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Mini Review

Ethnic Disparities in COVID-19 in the USA: An Update

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Abstract

Background: Available data suggest that minority groups are particularly impacted by coronavirus disease 2019 (COVID-19) caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

Objective: To review the latest data that reflects the impact of COVID-19 in minority groups in the USA.

Methods: Review of English literature by search of electronic databases: Pub/MEDLINE until July 22, 2020. Search terms included COVID-19, testing, admission, mortality, ethnicity, African Americans, Hispanics, and Asians. Retrospective studies, pertinent reviews and consensus guidelines are reviewed. Pre-print, not yet peer-reviewed studies are also carefully included.

Results: African American patients and Hispanics are more likely than Whites to be tested for COVID-19, and to have positive results. African American patients get tested for COVID-19 more frequently in the emergency department or as inpatients rather than in the ambulatory setting. As of June 12, 2020, compared with Whites, hospitalization rates for COVID-19 among American Indians/Alaska Natives was 5.5 times higher, and among non-Hispanic Blacks and Hispanics was 4.0 to 4.4 times higher. As of July 21st, 2020, compared with White patients, age-adjusted mortality rates for Blacks was 3.7 times higher, for Indigenous people was 3.5 times higher, for Pacific Islanders was 2.8 times higher, for Latinos 2.5 times higher, and Asians 1.4 times higher. A national internet survey suggests that knowledge regarding COVID-19 may be insufficient among African Americans and Hispanics.

Conclusion: Covid-19 disproportionately affects minority groups, particularly African Americans, who had the highest mortality among all ethnic/racial groups.

Keywords: *COVID-19; Testing; Admission; Mortality; Ethnicity; African Americans; Hispanics; Asians*

Introduction

Shortly after the start of pandemic of COVID-19 in the USA, it has become clear that minorities, particularly African Americans, are disproportionately affected by this disease. In fact, this pandemic has once again unveiled the long-existing health inequities in the USA. It is poignant that wealthy country with technologically advanced health systems like the USA still records inequitable health outcomes for its minority population. The American College of physicians recently released a statement to condemn and oppose racist policies and actions that perpetuate inequities in Medicine [1,2]. The purpose of this mini-review is to present the impact of COVID-19 on minorities in

the USA based on the latest statistics. Regarding the terminology of racial/ethnic group (e.g. Hispanics versus Latinos), we used the same terminology as it appears in the corresponding reference.

Ethnic disparities in prevalence

True prevalence rates are not available because they largely depend on the extent of COVD-19 testing. There is weak evidence that prevalence may be disproportionately high among African Americans. Cyrus., *et al*. [3] conducted an ecological study to investigate the association between density of African American communities and prevalence and death rates in the 3 most populous counties in each US state. These authors found a direct association between African American density and COVID-19 prevalence, with 5% increase in prevalence of COVID-19 for every percentage point increase in county African American density ($P < 0.01$) [3]. In addition, death rate from COVID-19 increased by 2 per 100,000 for every percentage point increase in county African American density ($P < 0.02$) [3].

Ethnic disparities in testing

In a large study from the department of Veterans Affairs (VA) including close to 6 million veterans, testing rates were higher among Blacks (16.4/1000) and Hispanics (12.2/1000), than Whites (9.0/1000) [4]. The proportions of positive test followed the same pattern: 15.2% among Blacks, 11.7% among Hispanics, and 5.8% among Whites [4]. Interestingly, there was a strong evidence that the location of testing may be affected by ethnicity. Thus, African Americans were less likely than other ethnic/racial groups to be tested as outpatients. In one study from Northern California, a smaller percentage of African Americans (29.9%) were tested in an ambulatory setting compared with Whites (56.0%), Asians (60.0%), and Hispanics (53.8%) [5]. On the other hand, the majority of black patients get testing in hospitals, either in the emergency department (37.8%) or as inpatients (32.3%) [5]. Likewise, in another study from Louisiana, percentage of black individuals who had testing in the emergency department was approximately double that of white patients, 65.3% vs 38.0% [6].

Ethnic disparities in hospital admissions

The earliest data showing that minority groups with COVID-19 are more likely than Whites to be admitted to the hospital were reported by the COVID-19-Associated Hospitalization Surveillance Network (COVID-NET) [7]. The latter is a population-based surveillance of hospitalization of patients with COVID-19 in 14 states representing approximately 10% of the US population [7]. The COVID-NET showed that among 580 patients admitted to the hospital with COVID-19 during March 1-28, 2020, 45% were Whites, 33% were Blacks, and 8% were Hispanics [7]. Knowing that in the COVID-NET catchment population, 59% of residents are Whites, 18% are Blacks, and 14% are Hispanics, these data suggested that Blacks are over-represented among hospitalized patients with COVID-19 [7].

In a multi-ethnic cohort ($n = 1,052$) of Sutter Health system, representative of California ethnic pattern, the likelihood of hospital admission for African American patients with COVID-19 was more than double that of Whites after adjustment for co-morbidities (odds ratio 2.7, $P = 0.007$) [5]. Similarly, in another study from Louisiana, black race was associated with increased odds of hospital admission compared with white race (adjusted odds ratio 1.96; 95% CI 1.62 - 2.37) [6]. In their retrospective analysis of multi-ethnic 689 patients with COVID-19 in Cincinnati, Mendy., *et al*. [7] found that both black and Hispanic patients had higher likelihood of admission compared with Whites with odds ratios 2.23 (95% CI, 1.41 - 3.53) and 1.91 (95% CI, 1.11 - 3.29) respectively.

However, more recently, the centers for disease control and prevention (CDC) statistics showed more dramatic ethnic differences in hospitalization from March-June 13, 2020 [8]. Thus, the CDC study reported that age-adjusted rates of hospitalization of COVID-19 (per 100,1000 population) were 221.1 for American Indian or Alaska Native persons, 178.1 for non-Hispanic Blacks, 160.7 for Hispanic or Latinos, 48.4 for Asian or Pacific Islander and finally 40.1 for non-Hispanic Whites [8].

The increased rate of hospitalization among American Indians, Blacks and Hispanics is likely due to presence of severe COVID-19 and added burden of co-morbidities. In addition, there is evidence that minorities present to the hospitals at a late stage with more advanced

disease. In support of this concept is the observation that most black patients get testing in emergency departments and inpatients rather than in the ambulatory setting as mentioned earlier [5,6]. The reasons for the delay of African Americans in seeking medical care are not fully investigated. Possible factors include difficulty to access places of testing close to their neighborhood, mistrust of medical providers, and insufficient knowledge about COVID-19, as mentioned below.

Ethnic disparities in mortality

As per July 21st, 2020, the CDC reported approximately 141, 000 deaths due to COVID-19 [9]. Race and ethnicity are known for 91% of these deaths [9]. In fact, mortality statistics showed clear ethic/racial disparities with the highest mortality rates recorded in Black and Indigenous Americans. Death rates (per 100,000) were 73.7 for Black Americans, 60.5 for Indigenous Americans, 48.0 for Pacific Islander Americans, 37.2 for Latino Americans, 32.4 for White Americans, and 30.7 for Asian Americans [9]. After adjustment for age, the mortality gap is even more pronounced. Thus, compared with Whites, age-adjusted mortality rate for Blacks is 3.7 times higher, for Indigenous people is 3.5 times higher, for Pacific Islanders is 2.8 times higher, for Latinos is 2.5 times higher and for Asians is 1.4 times higher [9].

In agreement with previous data, a retrospective study in Cincinnati evaluated prevalence of "severe" COVID-19 disease, defined as admission to the intensive care unit or death, among 689 patients with COVID-19 (29% Whites, 25% Blacks, 32% Hispanics) [7]. Compared with Whites, Blacks and Hispanics had higher frequency of severe disease with odds ratio 3.15 (95% CI, 1.71 - 5.79) and 2.78 (95% CI 1.29 - 5.96), respectively [7].

However, excess mortality among Blacks with COVID-19 may not be present in all areas across the USA. In one study of 3,481 patients (2,451 Blacks) with COVID-19 from Louisiana, 326 patients died in the hospital [6]. Black race was not independently associated with higher mortality (hazard ratio for death vs white race 0.89, 95% CI, 0.68 - 1.17) [6]. In a smaller retrospective study conducted in metropolitan Atlanta with black majority (83% blacks, 11% Whites), black patients with COVID-19 were not more likely than non-black patients to receive mechanical ventilation or die [10]. In addition, the large retrospective study from the VA including close to 6 million veterans showed that black race or Hispanic ethnicity were not associated with 30-day mortality from COVID-19 [4].

Clearly, the mortality rates reported by the CDC are more reliable than other studies conducted at the local/state levels or in the VA setting due to several reasons. First, the CDC data reflects total number of deaths at the national level since the beginning of pandemic, approximately 133,000 deaths, as opposed to less than few hundreds of deaths in other studies [4-7]. Second, the CDC data is constantly updated. Third mortality rates reported by the CDC are adjusted only for age, but not for co-morbidities, i.e. they reflect real-world situation [9]. Finally, although the relatively large VA study showed no ethnic differences in mortality, this is likely due to the fact that health disparities tend to be smaller in the VA setting than in the private sector [4]. In addition, total number of deaths in this study was relatively small, 284 deaths [4].

Ethnic disparities in knowledge about COVID-19

In a nationally representative survey conducted by internet, Alsan., *et al*. [11] evaluated knowledge about COVID-19 in 5,198 individuals (72% Whites, 165 Blacks, 12% Hispanics). Compared with white respondents, African American respondents were 9.4 percentage points (95% CI, -13.1 to -5.7; $P < 0.001$) less likely, and Hispanic respondents were 8.4% less likely (95% CI, -8.9 to -0.77) to understand fomite spread of COVID-19 [11]. Moreover, African American respondents were 10.8 percentage points (95% CI, -14.1 to -7.5%; $P < 0.001$) less likely than white respondents to know the main symptoms of COVID19 [11].

Causes of ethnic disparities in COVID-19

Causes of ethnic disparities in COVID-19 in the USA are multi-factorial. They were extensively addressed in several recent reviews [8,12,13]. Increase incidence of co-morbidities among minority groups such as diabetes, obesity, cardiovascular disease, and asthma play

an important role. In addition, structural (systemic or institutional) racism deeply embedded in this country is another major factor [14]. The latter issue has direct impact on COVID-19 pandemic. For instance, as result of structural racism, residential segregation of ethnic minorities in overcrowded areas has made social distancing challenging. Another issue that may contribute to the differential effect of COVID-19 on mortality among ethnic groups is the "do not resuscitate order", commonly referred to DNR. African Americans are nearly 3 times less likely than Whites to endorse DNR orders presumably due to medical mistrust and fear of receiving inadequate medical care [15,16]. It would be interesting to compare the DNR status between different ethnic populations to rule out the possibility that critically ill patients with COVID-19 are being steered towards DNR or less likely to be offered mechanical ventilation as result of possible implicit bias of treating physicians [16]. The main causes of ethnic disparities in COVID-19 are summarized in table 1.

Patient factors
• Increase in co-morbidities: diabetes, obesity, cardiovascular disease, asthma [8,17] • Living conditions: overcrowded areas, inability of social isolation, and air pollution [18]. • Working conditions: many minorities work as essential service workers exposed to the community [8]. • Lack of sick leave: minorities may be obliged to go out to work even in sickness [8] • Transport conditions: mainly use public transportation with inability of social isolation [8]. • Attitude towards medical providers: historic mistrust, possible negative past experience [12,13]. • Medical insurance: Compared to Whites, Hispanics are almost 3 times and Blacks are almost 2 times as likely to be uninsured [8]. • Genetic/immune factors? [19].
Medical provider factor
• Implicit bias [20].
Factors related to the US system
• Structural and systemic racism [14,21]. • Socio-economic factors: On average, racial minorities have lower income and educational level, and higher rates of unemployment compared with Whites [8]. • Residential segregation in overcrowded areas [14] • Some minority groups are over-representation in jails, homeless shelters, detention centers allowing rapid spread of COVID-19 [8].

Table 1: *Causes of increase burden of COVID-19 among minorities.*

Conclusion and Current Needs

There is strong evidence that racial and ethnic minorities are bearing a disproportionate burden of COVID-19 related hospitalization and death. The 2.5 - 3.8 times increase in age-adjusted mortality among Blacks, indigenous people and Hispanics compared with Whites is indeed disturbing [9]. There is still missing ethnicity/racial information in 9% of deaths attributed to COVID-19 in the most recent report [9]. All epidemiologic data related to COVID-19 should be reported as a function of ethnicity. Likewise, the rates of DNR for different ethnic groups should be clearly documented. There is an urgent need to establish more COVID-19 testing sites close to the locations of residence of minorities to avoid delay in seeking medical care for symptomatic patients and further transmission of the disease by asymptomatic carriers. Furthermore, local health authorities should intensify teaching about COVID-19 to vulnerable communities by means of all types of media to fill the knowledge gap demonstrated in the study of Alsan., *et al* [11]. It is the time to take serious actions to remedy historical injustices and health inequities and eliminate discrimination, bias and racism in the US health care system.

Conflict of Interest

The authors have no conflict of interest to disclose.

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