

NEWS | 17 December 2021

How severe are Omicron infections?

As cases spread and countries plan their response, researchers await crucial data on the severity of the disease caused by the coronavirus variant.

Heidi Ledford

 Medical workers photographed through a window treating a patient with COVID-19 in hospital in Switzerland

The Omicron variant is causing hospitalizations in many nations. Credit: Laurent Gillieron/EPA-EFE/Shutterstock

It has been less than four weeks since the announcement that [a mutation-laden coronavirus variant](#) had been discovered in southern Africa. Since then, dozens of countries around the world have reported Omicron cases – including [a worrying number of infections](#) in people who have either been vaccinated or experienced previous SARS-CoV-2 infections.

But as political leaders and public-health officials try to chart a course through oncoming Omicron surges, they must do so without a firm answer to a key question: how severe will those Omicron infections be?

So far, the data are scarce and incomplete. “There is inevitably a lag between infection and hospitalization,” says infectious-disease epidemiologist Mark Woolhouse at the University of Edinburgh, UK. “In the meantime, policy decisions have to be made and that’s not straightforward.”

Hospitalization rate

Early results suggest a glimmer of hope. Reports from South Africa have consistently noted a lower rate of hospitalization as a result of Omicron infections compared with infections caused by the Delta variant, which is currently responsible for most SARS-CoV-2 infections globally. On 14 December, the South African private health insurer Discovery Health in Johannesburg announced that hospitalization risk has been 29% lower among people infected with Omicron, compared with people infected with a previous variant.

This has fuelled suggestions that Omicron causes milder disease than previous variants. But researchers say it is too early to be sure, and key methodological details of that study have not yet been published. Such details are crucial when interpreting data on disease severity, which can be confounded by factors such as hospital capacity, the age and overall health of those initially infected, and the extent of previous exposure to coronavirus.

But the results from Discovery Health are in keeping with other studies in the country, says Waasila Jassat, a clinician and public-health specialist at the National Institute for Communicable Diseases in Johannesburg. “There are many caveats and disclaimers around early severity data,” she says. “But the picture is very consistent.”

It will take time for a consistent picture to emerge from countries that currently have fewer Omicron infections. On 13 December, Denmark released data showing that hospitalization rates for people infected with Omicron seemed to be on a par with those for people infected with other variants. But this comparison was based on only about 3,400 cases of Omicron infection and 37 hospitalizations.

Similarly, [a 16 December report](#) from Imperial College London found no evidence of diminished hospitalizations from Omicron infections compared with Delta in England, although this was again based on relatively few cases. Overall, the numbers are still too small to draw firm conclusions about the severity of disease caused by Omicron, says Troels Lillebæk, an infectious-disease specialist at the University of Copenhagen.

And a rapidly spreading variant could dangerously strain health-care systems, even if the risk of severe disease or death is relatively low for any individual. “A small fraction of a very large number is still a large number,” says Woolhouse. “So the population-level threat is very real.”

South Africa’s optimistic data might not be a sign that Omicron itself is more benign than previous variants. More than 70% of the population in regions heavily infected with Omicron have had previous exposure to SARS-CoV-2, and about 40% have received at least one dose of a COVID-19 vaccine, says Jassat. This makes it difficult to disentangle the effects of pre-existing immunity from inherent properties of the variant itself.

Vaccine protection

Laboratory studies have suggested that Omicron **might be able to evade some COVID vaccine-induced immunity**, and early data from the UK Health Security Agency suggest that the vaccines are not as protective against Omicron infections as they have been against other variants, although the number of cases studied was too small to be sure about how much protection has decreased.

Even so, vaccines could continue to protect many recipients from severe disease and death from COVID-19. In addition to antibodies, the immune system in previously infected and vaccinated people deploys cells called T cells that can recognize fragments of viral proteins and destroy virus-infected cells, potentially **limiting the scope of an infection**.

Researchers have mapped Omicron’s panoply of mutations onto the menu of SARS-CoV-2 protein fragments recognized by T cells following natural infection and vaccination, and found no mutations in most of these fragments. In the case of vaccination, more than 70% of the fragments are fully intact, according to immunologist Alessandro Sette at the La Jolla Institute for Immunology in California.

There is more work to be done – scientists are already conducting laboratory assays to determine how well T cells generated in response to vaccines and infection with other variants react to Omicron, with results expected in the coming weeks. “I’m optimistic that the reactivity is going to be preserved, at least in part,” Sette says. “How much of it will be preserved remains to be seen.”

At the moment, there is no way to draw a direct line between the degree of T-cell reactivity and protection against severe disease. Previous studies have found that robust T-cell reactions to SARS-CoV-2 are correlated with lower viral loads and less-severe disease, but do not establish a threshold at which that protection might begin to wane, Sette says. Ultimately, it will again come down to waiting for data on hospitalizations and deaths from Omicron.

Infections in children

As those data emerge, researchers will be looking particularly at the effects of Omicron on children. Results from South Africa have suggested that hospitalization rates for children infected with Omicron are higher than were seen in previous waves. But researchers again caution that this does not necessarily mean that children are more vulnerable to Omicron than they were to Delta or other variants. Jassat notes that children have lower rates of previous coronavirus infection and vaccination than adults, meaning that their levels of pre-existing immunity are not as high.

Higher rates of hospitalization in children during the early stages of an outbreak could also reflect more hospital capacity, affording the luxury of keeping a child in for observation who might otherwise be sent home, she adds.

And the setting in which children are exposed can also play a part: extended exposures at home from an infected parent could mean a higher initial exposure to the virus than a transient exposure at school, says David Dowdy, an infectious-disease epidemiologist at Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland. “Everyone is focused on the pathogen here,” he says. “But it’s not just about the variant, it’s also about the host and the environment.”

doi: <https://doi.org/10.1038/d41586-021-03794-8>

Latest on:

[Virology](#) SARS-CoV-2



How COVID vaccines shaped 2021 in eight powerful charts

NEWS | 16 DEC 21



Omicron blindspots: why it's hard to track coronavirus variants

NEWS | 16 DEC 21



Nature's 10: ten people who helped shape science in 2021

NEWS FEATURE | 15 DEC 21

Nature (*Nature*) | ISSN 1476-4687 (online) | ISSN 0028-0836 (print)

© 2021 Springer Nature Limited