

## Some reduction in hospitalisation for Omicron v Delta in England: early analysis

by *Dr Sabine L. van Elsland, Emily Head*  
22 December 2021



**Estimates suggest Omicron cases are 15% less likely to attend hospital, and 40% less likely to be hospitalised for a night or more, compared to Delta.**

The researchers stress that these reductions in severity must be balanced against the larger risk of infection with Omicron, due to the reduction in protection provided by both vaccination and natural infection. For example, at a population level, large numbers of infections could still lead to large numbers of hospitalisations. They say the estimates provided in this paper will assist in refining mathematical models of potential healthcare demand associated with the unfolding European Omicron wave.

"Given the high transmissibility of the Omicron virus, there remains the potential for health services to face increasing demand if Omicron cases continue to grow at the rate that has been seen in recent weeks."

– **Professor Neil Ferguson**

*Director of Imperial's MRC Centre for Global Infectious Disease Analysis and Jameel Institute*

The new report (Report 50) from the Imperial College London COVID-19 response team estimates hospitalisation risk for Omicron cases in England. It includes all PCR-confirmed SARS-CoV-2 cases in England between 1-14 December where the variant causing infection could be identified from genetic data or via S gene target failure (SGTF). The data set included 56,000 cases of Omicron and 269,000 cases of Delta.

In the study, hospital attendance was defined as any record of attendance at a hospital by a confirmed case in the 14 days following their positive PCR test, up to and including the day of attendance. A

secondary analysis examined the subset of attendances with a length of stay of one or more days. The researchers caution that insufficient time has passed for enough data to have accumulated for severity to be judged for more severe outcomes such as intensive care unit admission or death.

### Reduced risk of hospitalisation

The estimates suggest that Omicron cases have, on average, a 15-20% reduced risk of any hospitalisation and an approximately 40-45% reduced risk of a hospitalisation resulting in a stay of one or more nights. Reinfection is associated with approximately a 50-60% reduction in hospitalisation risk compared with primary infections.

However, after adjusting estimates to account for only one in three reinfections being identified, the estimated difference in intrinsic hospitalisation risk (i.e. defined for primary infections in unvaccinated people) between Delta and Omicron is reduced (ie, 0-30% reduced hospitalisation) but the estimated reduction in risk of hospitalisation due to previous infection is increased (around 55-70%).

Moderately reduced severity is also supported by the observation that the mean lengths of hospital stay for Delta and Omicron cases in the study were 0.32 (95%CI: 0.29-0.34) and 0.22 (95%CI: 0.15-0.28) days, respectively. However, it should be noted that Omicron cases on average had less follow-up time in the study.

The researchers say that as more data accumulate, with longer periods of follow-up, assessment of more severe outcomes will become feasible. They state that it is quite possible that larger reductions in hospitalisation risk for Omicron versus Delta may be estimated for ICU admission and death, given that remaining immune protection against more severe outcomes of infection are expected to be much higher than those against milder disease.

### Varied prior immunity

As different groups of the English population have widely varying prior immunity from both vaccination and natural infection, the researchers also provide estimates stratified by vaccination status, though the researchers caution about over-interpreting these trends due to limited sample sizes.

The estimates suggest that individuals who have received at least two doses of either AstraZeneca, Pfizer or Moderna vaccines have substantially reduced risk of hospitalisation compared with primary infections with Delta in unvaccinated individuals, even if protection against infection has been largely lost against the Omicron variant.

### Contextualising Omicron's severity

The authors say it is essential to place the severity of Omicron in the context of reinfection risk in countries, like England and South Africa, where a large proportion of the population may have already been infected.

"Whilst the reduced risk of hospitalisation with the Omicron variant is reassuring, the risk of infection remains extremely high."

– Professor Azra Ghani

For example, a total of 9.8 million people had tested positive for SARS-CoV-2 in England by 21st December 2021, equating to 17.3% of the population. Given that reported cases may only capture a third of total infections, over half the English population may have been infected prior to the start of the Omicron wave. Hence the hospitalisation rates in England for Omicron are being strongly affected by infection-induced immunity

Professor Neil Ferguson from Imperial College London said: "Our analysis shows evidence of a moderate reduction in the risk of hospitalisation associated with the Omicron variant compared with the Delta variant. However, this appears to be offset by the reduced efficacy of vaccines against infection with the Omicron variant. Given the high transmissibility of the Omicron virus, there remains the potential for health services to face increasing demand if Omicron cases continue to grow at the rate that has been seen in recent weeks."

Professor Azra Ghani from Imperial College London said: "Whilst the reduced risk of hospitalisation with the Omicron variant is reassuring, the risk of infection remains extremely high. With the addition of the booster dose, vaccines continue to offer the best protection against infection and hospitalisation."

*The work, which is not yet peer-reviewed, is presented in the latest report from the WHO Collaborating Centre for Infectious Disease Modelling within the MRC Centre for Global Infectious Disease Analysis, Jameel Institute, Imperial College London.*

*Since the emergence of the new coronavirus (COVID-19) in December 2019, the Imperial College COVID-19 Response Team has adopted a policy of immediately sharing research findings on the developing pandemic.*

[Read the full report 'Report 50 - Hospitalisation risk for Omicron cases in England'](#)

### Supporters



Article text (excluding photos or graphics) © Imperial College London.

Photos and graphics subject to third party copyright used with permission or © Imperial College London.

### Reporters



**Dr Sabine L. van Elsland**  
School of Public Health



**Emily Head**  
Communications Division

TAGS: [COVIDWEF](#), [Infectious-diseases](#), [Coronavirus](#), [Public-health](#), [Global-health](#)

[See more tags](#)



**Main campus address:**

Imperial College London, South Kensington Campus, London SW7 2AZ, tel: +44 (0)20 7589 5111

[Campus maps and information](#) | [About this site](#) | [This site uses cookies](#) | [Report incorrect content](#) | [Log in](#)

