

## Short Communication

### Should Schools Reopen during the COVID-19 Pandemic?

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**Keywords:** Covid-19, Children, School, Pandemic



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**DOI:** <https://doi.org/10.3329/jom.v22i1.51393>

**Received:** 02 October, 2020;

**Accepted:** 22 November, 2020

The 2019 outbreak of Coronavirus Disease 2019 (COVID-19) caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) was declared a pandemic by the World Health Organization (WHO) on 12 March 2020.<sup>1</sup> On 18 March 2020, the United Nations Educational, Scientific and Cultural Organization reported that 107 countries had adopted national COVID-19-related school closures affecting 862 million children. This situation escalated rapidly from 29 countries with closures of national schools a week before.<sup>2</sup> School closures are focused on facts and hypotheses from influenza outbreaks that they minimize student social contacts and therefore disrupt the transmission.<sup>3</sup>

Older children (ages 10 to 19) were almost as likely to transmit the disease as adults, whereas younger children were far less likely to transmit the disease than adults.<sup>4</sup> Surveys in Spain, France and England also showed that children are half as likely to have antibodies to COVID-19, which is a sign of prior infection. Ultimately, school closures slowed the spread of the virus and decreased deaths by only 2% to 4%.<sup>2</sup>

On 12 March 2020, the Director-General of the WHO stated that “all countries must strike a fine balance between health security, prevention of economic and social disruption and respect for human rights.” Currently, evidence to support national closure of schools to combat COVID-19 is very weak and data from influenza outbreaks suggest school closures could have a relatively small effect on a virus with

high transmissibility and apparently low clinical effect on school. These statistics also indicate, at the same time, that school closures can have significant economic and social implications.<sup>1</sup>

When the number of cases with COVID-19 starts to decline, the methods used to achieve suppression will change over time. Schools in parts of China have begun to reopen and it will be important for studies to track the impact of school reopening on COVID-19 cases numbers.<sup>5</sup> It will also be relevant to explore countries that have not adopted school closures. In late February 2020, Taiwan reopened schools relatively early in the outbreak; it has not yet implemented more large-scale closures but has been recognised as effectively reducing COVID-19 spread. Children may have been exposed to COVID-19 less often than adults; although 90 % of the world’s school children were cloistered at home at one stage during the shutdowns, parents continued to reach out to the wider world to get food or go to their workplaces.<sup>6</sup>

Countries that reopened schools and implemented standards such as physical distance and class size limits have not seen a spike in cases of coronavirus. Norway and Denmark represent good examples. Each reopened their schools in April, nearly a month after they were closed, but initially they only opened them to younger students, keeping high schools shut down until later. They enforced sanitising practices, and kept minimal class sizes, with children in small groups at recess and space between desks. Neither nation has seen a significant rise in incidents. No rigorous scientific studies have yet been carried out on the potential for school-based spread, but a smattering of case reports, most of them not yet peer-reviewed, reinforce the notion that it is not inevitably a high risk.<sup>7,8</sup>

After a school closure that started about March 16 March 2020, Denmark re-opened schools on 15 April 2020 for children under the age of 11 in response

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to early reports that COVID-19 causes very few children to get critically ill. Primary school children were the first to return to school and small groups with limited interaction with those outside their community. "Micro-groups" of students arrived at a separate time, ate lunch separately, stayed in their own zones in the playground and were taught by one teacher.<sup>7</sup> Such classes consisted of around 12 students, which was determined based on the maximum number of students able to fill a space while maintaining adequate physical distance between students and teachers. This necessitated class separation and additional teaching staff. Since many schools were designed to include both primary and secondary school children, limiting the reopening of schools to primary school students allowed sufficient physical classroom space to accommodate the small size of the classes. In this strategy, schools required shifts in the morning and in the afternoon. Students were given their own desks which were 2 metres apart. Children were only permitted to play in small groups during recess. Hand washing and sanitising were an additional component to reopening the school. Students were expected to wash their hands hourly. Neither students nor the staff were expected to wear face masks. In the sense of low group transmission, school reopening in Denmark did not lead to a significant increase in COVID-19 cases growth rate.<sup>8</sup>

Starting around March 3 March 2020, schools in Germany were closed, and reopened to older students around 4 May 2020. Students were given their own set seats, separated from other seats at least 2 metres apart. Contact tracers used the fixed location of the desks combined with the student seating charts if necessary.<sup>7</sup> School days were reduced, and online classes were supplemented. This allowed the sharing of classrooms by several groups of students, which could accommodate no more than 10 students. Students were screened for SARS-CoV-2 infection every 4 days in at least some schools, with a negative result that enabled them to attend school without a face mask.<sup>9</sup> In the background of moderate group transmission, school reopening in Germany was followed by increased transmission between students but not school staff.<sup>8</sup>

On 18 May 2020, schools in Vietnam were reopened and students could return to class if they did not have a fever. Required temperature tests were conducted at the school entrance. Facemasks were expected to be worn and the children maintained physical distance during the school day.<sup>10</sup> Japanese schools were closed on 2 March 2020. On 24 March 2020, the Prime Minister announced that the order to close schools will not be extended, leaving decisions on reopening schools up to local municipalities. The Ministry of Health issued school reopening guidelines which included

measures such as opening windows to ventilate classrooms, maintaining physical distance, checking regular temperatures and wearing face masks.<sup>11</sup>

In Switzerland, schools reopened on 11 May 2020 with strict social distancing steps in effect. Many schools implemented half class sizes and students only attended in-person classes two days a week to make room for the smaller class sizes. Desks were further pushed apart, and tape marks were placed on the floor to help students maintain sufficient physical distance. Manual sanitisation stations were added in the schools. Class reopening was postponed until 8 June 2020 for students in grade 10 and above and for university students.<sup>12</sup>

Malaysia's government from 24 June 2020 allowed more than 500,000 students from some 2,500 schools to return to class, as they would be taking their secondary and international leaving examinations shortly. The school-reopening standard operating procedures included daily temperature checks for students, teachers and school visitors with those having a body temperature above 37.5 degrees Celsius or feeling symptomatic not allowed to enter the school premises. In addition, no outdoor sports or face-to-face co-curricular activities were permitted until further notice. Students and teachers were expected to wear masks at all times and practise social distancing measures as they go about their activities.<sup>13,14</sup>

Data from individual countries, and a recent review of COVID-19 in children suggest that children are less often reported as cases than adults, and that the infection generally causes mild disease.<sup>15</sup> Serious illness due to COVID-19 is seen infrequently in children, although there have been rare cases of critical illness.<sup>16</sup> The role of children in transmission remains unclear<sup>17</sup> and additional data is needed, including from age-stratified sero-epidemiologic surveys.<sup>18</sup>

To date, there have been few educational institutions involved in COVID-19 outbreaks, but from these studies, it appears that disease transmission was primarily related to social events linked to school or university life rather than transmission within classrooms. These studies also suggest that the introduction of the virus was likely by an adult member of staff.<sup>17,19</sup>

Deciding to close, partially close or reopen schools should be guided by a risk-based approach to maximize the educational and health benefit for students, teachers, staff, and the wider community, and help prevent a new outbreak of COVID-19 in the community.<sup>20,21</sup> At the same time, the WHO is developing its own suite of guidance around various aspects of school reopening, including managing risks of COVID-19 transmission among school staff and wider

communities. These measures include supervision of children, enforced hand-washing, reducing mixing between age groups, limiting class sizes, staggering breaks, reducing children's movement between classrooms, and sanitizing high-risk surfaces. Although risk of transmission in classroom settings is likely to be substantially reduced with sufficient protective measures, it should be noted that there is currently less evidence on the epidemiology of COVID-19 in children. As a result, expansion of testing, contact tracing and isolation of suspected cases, and data sharing between schools and public health authorities will be essential to contain potential school-based outbreaks, and allow decisions on school reopening to be adapted as the situation evolves.<sup>22</sup>

The long term closing of schools has impacted negatively on the well-being of the children and youths, whilst the closings have not even decreased the transmission of COVID-19. However, children are not infected as often as adults and when they are infected they generally do not experience severe infections. Various countries have started reopening their schools based on the numbers of COVID-19 cases. Examining countries that have not implemented school closures will also be important. Policy makers and researchers should also look to other school social distancing interventions that are much less disruptive than full school closure and might substantially contribute to maintaining the control of this pandemic.

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