

## RESEARCH LETTER

## Reaching the hard to reach: Characteristics of patients who received a COVID-19 vaccine in the emergency department

In February 2021, the U.S. Food and Drug Administration (FDA) provided emergency use authorization for the Janssen vaccine—the first one-dose COVID-19 vaccine to become available in the United States. The one-dose regimen expanded the opportunity to vaccinate in settings that can reach vulnerable communities for which returning to a site for a second vaccine dose may prove difficult. With 139 million visits annually in the United States<sup>1</sup> and a tendency to serve in a safety net capacity for underserved patients,<sup>2</sup> the emergency department (ED) is one such setting.

Simultaneously, throughout the United States, African American and Hispanic populations have received a smaller proportion of COVID-19 vaccine compared with their proportion of the population and their proportion of COVID-19 cases and deaths.<sup>3</sup> This pattern is also seen in New Jersey and Middlesex County. As of March 31, 2021, Hispanic residents made up 20.9% of the population share<sup>4</sup> and 24.9% of COVID-19 cases,<sup>5</sup> but only 8.0% of the vaccinated<sup>5</sup> in New Jersey and 22.1% of the population,<sup>4</sup> 24.1% of COVID-19 cases, and 6.0% of the vaccinated<sup>5</sup> in Middlesex County. African Americans made up 15.1% of the population,<sup>4</sup> 16.5% of COVID-19 deaths,<sup>5</sup> and only 5.0% of vaccinations<sup>5</sup> in New Jersey, with similar rates in Middlesex County.<sup>4,5</sup> Additionally, more women than men have been vaccinated despite higher COVID-19 mortality rates in men.<sup>5</sup> Similarly, likelihood of influenza vaccine<sup>6</sup> and primary care utilization<sup>7</sup> are significantly higher in women than men. Increasing avenues to vaccination, such as distribution in the ED, may improve uptake in these populations.

The purpose of this study was to examine characteristics of patients who received a COVID-19 vaccination in the Robert Wood Johnson University Hospital (RWJUH) ED compared to everyone vaccinated in New Jersey and Middlesex County (where the hospital is located) to determine if vaccination distribution in the ED can better reach vulnerable populations.

We analyzed patient data for RWJUH ED during the first 365 doses of COVID-19 vaccine distribution, which occurred from March 4 to March 23, 2021. RWJUH's ED is a level I trauma center that provides 24/7 care for approximately 71,000 adult (21+ years) patients annually. Located in New Brunswick, New Jersey, at the southern edge of the New York City Metropolitan area, it serves a population of mixed socioeconomic spectrum and ethnicity in a diverse urban/suburban environment. The ED's patient population is

approximately 24% Hispanic, 21% non-Hispanic African American, 37% non-Hispanic White, 7% Asian, and 10% other race/ethnicity (remaining < 2% is unknown race/ethnicity).

The vaccine was available to ED patients who presented for a non-COVID-19 complaint, were likely to be discharged after ED care, and were eligible for the COVID-19 vaccine based on New Jersey state guidelines at the time. From March 4 to 14, the following groups were eligible for the vaccine: health care workers, residents and workers of long-term care and high-risk congregate care facilities, first responders, individuals over 65 years, and those 16 to 64 years with medical conditions that increase risk of virus severity. On March 15, eligibility opened to pre-K-12 and childcare workers, transportation workers, public safety workers, migrant farm workers, tribal communities, and homeless individuals. Patients could not get the vaccine if they came to the ED solely to get the vaccine and were directed to register online for a vaccine at a vaccine clinic in the health system.

ED patients registered for emergency medical care in the ED registration area, per usual protocol. At triage, patients were asked if they have had the COVID-19 vaccine. If not, the triage nurse informed the patient that we have a limited supply of one-shot Janssen COVID-19 vaccine in the ED today that is being offered to eligible patients. If interested, patients then had the opportunity to be screened for eligibility for the vaccine. Before vaccination, the nurse provided the patient a paper copy of the Janssen emergency use authorization (EUA) fact sheet for patients and caregivers, reviewed it with the patient, asked if they had questions, and explained that they would be observed for 15 minutes after administration (or 30 minutes if patient has a history of severe allergic reaction). Vaccinated patients received their CDC vaccine record card and VSafe handout on the CDC's vaccine monitoring program. The nurse reviewed with vaccinated patients the EUA fact sheet for side effects, allergic reactions, and how to report these and reviewed with the patient the need to still wear a mask, wash hands, avoid crowds, and physically distance.

For analysis, ED data were extracted from the system's electronic medical records, and New Jersey and Middlesex County data were extracted from the NJ COVID-19 dashboard website. We determined the proportion of demographics for people vaccinated in the ED and compared them to New Jersey and Middlesex County vaccination demographics using proportion tests. Analysis was

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**TABLE 1** Proportion of vaccinations distributed in RWJUH ED compared to state of New Jersey and Middlesex County, New Jersey, by race/ethnicity, gender, age group, and insurance status

	RWJUH ED (n = 365) % vaccinated (95% CI)	New Jersey (n = 4,300,375) % vaccinated <sup>a</sup>	p-value (ED compared to NJ)	Middlesex County, NJ (n = 364,744) % vaccinated <sup>a</sup>	p-value (ED compared to Middlesex County)
<b>Race/ethnicity</b>					
Hispanic	28.5 (23.9 to 33.1)	8.0	<0.001	6.0	<0.001
African American, non-Hispanic	23.6 (19.2 to 27.9)	5.0	<0.001	4.0	<0.001
White, non-Hispanic	34.8 (29.9 to 39.7)	59.0	<0.001	45.0	<0.001
Asian	5.5 (3.1 to 7.8)	8.0	0.08	22.0	<0.001
Other	7.4 (4.7 to 10.1)	11.0	0.03	14.0	<0.001
Unknown	0.3 (-0.3 to 0.8)	10.0	<0.001	8.0	<0.001
<b>Gender</b>					
Female	46.0 (40.9 to 51.1)	57.0	<0.001	56.0	<0.001
Male	54.0 (48.8 to 59.1)	43.0		44.0	
<b>Age (years)</b>					
18-29	11.2 (8.0 to 14.5)	8.0	0.02	NA	
30-49	29.6 (24.9 to 34.3)	24.0	0.01		
50-64	37.0 (32.0 to 41.9)	28.0	<0.001		
65-79	15.9 (12.1 to 19.6)	29.0	<0.001		
80+	6.3 (3.8 to 8.8)	10.0	0.02		
<b>Insurance type</b>					
Medicaid	21.9 (17.7 to 26.2)	NA		NA	
Medicare	25.2 (20.7 to 29.7)				
Private insurance	33.2 (28.3 to 38.0)				
Self-pay	13.2 (9.7 to 16.6)				
Charity care	5.2 (2.9 to 7.5)				
Other	1.4 (0.2 to 2.6)				

Abbreviations: RWJUH, Robert Wood Johnson University Hospital; NA, not available.

<sup>a</sup>From New Jersey COVID-19 Data Dashboard (<https://covid19.nj.gov/forms/datadashboard>) as of March 31, 2021.

performed using Stata version 16.0 (StataCorp). The study was approved by the Rutgers University Institutional Review Board.

Table 1 shows the demographic breakdown of the patients who received the vaccine in the RWJUH ED compared to those who received it in New Jersey and Middlesex County. Vaccinations in the ED were distributed to a significantly higher proportion of Hispanic and African American persons (28.5%, 95% confidence interval [CI] = 23.9% to 33.1%) and 23.6% (95% CI = 19.2% to 27.9%, respectively) than vaccinations in New Jersey (8.0%,  $p < 0.001$ ; and 5.0%,  $p < 0.001$ , respectively) and Middlesex County (6.0%,  $p < 0.001$ ; and 4.0%,  $p < 0.001$ , respectively; Table 1). Significantly more men were vaccinated in the ED (54.0%, 95% CI, 48.8%-59.1%) than in New Jersey (43.0%,  $p < 0.001$ ) or Middlesex County (44.0%,  $p < 0.001$ ).

The proportion of 18-29-, 30-49-, and 50-64-year-olds were significantly larger for persons vaccinated in the ED compared to New Jersey overall. The proportions of 65 to 79 and 80+ year olds were significantly lower for vaccinations in the ED compared to New Jersey. One-third of patients vaccinated in the ED had private insurance, one-quarter had Medicare, 22% had Medicaid, 13% were self-pay, and 5% were charity care.

It is important to consider sustainability of a COVID-19 vaccination program in the ED. ED-based vaccination programs have proven successful prior to COVID-19.<sup>8</sup> Likewise, COVID-19 vaccine distribution in the ED did not negatively affect the normal workflow of the ED, suggesting that the program is sustainable for continued vaccine distribution. After the study period, Janssen vaccine eligibility in New Jersey expanded to all people 18 years and older. Such expansion can further streamline the process as time to determine eligibility will not be needed. The biggest barrier to sustainability may be availability of the vaccine in the ED. After the first batch of doses were used, there was a wait for additional doses. As of May 2021, New Brunswick had the lowest vaccination rate (30%) of all New Jersey municipalities with population over 10,000<sup>9</sup> suggesting a continued need to increase vaccinations in this community.

Future work should explore reasons for vaccine refusal by eligible ED patients. Having a pool of ED patients who are eligible and refuse the vaccine presents a unique opportunity to reach people with vaccine hesitancy who might otherwise be difficult to reach by healthcare systems and researchers.

We found that distribution of COVID-19 vaccination in the ED can reach vulnerable populations that are most susceptible to COVID-19. There were significantly higher proportions of African American, Hispanic, men, and younger age groups vaccinated in the ED than in New Jersey and Middlesex County. Considering that the 2019 U.S. Census estimates of persons without health insurance under age 65 years are 9.2% for New Jersey residents and 7.7% for Middlesex County residents,<sup>4</sup> the proportion of people who received the vaccine in the ED with no insurance (self-pay and charity care) (18.4%) was much higher than the proportions in the general population. As the COVID-19 pandemic continues and for future vaccination campaigns for other diseases, it is important to vaccinate as many people as possible to keep people healthy and hospitals from reaching capacity. These findings should encourage other municipalities and health care systems to enlist EDs as an effective location for vaccine distribution to vulnerable populations.

### CONFLICT OF INTEREST

The authors have no potential conflicts to disclose.

### AUTHOR CONTRIBUTIONS

Sara W. Heinert conceived the study, analyzed the data, and led the writing. Jonathan McCoy assisted with interpretation of the data and drafting of the manuscript and provided critical revision of the manuscript for important intellectual content. Robert Eisenstein assisted with acquisition of the data and drafting of the manuscript and provided critical revision of the manuscript for important intellectual content. Jessica Rowley championed the vaccine program that was studied, assisted with drafting of the manuscript, and provided critical revision of the manuscript for important intellectual content.

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