Two high schools had secondary cases. In one high school, this was 1 student out of the 76 close contacts who underwent blood testing (from 211 total close contacts) at approximately 1 month after contact with the primary cases. In another high school, of 49 close contacts who underwent blood testing (from 74 total close contacts), 1 student and 1 teacher had antibodies detected.

Thus, as shown in Figure 3, only 3 of 696 individuals were identified to have been infected following close contact with a school case in these 10 high schools.

ECEC services

A total of 10 primary cases (three children and seven staff) were identified in 10 ECEC services. The total number of close contacts in these 10 ECEC services was 406 children and 128 staff (total of 534 contacts). Nose/throat swabs were taken from 46% (n=245) of symptomatic and asymptomatic contacts. No secondary cases were diagnosed in 497 close contacts in nine ECEC services. One ECEC service had a large outbreak with 13 secondary cases (seven children and six staff) in 37 close contacts (refer to Figure 4). Delayed case detection due to narrow testing criteria at the time may have contributed to this outbreak, as several generations of transmission would have occurred before outbreak was detected.

Figure 1: NSW schools and ECEC services with a COVID-19 primary case(s) from March to mid-April 2020

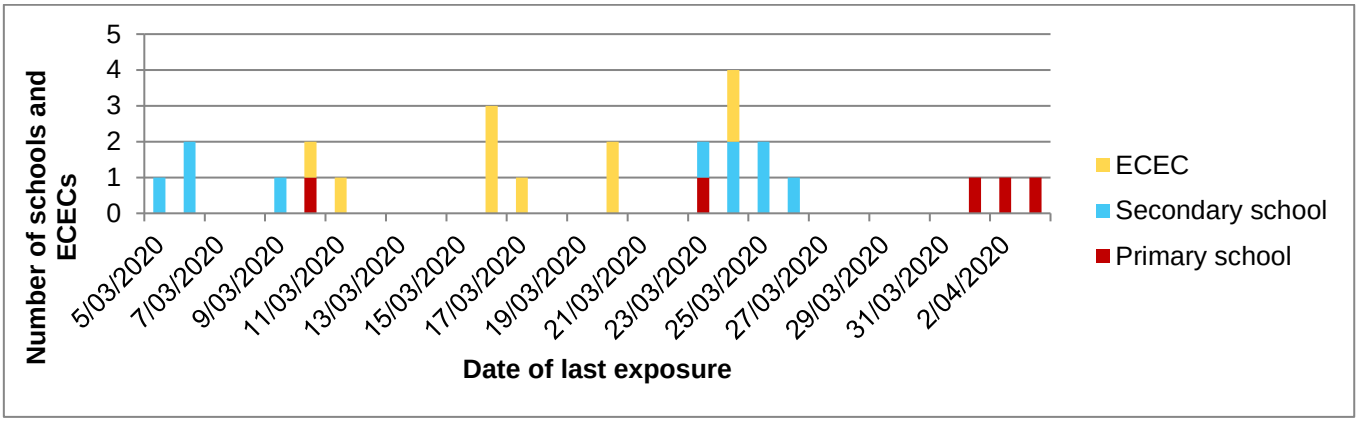


Figure 2: Cases and close contacts among teachers and students in 5 NSW primary schools showing 2 secondary cases in 1 student and 1 teacher

Figure 3: Cases and close contacts among teachers and students in 10 NSW high schools showing 3 secondary cases in 2 students and 1 teacher

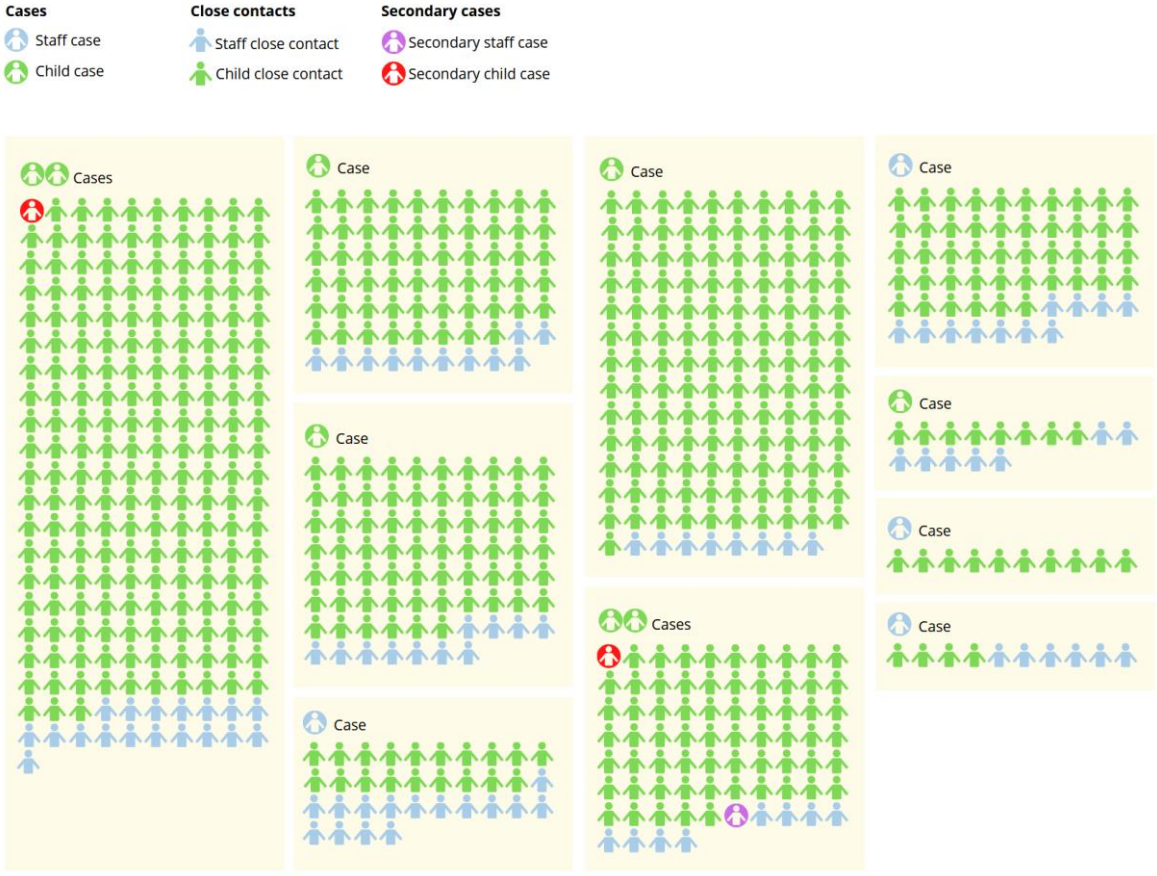
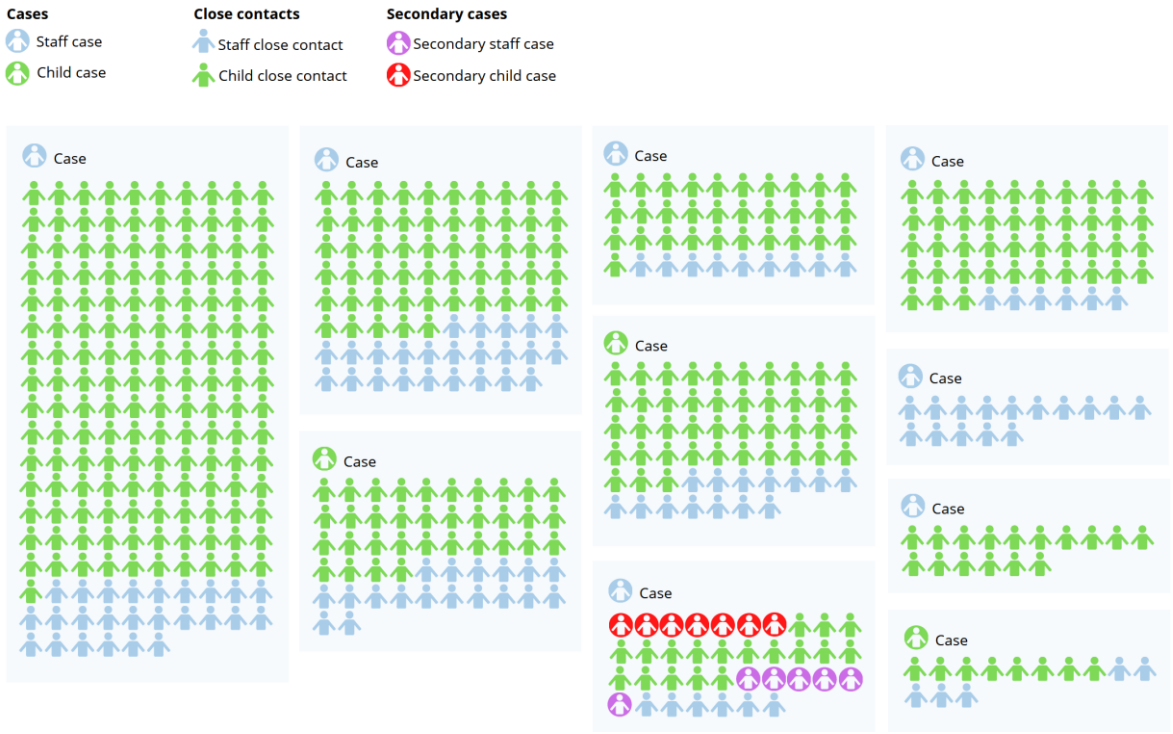


Figure 4: Cases and close contacts among teachers and students in 10 NSW ECEC services showing an outbreak in 1 ECEC service



Conclusion

Our detailed investigation of COVID-19 cases in 15 NSW primary and high schools found only five secondary cases: three in students and two in staff members. This was despite primary cases occurring in 12 children (including two schools which had two concurrent primary cases) and 15 staff members. In 10 ECEC services, 13 secondary cases were identified (seven children and six staff members), albeit all in one ECEC service. Very detailed follow-up occurred, including additional testing for the presence of the virus and for antibodies to the virus, in two thirds of contacts in selected enhanced surveillance sites and one third of the total 1,448 close contacts.

Of all 25 settings, only one ECEC service had an outbreak with a total of 13 secondary cases identified. This outbreak occurred early in the first wave of the epidemic and was potentially related to delayed case detection due to the narrow testing criteria at the time, resulting in several generations of transmission occurring before outbreak detection, as well as other factors. Overall, the secondary transmission rate was 1.2% (18/1,448) for all settings, or 0.4% (5/1,411) excluding the single ECEC service outbreak. The secondary attack rate within schools was 0.5% (5/914).

It is notable that more than half of the primary cases that occurred in schools and ECEC services were in staff members. This is consistent with the higher rate of COVID-19 seen in adults than in children. This reinforces the need for 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 and other school staff members, and where possible older children, to follow recommended social distancing practices while at school and in the community. Guidance has been issued at both national and state and territory levels to ensure schools and ECEC services can reduce the risk of the spread of COVID-19.

SARS-CoV-2 transmission in children in schools appears considerably less than the transmission seen for other respiratory viruses, such as influenza. These data suggest that children are not the primary drivers of COVID-19 spread in schools or in the community. This observation 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. Data from the whole of NSW during the same period also demonstrated that children (aged ≤18 years) represented only 4% of all cases of COVID-19 despite being approximately 23% of the population.

It is very important that the results of this investigation are taken in the context of the overall first epidemic wave in NSW during the observational period. The majority of cases that were occurring in NSW each day were related to overseas travel, and community transmission was not occurring at a high rate; the epidemic in NSW was considerably less intense than that seen in multiple other countries. As such these data should not be taken to imply that transmission rates would be the same in other settings with unchecked community transmission. The low case numbers and transmission rates across all NSW schools and ECEC services reflect the strong public health and community responses, which resulted in the COVID-19 epidemic in NSW being rapidly and effectively controlled. Tracking the rate of virus transmission was possible because multiple simultaneous case introductions to schools and ECEC services were not occurring and because these educational facilities remained opened throughout the epidemic peak. Greater spread of the virus may have occurred in schools and ECEC services if the epidemic had escalated or in the absence of rapid and effective case detection and quarantine of exposed close contacts.

In addition, attendance at schools and ECEC services over the observational period declined, although most schools remained open. More detail on this is available in the study published in The Lancet Child and Adolescent Health. From 23 March 2020 the NSW Premier advised that although schools remained open, parents were encouraged to keep their children at home for online learning and school holidays commenced in NSW on Friday 10 April for two weeks.

As the pandemic evolves it will be important to monitor its impact in educational settings. The NSW Department of Health and Department of Education and NCIRS have committed to continue enhanced investigations to monitor the transmission of COVID-19 in schools and ECEC services and report the findings.

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