

COVID-19 in schools – the experience in NSW

Prepared by the National Centre for Immunisation Research and Surveillance (NCIRS)
26 April 2020

Overview

- This report provides an overview of investigation into all COVID-19 cases in New South Wales (NSW) schools.
- In NSW, from March to mid-April 2020, 18 individuals (9 students and 9 staff) from 15 schools were confirmed as COVID-19 cases; all of these individuals had an opportunity to transmit the COVID-19 virus (SARS-CoV-2) to others in their schools.
- 735 students and 128 staff were close contacts of these initial 18 cases.
- No teacher or staff member contracted COVID-19 from any of the initial school cases.
- One child from a primary school and one child from a high school may have contracted COVID-19 from the initial cases at their schools.

Background

Globally, the control of COVID-19 (caused by the virus, SARS-CoV-2) has been focused on public health measures, including improving hygiene and ensuring social distancing. Some countries have closed schools as part of their response. The strategy of closing schools has previously been recommended to assist in the control of influenza pandemics¹ because we know children with influenza are likely to spread the infection and become ill from influenza. However, COVID-19 appears to be a less common infection in children than is influenza and in studies done overseas, many of the infected children had only mild symptoms. It has been suggested that children are also less likely to spread the virus. Thus, it has not been clear how common it is for SARS-CoV-2 to transmit among school children or school staff, and if school closures are an effective measure to control COVID-19. Prolonged school closures can have negative consequences for the community and for children.

The emergence of COVID-19 and early spread globally coincided with the start of school term 1 in Australia. The first NSW school with a COVID-19 case was identified on 5 March 2020. The National Centre for Immunisation Research and Surveillance (NCIRS), with the support of the NSW Ministry of Health and NSW Department of Education, started this schools investigation in early March. Through this investigation, we aimed to understand the transmission of SARS-CoV-2 in schools and childcare centres in NSW. This report summarises the preliminary findings (to 21 April 2020) of this work in NSW primary and high schools.

Methods

COVID-19 is a notifiable disease in Australia. When a person is diagnosed with COVID-19 a public health response is initiated that involves follow up of each case to identify the person's close contacts and when these contacts may have last been exposed to the person (case) while infectious. A 'close contact' is defined as a person who has been in face to face contact for at least 15 minutes or in the same room for two hours with a case while infectious. In

¹ Cauchemez S, Ferguson NM, Wachtel C, Tegnell A, Saour G, Duncan B, Nicoll A. Closure of schools during an influenza pandemic. *The Lancet Infectious Diseases*. 2009;9(8):473–481.

schools, close contacts of cases were usually found either to be students and teachers who shared the same class/classes or extracurricular activities as the case or in their close circle of friends.

Once the close contacts are identified, they are required to isolate themselves at home for 14 days from the date of last exposure to the infectious case, watch for any symptoms and if they become unwell, go to the doctor or a fever clinic to get a nose/throat swab to test for COVID-19. NSW Health and NCIRS followed up all close contacts of COVID-19 cases in the 10 high schools and five primary schools for which a person with COVID-19 had attended while infectious by collecting data on all tests done on close contacts (positive and negative). For schools, staff and students that agreed to participate in enhanced surveillance all close contacts also: a) had a symptom questionnaire; b) were swabbed for COVID-19 testing at between 5-10 days after the last contact with the case, and; c) had a blood sample taken to detect antibodies to the virus (which is evidence of an immune response to infection with the virus).

Results

In the 15 schools (10 high school and 5 primary schools) a total of 18 COVID-19 cases (9 students and 9 staff) were identified between 5 March 2020 and 3 April 2020 (refer to Figure 1). The public health staff identified 863 close contacts in these 15 schools. Of the 863 close contacts, only two students have been identified as secondary cases. One of these was diagnosed by nose/throat swab testing and one had a positive antibody test 4 weeks after their exposure. A review showed that it was most likely, but not certain, that these two children were infected by transmission in the school environment.

High schools

A total of 12 COVID-19 index cases (8 students and 4 staff) were identified who had attended 10 high schools while infectious. The total number of close contacts in these 10 high schools was 598 students and 97 staff (total of 695 contacts). Nose/throat swabs were taken from one third ($n=235$) of contacts, all of which tested negative. In one high school, of the 75 close contacts who underwent blood testing at approximately 1 month after contact with the initial cases while infectious, only 1 student had antibodies detected, indicating infection had occurred.

Overall, as shown in Figure 2, only one of 695 individuals was identified to have been infected following close contact with a school case in these 10 high schools.

Primary schools

A total of six initial cases (comprising one student and five staff) were identified in five primary schools. The total number of close contacts in these five primary schools was 137 students and 31 staff (total of 168 contacts). Nose/throat swabs were taken from one third ($n=53$) of contacts. Only one secondary case (nose/throat swab positive) was identified in the 168 close contacts. In the same primary school that had this secondary case, 21 close contacts underwent blood testing. The same student whose nose/throat swab tested positive also had antibodies detected through serology testing, consistent with their known recent infection.

Overall, as shown in Figure 3, only one of 168 individuals was identified to have been infected following close contact with a school case in these five primary schools.

Figure 1: NSW primary and high schools with a COVID-19 index case/s from March – mid April

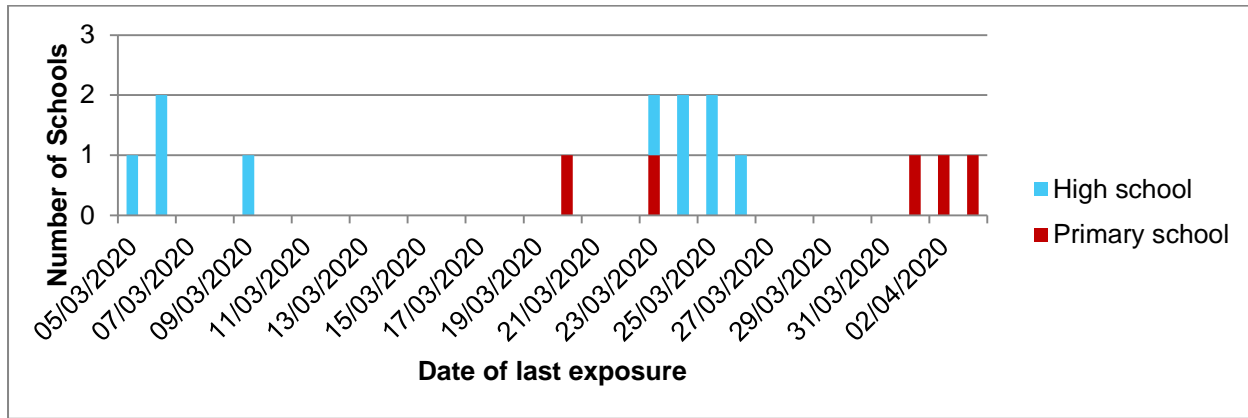


Figure 2: Cases and close contacts among teachers and students in 10 NSW high schools showing one secondary case in a student

Cases
 Staff case (blue person icon)
 Student case (green person icon)

Close contacts
 Staff close contact (blue person icon with red outline)
 Student close contact (green person icon with red outline)

Secondary cases
 Secondary student case (red person icon)

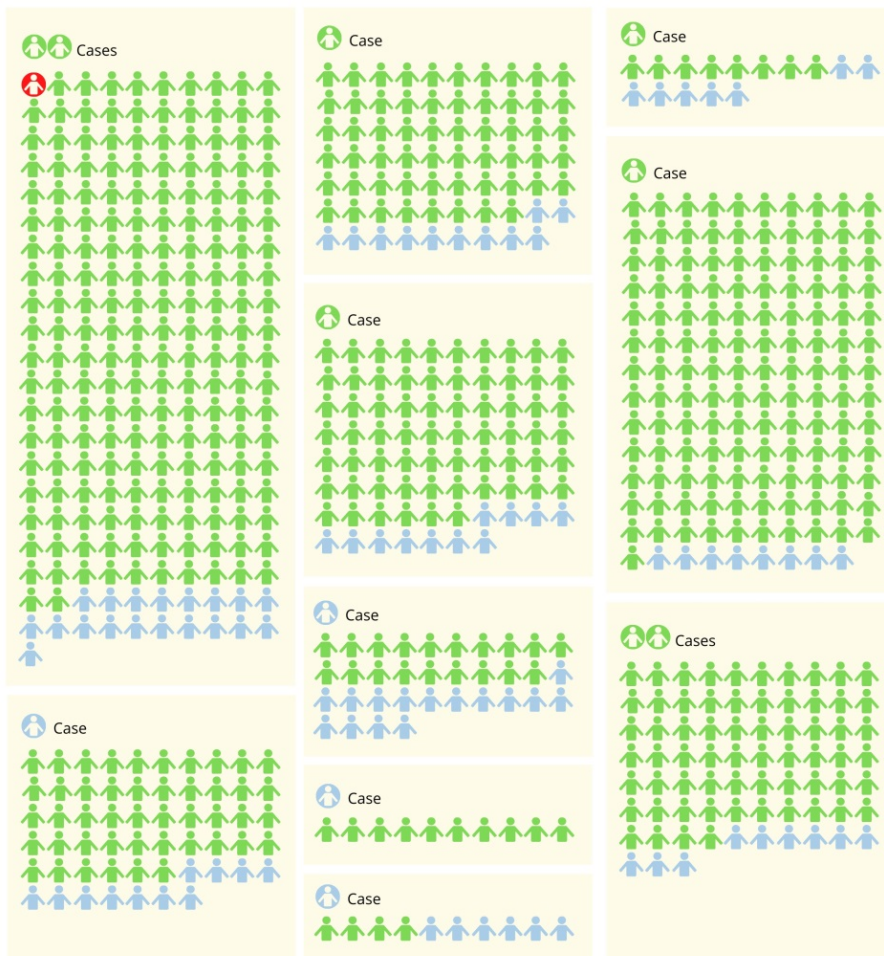
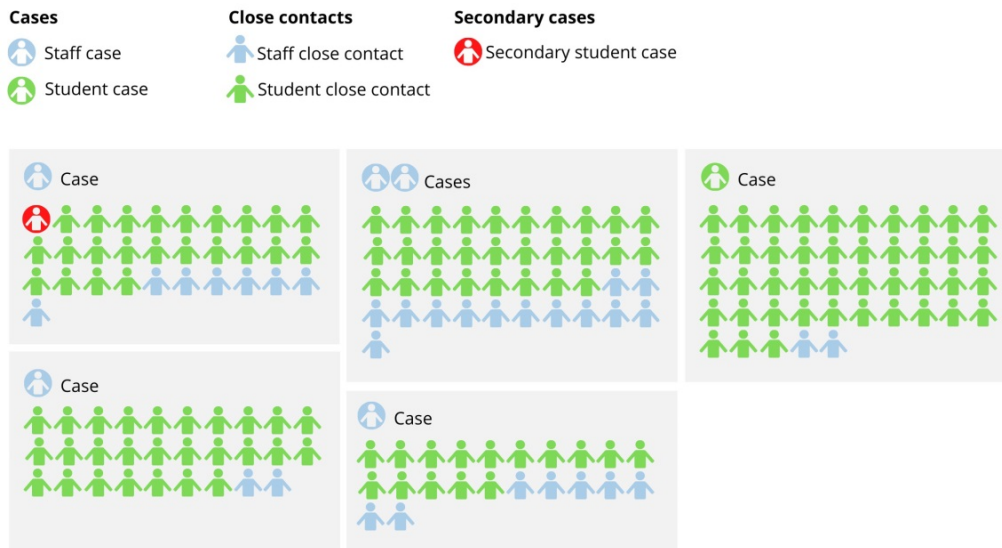


Figure 3: Cases and close contacts among teachers and students in 5 NSW primary schools showing one secondary case in a student



Conclusion

Our detailed investigation of COVID-19 cases in 15 NSW primary and high schools found only two secondary cases, both in students. This was despite initial cases occurring in 9 students (including two students in two schools) and 9 teachers. Very detailed follow-up, including additional testing for the presence of the virus and for antibodies to the virus, occurred in a proportion of the total 863 close contacts identified from the school setting.

Our investigation found no evidence of children infecting teachers. One secondary case (in the child in a high school) was presumed to have been infected following close contact with two student cases. The other secondary case was presumed to have been infected by a staff member (teacher) who was a case.

It is notable that half of the initial cases that occurred in schools were in staff. This is consistent with the higher rate of COVID-19 seen in adults than in children. This reinforces the need for both adults and children to ensure they do not attend school when ill and if they become ill to promptly isolate themselves and seek medical attention. It is also important for all adults, including teachers, to follow recommended social distancing practices while at school and in the community.

The findings from this detailed investigation are preliminary. However, they do suggest that spread of COVID-19 within NSW schools has been very limited.

SARS-CoV-2 transmission in children in schools appears considerably less than seen for other respiratory viruses, such as influenza. In contrast to influenza, data from both virus and antibody testing to date suggest that children are not the primary drivers of COVID-19 spread in schools or in the community. This is consistent with data from international studies showing low rates of disease in children and suggesting limited spread among children and from children to adults.^{2,3,4} Data from the whole of NSW also demonstrate children (aged <19 years) represent 4% of all cases of COVID-19 despite being approximately 23% of the population.

² World Health Organization (WHO). Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19). 16-24 February 2020. <https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf>

It is notable that on 23 March 2020 the NSW Premier advised that although schools remained open, parents were encouraged to keep their children at home for online learning. After this date face-to-face attendance in schools decreased significantly and this may have impacted the results of this investigation. Furthermore, school holidays commenced in NSW on Friday 10 April for two weeks.

Analysis of data collected here is ongoing and a full peer reviewed report is being prepared for publication. As a phased re-introduction of face-to-face learning in schools is planned for early Term 2 from 11 May 2020, it will be important to continue these detailed investigations to monitor the transmission of COVID-19 in schools.

Acknowledgements

We would like to thank all schools, staff and student contacts and their families who participated in this investigation, especially those who assisted with the enhanced investigation.

The following people have contributed to the COVID-19 schools transmission investigation project:

NCIRS core clinical and epidemiological team: Kristine Macartney, Nicholas Wood, Noni Winkler, Helen Quinn, Archana Koirala, Lucy Deng, Catherine Glover and Alexis Pillsbury

NCIRS interview and home visit team: Rosemary Joyce, Deidre Brogan, Nicole Dinsmore, Ajay Jadhav, Andrew Dunn, Laura Rost, Gemma Saravanos, Lisa Pelayo, Rama Kandasamy

ICPMR/NSW Pathology: Kerri Basile, Jen Kok, Matthew O'Sullivan, Linda Hueston, Dominic Dwyer
NSW Health: Caroline Sharpe, Craig Dalton, Paula Spokes

Western Sydney PHU: Anthea Katelaris, Shopna Bag, Stephen Corbett; **Northern PHU:** Michael Staff; **South West Sydney PHU:** Stephen Conaty, Christine Harvey, Kate Alexander; **Hunter New England PHU:** Craig Dalton and Kate Leadbeater; **Nepean-Blue Mountains PHU:** Brad Forssman

³ Children and COVID-19. National Institute for Public Health and the Environment, Ministry of Health, Welfare and Sport, The Netherlands. <https://www.rivm.nl/en/novel-coronavirus-covid-19/children-and-covid-19>

⁴ Gudbjartsson DF et al. Spread of SARS-CoV-2 in the Icelandic population. New England Journal of Medicine. 14 April 2020. <https://www.nejm.org/doi/full/10.1056/NEJMoa2006100>