


Reopening schools during the COVID-19 pandemic: governments must balance the uncertainty and risks of reopening schools against the clear harms associated with prolonged closure

Russell M Viner ¹, Christopher Bonell,² Lesley Drake,³ Didier Jourdan,⁴ Nicolette Davies,⁵ Valentina Baltag,⁶ John Jerrim,⁷ Jenny Proimos,⁸ Ara Darzi⁵

Evidence to support the effectiveness of global school closures in controlling COVID-19 is sparse. There is continued uncertainty about the degree to which school children are susceptible to and transmit COVID-19. Balancing the potential benefits with harms involves explicit trade-offs for governments, but there has been little recognition that low-income and middle-income countries face a very different set of trade-offs around school reopening from those in wealthy countries.

Both reopening schools and keeping them closed carry risks that actively require mitigation.

Schools remain closed in many countries globally as part of efforts to control the COVID-19 pandemic.¹ National governments face mounting dilemmas about when and how to reopen schools. We review the benefits and risks of school closures during the COVID-19 pandemic and outline key principles for reopening schools.

Data from previous outbreaks suggest that schoolchildren may play only a relatively small role in the transmission of

coronaviruses.² Data from COVID-19 are sparse. Those under 20 years appear to be around half as susceptible as adults to severe acute respiratory syndrome coronavirus 2^{3,4} and much less likely to be symptomatic.⁴ Yet data on viral load suggest that children may have COVID-19 viral load similar to that of adults.⁵ Data on transmission in schools are sparse. Population-based contact-tracing data on transmission in schools in Australia have identified almost no transmission.⁶

Given this uncertainty, the impact of reopening schools on transmission and the potential for a second pandemic wave is unclear. However, there is no evidence that children are more likely to transmit than adults, unlike in some respiratory viruses. When children do get COVID-19, there is also clear evidence that they are very unlikely to have severe illness or die.⁴ Together these data suggest that children, particularly primary schoolchildren, are likely to be among the safer groups to begin relaxation of social distancing.

In contrast, the harms related to prolonged school closure are well documented.² In addition to impacts on learning, these include reductions in physical activity and a range of impacts on mental health and well-being due to social isolation, reduced social support, increased exposure to violence at home, exclusion of children from school-delivered public health interventions (eg, vaccination, worming and feeding programmes) and exclusion of the most vulnerable students from social safety nets operating through schools. Indirect harms to broader society include short-term loss of healthcare and other key workers, as well as reductions to broader productivity due to parental absenteeism from work. These harms are greater in more deprived families, thus worsening health and educational inequalities. Balancing the potential

benefits with harms involves explicit trade-offs for governments, decisions that are not without significant risk.

The European Union recommends that relaxing of social distancing measures such as reopening schools should only occur after there is clear evidence that spread has decreased for a significant period, there is sufficient health system capacity to cope with future peaks, and countries have sufficient monitoring and testing capacity to quickly detect and isolate infected people.⁷ Some countries have never closed primary schools (Iceland, Sweden and Taiwan), and some have commenced reopening schools, for example, Denmark, Finland, Norway, France and Germany.

However, there has been little recognition that low-income and middle-income countries (LMICs) face a very different set of trade-offs around school reopening from those in wealthy countries. Low-income countries have much higher proportions of children in the population and smaller proportions of the elderly. Impacts of school closures on COVID-19 transmission are predicated on the effectiveness of wider approaches to social distancing while children are at home. While young people's adherence may be suboptimal in high-income countries, it is likely to be much less optimal in LMICs where broader distancing is challenged by population density and households being forced to leave their homes to access income, food and other necessities in the absence of social safety nets and distribution systems. Schools in LMICs also deliver a broader range of health interventions, with closures having significant impact on programmatic effectiveness. For example, mass drug administration for worm infection for one billion school-age children globally is currently stalled. School feeding programmes, a critical safety net in many societies, are also halted. The World Food Programme estimates that 370 million children are currently not receiving school meals,⁸ driving hunger, impacts on cognition and indirect effects on rural food chains.

Issues of inequality related to cessation of education have particular urgency in LMICs, especially for young women. Family poverty and hunger may require children and young people to gather food or seek work, and those who drop out are unlikely to return to school. School closures and disruption during the Ebola outbreaks in West Africa led to an increase in child marriages and failure to return to school postcrisis. Financial hardship and parent mortality may also result in girls leaving education to take on more

¹Population, Policy and Practice Research Programme, University College London Institute of Child Health, London, UK

²Public Health and Policy, London School of Hygiene & Tropical Medicine, London, UK

³Partnership for Child Development, Imperial College London, London, UK

⁴Faculty of Education, Université Blaise-Pascal, Clermont-Ferrand, Auvergne-Rhône-Alpes, France

⁵Institute of Global Health Innovation, Imperial College London, London, UK

⁶Child and Adolescent Health, WHO, Geneva, Switzerland

⁷UCL Institute of Education, University College London Institute of Education, London, UK

⁸Centre for Adolescent Health, The Royal Children's Hospital Melbourne, Melbourne, Victoria, Australia

Correspondence to Professor Russell M Viner, Population, policy and practice research programme, University College London Institute of Child Health, London, UK; r.viner@ucl.ac.uk

domestic responsibilities. The Malala Foundation estimate that approximately 10 million more secondary-aged school girls could be out of school after the current crisis has passed.⁹

As policymakers debate when and how to reopen schools, efforts must be made to mitigate the effects of closure on children and young people, their families and broader society. High-income countries are providing education and mental health support via online routes and alternative provision for school meals, although these are less possible for LMICs. Mitigation policies in LMICs need to focus on those at most risk of not returning to education, particularly girls and young women.

The major challenge for countries is how as well as when to reopen schools. We propose five key principles to guide decisions.

REOPEN SCHOOLS IN A STAGED FASHION

Schools may be opened in a staged fashion, by year groups (eg, primary and secondary), urban, rural or regionally, or for different groups of students. Staging allows monitoring of the impact of reopening on new infections locally before opening further schools. Schools must have sufficient time and resources to plan and implement changes to time-tabling, and physical structure to enable social distancing and support for teachers and vulnerable students.

INCORPORATE SOCIAL AND PHYSICAL DISTANCING

Social distancing measures can be implemented in schools, and evidence from influenza outbreaks supports their utility.¹⁰ Social contacts between children can be reduced within and across classes, years and schools (see table 1). In Taiwan, pupils are separated from each other by newly built plastic partitions between desks in classrooms and canteens. Splitting years or classes so that only part of the school attends at any one time may allow physical distancing even in normally crowded schools.

ENSURE INFECTION CONTROL MEASURES, INCLUDING TESTING AND CONTACT TRACING, ARE AVAILABLE IN SCHOOLS

Ensuring school hygiene and handwashing measures and the monitoring of infections among students and teachers (eg, test, trace and isolate programmes) will be important in terms of assessing the safety of reopening of schools, and also to gain and retain the trust of teachers and

Table 1 Strategies for reopening schools

1. Reopen schools in a staged fashion.	
	A number of countries have reopened kindergartens and primary schools first (Denmark and Norway).
2. Incorporate social distancing.	
Across the school	<ul style="list-style-type: none"> ▶ Close playgrounds or social distance within playgrounds, for example, single-class groups in playground at a time, implementing social distancing during play. ▶ Stagger school start times and period changes for year, to avoid years mixing and to reduce social contacts in corridors. ▶ Stop all communal activities, for example, dining, assemblies and sports. ▶ Ensure social distancing on school buses and other transports. ▶ Split school into halves so that only half the years attend at one time. This could be half-days (some years in the morning, some in the afternoon, with no mixing), alternating full days or alternating weeks (half the students attend every second week). ▶ Keep children in constant class groups to reduce range of contacts. ▶ Keep all books or equipment at school to reduce potential for transmission through surfaces. Avoid sharing of equipment between children.
Within-year groups	Split each year so that half the classes in a year attend at a time. Again this could be half-days, alternating full days or alternating weeks or fortnights. Fortnights may be epidemiologically more effective at disrupting transmission.
Within classes	<ul style="list-style-type: none"> ▶ Split classes so that only half of each class (or a maximum of 15–20 students) attend at any one time. Splits could be half-days, full days or weekly. ▶ Physical social distancing within classes, separation of desks by 1–2 m; physical barriers between desks have been implemented in some countries.
3. Infection control, testing and tracing.	
	<ul style="list-style-type: none"> ▶ Institute hygiene practices, both personal (handwashing) and institutional (regular cleaning of surfaces) and education of students in hygiene and infection control. ▶ Testing and tracing of contacts of positive cases. ▶ Isolation of suspected cases in students and staff. ▶ National and regional class and school closure policies, depending on infection burden in students.
4. Protect teachers and vulnerable students.	
	<ul style="list-style-type: none"> ▶ (Re)institute programmes to support vulnerable children before schools reopen and continue them during reopening. ▶ Encourage older or medically vulnerable teachers to provide administrative support or virtual teaching. ▶ Social distancing for teachers within classrooms. ▶ Basic protective equipment for teachers. ▶ Wearing of face masks: the WHO currently does not recommend wearing of face masks in community settings but recognises current uncertainty and that some countries recommend them.
5. Research and evaluate.	

the public. Algorithms for local class or school closures may be useful where local outbreaks occur.¹¹

PROTECT TEACHERS AND VULNERABLE STUDENTS

Ensuring that teachers and students are protected, and keeping their trust, will be essential in reopening schools. Social distancing and basic protective equipment for teachers should be provided. Avoiding group work and using digital tools in the classroom may maintain teacher and student collaboration while maintaining social distancing. An emphasis on promoting teacher and student mental health is essential.

RESEARCH AND EVALUATION

The impacts of school reopening on the epidemic curve but also on education,

health and well-being of children, staff and families must be documented and shared. Clear mechanisms for information sharing within and across countries must be established.

The restoration of education in a safe but timely way is essential to prevent what UNICEF argues might be catastrophic consequences for humanity.¹² School reopening should be prioritised over reopening other elements of society. Trade-offs in LMICs are different from those in wealthy countries, and evidence from previous pandemics suggests that school closures will impact on enrolment rates and increase inequalities in the long term.⁹ Decisions will need to be made based on available evidence and recognising that both reopening schools and keeping them closed carry risks. Phased reopening of schools introducing social

distancing and testing and tracing regimes in schools appear essential, although these may be difficult in LMICs. More research into the wider harms and benefits of school closures and reopening strategies during COVID-19 is critical to inform this and future pandemics.

Acknowledgements We thank Yuri Belfali (Organisation for Economic Co-operation and Development) and other colleagues from the Schools and Health Forum from the World Innovation Summit for Health (WISH) 2020. We are grateful to the WISH and Qatar Foundation for their support.

Contributors RMV and CB developed the idea for the paper and led the writing of the manuscript. All authors contributed to the editing of the manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; internally peer reviewed.



OPEN ACCESS

Open access This is an open access article distributed in accordance with the Creative Commons Attribution

Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

© Author(s) (or their employer(s)) 2021. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.



To cite Viner RM, Bonell C, Drake L, *et al.* *Arch Dis Child* 2021;**106**:111–113.

Received 16 June 2020

Revised 8 July 2020

Accepted 15 July 2020

Published Online First 3 August 2020

Arch Dis Child 2021;**106**:111–113.

doi:10.1136/archdischild-2020-319963

ORCID iD

Russell M Viner <http://orcid.org/0000-0003-3047-2247>

REFERENCES

- 1 Saavedra J. *Educational challenges and opportunities of the coronavirus (COVID-19) pandemic*. World Bank Blogs, 2020.
- 2 Viner RM, Russell SJ, Croker H, *et al.* School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review. *Lancet Child Adolesc Health* 2020;4:397–404.

- 3 Viner RM, Mytton O, Bonell C, *et al.* Susceptibility to COVID-19 amongst children and adolescents compared with adults: a systematic review and meta-analysis. *medRxiv preprint server* 2020. [Epub ahead of print: 24 May 2020].
- 4 Davies NG, Klepac P, Liu Y, *et al.* Age-Dependent effects in the transmission and control of COVID-19 epidemics. *Nat Med* 2020. doi:10.1038/s41591-020-0962-9. [Epub ahead of print: 16 Jun 2020].
- 5 Jones TC, Muhlemann B, Veith T, *et al.* *An analysis of SARS-CoV-2 viral load by patient age*. Berlin: Charité - Universitätsmedizin, 2020.
- 6 (NCIRS) NCFIRaS. *COVID-19 in schools - the experience in NSW*. Sydney: NSW Government, 2020.
- 7 Day M. Covid-19: European officials warn that exiting lockdown will be "very long" and will require cooperation. *BMJ* 2020;369:m1549.
- 8 World Food Programme. Global monitoring of school meals during COVID-19 school closures: world food programme, 2020. Available: <https://cdn.wfp.org/2020/school-feeding-map/index.html> [Accessed 25 April 2020].
- 9 Malala Fund. *Girls' education and COVID-19: What past shocks can teach us about mitigating the impact of pandemics*, 2020.
- 10 Uscher-Pines L, Schwartz HL, Ahmed F, *et al.* School practices to promote social distancing in K-12 schools: review of influenza pandemic policies and practices. *BMC Public Health* 2018;18:406.
- 11 Ministry of Education. Ministry of education standards for suspension Taiwan, 2020. Available: <https://cpd.moe.gov.tw/articleInfo.php?id=2568> [Accessed 25 Apr 2020].
- 12 United Nations. *Policy brief: the impact of Covid-19 on children*, 2020.