Article

Updating ethnic contrasts in deaths involving the coronavirus (COVID-19), England: 24 January 2020 to 31 March 2021

Estimates of differences in COVID-19 mortality risk by ethnic group for deaths occurring up to 31 March 2021, using linked data from the 2011 Census, death registrations, and primary care and hospital records. Risk of COVID-19 mortality is compared between the first and second waves of the pandemic.

Table of contents

1 . Main points

- During the first wave of the coronavirus (COVID-19) pandemic (24 January 2020 to 11 September 2020), people from all ethnic minority groups (except for women in the Chinese or "White Other" ethnic groups) had higher rates of death involving the coronavirus compared with the White British population.

- The rate of death involving COVID-19 was highest for the Black African group (3.7 times greater than for the White British group for males, and 2.6 greater for females), followed by the Bangladeshi (3.0 for males, 1.9 for females), Black Caribbean (2.7 for males, 1.8 for females) and Pakistani (2.2 for males, 2.0 for females) ethnic groups.

- In the second wave of the pandemic (from 12 September 2020 onwards), the differences in COVID-19 mortality compared with the White British population increased for people of Bangladeshi and Pakistani ethnic backgrounds; the Bangladeshi group had the highest rates, 5.0 and 4.1 times greater than for White British males and females respectively.

- Whilst males and females of Black Caribbean and Black African background remained at elevated risk in the second wave, the relative risk compared with White British people was reduced compared with the first wave.

- Adjusting for location, measures of disadvantage, occupation, living arrangements and pre-existing health conditions accounted for a large proportion of the excess COVID-19 mortality risk in most ethnic minority groups; however, most Black and South Asian groups remained at higher risk than White British people in the second wave even after adjustments.

2 . Overview

The Office for National Statistics (ONS) previously published analysis of deaths involving the coronavirus (COVID-19) by ethnic group for England and Wales between 2 March and 28 July 2020. In this article, we update the previous analysis to present provisional analyses of deaths involving COVID-19 by ethnic group for deaths occurring in England between 24 January 2020 (the date when the first COVID-19 case was reported in the UK) and 31 March 2021, that were registered by 19 April 2021.

In our previous analyses, we adjusted for differences in location, measures of deprivation, occupation, living arrangements (retrieved from the 2011 Census) and comorbidities based on Hospital Episodes Statistics for 2017 to 2019. We extend this by linking the 2011 Census to the General Practice Extraction Service Data for Pandemic Planning and Research, which enables us to assess the extent to which the increased risk of COVID-19 mortality in some ethnic groups is explained by differences in the prevalence of certain pre-existing health conditions which are known to increase the risk of dying from COVID-19.

Analyses are presented separately for the first and second waves of the pandemic to explore whether differences in the relative risk of COVID-19 mortality between different ethnic groups have changed over the course of the pandemic. We classify deaths from 12 September 2020 onwards as having occurred in the second wave.

The study population comprised 29.3 million people (aged 30 to 100 years) enumerated at the 2011 Census and living in either private households or communal establishments in England at the start of the pandemic. See the Technical Appendix for additional details on the data used in this release.

Estimates for the second wave of the pandemic should be considered provisional because our period of analysis does not encompass all deaths occurring during the second wave, which goes beyond 31 March 2021.

3 . Difference between the risk of death involving COVID-19 by ethnic group in the first and second waves of the pandemic

To understand the drivers of differences in the rate of death involving COVID-19 between ethnic groups, we used Cox proportional hazards models to estimate how differences in the rates changed when adjusting for a range of factors affecting both the risk of infection and the risk of death if infected. For full details of the variables included in the models, see the Technical Appendix.

In our baseline model, we adjusted for age only. We then adjusted for:

1. residence type (private household, care home, other communal establishments)

2. geography (local authority district and population density)

3. socio-economic factors (deprivation, household composition and occupational exposure)

4. certain pre-existing health conditions

Figure 1 shows how the risk of death involving COVID-19 varied by ethnic background during the first wave, separately for males and females. We report hazard ratios (HRs) for each ethnic group relative to the White British group (the largest group). A HR greater than one indicates a higher rate of death involving COVID-19 than the reference group. HRs for the entire outcome period are reported in the datasets.

During the first wave of the pandemic (24 January 2020 to 11 September 2020), after adjusting for age (first bar in Figure 1), males from all ethnic minority groups were at elevated risk of COVID-19 mortality compared with males identifying as White British; females from all ethnic minority groups other than Chinese and White Other were also at greater risk. The increased risk relative to the White British population was highest for the Black African group (male HR: 3.7, female HR: 2.6), followed by the Bangladeshi (male HR: 3.0, female HR: 1.9), Black Caribbean (male HR: 2.7, female HR: 1.8) and Pakistani (male HR: 2.2 , female HR: 2.0) ethnic groups. Age-standardised mortality rates (ASMRs) can be found in the datasets.

Adjusting further for location, measures of disadvantage, occupation, living arrangements, and certain pre-existing conditions (second bar in Figure 1) substantially reduced excess COVID-19 mortality risk for most ethnic groups. Rates of COVID-19 mortality remained highest amongst the Black African group (male HR: 2.2, female HR: 1.5), but some groups (White Other, Mixed and Chinese for males; Bangladeshi, Black Caribbean, Mixed and Pakistani for females) were no longer at greater risk of death involving COVID-19 than the White British ethnic group.

Figure 1: In the first wave of the pandemic, differences in COVID-19 mortality compared with the White British population were highest for people of Black African background

Hazard ratios of death involving COVID-19 by ethnic group and sex, England: 24 January 2020 to 11 September 2020

Notes:

1. ONS figures based on death registrations up to 19 April 2021, for deaths involving COVID-19 that occurred between 24 January 2020 to 11 September 2020, of people aged 30 to 100 years that could be linked to the 2011 Census and General Practice Extraction Service Data for Pandemic and Planning Research; these figures are provisional.

Download the data

The first bar in Figure 2 shows age-adjusted HRs (relative to the White British group) for the second wave (12 September 2020 onwards). The excess risk of death involving COVID-19 for people from the Bangladeshi (male HR: 5.0, female HR: 4.1) and Pakistani (male HR: 3.4, female HR: 2.8) ethnic groups was higher in the second wave than in the first wave. Although people from Black African and Black Caribbean ethnic groups remained at higher risk of COVID-19 mortality than White British people during the second wave, the magnitude of excess risk was reduced compared with the first wave.

After adjusting further for other factors (second bar in Figure 2), people in the Bangladeshi (male HR: 2.5, female HR: 1.9), Pakistani (male HR: 2.0, female HR: 1.5), Indian (male HR: 1.7, female HR: 1.4), and Black African (male HR: 1.7, female HR: 1.2) ethnic groups and men from the Black Caribbean group (HR: 1.2) remained at higher risk of death involving COVID-19 than the White British group.

Figure 2: In the second wave of the pandemic, differences in COVID-19 mortality compared with the White British population increased for people of Bangladeshi and Pakistani ethnic backgrounds and decreased for people of Black African and Black Caribbean backgrounds

Hazard ratios of death involving COVID-19 by ethnic group and sex, England: 12 September 2020 to 31 March 2021

Notes:

1. ONS figures based on death registrations up to 19 April 2021, for deaths involving COVID-19 that occurred between 12 September 2020 to 31 March 2021, of people aged 30 to 100 years that could be linked to the 2011 Census and General Practice Extraction Service Data for Pandemic and Planning Research; these figures are provisional.

Download the data

Our findings demonstrate that people from most ethnic minority groups have experienced greater rates of death involving COVID-19 compared with people of White British background during the pandemic. The patterns of excess COVID-19 mortality risk by ethnic group have changed over the course of the pandemic; Bangladeshi and Pakistani groups were particularly at risk during the second wave (up to 31 March 2021), whereas the risk to the Black African and Black Caribbean groups relative to the White British population was lower during the second wave than the first. These results are consistent with our previous analysis and a recently published paper based on the OpenSAFELY platform.

Differences in location, measures of disadvantage, occupation, living arrangements, and certain pre-existing health conditions explain a large proportion (but not all) of the excess COVID-19 mortality risk observed in some ethnic groups. Residual unexplained risk may be attributable to factors that we have not been able to account for in the analysis. Further work is needed to increase our knowledge and understanding of the possible mechanisms underlying this unexplained risk.

4 . Ethnic contrasts in COVID-19 deaths data

Updating ethnic contrasts in deaths involving the coronavirus (COVID-19), England
Dataset | Released 26 May 2021
Age-standardised mortality rates (ASMRs) and hazard ratios for deaths involving COVID-19 by ethnic group,
England: deaths occurring between 24 January 2020 and 31 March 2021.

5 . Glossary

Age-standardised mortality rates

Age-standardised mortality rates (ASMRs) are used to allow comparisons between populations that may contain
different proportions of different ages. The 2013 European Standard Population is used to standardise rates.

Cox proportional hazards regression model

The Cox proportional hazards regression model is a multiple regression procedure that measures the association
between a time-to-event outcome and a characteristic of interest (such as ethnic group), while adjusting for other
characteristics expected to also be associated with the outcome.

Hazard ratio

A hazard ratio is a measure of the relative differences in the instantaneous rate of mortality between groups. A
hazard ratio greater than 1 indicates the rate of mortality is higher, and likewise, less than 1 lower in the
population group under study compared with a reference group.

Deaths involving COVID-19

Deaths involving COVID-19 include those with an underlying cause, or any mention, of ICD-10 codes U07.1
(COVID-19, virus identified), U07.2 (COVID-19, virus not identified) or U09.9 (Post-COVID condition). A doctor
can certify the involvement of COVID-19 based on symptoms and clinical findings — a positive test result is not
required.

6 . Data sources and quality

These analyses are based on a unique linked dataset that encompasses 2011 Census records, death
registrations, Hospital Episode Statistics (HES), and primary care records retrieved from the General Practice
Extraction Service (GPES) Data for Pandemic Planning and Research (GDPPR) with England coverage only. For
further details on the data used, including how they were constructed, please refer to the accompanying Technical
Appendix.

7 . Related links

[Updating ethnic contrasts in deaths involving the coronavirus (COVID-19), England and Wales: deaths occurring 2 March to 28 July 2020](#)
Article | Released 16 October 2020
Updated estimates of mortality involving the coronavirus (COVID-19) by ethnic group and investigation of the explanatory power of hospital-based comorbidity on ethnic differences, building on previous models published by the Office for National Statistics.