was measured with the question: "How much do you trust the COVID-19 vaccine?" Response options included: "Not at all," "Very little," "Somewhat," "To a great extent," and "Completely." Concerning access to COVID-19 vaccination location, participants were asked about: travel, appointments, and information concerning where to get the COVID-19 vaccine via the questions "Overall, how easy or difficult was it to... [find information about when and where to get the vaccine; get an appointment to be vaccinated; travel to and from the place where you were vaccinated]." Response options for each of the three items included: "Very difficult," "Somewhat difficult," "Somewhat easy," and "Very easy." Participants were provided a visible "Prefer not to answer" option for all items excluding age.

Frequencies for each variable were tested using the Chi-square test. Each test was run separately comparing FBO vs. clinical locations. The age variable was binned into six categories for analysis. Responses of "Prefer not to answer" were not included in analyses. All analyses were conducted with Stata/SE 17.0.

### Results

A total of 1,476 valid responses to the survey were collected between April 22, 2021 and September 15, 2021. In total, 927 participants were recruited at clinical locations, and 519 were recruited at FBOs during vaccination events. See Table 1 for descriptive statistics.

There was statistically significant variation in age ( $\chi^2 (5) = 15.28 P = 0.009$ ), race and ethnicity ( $\chi^2 (6) = 415.17 P < 0.001$ ), education ( $\chi^2 (3) = 260.90 P < 0.001$ ), marital status ( $\chi^2 (1) = 28.46 P < 0.001$ ), insurance status ( $\chi^2 (1) = 116.96 P < 0.001$ ), health literacy ( $\chi^2 (4) = 68.26 P < 0.001$ ), and trust in the COVID-19 vaccine ( $\chi^2 (4) = 32.28 P < 0.001$ ).

Greater proportions of Hispanic/Latino and Marshallese participants came to FBOs than to clinical locations (57.7% and 32% of participants vs. 23.2% and 11.4%). Participants at clinical locations reported higher educational attainment than participants at FBO locations (38.6% reporting a 4-year degree vs. 9.3%), and a higher proportion reported having health insurance (75.4% vs. 45.9%). Participants at clinical locations also reported higher levels of health literacy than those at FBOs (65.9% extremely confident vs. 46.5%).

Trust in the COVID-19 vaccine was significantly different between FBO and clinical locations when reported by category. FBO participants were significantly more likely to report "completely" trusting the COVID-19 vaccine (30.6% FBOs, 19.8% for clinical). Sex, employment status, COVID-19 vaccine

**Table 1: Participant socio-demographic and attitudinal measures by location type**

Variable	Location Type		$\chi^2$
	FBO	Clinical	
Age (n=1,473)			15.28**
18-24	81 (15.17%)	203 (21.62%)	
25-34	124 (23.22%)	241 (25.67%)	
35-44	151 (28.28%)	230 (24.49%)	
45-54	115 (21.54%)	153 (16.29%)	
55-64	46 (8.61%)	84 (8.95%)	
65+	17 (3.18%)	28 (2.98%)	
Sex (n=1,452)			2.09
Female	292 (55.3%)	547 (59.2%)	
Male	236 (44.7%)	377 (40.8%)	
Race/Ethnicity <sup>a</sup> (n=1,453)			415.17***
American Indian/Alaska Native	3 (0.57%)	7 (0.75%)	
Asian	3 (0.57%)	26 (2.8%)	
Black/African American	1 (0.19%)	65 (7%)	
Marshallese Pacific Islander	168 (32.0%)	106 (11.42%)	
White	46 (8.76%)	484 (52.16%)	
Hispanic/Latino	303 (57.71%)	215 (23.17%)	
Multiracial	1 (0.19%)	25 (2.69%)	
Education <sup>b</sup> (n=1,404)			260.90***
Less than high school	187 (37.63%)	92 (10.14%)	
High school or GED	189 (38.03%)	220 (24.26%)	
Some college	75 (15.09%)	245 (27.01%)	
Four-year degree or more	46 (9.26%)	350 (38.59%)	
Marital status <sup>c</sup> (n=1,400)			28.46***
Married/Coupled	343 (68.46%)	484 (53.84%)	
Not married	158 (31.54%)	415 (46.16%)	
Employment status <sup>d</sup> (n=1,378)			0.22
Employed	316 (65.15%)	593 (66.41%)	
Unemployed	169 (34.85%)	300 (33.59%)	
Health insurance (n=1,349)			116.96***
Insured	212 (45.89%)	669 (75.42%)	
Not insured	250 (54.11%)	218 (24.58%)	
Health literacy (n=1,422)			68.26***
Not at all	27 (5.37%)	14 (1.52%)	
A little bit	38 (7.55%)	25 (2.72%)	
Somewhat	66 (13.12%)	71 (7.73%)	
Quite a bit	138 (27.44%)	203 (22.09%)	
Extremely	234 (46.52%)	606 (65.94%)	
COVID-19 vaccine hesitancy (n=1,446)			1.56
Not at all hesitant	204 (39.31%)	344 (37.11%)	
A little hesitant	157 (30.25%)	272 (29.34%)	
Somewhat hesitant	85 (16.38%)	171 (18.45%)	
Very hesitant	73 (14.07%)	140 (15.1%)	
COVID-19 vaccine trust (n=1,373)			32.38***
Not at all	13 (2.65%)	17 (1.93%)	
Very little	36 (7.33%)	36 (4.08%)	
Somewhat	135 (27.49%)	311 (35.26%)	
To a great extent	157 (31.98%)	343 (38.89%)	
Completely	150 (30.55%)	175 (19.84%)	
Access travel (n=1,427)			6.81
Very difficult	6 (1.2%)	3 (0.32%)	

Contd...

Table 1: Contd...

Variable	Location Type		$\chi^2$
	FBO	Clinical	
Somewhat difficult	15 (2.99%)	17 (1.84%)	
Somewhat easy	55 (10.98%)	119 (12.85%)	
Very easy	425 (84.83%)	787 (84.99%)	
Access appointment (n=1,409)			6.72
Very difficult	7 (1.39%)	6 (0.66%)	
Somewhat difficult	17 (3.38%)	38 (4.19%)	
Somewhat easy	74 (14.71%)	99 (10.93%)	
Very easy	405 (80.52%)	763 (84.22%)	
Access information (n=1,433)			7.29
Very difficult	11 (2.17%)	8 (0.86%)	
Somewhat difficult	25 (4.94%)	67 (7.23%)	
Somewhat easy	102 (20.16%)	197 (21.25%)	
Very easy	368 (72.73%)	655 (70.66%)	

Note: All percentages are column percentages. FBO=fair-based organization. \*P≤0.05; \*\*P≤0.01; \*\*\*P≤0.001 \*Participants could make multiple selections. All who selected "Hispanic" are coded as Hispanic/Latino. Participants who selected multiple races are coded as "Multiracial." †Less than high school category includes: "Never attended school," "Grades 1 through 8," and "Grades 9 through 11." ‡Married/Coupled includes: "Married" and "Unmarried couple"; Not married includes: "Divorced," "Widowed," "Separated," and "Never married." ††Employed includes: "Employed for wages (35+ hours per week)," "Employed for wages part-time (34 h per week or less)," and "Self-employed"; Unemployed includes: "Out of work for 1 year or more," "Out of work for less than 1 year," "taking care of your family and home," "A student," "Retired," and "Unable to work."

hesitancy, and each of the access items – travel, appointment, and information – were not significantly different.

## Discussion

The study examined two community-driven vaccine distribution methods with a focus on understanding differences in the participants who were vaccinated by each method. The key findings were significant differences by race/ethnicity, with distribution methods at FBOs reaching a higher proportion of Hispanic/Latino and Marshallese participants. The proportion of uninsured participants who had lower health literacy and had lower educational attainment was higher with the FBO distribution method. This study is significant as the first study to examine these factors for those receiving the COVID-19 vaccine at clinics compared to FBOs, and the finding is consistent with literature that shows FBOs as effective locations for reaching minority and lower socioeconomic communities.<sup>[21-23]</sup>

Surprisingly, FBO participants were more likely to report "completely" trusting the COVID-19 vaccine, and there was not a significant difference between FBO and clinic participants with regard to the level of vaccine hesitancy. This is in contrast to some literature that asserts those who identify as religious have lower trust in the COVID-19 vaccine and higher hesitancy towards the COVID-19 vaccine.<sup>[24-26]</sup> This study's finding suggests the participants' trust in their FBO may have influenced their trust in the COVID-19 vaccine due to the partnership with the FBO for distribution. These findings are part of emerging literature which demonstrates FBOs can be important allies in COVID-19 and other vaccination efforts.<sup>[27-29]</sup> Surprisingly, there were no statistically significant differences with regard to access, including ease of travel, making an appointment, and/

or accessing information. This is likely because participants chose the method they found the easiest to access, were familiar with, and/or felt comfortable with. Future research is needed to understand why populations chose the method they did.

## Limitations and strengths

This study does have limitations. Participants were not randomly assigned to the two distribution methods, and it is possible the participants would have gone to clinical locations if the FBO distribution was not available. Furthermore, we do not have information about those who did not choose to get a vaccination at either location nor do we know exactly why participants chose the method they did. The study is strengthened by the large number and diversity of participants. The study is also the first known article to examine the differences in participants who access vaccinations at clinical vs. FBO locations and provides important information that can inform efforts to reduce vaccination disparities for COVID-19 and other vaccination efforts, including human papillomavirus and influenza.

The authors have used these findings to implement clinical and community partnerships that provide vaccines in FBOs by primary care physicians and residents with referrals to primary care for ongoing care. The authors have also begun implementing qualitative research to better understand "why" participants access the location they do, and these efforts increase trust in primary care.

## Conclusion

People of racial and ethnic minority communities and low socioeconomic communities have been disproportionately affected by COVID-19 infection, hospitalization, and mortality. If fewer minority community members and low socioeconomic community members receive the COVID-19 vaccines, the differential vaccination rates could further worsen the health disparities they experience. These findings are important for primary care providers as they seek ways to reach minority and low-income communities who have constrained access to traditional health care. A higher proportion of Hispanic/Latino and Marshallese participants in our study utilized FBOs for vaccination, which suggests collaborations between primary care providers and FBOs can potentially increase vaccination uptake among minority communities and help mitigate vaccination disparities.

## Authors' contributions

PAM – concept, design, manuscript preparation, editing, and review, guarantor

BR – design, manuscript preparation, editing, and review

SH – design, statistical analysis, manuscript preparation, editing, and review

SC – clinical studies, manuscript editing and review

SR – clinical studies, manuscript editing and review

MDM – data acquisition, manuscript editing and review

SKS – literature search, manuscript preparation, editing, and review

MOR – data acquisition, manuscript editing and review

SR – clinical studies, manuscript editing and review

GR-D – clinical studies, manuscript editing and review

LPM – data acquisition, manuscript editing and review

ML – data acquisition, manuscript editing and review

BKM – data acquisition, manuscript editing and review

EA – data acquisition, manuscript editing and review

JPS – design, statistical analysis, manuscript editing and review

## Acknowledgments

We would like to thank our community partners: Marshallese Educational Initiative, Arkansas Coalition of Marshallese, Republic of the Marshall Islands Consulate General, RootED Northwest Arkansas, and Arkansas Immigrant Defense. We also wish to thank all of our local pastors and church partners.

## Ethical approval

All study materials and procedures were approved by the University of Arkansas for Medical Sciences Institutional Review Board (IRB# 262645).

## Financial support and sponsorship

The community engagement related to this research is supported by the Office of Minority Health of the U.S. Department of Health and Human Services (HHS) (1 CPIMP211231-01-00); a Racial and Ethnic Approaches to Community Health (REACH; CDC DP18-1813) award (5 NU58DP006595) from the Centers for Disease Control and Prevention; the University of Arkansas for Medical Sciences Translational Research Institute funding awarded through the National Center for Research Resources and National Center for Advancing Translational Sciences of the National Institutes of Health (NIH) (UL1 TR003107); Rapid Acceleration of Diagnostics (RADx) (NIH 3 R01MD013852-02S3 and 211 V2-53667-03); and Community Engagement Alliance (CEAL) Against COVID-19 Disparities (NIH 10T2HL156812-01). The content is solely the responsibility of the authors and does not necessarily represent the official views of the funders.

## Conflicts of interest

Dr. Sheena CarlLee reports owning some Pfizer stock. The remaining authors reported no potential conflicts of interest.

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