



COVID-19 in Early Childhood Education and Care and Schools

Executive Summary

Why is this important?

- Many children and adolescents have been adversely and inequitably impacted by remote learning. Returning to face-to-face learning is essential for the social, emotional, and cognitive development of children and adolescents.
- Opening of schools and Early Childhood Education and Care (ECEC) should remain a top priority even as public health restrictions are eased.
- There is currently no COVID-19 vaccine for children under 12 licensed in Australia. The number of young children with COVID-19 will therefore rise as restrictions are eased. This is due to an overall increase in community transmission in a mainly non-immune population.
- The best way to protect children from COVID-19 is for all their eligible household contacts to be vaccinated together with ECEC and school staff.
- Multi-layered mitigation strategies are also needed in ECEC and schools. This will facilitate a safe return to face-to-face learning. Implementation of strategies will need to consider children and adolescents with a range of diverse developmental and health needs.
- Efficient management responses to cases and outbreaks in educational settings will be required to avoid future school closures and to keep children at ECEC and school.

What does the research tell us?

- The Delta variant is more transmissible than earlier variants. Despite increased number of infections, internationally and in Australia most children and adolescents continue to have no, or only mild symptoms.
- Children and adolescents living with some pre-existing health conditions, including obesity, and those living in disadvantage, low socioeconomic or minority ethnic status have an increased risk of severe disease from COVID-19.
- In ECEC and school settings, transmission is largely seen between adults and from adults to children. Although child-child transmission also occurs, the highest risk of transmission remains within households.
- There are Australian modelling reports related to the easing of restrictions, which includes re-opening of schools. In addition, there are real-world surveillance data from other countries that have returned to face-to-face learning in the context of community transmission, that provide useful learnings for Australia.

This document outlines information about how COVID-19 directly affects children and adolescents, to inform decisions in Australia.

COVID-19 Delta variant transmission in children and adolescents

The Delta variant can infect more people in all age groups compared with other variants of COVID-19. This makes it much more common. However, in children and adolescents, it does not appear to cause more severe disease.^{1,2,3} Increased vaccine uptake in people over 12 years, and the absence of a licensed vaccine for those under 12, means that children are now making up an increasing proportion of COVID-19 cases. It is expected that clinical trial results on vaccinating children aged five to 11 years will be available soon. Children and adolescents living with some pre-existing conditions, including those with disadvantage, low socioeconomic or minority ethnic status and obesity^{4,5,6} have been shown to have an increased risk of severe COVID-19.⁷⁻⁹

Since Delta, the rate of infection in children and adolescents in Victoria has increased. From 1 May to 5 September 2021, those under 18 years of age made up 30% of all Victorian COVID-19 cases¹⁰ and during the outbreak in NSW, between 16 June and 19 August 2021, those under 18 years of age made up 27% of all cases.¹¹ This is approximately double the proportion seen in 2020 or in the first half of 2021. These differences can be explained by the increased transmission of Delta in a largely non-immune population and a relative shift of infections to the younger age groups because a large proportion of adults are now protected by vaccination.¹²⁻¹⁴

Similar patterns are also being seen in Canada¹⁵ and the United Kingdom¹⁶ and the United States¹⁴, with variations that likely reflect the age-based variations in vaccination policies, complemented with countries' timings of reopening, levels of community transmission, the public health and social measures in place and the public's compliance with these measures.

As in many countries, Australia is using mathematical models to inform our pandemic response and the roadmap out. Models are built on a combination of real data (such as vaccine effectiveness against the Delta variant) and assumptions (such as contribution of children to transmission) which, in the absence of known data, are derived from estimates informed by expert opinion.

For example, the Doherty Institute modelling team considered possible consequences for children over a range of scenarios using the data available at the time noting that the vaccination of 12–15-year-olds did not add much incremental benefit with regards to transmission overall.¹⁷

COVID-19 in ECEC and school settings

Transmission in ECEC and school settings can be influenced by many factors including the level of COVID-19 in the community, transmissibility of variants across age groups, vaccination coverage, the public health and social measures in place and the public's compliance with these measures. As schools open across the world, we have real-world data that is starting to tell us about what happens with COVID-19 transmission.

Australia/NSW: Between 16 June and 31 July 2021, the National Centre for Immunisation Research and Surveillance analysed the NSW delta outbreak which included intensive contact tracing to determine secondary and tertiary transmission. This included cases from 51 educational settings involving 34 student and 25 staff cases.

This report found that Delta was about five times more transmissible than the previous variant, and most transmission occurred between staff, followed by staff to child. Child to child transmission also occurred but to a lesser degree. However, household transmission was very high.

These findings reflect the increased transmissibility of the Delta variant, the importance of having staff and all age-eligible household members vaccinated, and mitigation measures in ECEC and schools.¹¹

Singapore (population 5.7 million): More than 80% of the eligible population are fully vaccinated, with high coverage in teenagers over 12 years of age. Singapore began re-opening schools on 28 June 2021. As of 22 September there were approximately 170 children aged less than 18 years in hospital (many admitted for monitoring, not for treatment) and none that require supplementary oxygen or intensive care.¹⁹ There have been some outbreaks in primary schools, but they have not been the main source of outbreaks overall. Students can now attend onsite if they have no symptoms and have a negative rapid antigen test.²⁰

Scotland (population 5.4 million): More than 85% of those over 18 years are fully vaccinated. Following the opening of schools on 11 August, 2021, there was an initial surge of cases in children under 19 years of age, followed by a steep decline over the following month.²¹ This is despite only 30% of 12-15 years covered with one dose. Vaccination is not mandatory for educators, and no masks are worn by primary school children.²² Each week, about 50 children are admitted to hospital that test positive for COVID-19, but these cases also include children who have been admitted "with COVID-19" and not "for" treatment of COVID-19.

United States (population 334 million): The situation in the US is highly variable and not directly comparable to the Australian context. Currently, the greatest number of cases in the US are in the southern states where there is low vaccination coverage and highly variable compliance to public health and social measures, including wearing face masks. Many paediatric intensive care units are at capacity in these states because of widespread COVID-19 community transmission,²³ as well as high rates of other childhood respiratory infections such as respiratory syncytial virus (common in children). In contrast, areas with high vaccination coverage have not seen such a surge. San Francisco (population 4.6 million) have over 90% of children aged 12-17 fully vaccinated. They re-opened schools on 11 August and have reported no school outbreaks.

In the **United Kingdom** a COVID-19 Schools Infection Survey (symptoms self-reported) conducted from November 2020 to July 2021 found that schools were not the main source of infection. Rates of infection in children were lower in schools than the wider community.²⁴ This is consistent with reports from Finland (to August 2021) where the risk of infection after exposure at school was significantly lower compared to the broader community; and that transmission was largely between staff.²⁵ Children returned to school in England in September 2021 which was followed by an increase in infections in children and adolescents which declined again in the last week. Vaccination of 12 to 15 year olds has only just begun and face masks are not worn.

Mitigation strategies and re-opening schools

The US CDC, WHO and the European Centre for Disease Control emphasise that keeping schools open is a key objective and that in-school transmission can be limited when appropriate mitigation measures are in place.³

In Victoria the Department of Education has instituted the Three V's approach to layered mitigation to keep ECEC and schools open: Ventilation, Vaccination and Vital COVID Safe Steps.²⁶

It is important that mitigation strategies are age-appropriate and strike a balance between infection control and enabling optimal learning and social interactions especially for children with additional developmental needs.²⁷

Globally many schools have re-opened despite significant levels of COVID-19 transmission within the community. The European Centre for Disease Control reviewed available evidence and, despite cases of COVID-19 increasing in children since March 2021, recommend school closures be a last resort due to the negative physical, mental and educational impact they have had on children.³

Delta outbreaks in ECECs and schools and sporting settings occur.^{28, 29} To balance the higher case numbers and the higher transmissibility of the Delta variant, with the importance of face-to-face learning, many countries have implemented a series of mitigation strategies including vaccination of staff and children over 12 years of age, rapid antigen testing (RAT), face mask wearing, ventilation and cohorting,* in addition to hand hygiene, surface cleaning, staying home if symptomatic and outbreak management (Table 1). Multiple mitigation measures applied together can help reduce transmission in ECEC and school settings.

In San Francisco, school mitigation measures included masks, hygiene, ventilation, and rapid testing. As of 1 October 2021, the city's schools reported 127 cases out of nearly 22,500 students and 5,000 staff, with the vast majority of cases in children occurring outside of school.^{30, 31}

There is considerable variability between countries with regard to the mitigation measures implemented in schools (Table 1).

Vaccination

Australian jurisdictions are recommending vaccination of school staff and some states and territories are mandating vaccination of teachers and ECEC workers. The impact of these staff mandates and vaccination coverage in secondary school students aged 12 and above will provide local evidence in coming months regarding the real-world impact of these vaccination strategies. Unvaccinated adolescents have a ten times risk of hospitalisation compared to vaccinated adolescents.

Masks

The use of face masks in schools varies between state and country (Table 1). The European Centre for Disease Control and WHO recommend face masks for children aged over five years, depending on the level of community transmission, ability of the child to safely and appropriately access and use a mask, and the impact on learning and psychosocial development.^{3,32} The Victorian Government has announced mask wearing for all students with a mandate for those in grade three and up. The US recommends universal indoor masking, including all children aged two years and over,³³ whereas in the United Kingdom and Denmark masks are not recommended for students or teachers.

Face masks are not recommended for children under five years based on safety, the overall interest of the social and emotional development of the child and their capacity to appropriately use a mask with minimal assistance.

The benefits of mask-wearing need careful balancing with the challenges for compliance for younger children and for older children with disabilities and/or behavioral issues.²⁷

* Student cohorting: students are divided into two separate populations that attend in-person classes on alternating schedules.

Screen testing

Rapid testing can limit school outbreaks by reducing the number of new infections, especially from asymptomatic cases.

The WHO currently recommends testing for symptomatic children if they belong to a vulnerable or high-risk group. They recommend a school-wide testing approach may be considered when there are clusters of pupils with confirmed COVID-19, on the condition that there are clear objectives for testing and an agreed plan of action following the test result.³⁴ Victoria and NSW aim to incorporate rapid testing models into schools this year. Modelling to determine the optimal approach to TTIQ in the school setting to ensure the least disruption to onsite learning is currently being undertaken.

Ventilation

The objective of ventilation strategies is to increase the number of air exchanges in a room to reduce infection. In Victoria the government is rolling out air purification devices to all government and low-fee non-government schools.²⁶

Research at the Royal Melbourne Hospital found that 99% of aerosols can be cleared from patient rooms using purification devices.³⁵ Other measures to improve air flow include opening windows, doors and teaching outdoors, where possible, may assist with increasing air exchanges. This is likely to be highly variable between ECEC/schools and compliance issues should be addressed, where possible.

Table 1: Mitigation Strategies in Early Childhood Education, Care and Schools on Strategies in Early Childhood Education, Care and Schools

Country/ Region	Cohorting	Hand hygiene and surface cleaning	Masks				Screening tests	Physical distancing	Vaccination of children aged ≥12	Ventilation	Ref.
			ECEC	Primary	Secondary	Staff					
Australia (NSW)	✓	✓		✓	✓	✓	RAT	✓	✓	✓	36
Denmark		✓					PCR, RAT	✓	✓	✓	37,39
Europe (ECDC)	✓	✓		✓	✓	✓	RAT	✓	✓	✓	3
Finland	✓	✓			✓	✓		✓	✓	✓	40
France	✓	✓		✓	✓	✓	PCR, RAT	✓	✓	✓	41,42
Italy	✓	✓		✓	✓	✓		✓	✓	✓	43
Norway	✓	✓						✓	✓	✓	44
Portugal	✓	✓		5+				✓	16+	✓	45
Singapore	✓	✓	✓	✓	✓	✓	Temperature	✓	✓		46
United Kingdom	✓	✓					RAT		✓	✓	47-49
United States (San Fransisco)		✓	✓	✓	✓	✓	PCR, RAT		✓	✓	31
WHO	✓	✓		✓	✓	✓	Temperature	✓	✓	✓	32, 34

RAT: Rapid Antigen Testing, PCR: Polymerase Chain Reaction.

Note: Some countries may have additional measures in place that were not stated in the sources; PCR (polymerase chain reaction), RAT (rapid antigen test). The WHO is in the process of updating their recommendations in the context of Delta.

Outbreak management

Consideration should be given to ways to streamline responses to outbreaks in educational and care settings, to minimise disruptions to face-to-face learning and keep educational and care settings open.

In Singapore and Denmark, the 'Test to Stay' strategy is used whereby close contacts of a COVID-19 case can return to school if they have no symptoms and a negative rapid test, without needing to isolate.^{39, 46} In the United Kingdom, contact tracing is no longer performed by educational settings. Close contacts are advised to take a polymerase chain reaction (PCR) test, although this is not mandatory, and are not required to isolate if they are fully vaccinated, below 18 years, or are unable to get vaccinated for medical reasons.⁴⁹ These changes may have led to an increase in cases when schools opened. In San Francisco, fully vaccinated close contacts are recommended to take a PCR test but do not have to isolate.

Transition back to ECEC and schools

Many parents will be both concerned about their children returning to ECEC and schools especially in regard to catching COVID-19.⁵⁰ This concern will be heightened for parents of ECEC and primary school aged children despite knowing that COVID-19 is not severe in children. This will be coupled with children and adolescent's own anxiety about COVID-19 plus the challenging adaptation back to the school environment. Parents should make decisions about their children returning to school as they would for any respiratory virus, this includes parents who have nonvaccinated children or children who are at high risk of severe COVID-19. Education Departments around the world (including Australia) are considering the necessary mitigation strategies to address both the educational and mental health concerns of children and adolescents.^{51, 52}

Considerations for policy

Children and adolescents' mental health, and learning and social development have been adversely and inequitably impacted by remote learning.

- Schools should be opened safely and remain open with closure only under exceptional circumstances.
- Multi-layered approaches with mitigation strategies such as Victoria's 3 Vs plan (Vaccination, Ventilation and Vital COVID-19 safe steps) can help prevent infections and outbreaks in ECEC and schools.
- An important mitigation strategy of outbreaks in ECEC and schools is vaccination. This includes vaccination of parents, staff, eligible students (12 years and over) and all eligible individuals within households.
- COVID-19 surveillance in schools and ECEC settings is needed. This will be crucial to monitor the COVID-19 situation, success of mitigation measures, inform future vaccination policies in those under 12 years and keep children at school. In addition, mental health surveillance is needed across both primary and secondary schools, as data on the mental health of children and adolescents during the pandemic is limited. These data will also inform management of other respiratory viruses and future pandemics.
- Outbreak management in ECEC and schools should consider the strategies that minimise disruption to face-to-face learning and keep children at school where possible
- Mask wearing in those five years and under is not recommended
- Communication plans on transitioning back to ECEC/schools are needed in order to support ECEC/school staff, parents and children. These should be tailored to address the range of developmental stages and needs (i.e. younger children, special schools and those with developmental disabilities) and our diverse communities. They should address both safety and developmental concerns.

What are the research gaps?

Data to inform future policy

COVID-19 surveillance in schools and ECEC settings is needed. This will be crucial to monitor the COVID-19 situation, success of mitigation measures, and inform future vaccination policies in those under 12 years.

In addition, mental health surveillance is needed, as data on the mental health of children and adolescents during the pandemic in Australia is limited.

These data can inform current policy (e.g. Royal Commission into Victoria's Mental Health System) and also inform management of other respiratory viruses and future pandemics.

Mitigation strategies

Important research needs to better delineate the effectiveness of individual mitigation strategies implemented across Australian schools, including understanding the issues related to mask wearing requirement at schools and the impacts this may have on transmission. The effectiveness of vaccinating children and adolescents on transmission is important.

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