

COVID-19: evidence shows that transmission by schoolchildren is low

Much fuss has been made in the UK, not least by teachers' unions, about recommencing physical school attendance. As this issue applies to many countries, I thought it worth highlighting research findings in Europe.

While it is evident that school age children can be infected by the SARS-CoV-2 virus, it is extremely rare for them to become seriously ill with COVID-19, and their risk of dying as a result of infection is almost zero. The relevant issue is therefore how much children's contribution to the spread of COVID-19 to adults, by themselves or via other children, is affected by school attendance.

A report last month "[COVID-19 in children and the role of school settings in COVID-19 transmission](#)" by the European Centre for Disease Prevention and Control analyses evidence from many countries and throws light on these questions. Some key summary conclusions that it reaches on various important issues are as follows:

Overview of outbreaks and transmission in childcare school settings: experiences from Member States¹

In summary, clusters in educational facilities were identified in several of the 15 reporting countries, however those that occurred were limited in number and size, and were rather exceptional events. Several countries specifically said that they had no indication that school settings played a significant role in the transmission of COVID-19. Secondary transmission in schools, either from child-to-child or from child-to-adult, was perceived to be rare. Countries where schools had re-opened by the time of the survey stated that they had not seen an increase in cases in these settings.

Overview of outbreaks and transmission in school settings: evidence from the literature

What is the evidence of transmission between children within the school setting?

The conclusion from these investigations is that child-to-child transmission in schools is uncommon and not the primary cause of SARS-CoV-2 infection of children whose infection onset coincides with the period during which they are attending school.

What is the evidence of transmission from children (students) to adults (teacher/staff) within the school setting?

Where COVID-19 in children was detected and contacts followed-up, no adult contacts in the school setting have been detected as SARS-CoV-2 positive during the follow-up period. The conclusion from these investigations is that children are not the primary drivers of SARS-CoV-2 transmission to adults in the school setting.

What is the evidence of transmission from adults (teacher/staff) to children (students) within the school setting?

While there is evidence of transmission from adults to children in household settings, there is little evidence of this occurring within the school setting.

What is the evidence of transmission between adults (teacher/staff) within the school setting?

The conclusion from these investigations is that adults are not at higher risk of SARS-CoV-2 within the school setting than the risk in the community or household.

What is the effect of school openings on transmission to the community/household?

There is limited evidence that schools are driving transmission of COVID-19 within the community, however there are indications that community transmission is imported into or reflected in the school setting.

There was one outbreak in Israel after school reopening, however the sequence of infection was not reported. Although Ireland closed schools relatively early in the epidemic, data there suggests that schools would be a minor source of infection for children:

An analysis of the probable origin for transmission of COVID-19 infection in outbreaks that have involved children in Ireland indicated that the most common setting was the home, followed by workplaces, travel and residential institutions, with none of the childhood cases linked to outbreaks in schools.

Evidence from EU/EEA countries that kept pre- and primary schools/day care open or reopened schools early on

The ECDC report includes the following information:

Iceland kept both childcare institutions and primary schools open throughout the spring term and the rates of SARS-CoV-2 in children under 15 years old remained low compared to rates in the older age groups. Physical distancing rules did not apply to childcare institutions and primary school children.

Similarly, the Netherlands did not see a sudden increase in their reproductive number or detect significant outbreaks, when primary schools and childcare facilities opened on 11 May, with moderately high notification rates at national level. Children up to and including 12 years did not have to keep 1.5 metres apart from each other or from adults, and this measure was applied in childcare and primary education settings. Children aged 13 to 18 years did not have to physically distance from one another.

Denmark reopened childcare and primary education on 15 April, with moderately high overall notification rates at national level, and did not report any increase in the reproductive number, or detect important school outbreaks. Denmark recommended splitting classes into smaller groups, keeping two metres between children, hand hygiene, and teaching more classes outside.

Comparison between Sweden and Finland

As in other areas, some of the most useful evidence involves Sweden, which never closed schools for children under 16. In July its Public Health Authority published a report (English version [here](#)) comparing COVID-19 in children between Sweden and Finland, where almost all physical school attendance was stopped from mid-March to mid-May. Key findings in the study are:

Closing schools had no measurable effect

There is no difference in the overall incidence of the laboratory confirmed covid-19 cases in the age group 1-19 years in the two countries and the number of laboratory confirmed cases does not fluctuate with school closure or change in testing policy in Finland.²

Closure or not of schools had no measurable direct impact on the number of laboratory confirmed cases in school-aged children in Finland or Sweden.

Transmission by children seems low

Outbreak investigations in Finland have not shown children to be contributing much in terms of transmission:

In the contact tracings in primary schools in Finland, there has been hardly any evidence of children infecting other persons. The Swedish comparison of number of reported cases among staff in day care and primary school to number of cases in other professions does not show any increased risk for teachers.³ This also indicates that the role of children in propagating this infection is likely to be small. Various papers on contact tracing have also found that children rarely are the first case in family clusters.

Impacts of school closures on the health and well-being of children

The ECDC report also highlights some negative impacts of school closures on the health and well-being of children, on top of the harm to their education, saying:

A number of organisations have identified various negative impacts on children's wellbeing, learning opportunities and safety caused by school closures. These range from the interruption of learning and the exacerbation of disparities and mental health issues to an

increased risk of domestic violence. The negative impacts particularly affect children from vulnerable and marginalised population groups.

Other health aspects, both physical and mental, also need consideration. For many students living in poverty, schools are not only a place for learning, but also for healthy eating, and therefore researchers warn that school closures will exacerbate food insecurity. Research has highlighted that the active social life that children aged 2–10 years have at school helps them to learn from peers and has a positive impact on their personality and sense of identity, while disruptions of close peer relationships have been associated with depression, guilt, and anger in children. Furthermore, school and extracurricular activities provide structure, meaning and a daily rhythm for children and youth. For those suffering from anxiety and depression, the loss of such activities can worsen symptoms and reinforce social withdrawal and feelings of hopelessness.

Conclusions

The evidence shows that concerns about recommencing physical school attendance are misplaced, at least if moderate social distancing measures (not requiring mask wearing, and only for child-adult contact) are mandated.

It also seems pretty clear that the original decisions by almost all European countries to close schools were, in retrospect, ill-judged measures that caused more harm than good, at least in relation to children under 16 years old.

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¹ Based on a survey of EU/EEA and UK countries, 15 of which responded.

² In Sweden, the number of laboratory confirmed cases is affected by change in testing policy

³ The relative risk of teachers catching COVID-19, compared to that in other professions, was 0.9 for day care, 1.1 for primary school (in neither case being statistically significant), and 0.7 for secondary school (just significantly lower than 1).