

EVIDENCE SEARCH REPORT

RESEARCH QUESTION: What COVID-19 community transmission indicators are used in school reopening plans?	UNIQUE IDENTIFIER: EOC081201-01 ESR
RESOURCES USED:	
<ul style="list-style-type: none"> • CDC (US) database & website • CPG Infobase • ECRI • Embase • Google Advanced Search • Google Scholar 	<ul style="list-style-type: none"> • McMaster NCCMT • MEDLINE • PubMed • TRIP Medical Database (Pro) • WHO Global Research on COVID-19
LIMITS/EXCLUSIONS/INCLUSIONS: English	REFERENCE INTERVIEW COMPLETED: August 05, 2020
DATE: August 12, 2020	
LIBRARIAN: Michelle Dalidowicz & Courtney Ellsworth	REQUESTOR: Dr. Nazeem Muhajarine
TEAM: EOC	
SEARCH ALERTS CREATED: N	
CITE AS: Dalidowicz, M; Ellsworth, C. What COVID-19 community transmission indicators are used in school reopening plans? 2020 Aug 12; Document no.: EOC081201-01 ESR. In: COVID-19 Rapid Evidence Reviews [Internet]. SK: SK COVID Evidence Support Team, c2020. 12 p. (CEST evidence search report)	

LIBRARIAN NOTES/COMMENTS

Hello Dr. Muhajarine,

Below is what we were able to find on COVID-19 community transmission indicators used in school reopening plans. Please let us know if there are any questions or concerns.

Thanks,

Michelle and Courtney

DISCLAIMER

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SEARCH RESULTS

To obtain the full-text articles or to request offsite access, email library@saskhealthauthority.ca.

SUMMARIES, GUIDELINES & OTHER RESOURCES

Arizona Department of Health Services. Safely Returning to In-Person Instruction. 06 August, 2020.
<https://www.azdhs.gov/documents/preparedness/epidemiology-disease-control/infectious-disease-epidemiology/novel-coronavirus/covid-19-safely-return-to-in-person-instruction.pdf>

- **Librarian's note:** Page 2 has benchmarks for community spread.

CDC

- FAQ for School Administrators on Reopening Schools
<https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/reopening-schools-faqs.html>
 - "At what point should schools close for in-person learning?
 - the [level of community transmission](#);
 - other indicators that local public health officials are using to assess the status of COVID-19 in their area;"
- Preparing K-12 School Administrators for a Safe Return to School in Fall 2020. 01 August 2020.
<https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/prepare-safe-return.html>
 - "Local health officials can help inform decisions related to school operations by examining public health [indicatorspdf icon](#) that are used to determine level of community transmission and disease severity levels. For example, indicators such as healthcare capacity (e.g., staffing, ICU bed occupancy), changes in newly identified COVID-19 cases, and percentage of people testing positive for SARS-CoV-2 infections in the community might be useful to determine whether to maintain or modify school operations. These indicators are set by state, local, tribal, and territorial health and healthcare officials, and should be shared with schools for decision making."

IndependentSage. When Should a School Reopen? A Final Report. 28 May 2020.

<https://www.independentsage.org/wp-content/uploads/2020/06/Independent-Sage-Brief-Report-on-Schools.pdf>

- Page 7: "All of the scenarios resulted in an increase in R and the scale of increase was highly dependent on current R and on the wider context within each community, in particular adherence to social distancing. SAGE warned that if current R is just below 1, then even small changes could trigger a return to exponential growth."

The impact of school reopening on the spread of COVID-19 in England. 05 June 2020.

<https://www.medrxiv.org/content/10.1101/2020.06.04.20121434v1.full.pdf>

- "Our work indicates that any reopening of schools will result in increased mixing and infection amongst children and the wider population, although the opening of schools alone is unlikely to push the value of R above one."

Institute for Disease Modeling. Schools are not Islands: We Must Mitigate Community Transmission to Reopen Schools. 13 July 2020.

https://covid.idmod.org/data/Schools_are_not_islands_we_must_mitigate_community_transmission_to_reopen_schools.pdf

- Page 3: "We found that King County will not be able to fully return to work and community mobility patterns while keeping the effective reproductive number below one with any level of school reopening."
- Page 8: "We found that school reopening with countermeasures is possible, but reopening without countermeasures could lead to a doubling of the COVID attack rate in the population in the first three months of the school year. These findings depended upon the level of community transmission in the model. For sufficiently high community transmission (80% or more of mobility restored), none of the mitigating strategies in schools we explored would be able to reduce the effective reproductive number to one or below. And for sufficiently low community transmission (no increase above the level observed in early June), mitigating strategies in schools would not be needed to maintain an effective reproductive number below one."

Minnesota's Department of Education. Safe Learning Plan for 2020-21 A Localize, Data-Driven Approach. 30 July 2020.

https://education.mn.gov/mdeprod/idcplg?IdcService=GET_FILE&dDocName=MDE033418&RevisionSelectionMethod=latestReleased&Rendition=primary

- Page 5: "In order to determine the base learning model, school districts and charter schools will be advised of the **bi-weekly case rate (over 14 days) by county of residence**. These data are the number of cases by county of residence in Minnesota over 14 days per 10,000 people by date of specimen collection (when a person was tested). While any increase in case incidence represents greater potential risk, schools may consider a bi-weekly case rate of 10 or more cases per 10,000 to be an elevated risk of disease transmission within the local community, especially when the level of cases per week is sustained or increasing over time. "
- **Librarian's Note:** Page 6 has a table detailing the number of active cases in the community and the corresponding learning model.

Royal Society DELVE Initiative. Balancing the Risks of Pupils Returning to Schools. 24 July 2020. <https://rs-delve.github.io/reports/2020/07/24/balancing-the-risk-of-pupils-returning-to-schools.html>

- "Keeping schools open should be the default policy. The Government should do everything feasible in order to not close schools. This means:
 1. Suppressing the virus in the wider community to reduce the risk of transmission in schools once at full capacity, and to minimise future disruptions to learning; if local outbreaks occur, other facilities where the risk of transmission is high (such as pubs or gyms) and non-essential shops should be closed, before considering school closures;"
- "B. If local full or partial closures must occur, this should be based on clear scenarios with objective criteria:
 1. Sporadic cases or clusters in the local community: provide alerts to local schools and families, test, trace and isolate, and where appropriate group isolation.
 4. Widespread local community transmission: local area lockdown;"

Sick Kids. COVID-19: Guidance for School Reopening . 29 July 2020. <https://www.sickkids.ca/PDFs/About-SickKids/81407-COVID19-Recommendations-for-School-Reopening-SickKids.pdf>

- Page 5: "The mitigation strategies implemented for school reopening have varied from country to country,56 in part depending on local epidemiology."
- Pages 5-6."As a result, it is anticipated that there may be an increase in cases of COVID-19 and other seasonal respiratory viral infections with similar symptoms upon the resumption of school and appropriate measures should be proactively put in place to mitigate the effects of such an increase. It will be critical to monitor the impact of school reopening on SARS-CoV-2 transmission and thresholds

should be identified that would trigger re-evaluation of mitigation strategies as well as the school model."

- Page 6: "Furthermore, several countries have reopened schools without demonstrating a significant increase in cases when community rates have been low."
- Page 12: "When transmission in the community is low, the use of NMMs throughout the entire school day should not be mandatory for elementary, middle or high school students returning to school."

WHO

- Q&A: Schools and COVID-19. 13 July 2020. <https://www.who.int/news-room/q-a-detail/q-a-schools-and-covid-19>
 - "1. Benefits and risks: what are the likely benefits and risks to children and staff of open schools? Including consideration of :
 - Disease trends: are COVID-19 cases being reported in the area?"
- Considerations for school-related public health measures in the context of COVID-19. 10 May 2020. <https://www.who.int/publications/i/item/considerations-for-school-related-public-health-measures-in-the-context-of-covid-19>
 - "Decision makers should consider the following when deciding on whether to open or close schools:
 - Current understanding about COVID-19 transmission and severity in children
 - Local situation and epidemiology of COVID-19 where the school(s) are located
 - School setting and ability to maintain COVID-19 prevention and control measures"

ARTICLES

Note: References are sorted by year (newest to oldest)

1. Angoulvant F, Ouldali N, Yang DD, et al. COVID-19 pandemic: Impact caused by school closure and national lockdown on pediatric visits and admissions for viral and non-viral infections, a time series analysis. Clin Infect Dis. 2020;03. DOI: 10.1093/cid/ciaa710

ABSTRACT: A time series analysis of 871,543 pediatric emergency visits revealed that the COVID-19 lockdown and school closure were associated with a significant decrease in infectious diseases disseminated through airborne or fecal-oral transmissions: common cold, gastro-enteritis, bronchiolitis, acute otitis. No change was found for urinary tract infections.

URL: <https://www.ncbi.nlm.nih.gov/pubmed/32492117>

DOI: 10.1093/cid/ciaa710

2. Bonell C, Melendez-Torres GJ, Viner RM, et al. An evidence-based theory of change for reducing SARS-CoV-2 transmission in reopened schools. Health Place. 2020;64(102398):102398. DOI: 10.1016/j.healthplace.2020.102398

ABSTRACT: Schools have closed worldwide as part of measures to prevent SARS-CoV-2 transmission but are beginning to reopen in some countries. Various measures are being pursued to minimise transmission but existing guidance has not developed a comprehensive framework or theory of change. We present a framework informed by the occupational health hierarchy of control and a theory of change informed by realist approaches. We present measures focused on elimination, substitution, engineering, administration, education and personal protective equipment. We theorise that such measures offer a means of disrupting SARS-CoV-2 transmission via routes involving fomites, faeco-oral routes, droplets and aerosols.

URL: <https://www.ncbi.nlm.nih.gov/pubmed/32736311>

DOI: 10.1016/j.healthplace.2020.102398

3. Colao A, Piscitelli P, Pulimeno M, et al. Rethinking the role of the school after COVID-19. Lancet Public Health. 2020;5(7):e370. DOI: 10.1016/S2468-2667(20)30124-9

URL: <https://www.ncbi.nlm.nih.gov/pubmed/32464100>

DOI: 10.1016/S2468-2667(20)30124-9

4. Cooper DM, Guay-Woodford L, Blazar BR, et al. Reopening Schools Safely: The Case for Collaboration, Constructive Disruption of Pre-Coronavirus 2019 Expectations, and Creative Solutions. *The Journal of pediatrics*. 2020;223:183-5.

DOI: 10.1016/j.jpeds.2020.05.022

URL: <https://www.ncbi.nlm.nih.gov/pubmed/32445649>

DOI: 10.1016/j.jpeds.2020.05.022

5. Donohue JM, Miller E. COVID-19 and School Closures. *JAMA*. 2020;29. DOI: 10.1001/jama.2020.13092

URL: <https://www.ncbi.nlm.nih.gov/pubmed/32745182>

DOI: 10.1001/jama.2020.13092

6. Fantini MP, Reno C, Biserni GB, et al. COVID-19 and the re-opening of schools: a policy maker's dilemma. *Italian journal of pediatrics*. 2020;46(1):79. DOI: 10.1186/s13052-020-00844-1

ABSTRACT: The epidemic of coronavirus disease 2019 (COVID-19) broke out in Wuhan, China, in December 2019 and rapidly spread across the world. In order to counter this epidemic, several countries put in place different restrictive measures, such as the school's closure and a total lockdown. However, as the knowledge on the disease progresses, clinical evidence showed that children mainly have asymptomatic or mild disease and it has been suggested that they are also less likely to spread the virus. Moreover, the lockdown and the school closure could have negative consequences on children, affecting their social life, their education and their mental health. As many countries have already entered or are planning a phase of gradual lifting of the containment measures of social distancing, it seems plausible that the re-opening of nursery schools and primary schools could be considered a policy to be implemented at an early stage of recovery efforts, putting in place measures to do it safely, such as the maintenance of social distance, the reorganisation of classes into smaller groups, the provision of adequate sanitization of spaces, furniture and toys, the prompt identification of cases in the school environment and their tracing. Therefore, policy makers have the task of balancing pros and cons of the school re-opening strategy, taking into account psychological, educational and social consequences for children and their families. Another issue to be considered is represented by socio-economic disparities and inequalities which could be amplified by school's closure.

URL: <https://www.ncbi.nlm.nih.gov/pubmed/32517815>

DOI: 10.1186/s13052-020-00844-1

7. Heavey L, Casey G, Kelly C, et al. No evidence of secondary transmission of COVID-19 from children attending school in Ireland, 2020. *Euro Surveill*. 2020;25(21):05. DOI: 10.2807/1560-7917.ES.2020.25.21.2000903

ABSTRACT: As many countries begin to lift some of the restrictions to contain COVID-19 spread, lack of evidence of transmission in the school setting remains. We examined Irish notifications of SARS-CoV2 in the school setting before school closures on 12 March 2020 and identified no paediatric transmission. This adds to current evidence that children do not appear to be drivers of transmission, and we argue that reopening schools should be considered safe accompanied by certain measures.

URL: <https://www.ncbi.nlm.nih.gov/pubmed/32489179>

DOI: 10.2807/1560-7917.ES.2020.25.21.2000903

8. Kim S, Kim YJ, Peck KR, et al. School Opening Delay Effect on Transmission Dynamics of Coronavirus Disease 2019 in Korea: Based on Mathematical Modeling and Simulation Study. *J Korean Med Sci*. 2020;35(13):e143. DOI: 10.3346/jkms.2020.35.e143

ABSTRACT: BACKGROUND: Nonpharmaceutical intervention strategy is significantly important to mitigate the coronavirus disease 2019 (COVID-19) spread. One of the interventions implemented by the government is a school closure. The Ministry of Education decided to postpone the school opening from March 2 to April 6 to minimize epidemic size. We aimed to quantify the school closure effect on the COVID-19 epidemic. METHODS: The potential effects of school opening were measured using a mathematical model considering two age groups: children (aged 19 years and younger) and adults (aged over 19). Based on susceptible-exposed-infectious-recovered model, isolation and behavior-changed susceptible individuals are additionally considered. The transmission parameters were estimated from the laboratory confirmed data reported by the Korea Centers for Disease Control and Prevention from February 16 to March 22. The model was extended with estimated parameters and estimated the expected number of confirmed cases as the transmission rate increased after school opening. RESULTS: Assuming the transmission rate between children group would be increasing 10 fold after the schools open, approximately additional 60 cases are expected to occur from March 2 to March 9, and approximately additional 100 children cases are expected from March 9 to March 23. After March 23, the number of expected cases for children is 28.4 for 7 days and 33.6 for 14 days. CONCLUSION: The simulation results show that the government could reduce at least 200 cases, with two

announcements by the Ministry of education. After March 23, although the possibility of massive transmission in the children's age group is lower, group transmission is possible to occur.

URL: <https://www.ncbi.nlm.nih.gov/pubmed/32242349>

DOI: 10.3346/jkms.2020.35.e143

9. Kuttiatt VS, Menon RP, Abraham PR, et al. Should Schools Reopen Early or Late? - Transmission Dynamics of COVID-19 in Children. Indian Journal of Pediatrics. 2020.

10. Leask J, Hooker C. How risk communication could have reduced controversy about school closures in Australia during the COVID-19 pandemic. Public Health Res Pract. 2020;30(2):30. DOI: 10.17061/phrp3022007

ABSTRACT: Although there has been consistent evidence indicating that school closures have only limited efficacy in reducing community transmission of coronavirus disease 2019 (COVID-19), the question of whether children should be kept home from school has attracted extensive and often divisive public debate in Australia. In this article we analyse the factors that drove high levels of concern among parents, teachers and the public and led to both demands for school closures in late March 2020, and to many parents' reluctance to return their children to school in May 2020. We discuss how the use of well-established principles of risk communication might have reduced much of this community concern. Then we set out a range of practical suggestions for communication practices that build trust and hence diminish concerns in relation to managing schools over the long term of the COVID-19 pandemic.

URL: <https://www.ncbi.nlm.nih.gov/pubmed/32601650>

DOI: 10.17061/phrp3022007

11. Liu Y, Gu Z, Xia S, et al. What are the underlying transmission patterns of COVID-19 outbreak? An age-specific social contact characterization. EClinicalMedicine. 2020;22 (no pagination)(100354).

ABSTRACT: Background: COVID-19 has spread to 6 continents. Now is opportune to gain a deeper understanding of what may have happened. The findings can help inform mitigation strategies in the disease-affected countries. Method(s): In this work, we examine an essential factor that characterizes the disease transmission patterns: the interactions among people. We develop a computational model to reveal the interactions in terms of the social contact patterns among the population of different age-groups. We divide a city's population into seven age-groups: 0-6 years old (children); 7-14 (primary and junior high school students); 15-17 (high school students); 18-22 (university students); 23-44 (young/middle-aged people); 45-64 years old (middle-aged/elderly people); and 65 or above (elderly people). We consider four representative settings of social contacts that may cause the disease spread: (1) individual households; (2) schools, including primary/high schools as well as colleges and universities; (3) various physical workplaces; and (4) public places and communities where people can gather, such as stadiums, markets, squares, and organized tours. A contact matrix is computed to describe the contact intensity between different age-groups in each of the four settings. By integrating the four contact matrices with the next-generation matrix, we quantitatively characterize the underlying transmission patterns of COVID-19 among different populations. Finding(s): We focus our study on 6 representative cities in China: Wuhan, the epicenter of COVID-19 in China, together with Beijing, Tianjin, Hangzhou, Suzhou, and Shenzhen, which are five major cities from three key economic zones. The results show that the social contact-based analysis can readily explain the underlying disease transmission patterns as well as the associated risks (including both confirmed and unconfirmed cases). In Wuhan, the age-groups involving relatively intensive contacts in households and public/communities are dispersedly distributed. This can explain why the transmission of COVID-19 in the early stage mainly took place in public places and families in Wuhan. We estimate that Feb. 11, 2020 was the date with the highest transmission risk in Wuhan, which is consistent with the actual peak period of the reported case number (Feb. 4-14). Moreover, the surge in the number of new cases reported on Feb. 12 and 13 in Wuhan can readily be captured using our model, showing its ability in forecasting the potential/unconfirmed cases. We further estimate the disease transmission risks associated with different work resumption plans in these cities after the outbreak. The estimation results are consistent with the actual situations in the cities with relatively lenient policies, such as Beijing, and those with strict policies, such as Shenzhen. Interpretation(s): With an in-depth characterization of age-specific social contact-based transmission, the retrospective and prospective situations of the disease outbreak, including the past and future transmission risks, the effectiveness of different interventions, and the disease transmission risks of restoring normal social activities, are computationally analyzed and reasonably explained. The conclusions drawn from the study not only provide a comprehensive explanation of the underlying COVID-19 transmission patterns in China, but more importantly, offer the social contact-based risk analysis methods that can readily be applied to guide intervention planning and operational responses in other countries, so that the impact of COVID-19 pandemic can be strategically mitigated. Funding(s): General Research Fund of the Hong Kong Research Grants Council; Key Project Grants of the National Natural Science Foundation of China. Copyright © 2020 The Author(s)

12. Merckx J, Labrecque JA, Kaufman JS. Transmission of SARS-CoV-2 by Children. Dtsch Arztebl Int. 2020;117(33-34):553-60. DOI: 10.3238/arztebl.2020.0553

ABSTRACT: BACKGROUND: Six months into the COVID-19 pandemic, children appear largely spared from the direct effects of disease, suggesting age as an important predictor of infection and severity. They remain, however, impacted by far-reaching public health interventions. One crucial question often posed is whether children generally transmit SARS-CoV-2 effectively. METHODS: We assessed the components of transmission and the different study designs and considerations necessary for valid assessment of transmission dynamics. We searched for published evidence about transmission of SARS-CoV-2 by children employing a narrative review methodology through 25 June, 2020. RESULTS: Transmission dynamics must be studied in representative pediatric populations with a combination of study designs including rigorous epidemiological studies (e.g. in households, schools, daycares, clinical settings) and laboratory studies while taking into account the social and socio-economic contexts. Viral load (VL) estimates from representative pediatric samples of infected children are missing so far. Currently available evidence suggests that the secondary attack rate stratified by age of the infector is lower for children, however this age pattern needs to be better quantified and understood. CONCLUSION: A generalizable pediatric evidence base is urgently needed to inform policy making now, later when facing potential subsequent waves, and extending through a future in which endemicity alongside vaccination may become the enduring reality.

URL: <https://www.ncbi.nlm.nih.gov/pubmed/32705983>

DOI: 10.3238/arztebl.2020.0553

13. Munro APS, Faust SN. Addendum to: Children are not COVID-19 super spreaders: Time to go back to school. Archives of Disease in Childhood. 2020.

14. Panovska-Griffiths J, Kerr CC, Stuart RM, et al. Determining the optimal strategy for reopening schools, the impact of test and trace interventions, and the risk of occurrence of a second COVID-19 epidemic wave in the UK: a modelling study. Lancet Child Adolesc Health. 2020;03:03. DOI: 10.1016/S2352-4642(20)30250-9

ABSTRACT: BACKGROUND: As lockdown measures to slow the spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection begin to ease in the UK, it is important to assess the impact of any changes in policy, including school reopening and broader relaxation of physical distancing measures. We aimed to use an individual-based model to predict the impact of two possible strategies for reopening schools to all students in the UK from September, 2020, in combination with different assumptions about relaxation of physical distancing measures and the scale-up of testing. METHODS: In this modelling study, we used Covasim, a stochastic individual-based model for transmission of SARS-CoV-2, calibrated to the UK epidemic. The model describes individuals' contact networks stratified into household, school, workplace, and community layers, and uses demographic and epidemiological data from the UK. We simulated six different scenarios, representing the combination of two school reopening strategies (full time and a part-time rota system with 50% of students attending school on alternate weeks) and three testing scenarios (68% contact tracing with no scale-up in testing, 68% contact tracing with sufficient testing to avoid a second COVID-19 wave, and 40% contact tracing with sufficient testing to avoid a second COVID-19 wave). We estimated the number of new infections, cases, and deaths, as well as the effective reproduction number (R) under different strategies. In a sensitivity analysis to account for uncertainties within the stochastic simulation, we also simulated infectiousness of children and young adults aged younger than 20 years at 50% relative to older ages (20 years and older). FINDINGS: With increased levels of testing (between 59% and 87% of symptomatic people tested at some point during an active SARS-CoV-2 infection, depending on the scenario), and effective contact tracing and isolation, an epidemic rebound might be prevented. Assuming 68% of contacts could be traced, we estimate that 75% of individuals with symptomatic infection would need to be tested and positive cases isolated if schools return full-time in September, or 65% if a part-time rota system were used. If only 40% of contacts could be traced, these figures would increase to 87% and 75%, respectively. However, without these levels of testing and contact tracing, reopening of schools together with gradual relaxing of the lockdown measures are likely to induce a second wave that would peak in December, 2020, if schools open full-time in September, and in February, 2021, if a part-time rota system were adopted. In either case, the second wave would result in R rising above 1 and a resulting second wave of infections 2.0-2.3 times the size of the original COVID-19 wave. When infectiousness of children and young adults was varied from 100% to 50% of that of older ages, we still found that a comprehensive and effective test-trace-isolate strategy would be required to avoid a second COVID-19 wave. INTERPRETATION: To prevent a second COVID-19 wave, relaxation of physical distancing, including reopening of schools, in the UK must be accompanied by large-scale, population-wide testing of symptomatic individuals and effective tracing of their contacts, followed by isolation of diagnosed individuals. FUNDING: None.

URL: <https://www.ncbi.nlm.nih.gov/pubmed/32758453>

DOI: 10.1016/S2352-4642(20)30250-9

- 15. Perez-Lopez A, Hasan M, Iqbal M, et al. Dramatic decrease of laboratory-confirmed influenza A after school closure in response to COVID-19. *Pediatr Pulmonol.* 2020. DOI: 10.1002/ppul.24933**
URL: <https://www.ncbi.nlm.nih.gov/pubmed/32598576>
DOI: 10.1002/ppul.24933
- 16. Pollock AM. Covid-19: Local implementation of tracing and testing programmes could enable some schools to reopen. *The BMJ.* 2020;368 (no pagination)(m1187).**
- 17. Sharfstein JM, Morpew CC. The Urgency and Challenge of Opening K-12 Schools in the Fall of 2020. *JAMA.* 2020;324(2):133-4. DOI: 10.1001/jama.2020.10175**
URL: <https://www.ncbi.nlm.nih.gov/pubmed/32478827>
DOI: 10.1001/jama.2020.10175
- 18. Stein-Zamir C, Abramson N, Shoob H, et al. A large COVID-19 outbreak in a high school 10 days after schools' reopening, Israel, May 2020. *Euro Surveill.* 2020;25(29):07. DOI: 10.2807/1560-7917.ES.2020.25.29.2001352**
ABSTRACT: On 13 March 2020, Israel's government declared closure of all schools. Schools fully reopened on 17 May 2020. Ten days later, a major outbreak of coronavirus disease (COVID-19) occurred in a high school. The first case was registered on 26 May, the second on 27 May. They were not epidemiologically linked. Testing of the complete school community revealed 153 students (attack rate: 13.2%) and 25 staff members (attack rate: 16.6%) who were COVID-19 positive.
URL: <https://www.ncbi.nlm.nih.gov/pubmed/32720636>
DOI: 10.2807/1560-7917.ES.2020.25.29.2001352
- 19. Torres JP, Pinera C, De La Maza V, et al. SARS-CoV-2 antibody prevalence in blood in a large school community subject to a Covid-19 outbreak: a cross-sectional study. *Clin Infect Dis.* 2020;10:10. DOI: 10.1093/cid/ciaa955**
ABSTRACT: BACKGROUND: A SARS-CoV-2 outbreak affecting 52 people from a large school community in Santiago, Chile was identified (March 12), nine days after the first country case. We assessed the magnitude of the outbreak and the role students and staff played using a self-administered antibody detection test and survey. METHODS: The school was closed on March 13, and the entire community was placed under quarantine. We implemented a home-delivery, self-administered, IgG/IgM antibody test and survey to a classroom stratified sample of students and all staff from May 4-19. We aimed to determine overall seroprevalence rates by age group, reported symptoms, contact exposure and to explore dynamics of transmission. RESULTS: Antibody positivity rates were 9.9% (95%CI: 8.2-11.8) for 1,009 students and 16.6% (95%CI: 12.1-21.9) for 235 staff. Among students, positivity was associated with younger age (P=0.01), lower grade level (P=0.05), prior RT-PCR positivity (P=0.03), and history of contact with a confirmed case (P<0.001). Among staff, positivity was higher in teachers (P=0.01) and in those previously RT-PCR positive (P<0.001). Excluding RT-PCR positive individuals, antibody positivity was associated with fever in adults and children (P=0.02; P=0.002), abdominal pain in children (P=0.001), and chest pain in adults (P=0.02). Within antibody positive individuals, 40% of students and 18% of staff reported no symptoms (P=0.01). CONCLUSIONS: Teachers were more affected during the outbreak and younger children were at higher infection risk, likely because index case(s) were teachers and/or parents from preschool. Self-administered antibody testing, supervised remotely, proved to be a suitable and rapid tool. Our study provides useful information for school re-openings.
URL: <https://www.ncbi.nlm.nih.gov/pubmed/32649743>
DOI: 10.1093/cid/ciaa955
- 20. Vanhems P. SARS-CoV2 infection and primary school closure. *Euro Surveill.* 2020;25(15). DOI: 10.2807/1560-7917.ES.2020.25.15.2000617**
URL: <https://www.ncbi.nlm.nih.gov/pubmed/32317053>
DOI: 10.2807/1560-7917.ES.2020.25.15.2000617
- 21. Viner RM, Russell SJ, Croker H, et al. School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review. *Lancet Child Adolesc Health.* 2020;4(5):397-404. DOI: 10.1016/S2352-4642(20)30095-X**
ABSTRACT: In response to the coronavirus disease 2019 (COVID-19) pandemic, 107 countries had implemented national school closures by March 18, 2020. It is unknown whether school measures are effective in coronavirus outbreaks (eg, due to severe acute respiratory syndrome [SARS], Middle East respiratory syndrome, or COVID-19). We undertook a systematic review by searching three electronic databases to identify what is known about the effectiveness of school closures and other school social distancing practices during coronavirus outbreaks. We included 16 of 616 identified articles. School closures were deployed rapidly across mainland China and Hong Kong for COVID-19. However, there are no data on the relative contribution

of school closures to transmission control. Data from the SARS outbreak in mainland China, Hong Kong, and Singapore suggest that school closures did not contribute to the control of the epidemic. Modelling studies of SARS produced conflicting results. Recent modelling studies of COVID-19 predict that school closures alone would prevent only 2-4% of deaths, much less than other social distancing interventions. Policy makers need to be aware of the equivocal evidence when considering school closures for COVID-19, and that combinations of social distancing measures should be considered. Other less disruptive social distancing interventions in schools require further consideration if restrictive social distancing policies are implemented for long periods.

URL: <https://www.ncbi.nlm.nih.gov/pubmed/32272089>

DOI: 10.1016/S2352-4642(20)30095-X

22. Walger P, Heininger U, Knuf M, et al. Children and adolescents in the CoVid-19 pandemic: Schools and daycare centers are to be opened again without restrictions. The protection of teachers, educators, carers and parents and the general hygiene rules do not conflict with this. GMS hygiene and infection control. 2020;15:Doc11. DOI: 10.3205/dgkh000346

ABSTRACT: In the opinion of the medical societies of hygiene and pediatrics undersigning the present statement, the analyses published to date regarding transmission of SARS-CoV-2 and the course of CoVid-19 show that children play a much less significant role in the spread of the virus than do adults. According to the findings available to date, not only do children and adolescents less frequently fall ill with CoVid-19, they also generally become less severely ill than do adults. The vast majority of infections in children and adolescents are asymptomatic or oligosymptomatic. Even the first analyses from China demonstrated that children and adolescents play a subordinate role in the transmission of the virus - not only to other children and adolescents, but also to adults. Taking into account regional infection rates and available resources, daycare centers, kindergartens and elementary schools promptly should be reopened. For children, this should be possible without excessive restrictions, such as clustering into very small groups, implementation of barrier precautions, maintaining appropriate distance from others or wearing masks. A factor more decisive than individual group size is the issue of sustaining the constancy of respective group members and the avoidance of intermixing. Children can be taught basic rules of hygiene such as handwashing and careful hygiene behavior when coming into contact with others during mealtimes and/or when using sanitary facilities. Independent of the prevention measures implemented for children and adolescents, the protection of teachers, educators and caregivers is crucial, (e.g., the maintenance of appropriate distance from others, use of medical masks, situation-dependent hand disinfection, when necessary, supported by regular pool testing). Children over the age of 10 and adolescents up to school graduation age are more capable of actively understanding and conforming to specific hygiene rules. For this group, maintaining appropriate distance from others (1.5 meters), wearing a mouth-and-nose protection (whenever they are not sitting in their assigned classroom seats) and consistent education regarding the basic rules of infection prevention may provide increased options for normalizing teaching activities. Children and adolescents suspected of infection with SARS-CoV-2 should be tested immediately in order to either confirm or rule out such an infection. Evidence of individual infections in children or students must not automatically lead to the closure of the entire daycare center or school. A detailed analysis of the chain of infection is a prerequisite for a balanced approach to infection control. The opening of schools and children's facilities should be accompanied by specifically structured, model surveillance studies that further clarify outstanding questions about infectious disease events and hygiene control. These prospective, concomitant examinations will be essential for the purpose of evaluating and verifying the effectiveness of the required hygiene measures.

URL: <https://www.ncbi.nlm.nih.gov/pubmed/32547911>

DOI: 10.3205/dgkh000346

23. Wise J. Covid-19: Push to reopen schools risks new wave of infections, says Independent SAGE. BMJ. 2020;369:m2161. DOI: 10.1136/bmj.m2161

URL: <https://www.ncbi.nlm.nih.gov/pubmed/32467094>

DOI: 10.1136/bmj.m2161

24. Hildenwall H, Luthander J, Rhedin S, et al. Paediatric COVID-19 admissions in a region with open schools during the two first months of the pandemic. Acta Paediatr. 1992(pagination).

ABSTRACT: According to the United Nations Educational, Science and Cultural Organization, 194 countries had implemented country-wide school closures by April 1st 2020 in an effort to combat the COVID-19 pandemic. It's estimated that those closures affected 91.3% of students across the globe. However, Sweden adopted a different approach to the strict lockdowns imposed elsewhere and day care centres and schools for children up to 15 years of age remained open. The strategy decision to shift schools to distance learning only for children aged 16 years and older was influenced by multiple factors, including the potential impact on school closures on the availability of the healthcare work force, the increasing evidence of mainly mild

SEARCH STRATEGIES

Database: Ovid MEDLINE(R) ALL <1946 to August 07, 2020>

Search Strategy:

- 1 exp coronavirus/ (25248)
- 2 exp Coronavirus Infections/ (26122)
- 3 ((corona* or corono*) adj1 (virus* or viral* or virinae*)).ti,ab,kw,kf. (1582)
- 4 (coronavirus* or coronovirus* or coronavirinae* or CoV).ti,ab,kw,kf. (33815)
- 5 ("2019-nCoV" or 2019nCoV or nCoV2019 or "nCoV-2019" or "COVID-19" or COVID19 or "CORVID-19" or CORVID19 or "WN-CoV" or WNCov or "HCoV-19" or HCoV19 or "2019 novel*" or Ncov or "n-cov" or "SARS-CoV-2" or "SARSCoV-2" or "SARSCoV2" or "SARS-CoV2" or SARSCov19 or "SARS-Cov19" or "SARSCov-19" or "SARS-Cov-19" or Ncovor or Ncorona* or Ncorono* or NcovWuhan* or NcovHubei* or NcovChina* or NcovChinese* or SARS2 or "SARS-2" or SARScoronavirus2 or "SARS-coronavirus-2" or "SARScoronavirus 2" or "SARS coronavirus2" or SARScoronavirus2 or "SARS-coronavirus-2" or "SARScoronavirus 2" or "SARS coronavirus2").ti,ab,kw,kf. (38489)
- 6 (respiratory* adj2 (symptom* or disease* or illness* or condition*) adj10 (Wuhan* or Hubei* or China* or Chinese* or Huanan*)).ti,ab,kw,kf. (496)
- 7 (("seafood market*" or "food market*" or pneumonia*) adj10 (Wuhan* or Hubei* or China* or Chinese* or Huanan*)).ti,ab,kw,kf. (1461)
- 8 ((outbreak* or wildlife* or pandemic* or epidemic*) adj1 (Wuhan* or Hubei* or China* or Chinese* or Huanan*)).ti,ab,kw. (279)
- 9 "severe acute respiratory syndrome*".ti,ab,kw,kf. (9176)
- 10 or/1-9 (62499)
- 11 schools/ or schools, nursery/ (39545)
- 12 (school* or playschool? or education* or student?).tw,kf. (783448)
- 13 11 or 12 (787985)
- 14 Basic Reproduction Number/ (962)
- 15 (R0 or reproduction number or reproduction rate or reproductive number or reproductive rate or Rt or effective reproduction number or positive or active case? or new case? or daily average).kf,tw. (1706008)
- 16 (trigger* or restriction* or indicator* or threshold*).tw,kf. (1007005)
- 17 or/14-16 (2620637)
- 18 (lockdown? or lock-down? or shut-down? or shutdown? or re-open* or reopen* or close or closing or closure? or opening?).tw,kf. (538530)
- 19 10 and 13 and 17 and 18 (89)
- 20 11 or 12 (787985)
- 21 10 and 17 and 13 (295)
- 22 19 or 21 (295)
- 23 limit 22 to (english language and yr="2019 -Current") (228)
- 24 from 23 keep 1,5,39,41,57,91,117,123-124,134,156,199,203,227 (14)
- 25 community transmission.tw,kf. (375)
- 26 10 and 13 and 25 (9)
- 27 from 26 keep 5-6,8 (3)
- 28 (R0 or reproduction number or reproduction rate or reproductive number or reproductive rate or Rt or effective reproduction number or attack rate or trigger* or indicator? or threshold).ti. (104981)
- 29 school?.tw,kf. (270497)

30 10 and 28 and 29 (2)
31 24 or 27 (17)

Database: Embase <1974 to 2020 August 10>

Search Strategy:

-
- 1 exp Coronavirinae/ or exp Coronavirus infection/ (26433)
 - 2 (coronavirus disease 2019 or severe acute respiratory syndrome coronavirus 2).sh,dj. (37039)
 - 3 ((corona* or corono*) adj1 (virus* or viral* or virinae*)).ti,ab,kw. (1259)
 - 4 (coronavirus* or coronavir* or coronavirinae* or CoV).ti,ab,kw. (35646)
 - 5 ("2019-nCoV" or 2019nCoV or nCoV2019 or "nCoV-2019" or "COVID-19" or COVID19 or "CORVID-19" or CORVID19 or "WN-CoV" or WNCov or "HCoV-19" or HCoV19 or "2019 novel*" or Ncov or "n-cov" or "SARS-CoV-2" or "SARSCoV-2" or "SARSCoV2" or "SARS-CoV2" or SARSCov19 or "SARS-Cov19" or "SARSCov-19" or "SARS-Cov-19" or Ncovor or Ncorona* or Ncorono* or NcovWuhan* or NcovHubei* or NcovChina* or NcovChinese* or SARS2 or "SARS-2" or SARScoronavirus2 or "SARS-coronavirus-2" or "SARScoronavirus 2" or "SARS coronavirus2" or SARScoronavirus2 or "SARS-coronavirus-2" or "SARScoronavirus 2" or "SARS coronavirus2").ti,ab,kw. (38695)
 - 6 (respiratory* adj2 (symptom* or disease* or illness* or condition*) adj10 (Wuhan* or Hubei* or China* or Chinese* or Huanan*)).ti,ab,kw. (617)
 - 7 ((outbreak* or wildlife* or pandemic* or epidemic*) adj1 (Wuhan* or Hubei* or China* or Chinese* or Huanan*)).ti,ab,kw. (133)
 - 8 "severe acute respiratory syndrome*".ti,ab,kw. (9457)
 - 9 or/1-8 (67535)
 - 10 limit 9 to yr="2019 -Current" (44506)
 - 11 exp basic reproduction number/ (1552)
 - 12 disease transmission/ (98827)
 - 13 (R0 or reproduction number or reproduction rate or reproductive number or reproductive rate or Rt or effective reproduction number or attack rate or positive case? or active case? or new case?).tw,kw. (397347)
 - 14 11 or 12 or 13 (493704)
 - 15 exp school/ (354662)
 - 16 (school? or education* institution? or education* facilit*).tw,kw. (331172)
 - 17 15 or 16 (578214)
 - 18 9 and 14 and 17 (89)
 - 19 from 18 keep 7-8,14-15,40 (5)
 - 20 9 and 17 (846)
 - 21 (school? or education* institution? or education* facilit*).ti. (97564)
 - 22 20 and 21 (153)
 - 23 limit 22 to yr="2019 - 2021" (122)
 - 24 23 not 18 (112)
 - 25 from 24 keep 3-6,12,23-25,33,53-54,64,72,76,83,86,96 (17)
 - 26 19 or 25 (22)

Pubmed

Search (((("coronavirus"[MeSH Terms] OR "Coronavirus Infections"[MeSH Terms]) OR ("coronavirus"[Text Word] OR "coronavirus"[Text Word]) OR "coronavirinae"[Text Word]) OR "CoV"[Text

Word])) OR (((((((((((((((((((("2019-nCoV"[Text Word] OR "2019nCoV"[Text Word]) OR "nCoV2019"[Text Word]) OR "nCoV-2019"[Text Word]) OR "COVID-19"[Text Word]) OR "COVID19"[Text Word]) OR "HCoV-19"[Text Word]) OR "HCoV19"[Text Word]) OR "2019 novel*"[Text Word]) OR "Ncov"[Text Word]) OR "n-cov"[Text Word]) OR "SARS-CoV-2"[Text Word]) OR "SARSCoV-2"[Text Word]) OR "SARSCoV2"[Text Word]) OR "SARS-CoV2"[Text Word]) OR "SARSCov19"[Text Word]) OR "SARS-Cov-19"[Text Word]) OR "ncorona*"[Text Word]) OR "SARS2"[Text Word]) OR "SARS-2"[Text Word]) OR "SARScoronavirus2"[Text Word]) OR "SARS-coronavirus-2"[Text Word]) OR "SARS coronavirus2"[Text Word])) OR (((((((("wuhan*"[Text Word] OR "hubei*"[Text Word]) OR "china*"[Text Word]) OR "chinese*"[Text Word]) OR "huanan*"[All Fields]) AND (((("respiratory symptom*"[Text Word] OR "respiratory disease*"[Text Word]) OR "respiratory illness*"[Text Word]) OR ("respiratory"[All Fields] AND "condition*"[All Fields]))) OR (((((((("wuhan*"[Text Word] OR "hubei*"[Text Word]) OR "china*"[Text Word]) OR "chinese*"[Text Word]) OR "huanan*"[All Fields]) AND (("seafood market"[Text Word] OR "food market"[Text Word]) OR "pneumonia*"[All Fields]))) OR (((((((("wuhan*"[Text Word] OR "hubei*"[Text Word]) OR "china*"[Text Word]) OR "chinese*"[Text Word]) OR "huanan*"[All Fields]) AND (((("outbreak*"[Text Word] OR "wildlife*"[Text Word]) OR "pandemic*"[Text Word]) OR "epidemic*"[Text Word]))) OR "severe acute respiratory syndrome*"[Text Word]) AND (((("schools"[Title/Abstract] OR "school"[Title/Abstract]) OR "educational institution*"[Title/Abstract])) AND (((((((("R0"[Title/Abstract] OR "reproduction number"[Title/Abstract]) OR "reproduction rate"[Title/Abstract]) OR "reproductive number"[Title/Abstract]) OR "reproductive rate"[Title/Abstract]) OR "Rt"[Title/Abstract]) OR "effective reproduction number"[Title/Abstract]) OR "attack rate"[Title/Abstract]) OR "positive cases"[Title/Abstract]) OR "active cases"[Title/Abstract]) OR "new cases"[Title/Abstract])

Google Scholar

(covid-19|novel coronavirus) AND (school) AND (reopening) and (community transmission|reproductive rate| active cases| new case)

Search terms for other resources used in various combinations:

- COVID-19/Coronavirus
- school re-open/reopen/close/open
- community transmission/reproductive rate/active cases/new cases