

# COVID-19 Mortality in Adults in England

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## Editorial

There is mounting evidence that the strength of the association between BMI and COVID-19 outcomes may be influenced by key sociodemographic factors, most notably ethnicity, which is also a risk factor for COVID-19 severity and mortality, with Black and South Asian ethnicities at a fourfold higher risk. Obesity was associated with a higher risk of intensive care, mechanical ventilation, or in-hospital mortality in all ethnic groups, but with the greatest risk observed in Black ethnicities with obesity, according to a study of 65,932 in-patients admitted with COVID-19.

A community study of 6.9 million adults from general practises in England discovered that the link between BMI and COVID-19 mortality at the start of the pandemic was strongest in people of Black ethnicity. Despite the fact that ethnicity has been shown to modify associations between BMI and COVID-19 outcomes, previous research has not quantified how this interaction affects both within-ethnicity and between-ethnicity risk across the BMI spectrum. An early analysis of 5,623 community and in-hospital test results suggested the potential significance of this by demonstrating that the risk of SARS-CoV-2 positivity was not different between ethnic groups at low BMI, but was more than twofold higher in ethnic minority groups compared to white ethnicities at high BMI. This has not been investigated in larger, more representative community cohorts or with COVID-19.

Previous studies with cardiometabolic outcomes used the differential associations between ethnicity and BMI to calculate obesity thresholds in ethnic minority groups where risk is equivalent to white ethnicities at established obesity thresholds with current guidelines suggesting that ethnic minority group thresholds should be reduced by 2.5 kg/m. It is unclear whether these guidelines apply to COVID-19 results. As a result, determining the within and between ethnicity risk for COVID-19 mortality has important implications for public health policy and guidelines related to infectious disease.

The goal of this study was to investigate the interaction between BMI and ethnicity in the risk of COVID-19 mortality, quantify how the difference in risk between ethnic groups varies by BMI, and generate risk equivalency at established BMI thresholds for class I, II, and III obesity using linked national Census, electronic health care records, and mortality datasets.

BMI was associated with COVID-19 mortality among all ethnic groups in 12.6 million adults with linked Census, electronic health care records, and mortality data, but with a stronger association in ethnic minority groups. The interaction of BMI and ethnicity with COVID-19 mortality revealed an ethnic risk that was also BMI dependent. At a low BMI of 20 kg/m<sup>2</sup>, there was no difference in risk between Black and other ethnic minority groups compared to white ethnicities, and South Asians had a slightly higher risk. However, the risk of COVID-19 mortality in Black, South Asian, and other ethnic minority groups increased in comparison to white ethnicities as BMI increased.

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