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Cite this as: *BMJ* 2021;372:n701<http://dx.doi.org/10.1136/bmj.n701>

Published: 15 March 2021

# Children and the return to school: how much should we worry about covid-19 and long covid?

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Among the unknowns that have featured in the steep learning curve of our covid-19 year, the question of risks to (and from) children has been an ongoing area of uncertainty. At first, the conundrum that the young seemed so little affected by the infection prompted at least one world leader to pronounce that they were “somehow immune.”

A year into the pandemic we have a much clearer perspective, especially from random testing surveys such as R, seroprevalence studies, and contact tracing studies. The overwhelming observation has been that, across the pandemic, children and adolescents are considerably less likely to be affected by severe disease or to be admitted to hospital. In transmission tracing studies, children are roughly half as likely as adults to become infected.<sup>1</sup> While this is still the case, during the latest wave the age distribution of cases has shifted downwards.

In general, child and adolescent cases account for no more than a few per cent of reported, symptomatic cases and few severe or fatal cases. The difference may partly relate to the lower expression of angiotensin converting enzyme 2 in younger children. However, seroprevalence is similar between adolescents and adults, suggesting a high prevalence of asymptomatic spread in the former group.<sup>1,2</sup> Since access to testing has mostly been predicated on presence of case defining symptoms (and these have been defined in adults where they are likely to be more explicit), the likelihood is that the caseload in children has been underestimated. This seems to be confirmed by comparison between unbiased population sampling (such as the React study) and symptom based surveys.<sup>2</sup>

The clinical presentation and immune profile in those children who are admitted to hospital seems similar to the disease in adults. An exception to this is a small subset who develop multisystem inflammatory syndrome in children (MIS-C)—a disease of vascular involvement, shock, and strong T cell activation.

Where does this leave us in terms of evaluating risks—both to and from children—around the return to school? The first point to consider is whether the high seroprevalence among adolescents offers potential hubs of super-spreaders for the community. Certainly, in those children who become sufficiently unwell for hospital admission, viral load reaches much higher levels than seen in adults, though it is unclear whether these high levels are also seen in asymptomatic disease. While some reported contact tracing studies in schools identified relatively little spread, others show that teachers engaged in face-to-face teaching have roughly twice the infection risk of those teaching online.<sup>3-5</sup> Also, the data

indicate that jumps in the R value have followed term date restarts in countries where children have been at school during the pandemic.<sup>6</sup> This scenario is reminiscent of the role played by children in transmission of winter flu—they are relatively unlikely to have severe disease, but can play a significant role in spread to the community and to older relatives.

Arguably the biggest unknown is the evaluation of risk of developing long covid during asymptomatic spread in a school setting. Estimating the prevalence of long covid in adults remains a challenge, and for children and adolescents considerably more so. Until more detailed studies are completed, evidence of the total long covid caseload appears to lie somewhere between the Office for National Statistics (ONS) estimate of around 10% and some research cohort studies that tend to put it considerably higher. The ONS data also indicate that around 79 000 of those in the UK with long covid are under the age of 19. Most of the symptoms described at [www.longcovid-kids.org](http://www.longcovid-kids.org) are like those reported by adults: fatigue, shortness of breath, joint pain, rashes, and headaches.

Given the strong imperative to get children back into full time, face-to-face teaching after the disruptions of the past year, the key challenge is to maximally offset the risks of community transmission and paediatric cases of covid-19 and long covid. Analysis has shown that the protective impact of mitigation measures is cumulative as one adds in mask wearing, ventilation, regular testing, small class sizes, and spaced classrooms. The next few weeks will pose enormous logistical challenges for heads and teachers. Luckily this is happening as we head into spring, with potential to make use of outdoor teaching and dining. After that, it will be time to start planning for the extension of vaccination programmes into schools.

The authors declare no competing interests

Commissioned, not peer reviewed

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