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# Are black and Hispanic persons disproportionately affected by COVID-19 because of higher obesity rates?

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## Abstract

**Background:** On March 13, 2020, the World Health Organization declared COVID-19 a pandemic. Shortly after that, it was reported that mortality rates in New York City (NYC), the epicenter of the pandemic in the United States, were found to be significantly higher in black and Hispanic populations. **Objectives:** The aim of this article is to evaluate the mortality rates in NYC among the different ethnic groups and the different boroughs as they relate to the obesity rates to see whether this issue merits further evaluation.

**Setting:** NYC.

**Methods:** COVID-19 data were obtained from the official New York authorities in relation to total number of cases in the different boroughs of NYC. Age-adjusted COVID-19-related mortality rates of the different ethnic groups were also obtained. These data were cross-compared with historic community health data on obesity rates previously published and also obesity rates among the different ethnic groups in NYC.

**Results:** The 2 NYC boroughs that have the highest mortality rates are the Bronx (6%) and Brooklyn (5.4%). Both the Bronx and Brooklyn were also found to have the highest obesity rates at 32% and 27%, respectively. The 2 ethnic groups with the highest obesity rates (Hispanic and black) were also found to have the highest age-adjusted mortality rates per 100,000 compared with the other ethnic groups (22.8% and 19.8%, respectively).

**Conclusions:** The Hispanic and black populations in NYC seem to be disproportionately affected by the COVID-19 pandemic because of the higher incidence of mortality rates. Obesity may have played a role in the high incidence of mortality in those ethnic groups. (*Surg Obes Relat Dis* 2020;16:1096–1099.) © 2020 American Society for Bariatric Surgery. Published by Elsevier Inc. All rights reserved.

**Keywords:** COVID-19; Obesity; Mortality rates

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In December 2019, a novel severe acute respiratory syndrome coronavirus, SARS-CoV-2, was found to have caused

an outbreak in Wuhan, China [1]. On March 13, 2020, the World Health Organization declared the SARS-CoV-2 outbreak a pandemic. Coronavirus disease, or COVID-19 as it is called, can vary from mild flu-like symptoms to severe acute respiratory distress syndrome, multiple organ system failure, and death [2]. To date no therapeutics have been proved effective for the treatment of severe illness caused by SARS-CoV-2 [3]. Mortality rates vary depending on the country of origin. The high mortality rates in Italy

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**COVID-19 Total Number of Cases and Mortality Rates**

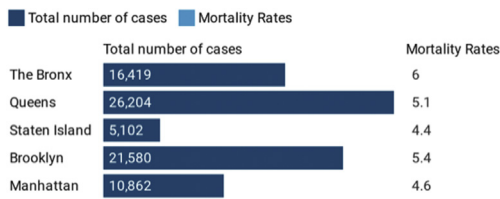


Fig. 1. Total number of cases and mortality rates per location.

**[ NYC % Obesity rates in Adults ]**

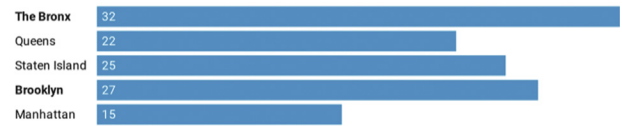


Fig. 2. NYC obesity rates 2015-2016. NYC = New York City.

compared with other countries, for example, were explained by the fact that 23% of the Italian population were 65 years or older. In addition, compared with China, a much higher proportion of the infected population is older than 70 years (37.6% compared with 11.9% in China) [4]. Another possible explanation of the high fatality rate in Italy is the high number of obese individuals among the elderly population [4]. Given the high incidence of obesity among the American population, this can have devastating consequences on the case fatality rates in the United States. Recently, it was reported that mortality rates in New York City (NYC), the epicenter of the pandemic in the United States, were found to be significantly higher in the black and Hispanic populations than other ethnic groups. The aim of this article is to evaluate the mortality rates in NYC among the different ethnic groups and the different boroughs as they relate to the obesity rates to see whether this issue merits further evaluation.

**Methods**

Data were obtained from the official NYC Health public website as they relate to the COVID-19 cases, hospitalizations, and deaths. The data presented reflect the most recent information the health department has collected about people who have tested positive for COVID-19 in NYC. Death rate by race and ethnicity groups was most recently updated on April 6, 2020, and the overall number of COVID-19 confirmed cases, total number of hospitalizations, and death rates were most recently updated on April 8, 2020 at 5:00 PM. The total number of cases in NYC and the COVID-19 mortality rates were divided based on the 5 different boroughs of NYC (Fig. 1). Adult obesity rates of the different boroughs were obtained from the NYC Department of Health and Mental Hygiene, Community Health Survey 2015-2016 (Fig. 2).

Age-adjusted mortality rates for the different ethnic groups in NYC were derived from the Bureau of Communicable Disease Surveillance System as of April 6, 2020 and were reported based on ethnicity (Fig. 3). Obesity and overweight data divided per ethnicity were obtained from the NYC Bureau of Chronic Disease Evaluation and Research, which released its obesity data in 2012. Data were collected

between 2000 and 2010 as part of the Healthy People 2010 project (Fig. 4).

**Results**

As of April 8, 2020, the overall number of cases reported by the NYC Health was 80,204. Among those cases, 20,474 were hospitalized. The overall number of deaths was 4260. The 2 boroughs that have the highest mortality rates, as shown in Figure 1, are the Bronx (6%) and Brooklyn (5.4%). Both the Bronx and Brooklyn were also found to have the highest obesity rates among the 5 boroughs at 32% and 27%, respectively Figure 2. Age-adjusted mortality rates divided based on race are shown in Figure 3. The Hispanic and black populations had the highest age-adjusted mortality rates per 100,000 compared with the other ethnic groups (22.8 and 19.8, respectively) Figure 3. Asians had the lowest mortality rate at 8.4%. Interestingly, the Hispanic and black populations also had higher obesity rates than the other ethnic groups (25.7% and 35.4%, respectively;  $P < .05$ ) as shown in Figure 4.

**Discussion**

Patients with obesity are known to have obesity-associated health conditions, such as diabetes mellitus, hypertension, obstructive sleep apnea, and others, which may

**[ COVID-19 Age Adjusted Mortality Rates per 100,000 cases ]**

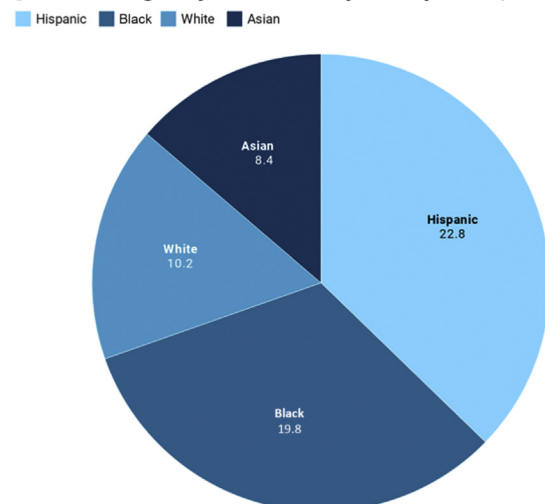


Fig. 3. Ethnic groups age adjusted mortality rates due to COVID-19.

## NYC % Overweight and Obesity rates in Adults 2010 per Ethnicity

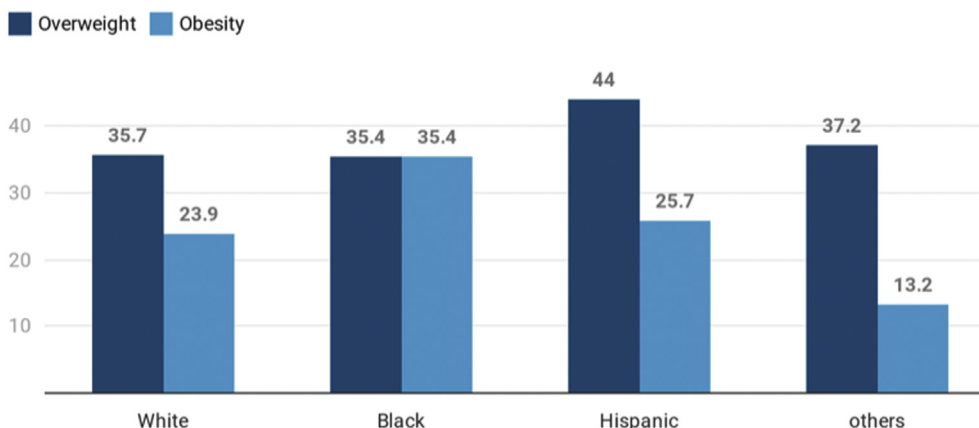


Fig. 4. Overweight and obesity rates in NYC divided per ethnicity. NYC = New York City.

contribute to higher mortality and morbidity [5]. Our prior experience with the effect of obesity on outcomes of patients infected with H1N1 influenza raises major concerns and should be taken into account while dealing with patients with COVID-19 with obesity [6]. In this observational study we noticed that the NYC boroughs with the highest mortality rates are the ones that have high incidence of obesity among the adult population and that the Hispanic and black populations who have historically higher obesity rates are also disproportionately affected by higher age-adjusted mortality rates compared with the other ethnic groups. Although we cannot make any definitive conclusions based on those observations, it is prudent to say that more work needs to be done to clearly elucidate the correlation between obesity and mortality rates secondary to COVID-19.

The Centers for Disease Control and Prevention stated in the weekly mortality and morbidity April 2020 report that hypertension, cardiovascular disease, chronic lung disease, and diabetes mellitus are among the most common underlying conditions in hospitalized patients with COVID-19, which are all known to be more prevalent in patients with obesity. The effect of obesity on the high mortality rates can be explained by the presence of obesity-related health conditions in individuals with obesity, as mentioned previously, or by the fact that obesity was associated with poor lung function, including high rates of obstructive sleep apnea, decreased expiratory reserve volume, decreased functional capacity, and poor lung compliance [7]. The other explanation is possibly the increase in inflammatory cytokines in patients with obesity, especially with new reports stating that cytokine storms are leading to some of the observed rapid deterioration of certain patients with COVID-19 [2,8,9].

This observational study has multiple limitations. First, the data, although very recent, are being updated by

government officials on a daily basis, and given the lag in reports from laboratories, the mortality rate reported herein can be an underestimation or overestimation based on the COVID-19 laboratory results. Second, to date we do not have de-identified data on the body mass index and race of patients who succumbed to COVID-19; with more granular data from government officials we may be able to answer the question of whether obesity is directly associated with COVID-19–related deaths. Finally, NYC officials were discouraging patients with mild to moderate symptoms from being tested (this may be subject to change over time), so the data presented in this article represent mostly patients with severe illness. Lastly, the age-adjusted mortality rates per ethnicity group were missing data (data were complete in only 63% of reported deaths).

### Conclusion

Healthcare providers need to be more vigilant in taking care of Hispanic and black patients with COVID-19 given the higher mortality rates in those ethnic groups. Obesity is more prevalent in the Hispanic and black populations, and the 2 boroughs in NYC with the highest COVID-19 mortality rates have higher obesity rates. Obesity may be playing a role in the high incidence of mortality in certain ethnic groups.

### Disclosures

*The authors have no commercial associations that might be a conflict of interest in relation to this article.*

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