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Daily antigen testing to reduce disruption when schools return

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The role of schoolchildren and schools in the transmission of SARS-CoV-2 will come again to the fore with the reopening of schools in September in many northern hemisphere countries. In many other countries, including Australia and New Zealand, it remains uncertain whether schools will reopen before the end of the academic year.

School policy during the COVID-19 pandemic has had to balance the risks of transmission of the virus from children mixing in schools with the harms that arise from school closures or mitigations to reduce social mixing. Over a year and a half into the pandemic, it is an uncomfortable truth that we remain uncertain about the role of schools in transmission of this virus.¹ Outbreaks do occur in educational institutions, although large-scale studies have found that schools seem to be low risk for virus transmission,^{2,3} and systematic reviews found very mixed evidence that either closure or reopening of schools influences community virus transmission rates.¹ However, the evidence is mounting that school closures produce a range of harms for children and young people, particularly loss of learning, delayed development, mental health problems, poor sleep, and lower physical activity.⁴ We must therefore be certain that the mitigations we put in place for schools, from isolation of positive cases and class cohorting through to school closures, are effective—and more effective than alternatives.

In *The Lancet*, Bernadette Young and colleagues⁵ report the findings from a cluster-randomised controlled trial aimed at the heart of this school management risk balance. The trial involved 201 schools and was undertaken at a time of moderate community prevalence (7-day incidence 30–180 per 100 000 population across the study)⁶ and during the emergence of the SARS-CoV-2 delta (B.1.617.2) variant in England from April 19 to June 27, 2021.⁵ Young and colleagues⁵ compared the impact of daily antigen lateral flow testing for 7 days with standard 10-day home isolation on school attendance and SARS-CoV-2 transmission among staff and an ethnically diverse group of 11–18-year-old students (about 25% of whom were non-White) who were close contacts of a proven case.

Young and colleagues⁵ found similar numbers of secondary cases identified in the intervention and control schools, with 44 (1.5%) of 2981 asymptomatic contacts in the intervention group and 14 (1.6%) of 886 asymptomatic contacts in the control group testing positive for SARS-CoV-2 (adjusted odds ratio 0.73 [95% CI 0.33–1.61]; $p=0.44$). Overall, school attendance was not significantly greater in the daily testing group than in the control group. The trial was subject to common issues with cluster-randomised trials, including greater dropout among control schools. Young and colleagues did not directly measure in-school transmission and did not report the genomic sequencing data specified in their protocol, although this will follow in a later publication.

Young and colleagues' findings will be important for many countries. In European and North American countries reopening schools in September, these findings point the way to policies that support continued in-person learning for contacts of positive cases. In Australia, which was able to keep schools open during periods of community transmission in 2020,⁷ public health responses have recently become overwhelmed, with the introduction of widespread lockdown and school closures to manage viral spread. Daily antigen testing could provide a tool to ensure students are back in the classroom, especially for key events such as final year exams. School-based testing might have value beyond effectiveness in that it can



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provide the comfort that students, parents, teachers, and staff need to resume face-to-face learning.⁸

One might argue that, regardless of the lack of difference in the transmission outcomes, the inability to show reduction in school absence means that the intervention failed to reduce educational disruption, greatly reducing its usefulness. However, the lack of a change in school absence at the 0.05 significance level probably reflects a lack of power, as the CIs were consistent with reduced absences at a lower significance. Moreover, daily testing regimens provide increased flexibility and choice for families and schools. The study also provides useful data on the operation of lateral flow devices in real life schools—the authors report a low sensitivity of 53% (exact binomial 95% CI 40–66) and a high specificity of 99.93% (99.77–99.99). However, given that sensitivity increases with higher viral loads, identification of individuals currently transmitting SARS-CoV-2 might be a reason why the intervention did not lead to increased transmission compared with isolation.

Young and colleagues' study also provides further evidence that the proportions of contacts testing positive in school studies are notably lower than seen in multiple household contact-tracing studies,⁹ supporting the contention that schools are a lower risk setting for transmission. It is important to note that this was the case even with the delta variant emerging and with the cessation of mandatory mask use halfway through the trial.

Vaccination of high proportions of adults in a population inevitably moves the focus onto transmission among children in schools. Yet there have been disappointingly few school-related trials during the COVID-19 pandemic, with children excluded from the clear benefits that randomised evidence gathering brings

to policy. Developing practical and effective ways of keeping schools open with circulating SARS-CoV-2 should be a priority for all countries. No longer can pandemic school policy be driven only by benefit to adults (ie, reduction in transmission to vulnerable adults) rather than benefit to children.

We declare no competing interests.

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- 1 Walsh S, Chowdhury A, Braithwaite V, et al. Do school closures and school reopenings affect community transmission of COVID-19? A systematic review of observational studies. *BMJ Open* 2021; **11**: e053371.
- 2 Macartney K, Quinn HE, Pillsbury AJ, et al. Transmission of SARS-CoV-2 in Australian educational settings: a prospective cohort study. *Lancet Child Adolesc Health* 2020; **4**: 807–16.
- 3 Ulyte A, Radtke T, Abela IA, et al. Clustering and longitudinal change in SARS-CoV-2 seroprevalence in school children in the canton of Zurich, Switzerland: prospective cohort study of 55 schools. *BMJ* 2021; **372**: n616.
- 4 Viner R, Russell S, Saule R, et al. Impacts of school closures on physical and mental health of children and young people: a systematic review. *MedRxiv* 2021; published online Feb 12. <https://doi.org/10.1101/2021.02.10.21251526> (preprint).
- 5 Young BC, Eyre DW, Kendrick S, et al. Daily testing for contacts of individuals with SARS-CoV-2 infection and attendance and SARS-CoV-2 transmission in English secondary schools and colleges: an open-label, cluster-randomised trial. *Lancet* 2021; published online Sept 14. [https://doi.org/10.1016/S0140-6736\(21\)01908-5](https://doi.org/10.1016/S0140-6736(21)01908-5).
- 6 UK Government. Coronavirus (COVID-19) in the UK: cases in United Kingdom (May 26 to June 28, 2021). <https://coronavirus.data.gov.uk/details/cases> (accessed Aug 25, 2021).
- 7 National Centre for Immunisation Research and Surveillance. COVID-19 in schools and early childhood education and care services—the Term 3 experience in NSW. Oct 21, 2020. https://www.ncirs.org.au/sites/default/files/2020-10/COVID-19%20Transmission%20in%20educational%20settings%20in%20NSW%20Term%203%20report_0.pdf (accessed April 5, 2021).
- 8 Vohra D, Rowan P, Hotchkiss J, Lim K, Lansdale A, O'Neil S. Implementing COVID-19 routine testing in K-12 schools: lessons and recommendations from pilot sites. Rockefeller Foundation, July, 2021. https://www.rockefellerfoundation.org/wp-content/uploads/2021/07/implementing_covid-19_routine_testing_in_k-12_schools_lessons_and_recommendations_from_pilot_sites.pdf (accessed Aug 28, 2021).
- 9 Madewell ZJ, Yang Y, Longini IM Jr, Halloran ME, Dean NE. Household transmission of SARS-CoV-2: a systematic review and meta-analysis. *JAMA Netw Open* 2020; **3**: e2031756-e.

ECMO in COVID-19: do not blame the tool

Initial reports suggested a high mortality for COVID-19 patients supported with extracorporeal membrane oxygenation (ECMO).¹ However, subsequent cohort studies reported ECMO outcomes did not differ between COVID-19 and other types of acute respiratory distress,^{2,3} encouraging many to provide ECMO when deemed appropriate, including coordinating its delivery at national level in England.⁴

In *The Lancet*, Ryan P Barbaro and colleagues⁵ report an analysis of an international cohort of 4812 patients (aged ≥ 16 years) with COVID-19 who were supported with ECMO. Patients were divided into three groups based on the time and centre at which ECMO was started. The median age of patients was 49–51 years across the three groups, and 3523 (73%) were male. Data on race were not reported. The primary outcome was in-hospital



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