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## Most US kids have caught the coronavirus, antibody survey finds

Study shows that infections in very young children doubled during the Omicron wave.

Smriti Mallapaty



Credit: Sarah Silbiger/UPI/Shutterstock

Roughly two in every three children aged between one and four years old in the United States have been infected with SARS-CoV-2, according to a nationwide analysis<sup>1</sup>. Infections in that age group increased more than in any other during the Omicron wave, which researchers say demonstrates the variant's high transmissibility.

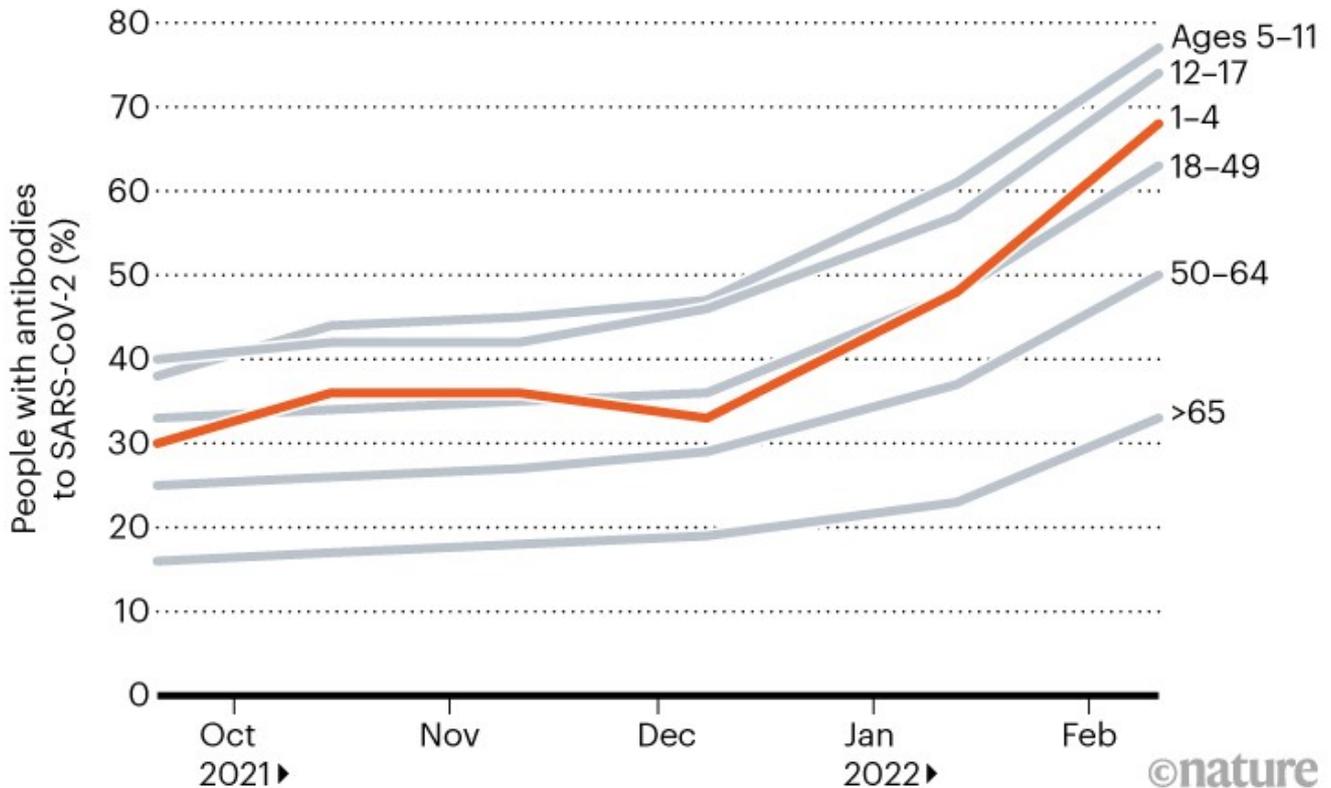
Researchers looked for COVID-19 antibodies in blood samples from more than 86,000 children under 18 years old – including some 6,100 children aged between one and four. In the youngest children, the number of infections more than doubled, from 33% to 68% between December 2021 and February 2022.

Although the analysis involved a small number of very young children, the results are consistent with the rapid rise in documented infections in that age-group, says Pamela Davis, a physician and medical researcher at Case Western Reserve University in Cleveland, Ohio.

Overall, the researchers found that most children aged 1–17 had probably been infected by February this year. Infections in children aged 5 to 11 reached the highest level, 77%. Infection rates in children exceed those observed in adults (see 'Omicron surge').

## OMICRON SURGE

In the United States, the rate of SARS-CoV-2 infection grew markedly during the Omicron wave across all age groups, but the increase was most pronounced in children between the ages of one and four.



Source:

These are important findings, especially for low- and middle-income countries where vaccination rates are low in adult populations and where children probably won't be vaccinated for some time, says Fiona Russell, a paediatrician and infectious-diseases epidemiologist at the University of Melbourne in Australia. The immunity generated from an infection could help to prevent future infections and serious illness in kids, but "the pandemic is not over until children worldwide are also offered vaccination".

### Missed infections

Reported cases of COVID-19 in the United States suggest that some 17% of children under age 18 have been infected. "That's just the tip of the iceberg," says Kristie Clarke, a medical epidemiologist at the US Centers for Disease Control and Prevention in Atlanta, Georgia, who led the study, which was posted online this week without peer review. Reported cases, based on PCR and antigen testing, grossly

under-represent the true rate of infection, especially in children because many asymptomatic and mild infections probably didn't get tested.

To assess the scale of unrecorded infections, Clarke and her colleagues looked for the presence of antibodies against SARS-CoV-2 in leftover blood samples taken during doctor visits between September 2021 and February 2022. The antibodies they looked for target a specific protein on the SARS-CoV-2 virus that is not present in the COVID-19 vaccines used in the United States – so they can tell that children gained immunity from infection, rather than vaccination.

The high rates of infection in children are reflected in US hospitalization data. The number of children under five admitted to hospital with COVID-19 during the peak of the Omicron wave was 5 times that at the peak of the Delta wave, and admissions to intensive care were 3.5 times higher.

Many factors could explain the increased infections in toddlers and preschoolers, says Clarke, including that children under five are not eligible for vaccination and might be less likely to wear masks or practice social distancing than older kids and adults.

The numbers are striking but not surprising, and “might well have underestimated the force of infection during the Omicron wave”, says Shabir Mahdi, a vaccinologist at the University of the Witwatersrand, South Africa. Antibody tests can't tell whether someone has been infected multiple times, and could have missed some infections owing to waning numbers of antibodies over time, he says. The antibody test used in the study captured only about 80% of infections that could be detected using a different antibody test, says Madhi.

## Sparing kids

Studies suggest that the risk of severe disease is lower in children infected with Omicron than with Delta. One US study<sup>2</sup> by Davis and Rong Xu, a data scientist who is also at Case Western Reserve University, looked at more than 650,000 children under five and found that their risk of getting severe disease during the Omicron wave was

about one-third of that during the Delta wave, measured by emergency visits to hospital between November 2021 and January 2022. Xu says it will be important to look at the long-term effects of the surge in kids.

So far, hospitalization rates in kids have been far lower than those observed in older age-groups, says Madhi. “Children have been spared,” he says. “We should be thankful for that.”

*doi:* <https://doi.org/10.1038/d41586-022-01231-y>

## References

1. Clarke, K. E. N. *et al.* Preprint at <https://ssrn.com/abstract=4092074> (2022).
2. Wang, L. *et al.* *JAMA Pediatr.* <https://doi.org/10.1001/jamapediatrics.2022.0945> (2022).

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