

COVID VARIANTS' IMPACT ON SCHOOLS REMAINS UNCERTAIN

Children are no more susceptible than adults, but closing schools could have long-term social effects.

By Dyani Lewis

The emergence of fast-spreading coronavirus variants has once again put a spotlight on the role of children in the COVID-19 pandemic. Early data on one new variant had suggested that it was spreading more easily in children than in adults. But researchers now think the variant is spreading more efficiently than other lineages in all age groups, allaying those fears.

Still, a year into the pandemic, much remains unknown about the spread of SARS-CoV-2 in children, prompting calls for increased surveillance and testing to inform decisions about school closures. "We still don't really know how much schools and children actually contribute to spread," says Catherine Bennett, an epidemiologist at Deakin University in Melbourne, Australia.

Children seem to be less susceptible to SARS-CoV-2 than adults are, possibly because of inherent biological differences, says Calum Semple, an outbreak specialist at the University of Liverpool, UK. And studies in several countries last year suggested that schools were not hotspots for transmission, provided they took precautions such as maintaining hygiene and social distancing (see *Nature*

587, 17; 2020). However, it's often difficult to compare data between countries because of variations in practices.

But if new variants are increasing infection rates in children, then the dynamics of transmission in schools should be reinvestigated, says Bennett. Better data are needed because cases in children – who are more likely than adults to remain asymptomatic – are probably being missed. A number of countries don't test people without symptoms.

Many researchers caution against closing schools before other parts of society, noting the harm to children from missed learning. Other scientists think that governments should act quickly when there is a rise in infections, including closing schools. George Milne, who leads COVID-19 modelling at the University of Western Australia in Perth says: "It's better to go hard early and [then] relax."

A changing picture

A new variant now called B.1.1.7 was first detected in the United Kingdom in November. Data collected between late November and mid-December suggested that the proportions of coronavirus infection attributable to B.1.1.7 rather than other lineages were higher in children than in people in other age

groups. This prompted suggestions that the variant was spreading more easily in children than in adults.

But a January report from Public Health England, a government agency, found that the variant, which has spread to dozens of countries, transmits more easily in all age groups (see go.nature.com/36avuwi). It also found that children – especially those under the age of ten – are about half as likely as adults to transmit the variant to others.

A similar picture is emerging about another fast-spreading variant, which was first detected in South Africa and is known as 501Y.V2, says Richard Lessells, an infectious-diseases specialist at the University of KwaZulu-Natal in Durban. "There's nothing jumping out at us that there's different outcomes in the younger group[s]," he says.

If children do now account for a greater proportion of new COVID-19 infections in the United Kingdom than previously, that could be partly because schools stayed open when workplaces and retail outlets were closed at the end of last year, says Semple.

Biological differences?

Estimates suggest that children are half as susceptible to SARS-CoV-2 infection as adults (N. G. Davies *et al. Nature Med.* 26, 1205–1211; 2020) – and some researchers say their biology could be one reason why. Semple says this could be because of differences in the number and location of ACE2 receptors in the respiratory tract; these receptors are used by the virus to latch onto host cells. Children are thought to have fewer ACE2 receptors than do adults. And whereas adults have these receptors throughout their airways, children might have them only in the upper respiratory tract, says Semple. This could explain why the virus doesn't seem to take hold in young children.

Three recently identified variants have been found with mutations to the spike protein, which the virus uses to latch onto cells, making the variants better able to infect host respiratory cells (K. K. Chan *et al. Preprint at bioRxiv* <https://doi.org/frvn>; 2020). But Semple says children might always be less susceptible than adults to an infection that uses the ACE2 receptor, although that needs to be investigated.

In light of the increased infections in children, more accurate data are needed on how they transmit the virus, including how many close contacts children infect, says Bennett.

But Kim Mulholland, a paediatrician at the Murdoch Children's Research Institute in Melbourne, cautions against knee-jerk reactions to early and incomplete information about increased transmission of recent variants in children. The cost of school closures – in terms of lost education and potential exposure to abuse – could have devastating social impacts that blight a generation of children.



There is need for more COVID-19 testing in children, say scientists.

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