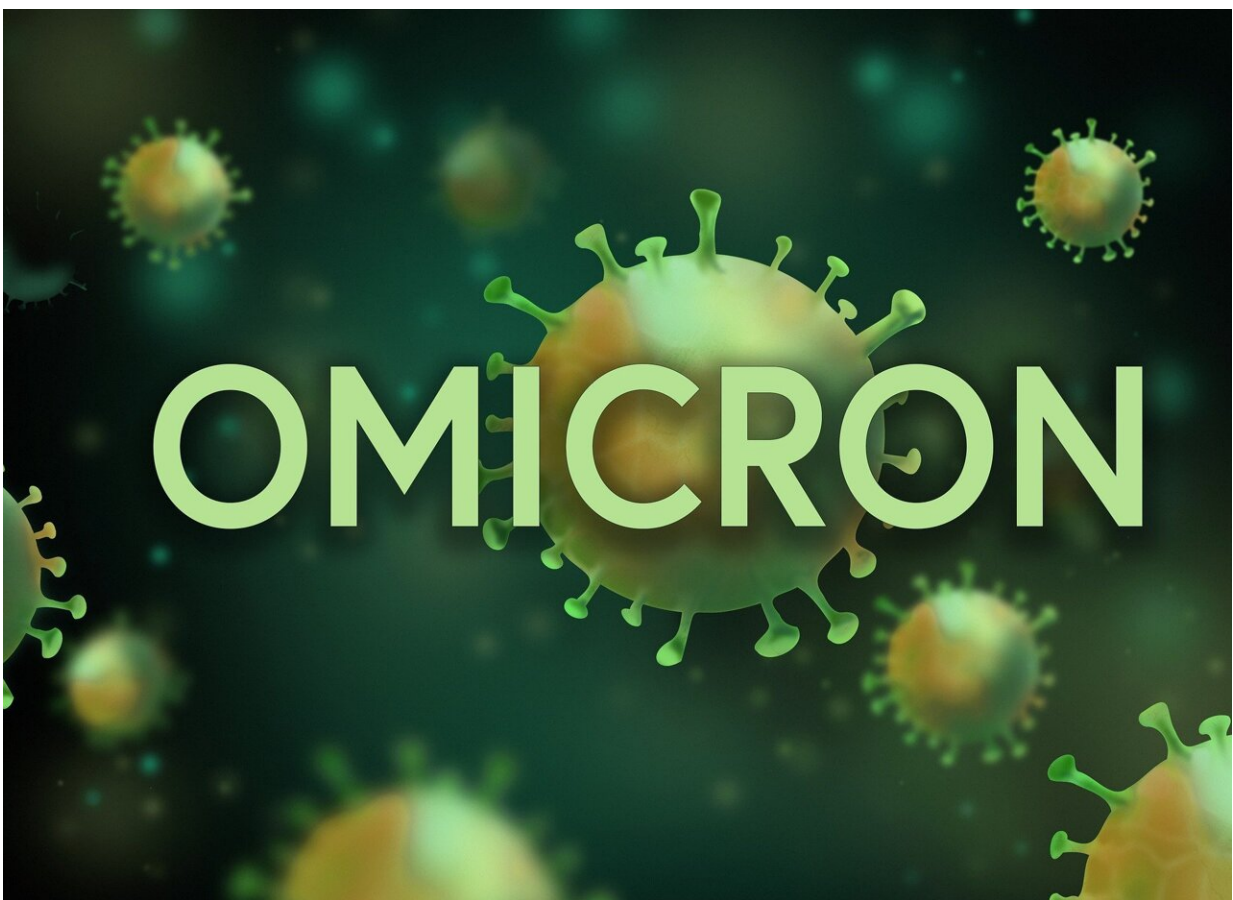


Modeling the potential impact of omicron in the UK projects wave of COVID-19 transmission

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Credit: Pixabay/CC0 Public Domain

New modeling from the London School of Hygiene & Tropical Medicine (LSHTM) suggests the Omicron variant has the potential to cause a wave of transmission in England that could lead to higher levels of cases and hospitalisations than those seen during January 2021, if additional control measures are not taken.

The research is not yet peer reviewed and is set out in a pre-print paper. The team used the latest experimental data on the antibody-evading characteristics of the Omicron variant to explore plausible scenarios for the immune escape of Omicron.

The team selected the level of transmissibility and introduction time of Omicron to match with the growth of observed S gene target failure data in England, given the emerging evidence on immune escape. These scenarios were used to project the dynamics of SARS-CoV-2 transmission into the first half of 2022 for England.

The results project a wave of COVID-19 transmission for all scenarios considered, with varying levels of infections, hospital admissions, and mortality depending on the assumptions made.

Under the most optimistic scenario (low immune escape of Omicron and high effectiveness of boosters), a wave of infection is projected which could lead to a peak of over 2,000 daily hospital admissions, with 175,000 (95% CI: 139,000–198,000) hospitalisations and 24,700 (19,500–28,700) deaths between 1st December 2021 and 30th April 2022, if no additional control measures are implemented over and above the current "Plan B" policy in England.

In this scenario, bringing in control measures early in 2022 which are equivalent in stringency to Step 2 of the roadmap—which involved restrictions on indoor hospitality, closure of some entertainment venues, and restrictions on gathering sizes—would be sufficient to substantially

control this wave, reducing hospitalisations by 53,000 and deaths by 7,600.

The most pessimistic scenario (high immune escape and lower effectiveness of boosters) projects a wave of infection which is likely to lead to a peak in hospital admissions around twice as high as the peak seen in January 2021, if no additional control measures are taken, with 492,000 (418,000–537,000) hospitalisations and 74,800 (63,500–82,900) deaths.

In this scenario, the team estimates that stronger measures may be required to keep the peak number of hospital admissions below the January 2021 peak.

Dr. Rosanna Barnard from LSHTM's Centre for the Mathematical Modeling of Infectious Diseases (CMMID), who co-led the research, said: "There is a lot of uncertainty about the characteristics of Omicron, and whether Omicron in England will follow the same course as it has in South Africa. More data over the next few weeks will strengthen our knowledge on Omicron and the consequences of this on transmission in England. However, these early projections help guide our understanding about potential futures in a rapidly evolving situation.

"In our most optimistic scenario, the impact of Omicron in the early part of 2022 would be reduced with mild control measures such as working from home. However, our most pessimistic scenario suggests that we may have to endure more stringent restrictions to ensure the NHS is not overwhelmed. Mask-wearing, social distancing and booster jabs are vital, but may not be enough.

"Nobody wants to endure another lockdown, but last-resort measures may be required to protect health services if Omicron has a significant level of immune escape or otherwise increased transmissibility compared

to Delta. It is crucial for [decision makers](#) to consider the wider societal impact of these measures, not just the epidemiology."

Assumptions about the levels of transmissibility and immune escape of Omicron were formulated using "S" gene target failure (SGTF) data from cases in England—these are cases that are not yet confirmed with genomic sequencing to be Omicron but thought to be highly likely to be Omicron, as the Omicron variant causes this failure but the widespread Delta variant does not.

For the two immune escape scenarios considered, the team estimate the Omicron variant to be between 10% less transmissible than the Delta variant to 35% more transmissible than Delta.

The researchers account for the additional protection afforded by booster doses against Omicron in their scenarios. If a very high uptake of booster vaccines is achieved, then this is projected to further mitigate projected surges in cases, hospitalisations and deaths.

Dr. Nick Davies from CMMID, who co-led the research, said: "These are early estimates, but they do suggest that overall Omicron is outcompeting Delta rapidly by evading vaccines to a substantial degree. If [current trends](#) continue then Omicron may represent half of UK cases by the end of December.

"Further analysis suggests that the booster program is vital, with a counterfactual scenario with no boosters showing a peak in hospitalisations that could be as much as five times as high as the scenario with boosters."

The research team say these projections are subject to considerable uncertainty, with limitations including the early nature of the data used to make predictions, uncertainty over policy decisions that will be made

over the next several months, and a lack of information on the relative severity of Omicron.

More information: Modelling the potential consequences of the Omicron SARS-CoV-2 variant in England.

[cmmid.github.io/topics/covid19 ... port 11 dec 2021.pdf](https://cmmid.github.io/topics/covid19...port_11_dec_2021.pdf)

Provided by London School of Hygiene & Tropical Medicine

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