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School reopening without robust COVID-19 mitigation risks accelerating the pandemic

On Feb 22, 2021, the UK Government announced that schools in England would fully reopen on March 8, 2021. While returning to school as soon as possible is imperative for the education, social development, and mental and physical welfare of children, not enough has been done to make schools safer for students and staff.¹ Without additional mitigations, increases in transmission are likely, this time with more infectious and possibly more virulent variants, resulting in further lockdowns, school closures, and absenteeism. Even when schools were supposed to be fully open, at points of high community transmission, 22% of secondary school children were not attending due to self-isolation.² In some areas, attendance was as low as 61%.³

Arguments that schools do not contribute to community transmission and that the overall risk to children from COVID-19 is very small have meant that mitigations in schools have received low priority. Yet the evidence cited for these arguments has serious limitations.^{4,5} Primary and secondary school closures have been associated with substantial reductions over time in the effective reproduction number (Rt) across many countries (including England) and time periods.^{6,7} In contrast, data from the Office for National Statistics' (ONS) 2020 COVID-19 Infection Survey show that the prevalence of infection among children aged 2–10 years (2%) and 11–16 years (3%) rose above the prevalence for all other age groups before the 2020 Christmas break (appendix p 4). Both modelling and real-world data in preprint showing rising cases in regions where the SARS-CoV-2 B.1.1.7 variant was prevalent during the lockdown in November, 2020 (when schools were

open),^{8,9} suggest that opening all schools now without robust mitigatory measures in place will probably lead to Rt rising above 1 in almost all scenarios. Modelling data by the University of Warwick and Imperial College London¹⁰ suggest that at least 30 000 more deaths from COVID-19 are estimated under the proposed reopening scenarios. Throughout February, 2021,¹¹ despite fewer students being in school at this time, teaching staff were at higher risk of infection. Recent school

outbreaks in northern Italy, where the B.1.1.7 variant is prevalent, are also concerning.¹²

Although COVID-19 is unlikely to cause severe disease in children, estimates of the prevalence of long COVID symptoms based on the ONS Infection Survey suggest that 13% of children aged 2–10 years and 15% of those aged 12–16 years have at least one persistent symptom 5 weeks after testing positive. Given uncertainty around the long-term health effects



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For estimates of the prevalence of long COVID symptoms see <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandlifeexpectancies/adhocs/12788-updatedestimatesoftheprevalenceoflongcovidsymptoms>

Panel: Recommendations

Physical distancing

General

- Traffic light system of risk
- Use remote or blended learning to reduce footfall

During travel

- Keep travel bubbles constant
- Stagger start and finish times
- Avoid mixing (eg, at school gates)
- Open windows and wear masks on transport

In classrooms

- Keep bubble size small
- Reduce movement among bubbles
- Deploy additional staff to reduce class sizes
- Use large spaces (eg, halls)
- Quarantine applies to whole bubbles

Protections for students and staff

Hand and surface hygiene

- Provide hand washing stations and hand sanitisers
- Wash hands regularly and at key points (eg, after using the toilet)

Vaccination

- Account for exposure alongside age and disease-related risk in vaccine prioritisation
- Prioritising school staff reduces educational disruption due to staff illness

Testing

- Do not assume tests are 100% accurate
- Testing complements other measures rather than replacing them

Ventilation and face coverings

Ventilation

- Open windows and doors
- Teach outdoors (or in large halls) wherever possible
- Use CO₂ monitors to assess air quality
- Install High Efficiency Particulate Air filters with air cleaning devices
- All physical education outdoors
- No high-risk lessons (eg, singing, brass or wind instruments), except remotely

Face coverings

- Encourage children aged 5 years or older to use a mask (with exemptions)
- Teach correct mask fitting and use
- Remove masks only when outdoors or eating
- Consider transparent face coverings to improve communication
- Safe disposal or washing of masks

Support children and families

Support blended and remote learning

- Allow optional remote learning
- Support remote learning with technologies, funding, practical support, and skills training
- Provide for safe delivery or pick-up of free school meals
- Ensure safeguarding of at-risk children

Address the harms of educational disruption

- Support with isolation
- Record educational disruption alongside grades
- Provide mental health support to children
- Enhanced skills provision (eg, summer schools)

For the COVID-19 Infection Survey see <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/datasets/coronaviruscovid19infectionsurveydata>

See Online for appendix

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For the CDC's guidelines for reopening schools see <https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/index.html>

of SARS-CoV-2 infection, it would be unwise to let the virus circulate in children, with consequent risk to their families. Reopening fully in the setting of high community transmission without appropriate safeguards risks depriving many children of education and social interaction again, worsening existing inequalities. By contributing to high community transmission, it also provides fertile ground for virus evolution and new variants.

Multi-layered mitigations can substantially reduce the risk of transmission within schools and into households.¹³ In the panel we summarise a set of recommendations that are in line with guidelines from the US Centers for Disease Control and Prevention (CDC) and practised in many countries to reduce the risk of transmission in schools and mitigate the impact of COVID-19 on children and families. A detailed set of recommendations and an infographic are provided in the appendix. Making schools safer goes hand in hand with reducing community transmission and is essential to allow schools to safely reopen and remain open.

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Effect of previous SARS-CoV-2 infection on humoral and T-cell responses to single-dose BNT162b2 vaccine

The rapid implementation of SARS-CoV-2 vaccination is now a global health-care priority. Successful phase 3 trial outcomes have been reported for numerous vaccines that induce robust humoral and cellular immune responses against the SARS-CoV-2 spike protein.^{1–6} To gain rapid control of accelerating cases and maximise public health impact, the UK Government has adopted the strategy of delaying second vaccination to 12 weeks. This policy has generated controversy, particularly among health-care workers (HCWs), the majority of whom have received BNT162b2 mRNA vaccine.⁷

Limited data on immune responses to single-dose vaccination with BNT162b2 are available, and vaccine responses following previous natural infection have not been assessed in clinical trials.^{2–6} We have therefore investigated immunological responses to single-dose BNT162b2 using a combination of serology, live virus neutralisation, and T-cell enzyme-linked immunospot (ELISpot) assays.

72 HCWs from Imperial College Healthcare NHS Trust, who were vaccinated between Dec 23 and Dec 31, 2020, provided blood samples at the time of receiving their first dose of BNT162b2 vaccine and 21–25 days after vaccination. Baseline samples were tested for antibodies to SARS-CoV-2 nucleocapsid and spike (anti-S) proteins using the Abbott Architect SARS-CoV-2 IgG and IgG Quant II, respectively