A call for international school safety measures


Background

The COVID-19 pandemic is still progressing across the world with increasing cases in many areas due to new more transmissible, and somewhat vaccine-evading, variants. In the last months, many countries have adopted measures, including school closures, to reduce the spread of the virus. Some of these non-pharmacological interventions initially succeeded in reducing virus transmission; however, these measures have not been implemented homogeneously across countries and faced with more transmissible or vaccine-evading variants, many countries will be likely confronted with further waves of viral spread. Such a context threatens the possibility of maintaining in-person learning, with potential negative consequences on children’s health, education and social development. Additionally, new waves in one or more countries have negative consequences on all the others, given the frequent exchanges at borders, without systematic tests and quarantine.

Thus, an international defence against SARS-CoV-2 and its variants is necessary and it should necessarily include a common strategy for schools. Presently, unequal protection of staff and students is seen in disparate mitigation measures initiated across the world since school reopening in 2020. Frequent testing, tracing and isolation, airborne transmission and ventilation are not sufficiently addressed. Face masks have not been systematically applied and the age for their mandatory use varies significantly. The lack of guidance for appropriate mitigation in schools has encouraged countries to implement their own strategies without proper coordination.

Thus, we propose a common strategy based on the best practices identified among the different countries and inspired by the guidelines from the US Centers for Disease Control and Prevention (CDC), in order to reduce the risk of transmission in schools and households and reduce the number of school closures, absenteeism and associated detrimental effects. We call on countries to turn these strategies into policy and call on individual schools and school districts to implement these strategies to protect their students, staff and communities.

Children and COVID-19

Children of all ages are susceptible to and can transmit SARS-CoV-2. Whilst children under 10 appear to be at a somewhat reduced risk of catching and spreading the virus compared to adults, children over 10 may spread the virus comparably to adults. In addition, children of all ages show viral loads that are comparable to, or greater than those in
adults\textsuperscript{10}. Severe illness is less common than in other age groups, but it occurs and it is an individual and family tragedy that cannot be forgotten in our society. Besides severe infections and complications such as Paediatric Multisystem Inflammatory Syndrome (PIMS) also known as Multisystem Inflammatory Syndrome (MIS-C)\textsuperscript{11}, emerging data on persistent symptoms in children is of major concern. Official UK figures\textsuperscript{12} suggest that 7.4\% of children under 11 years old and about 8.2\% of 12 to 16-year-olds reported at least one symptom twelve weeks after a confirmed COVID-19 infection. In many countries, experts, support groups and parents report of children suffering from long-term and severe health problems referred to as Long COVID, affecting even their return to school\textsuperscript{13-24}. The potential longer-term morbidity of Long COVID is of particular concern given that the vaccine is not yet available for this age group and the full long-term impacts of the disease are not known. This consideration requires strong COVID-19 prevention and mitigation strategies in the school setting, which can be indoor, crowded, and poorly ventilated spaces that are at high risk of virus transmission if hygiene and safety measures are insufficient.

**The role of schools in the pandemic**

Transmission of SARS-CoV-2 can occur within school settings and clusters have been reported in preschools, primary and secondary schools\textsuperscript{4}. The increased transmissibility and virulence of the UK B.1.1.7 and now the Delta variants of SARS-CoV-2 may increase the transmission risk in schools and may be a factor in the recent increases in cases in children in Italy and Israel\textsuperscript{25-26}. The real exposure rate in children is difficult to assess, because of their lower testing rate; however, in Germany a serological study indicated a 6-fold higher SARS-CoV-2 exposure rate than reported cases\textsuperscript{27}. Educational staff\textsuperscript{28} and parents\textsuperscript{3,29} of children going to school have been reported to be at higher risk of infection. School and university closures have also been reported to be effective non-pharmaceutical interventions (NPIs) to mitigate the spread of SARS-CoV-2\textsuperscript{30-33}.

Many governments generally claim that school closures to control the pandemic should be a last resort measure, because of the obvious negative physical, mental health and educational impact on children, as well as the potential for long-term economic loss. However, there is a lack of data on the conditions and tools made available by each government for distance learning and family social burden. Moreover, in person school has been maintained in some countries such as France\textsuperscript{34} or Belgium\textsuperscript{35}, at all virus incidence levels, in some cases higher than 1000 cases per 100,000 inhabitants, exposing children, educational staff families and the wider community to high risk of infection. Such countries adopted a number of other interventions at high social and economic cost to counteract the virus spreading in the community, with limited effects. In order to maintain in-person learning for as long as possible, all the efforts should be focused at reducing the risk of viral spread in schools and consequently keeping the virus under control by a strict implementation of layered mitigation strategies.
The increasing death toll of the pandemic, its social and economic costs, and its mid-to-long term health consequences, for both adults and children, urgently requires international guidelines for school safety. A common strategy of all countries to control virus transmission in schools will offer equal health protection to all students and will make each national and local effort more effective at controlling the pandemic spreading around the world).

**Call for Measures**

Schools around the world should implement strict mitigation strategies to prioritise and facilitate safe in-person instruction whenever virus transmission rates allow. A contingency plan for reactive closures could be implemented as required. In this case, equity in education should be ensured by providing access to remote learning technology, support systems and take-away meals for students from low-resourced communities. Families of students who are at increased risk of severe illness, or who live with people at increased risk, should be given the option of virtual instruction regardless of the mode of learning offered.

**Communication:**

- Schools should lead by example and communicate the individual actions that staff and students are expected to take and the reasons why they are important (i.e. getting vaccinated, mask wearing, participating in testing, etc).
- It should be clearly emphasised, and enforced, that anyone experiencing any COVID-19 symptoms should stay home and take a COVID-19 test before returning to school.
- The school should provide regular and clear communications to staff, students and parents to document and discuss the actions the school is currently taking based on the levels of community COVID-19 transmission.
- The school community should be notified about any and all students or staff that test positive and should be kept up to date about any on-going transmission in the school.

**Definition of thresholds for school decision making**

- Schools should determine actions to be taken at different thresholds of community COVID-19 transmission (based on local 7 day rolling average case numbers per 100,000 people and positivity rates).
- At 10 cases/100,000 or 5% positivity the school should increase testing (as described below) and prepare for a potential switch to virtual learning. High risk indoor activities (e.g.singing, indoor sport, etc) should be paused.
- At >100 cases/100,000 or >10% positivity the school should switch to virtual learning.

**Vaccination**

- Staff, students and parents should be given information on the vaccines, including where and when it is possible to get vaccinated.
• Vaccination should be encouraged but not mandated. Education and discussion opportunities should be offered to support older children with their decision.
• If vaccines are not currently available to all adults, educational staff should be classified as frontline essential workers and provided with expedited access to the vaccines.
• Any students or staff that choose not to get vaccinated should agree to regular testing 2-3 times per week.

Masks
• All students and staff should wear a double layer fabric mask when indoors, except for lunch periods.
• Guidance should be provided for proper wearing and maintenance of masks.
• Masks should be provided for families that can not afford to purchase them.
• Where possible, KN95/FFP2 face masks should be used, especially for any high-risk students or staff.

Ventilation
• The school HVAC system should be fitted with MERV-13 or HEPA filters. Any areas where students or staff will be unmasked (i.e. the cafeteria) should have room air purifiers with HEPA filters36.
• All classrooms and common areas of the school should be fitted with CO₂ monitors with a threshold of 800 ppm.
  ○ If budgetary constraints do not allow for permanent monitors, a portable CO₂ monitor should be used to test the ventilation in each room in the presence of the full cohort of students.
• If the CO₂ levels rise above 1000 ppm, the room should be evacuated and the ventilation adjusted before the class returns.
• If the CO₂ levels are between 800-1000 ppm37, the ventilation should be adjusted till a reading of less than 800 ppm is obtained.
  ○ Ventilation can be increased by: opening doors and windows in conjunction with well positioned fans, the occupancy level of the room can be reduced, the airflow rate of the HVAC system can be increased, room air purifiers with HEPA filters36 can be purchased or self-assembled for a low cost solution.
• Online ventilation calculators can be used to estimate the airflow needed for a given room size and occupancy. https://schools.forhealth.org/covid-19-tools/ and http://kazetoshi.fr/simulateur/.
• More guidance is available on the CDC ventilation guide.

Test, trace, isolate and support:
• Schools should implement routine surveillance testing using pooled PCR, RT-LAMP or rapid antigen testing.
  ○ At low COVID-19 community transmission levels, surveillance can be performed through wastewater testing of the school.
Low cost olfactory smell tests can also be used if needed due to budgetary constraints.

As even vaccinated individuals can transmit SARS-CoV-2, all students and staff should be tested, regardless of vaccination status.

- After any term break, all students and staff should be tested before returning to any indoor spaces within the school.
- All students participating in sports or music (singing or playing wind instruments) should be tested weekly.
- At low COVID-19 community transmission levels, all students and staff should be tested at least every other week, preferably weekly.
- At increased transmission levels, testing frequency should be increased, testing all students and staff 2-3 times per week. Use of rapid antigen tests is preferable, but pooled PCR can still be used if necessary due to budget.
- In the event of a positive case, the infected individual should isolate at home for 10 days and the information should be reported to the public health department and the school community should be notified.
- Contact tracing should be performed for any positive cases in conjunction with the public health department. Families of contacts should have the choice between continuing in person learning while undertaking rapid antigen testing, daily for 10 days or home isolation for the same period.
- Where possible, support should be provided to any in-need families of students or staff testing positive.
- Optimisation of testing frequency can be assisted by an online calculator.

**Transportation**

- Ventilation on school transportation vehicles should be assessed as above using CO₂ monitors.
- When possible, vehicle windows should be opened and fans should be circulating.
- All students and staff should wear masks at all times on the vehicle.
- Where possible, extra space should be ensured between students, occupancy should be limited and the same cohort of students should be transported together each day.

**Remote learning:**

- Schools should prepare for the transition to remote learning in the event that community transmission increases above the critical threshold mentioned above.
- Psychosocial support should also be provided for at risk children.
- Remote learning should be provided as an option, even at low community transmission levels.

**Additional measures:**

- Schools should ensure bathrooms are fully supplied with soap and have signage that provides guidance for proper hand washing techniques.
- Schools should ensure regular cleaning and disinfection.
- Schools should ensure regular updates of all safety protocols and devices.
● When possible, hand sanitizer stations should be provided.
● Where possible, classroom usage should be optimised to enable 2m physical distancing.
● Where possible, students should remain in a single cohort or pod and movement between rooms should be minimized and regulated to ensure all classes are not in the hallways at the same time.
● In the event that a school is not taking any/all of the above precautions, multiple individual actions are still possible to take to ensure individual and class safety. This includes: vaccination, masks, ventilation (CO₂ monitors and self-assembled HEPA filters), self testing with rapid antigen tests, and proper hand hygiene.

Together these measures should help to enable the maintenance of in-person education while minimising virus spread and safeguarding both the immediate and long-term health of children, staff and the wider community. We call for the creation and adoption of an international strategy for COVID-safe schooling.

Assistance Provided:
For any parents, teachers, administrators or students that are interested in implementing or advocating for safe schools measures in their own schools, Research-Aid Networks can provide support. For more information, please contact schools@researchaidnetworks.org.

References:


7 Park YJ, Choe YJ, Park O, et al. Contact Tracing during Coronavirus Disease Outbreak, South Korea, 2020 - Volume 26, Number 10—October 2020 - Emerging Infectious Diseases journal - CDC. DOI:10.3201/eid2610.201315.


Additional Resources:

- CDC Guidance for COVID-19 Prevention in K-12 Schools
- K-12 School-based COVID-19 Testing Strategies
- Strategies for Safely Reopening Elementary and Secondary Schools
- Harvard Risk Reduction Strategies for Reopening Schools
- When To Test K-12 Playbook and Calculator
- Ensuring Safe & Just Schools: Mitigation Strategies
- Strong Schools: Public Health Toolkit (K-12)
- COVID-19 Response Toolkit for Public Schools
- COVID-19 School and Community Resource Library
- Household Transmission of SARS-CoV-2 from Children and Adolescents