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Ethnic Disparities in COVID-19 Vaccination in the US

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1. Abstract

Background: It is unclear to what extent ethnic disparities exist with respect to the coronavirus disease 2019 (COVID-19) vaccination.

Objective: To clarify the magnitude of ethnic disparities and attitudes towards COVID-19 vaccine.

Methods: PubMed research up to March 24, 2021. Search terms include COVID-19, vaccine, ethnicity, disparities, equity, African American, Blacks, Hispanics, Asians. Cross-sectional surveys, retrospective investigations, studies, internet data and pre-print studies are reviewed.

Results: Minority groups are generally underrepresented in vaccine trials. During the first month after initiation of COVID-19 vaccination, information about race/ethnicity was unknown in 48.1% of vaccine recipients. Compared with White Americans, Black Americans had 6-fold and Hispanics had 2.4-fold higher chance of not intending to receive COVID-19 vaccine. In the largest and most recent survey, compared with White respondents, the odds ratios (OR) of vaccine hesitancy were 3.15, 1.42 and 1.34 for Blacks, Hispanics, and Asians, respectively. The same survey showed that Blacks were less likely to receive the COVID-19 vaccine compared with Whites, (OR) 0.71 (95% CI, 0.64-0.79). This finding was still true even within the subgroup of Black Americans willing to take the vaccine. In most surveys, Asians exhibit low degree of hesitancy towards COVID-19 vaccination. Similar ethnic disparities were shown among health care workers (HCW) and first responders. Main reason of low acceptance of COVID-19 vaccine among Black HCW was "waiting to review safety data."

Conclusions: Large ethnic gaps exist with respect to attitudes and receipt of COVID-19 vaccination. Black Americans have the lowest rates of vaccine acceptance followed by Hispanics. Serious local and national efforts are urgently needed to ensure equitable access and receipt of COVID-19 vaccine.

2. Key words: Ethnicity; COVID-19; Vaccination; Disparities; Hispanic; African Americans; Minorities

3. Introduction

Ethnic minorities are disproportionally affected by

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COVID-19. According to the latest statistics released on March 2, 2021, actual (crude) mortality rates by race and ethnicity due to COVID-19 (per 100,000 Americans of their respective group) were 256 for Indigenous people, 180 for Blacks, 177 for Pacific Islanders, 150 for Whites, 147 for Latinos, and 96 for Asians [1]. Adjusting the data for age differences in race groups widens the gap in the overall mortality rates between all other groups compared to White and Asian Americans, who have the lowest age-adjusted mortality rates [1]. Thus, after age-adjustment, and compared with Whites and Asians, Pacific Islanders are 2.6, Latinos are 2.4, Indigenous are 2.2, and Blacks are 2 times more likely to have died from COVID-19 [1]. It is essential therefore to target COVID-19 vaccination toward minority groups who exhibit excess mortality rates. Unfortunately, this is still not the case. For instance, while Black adults are expected to represent 17% in the first phase of COVID-19 vaccination, they comprised only 5.4% of adults vaccinated in the first month of the US vaccination program [2,3]. In this review, the authors summarize most recent data regarding ethnic disparities with respect to the vaccination against COVID-19.

3.1. Underrepresentation of minority groups in COVID-19 vaccination trials

In trials of vaccines in general, ethnic minorities are underrepresented. Flores et al [4] examined data derived from 230 US-based vaccine clinical trials. Only 58.3% of trials reported race and 34.3% reported ethnicity. Compared with US census data, there was clear underrepresentation of Black (10.6%), Hispanic (11.6%), American Indian or Alaska Native Americans (0.4%) [4]. In contrast, there was overrepresentation of Whites (77.9%), whereas enrollment of Asians was similar to US census (5.7%) [4]. The Federal Drug Administration recommended recruitment of ethnic minorities in vaccine clinical trials [5]. Indeed, the most recent clinical trial of the mRNA-1273 vaccine for COVID-19 enrolled somewhat balanced multi-ethnic population, except for underrepresentation of Blacks (10.1% versus 13.9% in US 2018 census) [6].

3.2. Deficiency in ethnicity information during COVID-19 vaccination

In the US, information on ethnicity was not routinely collected in several vaccination centers. Thus, during the first month of initial phase of COVID-19 vaccination, data on race/ethnicity was available and collected for only 51.9% of vaccine recipients [2].

3.3. Ethnic disparities in COVID-19 vaccine hesitancy

Multiple surveys have consistently indicated hesitancy towards taking COVID-19 among Blacks and to a lesser extent among Hispanics. Fisher et al [7] conducted a nationally represented survey (n=991) in April 2020 during the peak of first surge of COVID-19. Compared to White race, Black race was independently associated with more than 6-fold higher chance of not intending to be vaccinated versus intending to be vaccinated, relative risk ratio (RRR), 6.4 (95% CI 3.2-13.0) [7]. Corresponding RRR in Hispanics was 2.4 (95% CI, 1.2-4.6), whereas this risk was not significantly increased among Asians being 1.2 (95% CI, 0.43-3.2) [7]. Other independent factors associated with vaccine hesitancy included lower educational attainment, younger age, and not having received the influenza vaccine in the prior year [7]. Another larger survey of 1,878 subjects (74% Whites, 19% Hispanics, 11% Blacks, 52% females), was conducted by Khubchabandi et al [8] in June 2020. Vaccine hesitancy was assessed by providing the following response about getting the COVID-19 vaccine “not likely or definitely not”. The proportions of respondents showing vaccine hesitancy were 34%, 29%, 22%, and 11% among Blacks, Hispanics, Whites, and Asians, respectively ($P<0.001$) [8]. These data are in agreement with the on-line survey

conducted by Malik et al [9] including 672 individuals. The latter survey showed that Blacks participants had the lowest rates for COVID-19 vaccine acceptance (40%), whereas Asians had the highest rate (81%) well above Hispanics and Whites (68% each) [8]. The largest and most recent survey was conducted by Nguyen et al [10] from March 24, 2020 to February 16, 2021 in the US and UK using the COVID Symptom Study smart phone application. In the US cohort (n=87,388), compared with White participants, adjusted ORs of vaccine hesitancy was 3.15 (95% CI, 2.86-3.47) for Black participants, 1.42 (95% CI, 1.28-1.58) for Hispanic participants, 1.34 (95% CI 1.18-1.52) for Asians, and 2.02 (95% CI 1.70-2.39) for subjects reporting more than one race [10].

Many surveys suggested positive association between prior flu vaccine receipt in 2019 and willingness to accept COVID-19 vaccine [7,11]. This observation implies that attitude towards vaccination may be generally similar. In the meantime, it provides an opportunity to change this attitude by proper education regarding vaccination benefits and risks. Meanwhile, the survey conducted by Malik et al [9] showed no relationship between acceptance of flu vaccine and COVID-19 vaccine. However, the number of respondents to the category of flu vaccine was very limited (7 subjects) [9].

3.4. Ethnic disparities in COVID-19 vaccine uptake

Nguyen et al [10] have shown that in the US, Black individuals were less likely to be vaccinated than White participants, adjusted OR 0.71 (95% CI, 0.64-0.79). Moreover, this observation persisted in the subgroup of subjects who reported vaccine willingness [10]. In contrast, in the UK cohort (n=1,254.294), ethnic disparities in vaccine uptake was not demonstrated [10]. This difference is probably attributed in part to the fact that in the US, the vaccine delivery was led by fragmented state and local health authorities as opposed to the centralized vaccine delivery through the National Health Service in UK [10].

3.5. Ethnic disparities among Health Care workers

Differences in vaccine hesitancy among minority groups extends to HCW and first responders. Shekhar et al [12] conducted an on-line survey (n=3,479) between October 7 and November 9, 2020, i.e. approximately 1 month prior to the COVID-19 vaccine availability in the US. Again, Black HCW ranked the lowest in terms of vaccine acceptance. Thus, only 19% of Black HCW showed vaccine acceptance compared with 37% of Whites and 30% of Hispanics, whereas Asian HCW had the highest acceptance rates 44% [12]. Main reason of lower vaccine acceptance among Black HCW was "waiting to review safety data" reported by 65% of Black respondents [12]. Caban-Martinez et al [11] conducted a web-based survey of a national sample (n=3,169) of firefighters and emergency medical services workers in October 2020. Less than half of respondents (48.2%) expressed high acceptability of the COVID-19 vaccine. Using the latter group as reference category, the groups with greater odds of reporting low acceptability included those 30-39 years of age (OR 3.62, 95% CI 2.0-6.5), Black race (OR 3.60, 95% CI 1.1-11.5), and Hispanic/Latino ethnicity OR 2.39, 95% CI 1.4-3.9) [11]. However, this survey is limited by inclusion of a small number of Black respondents (only 1%) and women (7.5%) [11].

4. Conclusions and Current Needs

Substantial ethnic differences exist with respect to attitudes towards COVID-19 vaccination. Black Americans consistently show the highest rates of hesitancy, whereas Asians are showing the highest degree of acceptance in most surveys. The persistence of these ethnic gaps is very concerning as it exacerbates the prevailing negative and

disproportionate impact of COVID-19 on ethnic minorities. Collection of data on ethnicity in all vaccine recipients is essential for careful monitoring of vaccination equity. Transportation is an important barrier for minority groups, particularly among vaccine candidates such as the elderly and those with chronic diseases. Therefore, local authorities must move to areas of residence of minorities using churches and other areas of religious and social gathering, as centers of vaccination. Transparency regarding vaccine safety is crucial. The authors propose reporting severe adverse effects (e.g. those that result in hospitalization) of each vaccine in the news and social media periodically. Further education about vaccine safety and efficacy using a simple and culturally appropriate language is needed. In addition, interacting media programs between invited medical experts, including those of color, and the public should enhance vaccine knowledge and trust. In this respect, patients' medical providers represent one of the most trusted sources of information. In fact, the survey conducted by Malik et al [9] showed that 70% of respondents from all ethnicities have confidence in their own physician and 64% trust the Center of Disease Control (CDC). Thus, physicians should spend few minutes talking to their patients about benefits of vaccination, answer their concerns, correct misinformation, and express their own personal experience after receiving the COVID-19 vaccine.

Conflict of interest

The authors do not have any conflict of interest to declare.

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