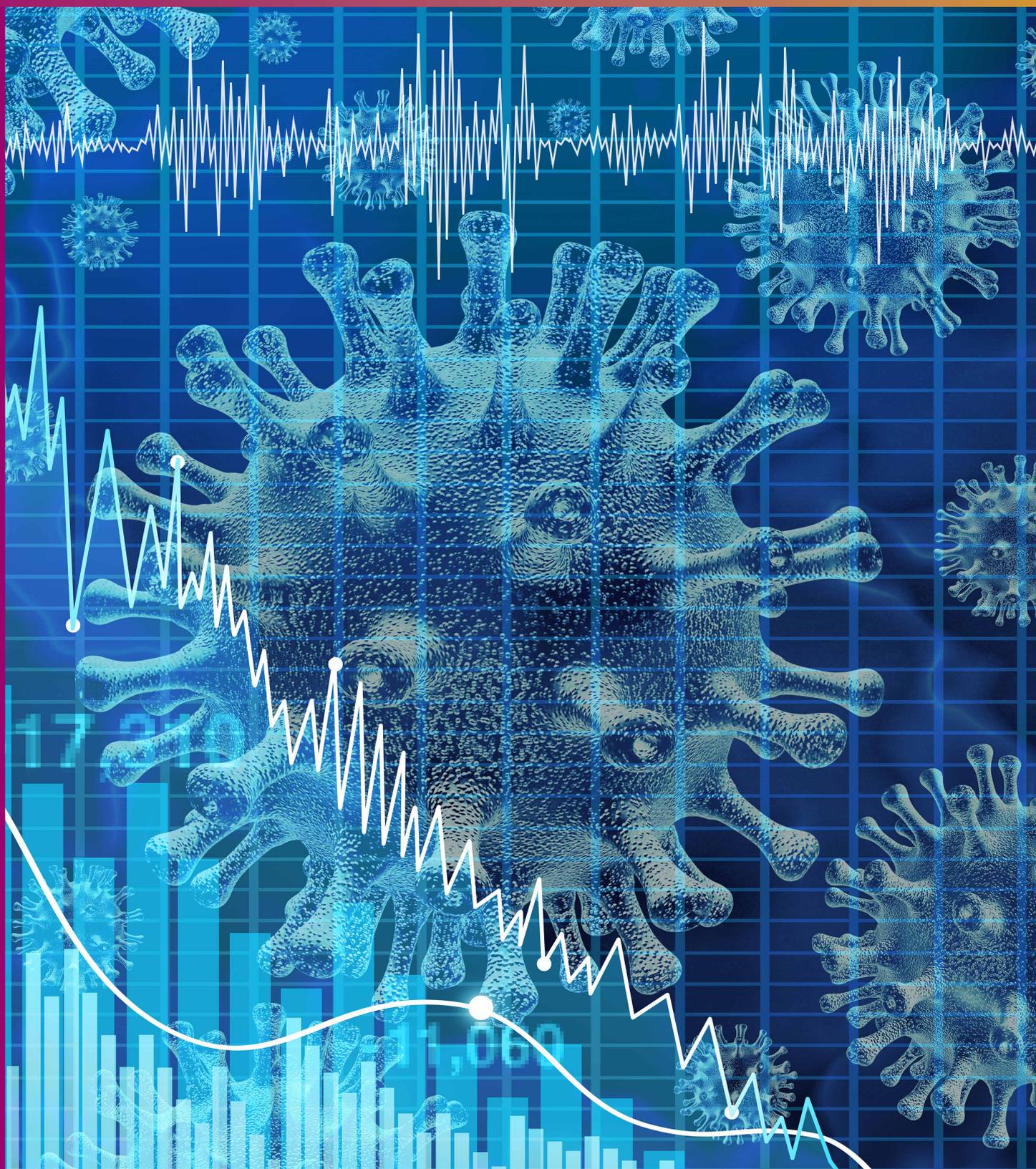




SOCIOECONOMIC DETERMINANTS OF COVID-19
INFECTIONS AND MORTALITY:
EVIDENCE FROM ENGLAND AND WALES
Dr Filipa Sá



Socioeconomic Determinants of Covid-19 Infections and Mortality: Evidence from England and Wales

The number of deaths from Covid-19 in the UK was at one point the highest among European countries. To better understand this, Dr Filipa Sá at King's College London combined data on the number of confirmed Covid-19 cases and the number of deaths from Covid-19 per 100,000 people for local areas in England and Wales with socioeconomic data to explore the factors influencing the numbers of infections and deaths.

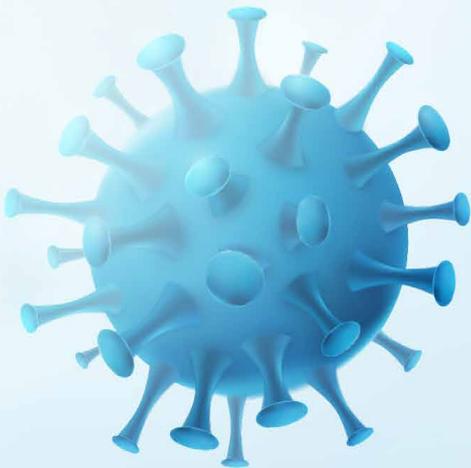
As of 6 May 2020, there had been 206,715 positive tests for Covid-19 and 30,615 deaths in the UK, the highest toll at that time among European countries. Closer inspection of these data revealed a clear pattern of regional variation. For infection, the highest numbers were found in Barrow-in-Furness and Lancashire. For mortality, the highest rates were found in Hertsmere in Hertfordshire and several London local authorities, but these were much lower in the South West.

Dr Filipa Sá at King's College London recently explored the socioeconomic determinants of infections and deaths using data obtained from Public Health England (as of 8 May 2020) and Public Health Wales (as of 5 May 2020) on the cumulative number of confirmed Covid-19 cases by local authority district. She used data on the number of deaths related to Covid-19 obtained from the Office of National Statistics, based on any mention of Covid-19 on the death certificate. Data on sociodemographics were taken from the 2011 Census, Office of National Statistics, and the English and Welsh Indices of Multiple Deprivation.



To begin, Dr Sá conducted simple correlations (a statistical measure of the association between variables) to test the relationships between Covid-19 infections and mortality with the socioeconomic characteristics of local authorities.

Consistent with other published analyses, a positive correlation between both infections and mortality and the percentage of black or Asian individuals in the local authority was identified. Similarly, population density and average household size were also positively correlated with infections and mortality. When looking at self-reported levels of health





categorised as ‘bad’ or ‘very bad’, a positive correlation was found for infections, but not mortality. Although more deprived local authorities had more confirmed cases of Covid-19, there was no correlation between deprivation and mortality. Turning finally to the intensity of use of public transport, positive correlations were found for both infections and mortality.

Although correlations present useful descriptions of patterns of data, they can't tell us anything more than there is an association between the variables. To look at causal mechanisms, a statistical technique known as regression analysis can be used. This allows the quantification of the relationship between one or more predictor variable(s) and one outcome variable.

Dr Sá's next step was to conduct a regression analysis, with Covid-19 infections as the outcome variable. Of the predictor variables, local authorities with larger households had a higher number of Covid-19 cases. In addition, local authorities where higher numbers of the population commuted by public transport and those with worse levels of self-reported health had significantly more Covid-19 cases.

For rates of mortality, this was higher in more densely populated areas, but household size was less important than for infections and was not statistically significant. Here, age was found to play an important role, with significantly higher numbers of Covid-19 deaths in older adults than younger individuals. Although the relationship between public transport and Covid-19 infection was significant, public transport was not found to be predictive of mortality.

The relationship with self-reported health remained significant, as it was for infection. Indeed, although infections and mortality appeared to be higher in more deprived areas, in both cases this relationship disappeared when self-reported health was controlled for statistically in the analyses.

For ethnicity, the relationship was much clearer for mortality than for infections, with local areas with a larger proportion of black or Asian individuals recording higher Covid-19 mortality rates. This relationship was so robust that it was maintained, even when variables including household size, age, deprivation and health were controlled for in the analyses.

In summary, the overall pattern of data showed that local areas with larger households, poorer levels of self-reported health, and a larger proportion of people using public transport had more Covid-19 infections per 100,000 people.

For mortality, the overall pattern of data indicated that household size and use of public transport were less important than for infections, but there was a clear relationship with age, ethnicity and self-reported health. Local areas with an older population, a larger share of black or Asian individuals and poorer levels of self-reported health had more Covid-19 deaths per 100,000 people.

On considering these patterns, Dr Sá made a number of recommendations to help reduce the risk of Covid-19 infection and mortality. First, she points to the importance of encouraging a healthy lifestyle. Here, tackling obesity will be critical, particularly given its association with poorer outcomes for Covid-19 patients.



Second, Dr Sá noted that many countries are now beginning to relax lockdown measures. At this stage, she recommends that attention should be paid to reducing the risk of infection when travelling by public transport. Approaches could include encouraging people to wear face coverings or to use other forms of transport. Additionally, the frequency of services could be increased to help reduce overcrowding.

Finally, from an employment perspective, Dr Sá proposes that working from home should continue to be encouraged when possible, especially for those who have to travel to work by public transport. For jobs where working from home is not possible, other working patterns, such as splitting the workweek into shifts should be considered.

This SciPod is a summary of the paper **‘Socioeconomic determinants of Covid-19 infections and mortality: Evidence from England and Wales’**, published by King’s Business School, King’s College London.

For further information, you can visit <https://kclpure.kcl.ac.uk/portal/filipa.sa.html> or connect with Filipa Sá at filipa.sa@kcl.ac.uk