



Research Article

COVID-19 Vaccine Hesitancy and Uptake among Caribbean, Latino/a, Native American, and Middle Eastern/North African Populations in Detroit and Surrounding Counties: A Qualitative Study

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Abstract

As of December 20, 2022, 2,977,727 confirmed cases and 40,657 deaths were identified in Michigan. COVID-19 vaccine uptake rates have remained below average throughout the state. Vaccine hesitancy has been operationalized to include the constructs of convenience, complacency, and confidence. While vaccine hesitancy is a global concern, vaccine decision-making is integrated within local sociocultural and historical contexts. Qualitative data were collected to identify factors contributing to decisions about vaccine uptake through focus group discussions with Caribbean, Latino/a, Native American, and Middle Eastern groups living in the Detroit tri-county area. Outreach for recruitment of participants was through local community-based organizations. Data were collected in English, Spanish, and Arabic. In relation to convenience, concerns included loss of work time in the event of side effects, transportation issues, and fears of legal ramifications for undocumented residents at vaccination sites. In terms of complacency, most respondents perceived COVID-19 to be a serious disease in terms of risk of long-term effects and death. There were also many concerns about the emotional and social impact of the pandemic including anxiety, social isolation, and inconsistencies in information and adherence to preventive practices (e.g., masking). Vaccine confidence was discussed within historical and extant traumas within respondents' communities. Overall, participants expressed positive views about information received about COVID-19 and vaccines from healthcare providers but were more skeptical about information from national health resources and the media. Despite multiple concerns, several respondents decided to take the vaccine to protect family members more vulnerable to poor outcomes.

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Keywords: COVID-19; Vaccine hesitancy; Urban; United States

Introduction

On December 31, 2019, the World Health Organization (WHO) Country office in China was informed of several cases of a pneumonia-like disease of unknown etiology in Wuhan [1]. By early April 2020, worldwide there were more than one million confirmed cases.

In response, pharmaceutical companies across the globe developed multiple COVID-19 vaccines. Through the United States Federal Drug Administration's (FDA) emergency use

approval process, the two-dose Pfizer-BioNTech and Moderna (SpikeVax) vaccines were available in December 2020 and the single-dose Johnson and Johnson's Janssen vaccine was available in February 2021.

With the emergence of new COVID-19 variants and evidence of decreasing efficacy of the vaccines over time, the FDA also approved the three primary series vaccines for use as boosters. In August 2022, the FDA approved use of newly reformulated booster Pfizer-BioNTech and Moderna vaccines with added protection against the Omicron variant and more recent BA.4 and BA.5 subvariants [2]. In October 2022, Novavax received FDA emergency approval for use as a COVID-19 vaccine booster [3] (Figure 1).

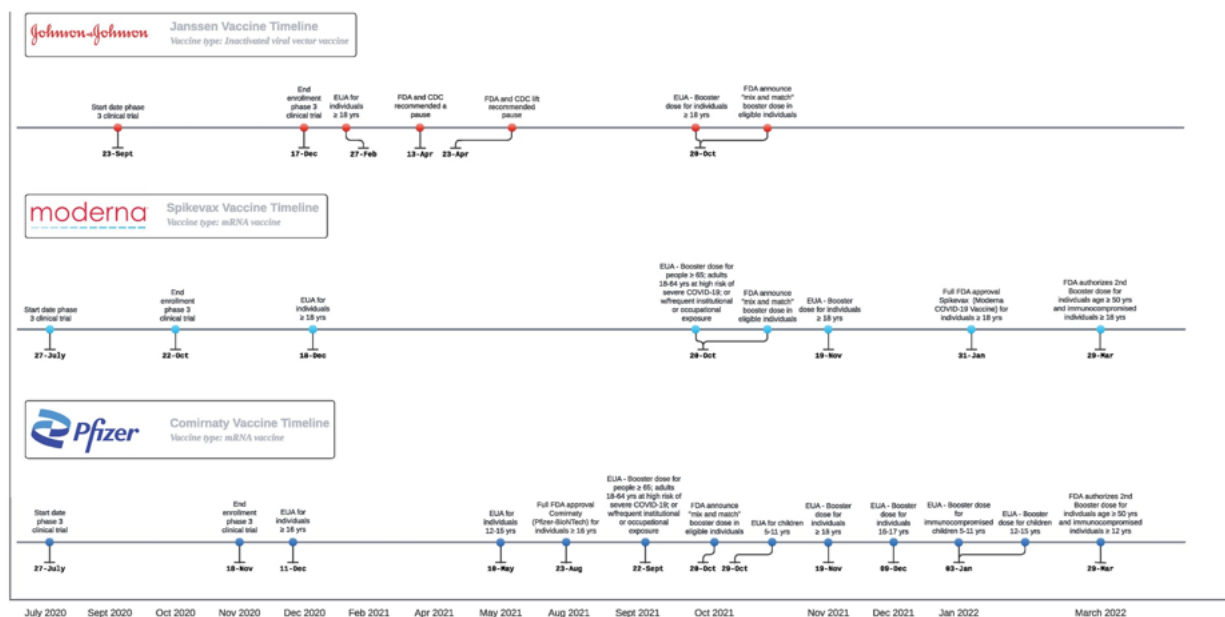


Figure 1: New COVID-19 variants and evidence of decreasing efficacy of the vaccines over time.

As of December 9, 2022, in the United States there have been over 98 million confirmed cases of COVID-19 with over 1.07 million deaths. More than 647 million vaccine doses have been administered [4]. For most of the past two years, the United States experienced a moderate level of COVID-19 vaccine uptake. Among the population 5+ years, the vaccination rate for the primary series (2 doses of Pfizer-BioNTech or Moderna and one dose of Johnson and Johnson's Janssen) is 72.9% and 12.7% for the up-dated bivalent booster [5]. At the National level by end of April 2021, Asian and White populations in the United States had proportionately higher rates of COVID-19 vaccine coverage; however, by the end of November 2021, these disparities for some groups narrowed with similar rates of adult coverage among Whites (78.7%), Black/African Americans (78.2%), and Latino/a (81.3%). However, there remain significant differences in vaccine coverage across and within socio-cultural and geographic groups [6]. In addition to differences by ethnicity, vaccine coverage varies by age and gender [7-9]. Pregnant women in general tend to underutilize COVID-19 vaccines and boosters despite no currently identified adverse events specific for pregnancy and data suggesting that pregnancy can put a person at higher-risk of severe outcomes from the disease [10].

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The first confirmed case of COVID-19 in Michigan was announced on March 10, 2020. As of December 20, 2022, 2,977,727 confirmed cases have been identified in Michigan with 40,657 (1.4%) deaths [11]. In Detroit, a total of 158,318 (6.5%) confirmed cases have been identified with a total of 4,070 (2.6%) deaths. The highest death rate (percentage of deaths per confirmed cases) was reported among the age groups 70-79 years (14.5%) and > 80 years (25.3%). The death rate was the same (4.0%) among African Americans and Whites and those individuals identifying as non-Hispanic. Mortality rates in males and females were 3.0% and 2.0% respectively (Table 1).

Variable	Category	Total # of tests	Total # of confirmed cases	Total # of deaths ^b
		2,452,541	158,318	4,070
	%		6.5%	2.6%
Age (in years)	< 20		33,839 (21.4%)	26 (0.08%)
	20-29		27,386 (17.3%)	60 (0.2%)
	30-39		28,860 (18.2%)	120 (0.4%)
	40-49		21,927 (13.9%)	245 (1.1%)
	50-59		19,822 (12.5%)	547 (2.8%)
	60-69		14,966 (9.5%)	988 (6.6%)
	70-79		7,507 (4.7%)	1085(14.5%)
	80>		3,949 (2.5%)	999 (25.3%)
	Missing		62 (0.004%)	0
	TOTAL			158,318
Race ^c	White		10,730 (6.8%)	384 (4.0%)
	Black or African American		88,354 (55.8%)	3375 (4.0%)
	Other		15,014 (9.5%)	199 (1.0%)
	Missing		44,220 (27.9%)	112(0.3%)
	TOTAL		158,318	4070
Ethnicity	Hispanic/ Latino		6,687 (0.04%)	134 (2,0%)
	Not Hispanic/ Latino		90,182 (0.6%)	3651 (4.0%)
	Missing		61,449 (0.4%)	285(0.5%)
	TOTAL		158,318	4070
Gender	Male		67,381 (42.6%)	2092 (3.0%)
	Female		89,542 (56.6%)	1977 (2.0%)
	Missing		1,395 (0.9%)	1 (0.07%)
	TOTAL		158,318	4070

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^aRetrieved from City of Detroit COVID Dashboard on December 20, 2022, - <https://codtableau.detroitmi.gov/t/DHD/views/CityofDetroit-PublicCOVIDDashboard/DemographicCasesDashboard?%3AisGuestRedirectFromVizportal=y&%3Aembed=y>

^bPercentage of deaths per confirmed cases

^cThe only choices for race were White, Black, or African American, and Other.

Table 1: Number of COVID-19 Tests, Confirmed Cases, and Deaths by Age Group, Ethnicity, and Gender (as of December 20, 2022) in Detroit^a

In Michigan, 6,269,891 individuals have received the first dose of the two dose COVID-19 vaccines (Moderna or Pfizer) or received the single dose of the Janssen vaccine and 5,459,695 individuals completed the primary series. The largest percentage of individuals completing the primary series of vaccines were 50+ years (50.1%), non-Hispanic White (65.0%), and female (53.8%). Similarly, of the 3,592,249 persons receiving the booster dose, highest percentage were 50+ years (61.2%), non-Hispanic White (69.4%) and female (54.9%). Individuals are considered ‘up-to-date’ on their COVID-19 vaccines if they meet the age specific recommendations from the US Center for Disease Control and Prevention. In Michigan, 1,391,469 individuals have met that requirement (Table 2).

Variable	Categories	Initiation ^b	Completion ^c	Booster Dose ^d	Up-to-Date ^e
		N=6,269,891	N=5,459,695	N=3,592,249	N=1,391,469
Age in years	< 5	49,721 (0.8%)	38,680 (0.7%)	305 (0.01%)	12,997 (0.9%)
	5-11	252,896 (4.0%)	229,303 (4.2%)	65,427 (1.8%)	28,800 (2.1%)
	12-15	247,160 (3.9%)	229,479 (4.2%)	92,314 (2.6%)	29,349 (2.1%)
	16-19	295,311 (4.7%)	255,946 (4.7%)	129,525 (3.6%)	22,957 (1.7%)
	20-29	778,344 (12.4%)	633,779 (11.6%)	310,239 (8.6%)	70,280 (5.1%)
	30-39	795,465 (12.7%)	666,185 (12.2%)	373,218 (10.4%)	107,658 (7.7%)
	40-49	786,665 (12.5%)	670,036 (12.3%)	421,602 (11.7%)	126,296 (9.1%)
	50-64	1,544,428 (24.6%)	1,341,780 (24.5%)	999,699 (27.8%)	380,468 (27.3%)
	65-74	908,613 (14.5%)	834,568 (15.3%)	721,909 (20.1%)	377,400 (27.1%)
	75 >	610,630 (9.7%)	559,901 (10.3%)	478,003 (13.3%)	235,264 (16.9%)
	Missing	658	38	8	0
	TOTAL	6,269,891	5,459,695	3,592,249	1,391,469

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Race Ethnicity^f	NH White	4,069,849 (64.9%)	3,869,116 (65.0%)	2,491,128 (69.4%)	1,019,836 (73.3%)
	NH Black or African American	599,554 (9.3%)	545,148 (9.2%)	289,183 (80.5%)	93,853 (6.7%)
	NH American Indian or Alaska Native	32,308 (0.5%)	30,134 (0.5%)	17,065 (0.5%)	5,776 (0.4%)
	NH Asian, Native Hawaiian or Other Pacific Islander	214,579 (3.3%)	198,652 (3.3%)	127,561 (3.6%)	38,398 (2.8%)
	Other	340,689 (5.3%)	321,085 (5.4%)	216,144 (6.0%)	0
	Hispanic/ Latino	325,108 (5.1%)	284,264 (4.8%)	138,652 (3.9%)	42,084 (3.10)
	Unknown	838,892 (13.1%)	706,801 (11.9%)	312,516 (8.7%)	0
	Missing	0	0	0	191,522 (13.8%)
	TOTAL	6,420,979	5,955,200	3,592,249	1,391,469
Gender	Male	2,951,598 (47.1%)	2,517,848 (46.1%)	1,619,573 (45.01%)	609,507 (43.8%)
	Female	3,312,901 (52.8%)	2,937,616 (53.8%)	1,970,460 (54.9%)	764,040 (54.9%)
	Unknown	5392 (0.09%)	4231 (0.08%)	2,216 (0.06%)	0
	Missing	0	0	0	17,922 (1.3%)
	TOTAL	6,269,891	5,459,695	3,592,249	1,391,469

^aRetrieved from COVID-19 Vaccine Dashboard on December 20, 2022, - <https://www.michigan.gov/coronavirus/resources/covid-19-vaccine/covid-19-dashboard>

^bInitiation: Having received first dose of the two dose vaccines (Moderna or Pfizer) or the one dose Jansen and Jansen.

^cCompletion: Having received one dose of J&J or two doses of Moderna and/or Pfizer (i.e., fully vaccinated).

^dBooster: Having received a dose of a vaccine after a primary vaccination series. Booster doses are recommended when protection from the primary series decreases over time.

^eUp-to-Date (UTD) Status: Having met the age specific recommendation from CDC.

- Children aged 6 months to 4 years are UTD two weeks after completing the second dose of their Moderna primary series, or third dose of their Pfizer primary series

- Individuals aged 5 years and older are UTD immediately after receiving the Pfizer or Moderna Bivalent Booster. For those 18 and older, a monovalent Novavax booster can also be used to meet the UTD recommendation.

^fRace and ethnicity were collected separately, which may have led to duplicate entries and resulted in higher total than other categories. NH=non-Hispanic.

Table 2: Vaccine coverage by age, race/ethnicity, and gender in Michigan^a.

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In Detroit, 313,738 individuals have received the first dose of the two dose COVID-19 vaccines or received the single dose of the Janssen vaccine and 257,876 individuals completed the primary series. The largest percentage of individuals completing the primary series of vaccines were 50+ years (50.7%), non-Hispanic Black/African American (56.3%), and female (56.2%). Of the 138,640 persons receiving the booster dose, highest percentage were 50+ years (66.5%), non-Hispanic Black/African American (67.2%) and female (57.2%). In Detroit, 42,072 individuals are considered ‘up-to-date’ (Table 3).

Variable	Category	Initiation ^b	Completion ^c	Booster dose ^d	Up to Date ^e
		N=313,738	N=257,876	N=138,640	N=42,072
Age in years	< 5	1,375 (0.4%)	861 (0.3%)	6 (0.004%)	230 (0.6%)
	5-11	3,36% (3.4%)	8,335 (3.2%)	1,299 (0.9%)	447 (1.1%)
	12-15	12,576 (4.0%)	10,369 (4.0%)	2,483 (1.8%)	562 (1.3%)
	16-19	14,175 (4.5%)	11,366 (4.4%)	3,704 (2.7%)	457 (1.1%)
	20-29	38,038 (12.1%)	29,196 (11.3%)	10,012 (7.2%)	2,123 (5.1%)
	30-39	41,470 (13.2%)	32,416 (12.6%)	12,691 (9.2%)	3,158 (7.5%)
	40-49	42,697 (13.6%)	34,640 (13.4%)	16,197 (11.7%)	3,694 (8.8%)
	50-64	82,895 (26.4%)	69,957 (27.1%)	44,464 (32.1%)	12,645 (30.1%)
	65-74	44,412 (14.2%)	38,865 (15.1%)	30,538 (22.0%)	12,017 (28.6%)
	75 >	25,491 (8.1%)	21,871 (8.5%)	17,246 (12.4%)	6,739 (16.0%)
	Missing	75 (0.02%)	0	0	0
	TOTAL	313,738	257,876	138,640	42,072

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Race/ Ethnicity^f	NH White	26,894 (8.3%)	24,298 (8.8%)	13,784 (9.9%)	5,267 (12.5%)
	NH Black or African American	175,733 (54.3%)	155,627 (56.3%)	79,291 (57.2%)	24,631 (58.5%)
	NH American Indian or Alaska Native	702 (0.22%)	615 (0.22%)	302 (0.22%)	115 (0.27%)
	NH Asian, Native Hawaiian or Other Pacific Islander	3901 (1.2%)	3444 (1.3%)	1,711 (1.2%)	347 (0.9%)
	Other Race	19,320 (6.0%)	17,395 (6.3%)	11,125 (8.0%)	0
	Unknown	49,235 (15.2%)	37,395 (13.5%)	15,215 (11.0%)	0
	Hispanic/ Latino	47,711 (14.8%)	37,782 (13.7%)	17,212 (12.4%)	4,122 (9.8%)
	Missing	0	0	0	7,590 (18.0%)
	TOTAL	323,496	276,556	138,640	42,072
Gender	Male	141,458 (45.1%)	112,849 (43.8%)	59,335 (42.8%)	17,343 (41.2%)
	Female	172,142 (54.9%)	144,914 (56.2%)	79,248 (57.2%)	24,033 (57.1%)
	Unknown	138 (0.04%)	112 (0.04%)	57 (0.04%)	0
	Missing	0	1 (0.0004%)	0	696 (1.7%)
	TOTAL	313,738	257,876	138,640	42,072

^aRetrieved from COVID-19 Vaccine Dashboard on December 20, 2022, - <https://www.michigan.gov/coronavirus/resources/covid-19-vaccine/covid-19-dashboard>

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In 2019, the WHO listed vaccine hesitancy as one of ten named major threats to global health [12]. The WHO SAGE working group operationalized the term in 2014 to include the concepts of vaccine convenience, complacency, and confidence [13,14]. Convenience is defined as factors associated with accessibility and logistics for obtaining available vaccines. These factors can include direct and indirect costs, travel time to vaccination centers, childcare needs, and employment obligations, as well as concerns about providing identification of self or others which could lead to legal ramifications [15]. Complacency refers to perspectives regarding the severity of the targeted disease and perceived vulnerability to that disease for self and others. Confidence is defined as the level of trust in the vaccine product (e.g., safety, effectiveness), vaccine producers (pharmaceutical companies), health care providers and the health system, and government, policy makers, and other authorities [16]. In addition, confidence and trust is often related to historical trauma and abuses of populations both recent and in the past [17,18].

Vaccine hesitancy involves decision-making processes which affect a person's level of readiness to receive a vaccine [19]. These decisions and responses are often in flux and change over time as new and evolving information are available. This was particularly true with COVID-19, as scientific knowledge regarding the virus changed as new data became available and the virus variants and subvariants evolved and resulted in changes in the disease itself and the efficacy of vaccines. At the same time, traditional and social media presented an excess of news and reports about COVID-19 and the vaccines, which led to confusing and conflicting information and misinformation [20,21].

This paper presents qualitative data from a project focused on the populations of community-based health and social service organizations serving Native American, Caribbean's, Latino/a, and Middle Eastern/North African (MENA) communities. The organizations are located in the Detroit Metropolitan Area. Data provide information on the experiences and perceptions of COVID-19 and associated vaccines among these diverse populations. Data were collected between May 16, 2021, and May 19, 2022. The data are presented within a vaccine hesitancy framework and are contextualized within the changing landscape of the evolving pandemic and modifications of vaccination recommendations.

Materials and Methods

Overview

Qualitative studies of vaccine hesitancy have provided insights into the complex factors related to perceptions and levels of trust which influence vaccine uptake [22]. The current study includes data from focus group discussions with individuals

receiving health and social services from community-based organizations in Detroit.

Study Sites and Population

The study sites included organizations in the Detroit Metropolitan Area. Most respondents lived in the Tri-County region including Wayne County and Detroit, and Macomb, and Oakland Counties. In 2021, the total population within this region was 3,921,625. Percentage of Black/African American population within the region range from 13.3% in Macomb County to 77.9% in Detroit. The Hispanic population range from 2.9% in Macomb to 10.1% in Detroit and the American Indian/Native American population range from 0.3% in Macomb/Oakland to 0.5% in Wayne County [23]. MENA population are at least 4.7% of the Detroit Metropolitan Area population [24].

Community Engagement and Study Recruitment

To effectively engage with underserved, the study team established a Stakeholders Advisory Board (SAB). This SAB consisted of federally qualified health centers, community-based and faith-based organizations that serve African American, Caribbean, Latina/o, MENA and American Indian communities. These organizations provide their community members with important health and social services and social support as their populations often face socio-economic, cultural and geographic barriers to essential services. With community members on staff and with their deeply rooted commitment to their communities, these organizations have trusted on-going relationships with community members. Meetings and conversations with community-based leaders provided background information on their experiences with providing and supporting COVID-19 testing, information, and vaccine programs. In the process they have encountered and responded to various facets of vaccine hesitancy. In this regard they have been ideal partners for the project to engage in discussions, interviews, and for gaining access to community members, which has allowed the project to document actual experiences and contexts of vaccine hesitancy.

In early 2021, the SAB met frequently to share information about COVID-19 vaccine uptake and hesitancy in their respective communities. The SAB was also instrumental in the development of recruitment materials and recruitment of participants for focus groups, who were approached, selected, and confirmed directly through the community-based organizations. Contact information was provided to the study team who proceeded with the enrollment process, which for the virtual focus groups and interviews constituted sending a (REDCap) link to participants to complete the consent form and a brief demographic questionnaire. Once completed, the WebEx link for the focus group or interview session was sent. During the in-person focus groups, the consent

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form and questionnaire were completed at the beginning of each session. Participants were compensated for their time and effort with a gift card.

Development of Research Tools

A brief survey was created to collect data on respondent demographics, COVID-19 vaccine status, and reasons for vaccination decision-making. Interview guides included questions on: 1) experiences and challenges during the pandemic; 2) vaccine status; 3) decision-making in regards to vaccine uptake including questions regarding convenience, complacency (e.g., disease severity and vulnerability), and confidence in the vaccines, healthcare systems and providers, government, and media; and, 4) trust in information sources about COVID 19 and the vaccines. Additional questions were added as the pandemic evolved and changes were made in terms of vaccine recommendations (e.g., additional boosters) and eligibility (vaccination for children and adolescents). Interview guides were translated into Spanish and Arabic for conducting focus groups with Spanish and Arabic speaking populations.

Data Collection and Management

Meetings with community-based organization staff and data collection with community members were done both virtually and in-person. All focus group discussions were audio recorded, transcribed, and as necessary translated into English. Transcribed data were uploaded into a qualitative data management program (Dedoose 9.0.86). The research team collaboratively created a coding dictionary based on readings of the data and constructs related to vaccine hesitancy. The dictionary was slightly modified during the coding process to accommodate emergent findings. Coding was conducted by an experienced study team member and reviewed by the project principal investigator.

Data Analysis

While coding provided a way to label portions of data within and across data sets into common areas of interest, the data analysis process was designed to identify cogent themes and patterns. These themes and patterns were documented in a table format with illustrative texts from the transcripts. These tables were reviewed and discussed by key team members. For the current paper, a review of these themes provided an initial categorization of topics related to COVID-19 experiences, the vaccine hesitancy constructs, and sources of information about the pandemic and vaccines.

Results

Survey Data

Eight focus group discussions were held with four community groups including one with the Caribbean Community

Service Center (N=3), one with the American Indian Health and Family Services (N=3), two with Brilliant Detroit – Southwest [Latino/a] (N=16), and four with the Arab Community Center for Economic and Social Services (N=18). Overall, 82.5% (33) of participants identified as female, 15.0% (6) as male, and 2.5% (1) as non-binary. Fifty percent (20) of participants were aged 50+ years, 45% (18) were aged 30 to 49 years, and 5.0% (2) were 18 to 29 years. Overall, 37.5% (15) of respondents were from Macomb County, 10.0% (4) from Oakland County, 17.5% (7) from Wayne County, and 32.5% (13) from Detroit. One individual lived outside of the Detroit Tri-County area.

For those participants interviewed in 2021, we asked vaccine status and intention to take the vaccine if unvaccinated. Of those 22 respondents, 68.2% (15) had completed the first series of vaccines. Of those 7 individuals who were not vaccinated, 14.3% (1) said they would definitely get the vaccine, 28.6% (2) said they would probably get the vaccine, 14.3% (1) said they would not be vaccinated and 42.8% (3) were not sure. For the 18 respondents interviewed in Spring 2022, we asked about vaccination status only. Fifty percent (9) had received the complete initial vaccine series, 11.1% (2) had received one booster, 16.7% (3) had received one of a two dose vaccine, and 22.2% (4) had not been vaccinated.

Qualitative Outcomes

Convenience

Initial eligibility for receiving the COVID-19 vaccines was focused on essential workers, persons 65+ years, and those individuals with high-risk health conditions (e.g., COPD, diabetes). At that time, there was high demand for the vaccines; however, there were also complicated web-based appointment procedures which were difficult for many people to navigate.

...at the beginning...to find the spot to get vaccinated, because it was a boom when they said, "We have the vaccines for everybody." It was a problem to get the spot [to receive the vaccine] (SEP2021_Latina/o)

By the time data collection started, the availability of vaccines had opened-up to all adults 18 + years and vaccines could be obtained at numerous sites in the Detroit area. However, this availability did not equate to accessibility and respondents discussed barriers to obtaining the vaccine including work schedules, impact of side effects on work, and transportation.

I don't have time because of work. I go to work early and don't have time to go get vaccinated. Also, the side effects I don't know if it will impact my work (MAY 2022_MENA)

...Some people may not have bus fare, so how are you going to get them there? You have to open it up...Until you go Downtown and say, "Listen, there's other people here besides people with

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cars, and you have to be sympathetic”... (JUNE2021_Native_American)

Among respondents living in communities inclusive of residents who are not legally in the United States, concerns were also expressed about perceived risk of exposing oneself or one’s community to potential arrest and/or deportation.

So, when the vaccine first came out...it was like you have to have an ID to get the vaccinations...And then because of the communities that we serve, to me, I did not know where to turn. And the undocumented were scared to ask any questions. They want the vaccine, but they didn’t know that they could get it... (MAY2021_Caribbean)

Complacency

Disease Severity and Susceptibility

A vast majority of respondents perceived COVID-19 to be a serious and potentially life-threatening condition. Many respondents discussed their fears of contracting COVID-19 and/or transmitting the disease to friends and family who are at higher risk for poor outcomes.

We have elders in my family, and immunocompromised elders at that... (JUNE2021_Native_American)

Some respondents discussed changes in attitudes about COVID-19 vaccines after direct or indirect experience with the disease. Others talked about decreases in cases and severity affecting vaccination decisions.

A young lady who heads the committee I sit on, she’s young, and she had it...she said, “I can’t even get through this meeting because I got brain fog.” So, someone that young, that is a concern. (JUNE2021_Native_American)

What led me to make the decision to get vaccinated was the death of my cousin, who was only 28 years old...She left two little girls, then all of us who did not believe in the vaccine, when we saw how it happened so quickly...on Christmas they got together...and then also on New Year’s Eve and on January 6 she passed away like that. (OCT2021_Latino/a)

...talking about my mom not believing in (COVID-19)...She was in Mexico....because I told her from here, what was happening and like, “Oh, it’s not true.” “They got something else.” ...it was the denial, it did not exist for her... thank God they got vaccinated, but it was until they saw it happening. (OCT2021_Latino/a)

There’s also the notion that we have come this far, and now we are out of the trouble and therefore we are safer...So, the uptake of the vaccine has really slowed..... (MAY2021_Caribbean)

Social and Emotional Impact

In addition to concerns about physical health and disease risks, respondents discussed the overwhelming social and emotional impact of COVID-19 for themselves and their families. These social and emotional sequelae from the pandemic included isolation, anxiety and depression, and inability to participate in day-to-day activities as well as in cultural practices. People also discussed the all-encompassing aspect of COVID-19.

Sometimes my children looked out the window and said, “We want to go out” and it scared me, because I did not see people outside, the news still said that we should not go out, only to get what was necessary...My husband also got desperate, my husband even said, “I would like to go to work, but we cannot because we are prohibited from going to work.” (OCT2021_Latino/a)

It impacted us...we couldn’t get together with everyone in the family... it has impacted our mental health too because we couldn’t even see our own family. (MAY2022_MENA)

Prevention Measures

The COVID-19 pandemic resulted in multiple international, national, and local level efforts to prevent disease spread. These included restricted travel, isolation of those exposed to or receiving positive test results, limiting size of gatherings, closing schools, places of worship, and businesses, and required use of face masks. Like uptake of vaccines, perceptions of disease severity and risk impacted adherence to other prevention measures. These prevention strategies also caused stress in relation to inconsistent compliance with regulations by others, changes in requirements within different localities, and the extensive and inconsistent information available about prevention of COVID-19.

Yes, of course I’m very concerned and that’s why I keep my children at home to virtual schooling. Because even when some of the counties put the masks as a requirement, I know some parents doesn’t have a care...I saw some pics for the third day of school this year, and some of the students doesn’t use the mask correctly. Now that the Delta variant is more contagious, I’m very scared about it. (SEPT2021_Latino/a)

In terms of the mask wearing...you didn’t know what the right mask was. Everyone had different reasons why you need the right mask...But finding the right mask...They’re telling you doubled mask, tripled mask, cloth mask...the uncertainty of, am I wearing the right mask? Am I protected?...it was a little bit unsettling... (MAY2021_Caribbean)

Our county government actually put out this big manifesto that said that nobody should use masks, and nobody should be getting the vaccine, and all kinds of crazy stuff... (JUNE2021_Native_American)

Confidence

Trust in Authorities

Vaccine confidence includes a broad range of issues in terms of perceptions and trust of government agencies and authoritative bodies, pharmaceutical companies, and health care systems and health care providers. These perceptions and levels of trust are based in historical memory, trauma related to structural racism and abuses of power, and existing social, economic and health disparities within communities, and personal experiences.

My go-to for information at the beginning of the pandemic was CDC. Quite frankly, and this might make me sound a little bit of a conspiracy theorist, but I am indigenous, and I know that the government lies, and I know that the government doesn't care about Black, Brown, indigenous people. I don't really trust the CDC anymore....When I'm comparing what the WHO is saying to the CDC, what they're saying about masks post-vaccination, I'm seeing conflicting information. That makes me, automatically, not trust the United States government because the government has genocided my ancestors, medically, in boarding schools, in multiple ways....Now you expect me to get onboard with it? I don't know. (JUNE2021_Native_American)

I got the vaccine, but I wasn't really sure to get it or not because in our community, in the past they have been using us a guinea pigs, so I didn't want to take it because of that, but it was more the risk than the benefit...I ended up taking the vaccine in April... It's still on the back of my mind, it's kind of experimental...I don't know what's going to happen in the future, if I'm going to have complications or not....It is something that's still fresh, like an open wound. (OCT2021_Latino/a)

Alternatively, for some members of recent refugee and asylum-seeking populations, the United States has provided them with security after traumatic events in their countries of origin. For these individuals, there is a higher level of trust in government and health care institutions.

So [I] trust medical resources, like [my] healthcare provider... The news, like the medical resources on the TV. And [I] believe that America is a great country that would never kill their people or harm them...as they protect them, provide everything, safety, security, food for their people.... (MAY2022_MENA)

Trust in Healthcare Providers

Overall, respondents felt that they could trust information from health care providers. However, they were aware that in some cases healthcare providers may feel that they don't have insufficient information to inform patients in an evolving health crisis.

I don't believe in the news, I don't believe in Facebook, I don't believe in anything, I go to my doctor, and he is the one I ask, my doctor. (OCT2021_Latino/a)

It was almost immediately a cause for debate in this community... I know that I had some of those same conversations that were just being talked about, with some physician friends here. That helped to make me feel a little bit better. (JUNE2021_Native_American)

So, at first, when the vaccine came up, there was like a lack of information around it. And when I was even asking the healthcare provider about their advice or their opinion, even the people who work at the medical field, they were having a lack of information. They were telling (us) this is a new disease and this is a new vaccine. (MAY2022_MENA)

Trust in Vaccine Product

Levels of confidence and trust also extend to the vaccine products in terms of effectiveness and protection against disease, adverse events, and country of production. The latter concerns overlap with general distrust of the U.S. government. These perceptions are based on personal experiences and feelings regarding the importance of protecting oneself and ones' family and community.

I am in favor of the vaccine. I got vaccinated, my whole family is vaccinated...I did it because my girls are very little, I want to take care of them, I want them to be well. I have the mentality that, God does not forbid it, and if I get COVID, it won't send me to the hospital, or I am not going to die...I feel that I am more protected with it. Having been vaccinated, I feel that I am protecting my family and other people.... (OCT2021_Latino/a)

I had a relative who was vaccinated and after three days he became fatally ill, he almost died on us and it's like that scares you more. Another relative who did get vaccinated died a month later, so you're like you don't know what to do, whether to get vaccinated or not... I don't believe in the vaccine because what happened to us....(OCT 2021_Latino/a)

I think I have questions about the long-term effects of the vaccine... if I got the vaccine a year ago...maybe in 10 years, do I have any effects related to the vaccine that I got? (MAY2022_MENA)

I'll be real honest, my Tribe, we got Moderna, so that's what we all ended up with in my family, because that's what's the health (provider) said, but I would have preferred Pfizer because it's from Germany...(JUNE2021_Native American)

Trust in Media

While trust is deeply affected by racism, historical trauma, and negative personal experiences, throughout the COVID-19 pandemic, a barrage of information and misinformation reinforced

feelings of mistrust. Respondents expressed anxiety and concern in terms of the veracity of information from social, print, and broadcast media. This was reflected in decision-making about the uptake of COVID-19 vaccines.

...the main reason we didn't receive the vaccine when it just came out was because of the things that we heard from the news and the social media. So, we heard like it makes like a clot...It makes like strokes and heart diseases...we waited until we got confident about it and trusted (it)... (MAY2022_MENA)

And for me and my family, we made sure we made a conscious decision to shut out the noise. A lot of misinformation that was coming in through other [sources] ... And we stuck with the michigan.gov, the governor's daily briefings, and of course, CDC... (MAY2021_Caribbean)

Vaccine Uptake

A majority of individuals participating in the study had at least received their primary COVID-19 doses. However, there were variations in terms of early and delayed use of the vaccine, continued refusal to use the vaccine, and uptake of boosters. Delays were attributed to concerns about adverse events, perceptions of the effectiveness of the vaccine, and knowledge regarding where to obtain the vaccine.

We didn't think about it. We took the vaccine right away. We took an appointment and took the vaccine we didn't have any problems with that.... (May2022_MENA)

I was hesitant because I don't have health insurance. And at my age, I am afraid from getting side effects... I was hesitant about getting the vaccine. (May2022_MENA)

So, after I got two doses of the vaccine, I got COVID. So, I believe that the two doses did not do that much... (MAY2022_MENA)

A few respondents who were not vaccinated in mid-2022 perceived that other COVID-19 prevention methods were sufficient, that having COVID-19 provided immunity, and/or that their 'healthy' lifestyles would mediate contracting the disease.

I did not get the vaccine. I don't need it. Until now I still wear the mask. (MAY2022_MENA)

Vitamin zinc, vitamin C and D. This is necessary, especially for the old, for the seniors....and then exercising....Clean everything, the house and everything clean, and use the mask. (MAY2022_MENA)

Hesitancy and Immunization of Children

Overall, there was hesitancy in terms of children receiving the COVID-19 vaccine. These concerns are focused on short- and long-term effects associated with taking the vaccine, perceptions

of children's level of immunity to COVID-19, and differing perspectives regarding the vaccine between parents.

I now am extremely overwhelmed because they are opening the vaccine for little kids. 50% it was good for me enough to take that decision but to take that decision for my daughter, that 50% is not enough. I love my baby girl. It took me five years of miscarriage to get her. That 50% is not doing enough for me right now.... (OCT2021_Latino/a)

You no longer know where to go because you get so much information that if you give your daughter the vaccine, in the future she will be infertile, she will not be able to have babies. I say, "No, I want grandchildren." I told my daughter, "Wait. Let's see how the vaccine process goes and then we'll see... (SEPT2021_Latino/a)

In my case, seeing my child feel those side effects, I don't know, I would be afraid, I would feel like he is not going to endure the pain that I had...if I took him to get the vaccine, he would come home and if something happened, God forbids, my husband would come into a confrontation with me and he will blame me for taking him to get vaccinated... (OCT2021_Latino/a)

My daughter and her husband, they got the COVID-19, but their kids did not get it. So, that's another proof of kids' immunity that they were staying with their parents at home, but they did not catch it. (MAY2022_MENA)

Discussion

We present data on COVID-19 vaccine hesitancy from diverse populations in the Detroit Metropolitan Area. The project was focused on community engagement and the research team identified and interacted with leaders in multiple community-based organizations. The data are presented within the constructs of a vaccine hesitancy model including convenience, complacency, and confidence.

Existing literature suggests that acceptance of the COVID-19 vaccine fluctuated over time. In early 2021, there was a significant demand for the vaccines among persons 65+ years, essential personnel, and those with conditions which contribute to more severe disease. However, this high demand and the initial vaccine delivery infrastructure made access difficult for individuals without internet/computers to schedule an appointment, for those living in underserved areas with limited access to health services, and for those with limited transportation options to reach vaccination sites. In addition, even as the vaccine became more available through primary care clinics and pharmacies, there were concerns about missing work and potential risks of arrest and deportation within undocumented communities [25,26]. In our research, both Caribbean and Latino/a respondents discussed concerns from a perspective of their communities' undocumented residents. Among

respondents interviewed a year and a half after the vaccines were more fully rolled out, there were still some concerns about the potential impact of adverse events on their ability to work.

Complacency is generally defined as perceptions of disease severity and vulnerability. However, COVID-19 was unique in modern history in terms of the degree to which the disease disrupted social life, intensified emotional stress and associated anxiety, and required personal protective measures beyond vaccination [e.g., social distancing, masks] [27]. In a study about adherence to Center of Disease Control COVID-19 prevention guidelines, common stressors included social distancing requirements, uncertainty about length of quarantine, and inability to engage in social routines [28]. In the current paper, integrated social and emotional stressors and experiences with non-vaccine preventive measures have been included as a part of the complacency construct. Across all groups, respondents discussed the impact of COVID-19 on their ability to engage in 'cultural' practices, day-to-day social activities, and in work and school. These restrictions created anxiety within individuals both for themselves and their families. Preventive practices like masking and social distancing also caused anxiety related to risks associated with 'others' not following protocols, as well as inconsistent and frequently changing recommendations.

Respondents also discussed their perceptions of COVID-19 disease severity and vulnerability in relation to hospitalization, death, and risks for long COVID. These concerns were not focused only on themselves but involved perceptions of risk for their children and relatives/friends with underlying morbidities. Some literature suggests expanding the 3 C's model of vaccine hesitancy to include calculation (of risks and benefits of vaccines) and collective responsibility [29]. In terms of the latter, in this paper we have expanded complacency to include decisions being made about risks not only for oneself but others. Within the context of these interviews, we heard from some parents that their concerns about contracting COVID-19 were not only in regard to their physical well-being, but also about the long-term care of their children if they died. In many instances, it is difficult to untangle self and others in relation to the physical, emotional, and social impact of COVID-19. For many respondents, vaccine uptake was directly associated with wanting to protect their families and communities and to reengage in social activities.

Vaccine confidence is perhaps the most complex construct as it involves multiple levels of trust. Throughout the pandemic, vaccine confidence has been shown to be a significant factor in relation to vaccine uptake among a broad range of geographical, social, and demographic groups [30-33]. In the current study, respondents from Native American, Latino/a, and Caribbean communities discussed distrust of the government, of U.S. based pharmaceutical companies, and of the broader health infrastructure.

This distrust was focused on both current and historical abuses of their communities. Respondents discussed how these abuses affected their sources of trusted information as well as use or intent to use COVID-19 vaccines. Alternatively, some respondents expressed that their experiences of COVID-19 and their broader concerns about the well-being of their families outweighed feelings of distrust of government and other authoritative agencies in terms of vaccination up-take.

Overall, respondents trusted their healthcare providers or family and friends in the medical profession for advice on the vaccines. Many studies have indicated the importance of healthcare providers' advice in increasing willingness to accept vaccines for oneself or for one's children [34-37]. Important caveats in terms of healthcare providers contributing to the uptake of vaccines are providers' confidence in initiating discussions about vaccines with their patients and the need for training providers to address patient concerns in a non-judgmental and open approach [38-41].

During COVID-19, trust in the vaccines in terms of production, safety, and efficacy were key factors associated with hesitancy [30]. Respondents in the current study expressed issues of trust and confidence in terms of place of vaccine production, concerns and experiences related to adverse events after vaccination, and questions regarding the efficacy of the vaccines. In terms of the latter, breakthrough cases contributed to hesitancy particularly in relation to boosters [42].

Most of the participants had received the full primary vaccine course. Among those not vaccinated, there remained concerns about vaccine safety and efficacy, as well as the need for a vaccine if they live a 'healthy lifestyle'. A majority of respondents expressed hesitancy in terms of vaccinating their children. Previous research indicates that parents are often reluctant to vaccinate their children against COVID-19 due to safety and efficacy concerns. In the current study, respondents expressed similar concerns and recognized that children have higher levels of immunity to the disease. In a U.S. national survey, only 46% of respondents stated they were very or somewhat likely to vaccinate their children [43]. In Michigan, of 5,459,695 persons completing initial vaccine doses, only 9.1% (497,462) are 15 years and younger, even though this age cohort is larger in its proportion of the vaccine-eligible population. In Detroit, of 257,876 persons completing their initial vaccine doses, only 7.5% (19,565) are 15 years and younger. Discussions at the programmatic and policy levels continue regarding vaccinating children under 12 years of age. Data indicate that the balance of vaccine risks and benefits for children is complex due to lower incidence of acute COVID-19 in this age group. Alternatively, vaccination can help protect children from new variants and risk of long covid symptoms, it can support decreasing community transmission, and help to avoid school

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closures [44].

A significant amount of attention has been given to the onslaught of information about COVID-19 and vaccines through news, social, and web media. This phenomenon has been dubbed by the World Health Organization as an ‘infodemic’ [45]. Respondents reported a wide range of trusted sources of information including local health department news releases, the US Center for Disease Control, and the World Health Organization. However, respondents were left frustrated and anxious about what to listen to and what to ignore. There was a consensus that there was too much information to digest and that even trusted sources of information changed recommendations too frequently.

This was a qualitative study and therefore it is difficult to generalize findings. However, most of the data are supported through other studies on COVID-19 and vaccine hesitancy. The descriptive nature of the data supported expanding some of the definitions of the three constructs of hesitancy (convenience, complacency, confidence) and provided important linkages between these constructs as respondents talked about their decision-making processes.

Conclusions

Vaccine-hesitant cohorts can potentially reduce the potential for COVID-19 vaccines to provide population immunity and protection against severe disease [46]. Factors that affect vaccine hesitancy are shaped by local culture, social and historical conditions, and the sources and content of information that people accessed throughout the pandemic [47-49]. We present qualitative data from individuals living in diverse communities in the Detroit Michigan area. Data were collected across a one-year period during which time evolving changes in the pathogen and vaccine recommendations affected perspectives related to disease risk and severity, vaccine efficacy, and trustworthiness of information sources. Local data collected across time points can contribute to development of messaging to address changing concerns and questions and interventions that are salient within and across diverse communities.

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Ethical Considerations

This study was reviewed and approved by the Henry Ford Health Institutional Review Board (protocol number 14692). All participants signed a consent form prior to data collection.

Conflict of Interest

The authors have no financial or non-financial interests to disclose.

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