VBCPS January Plan

We recommend that the VBCPS school board grant the administration authority to work in real time with local officials and the health department to make opening-closing decisions for classrooms, schools, and grades moving forward, given the dynamic situation and the need to consider a myriad of factors. Data support a post-holiday break of 14 days before reintroduction of students.

COVID-19 caught the country unprepared in the spring of 2020, prompting shutdowns across all sectors in order to give us time to prepare and gather data. Schools did not close because they were overwhelmed with disease but because so much was still unknown and in an effort to "flatten the curve". At that time, we expected that children would be significant spreaders of the virus like they are with influenza, so some leaders felt a complete shutdown was prudent.

In June 2020, after several months of data were available, the American Academy of Pediatrics released guidance[1] for school reopening, emphasizing that all policy considerations for the coming school year should start with a goal of having students physically present in school. The National Academy of Sciences (NAS), in a report entitled "Reopening K-12 Schools During the COVID-19 Pandemic: Prioritizing Health, Equity, and Communities[2]," created a set of recommendations designed to help districts and schools successfully navigate the complex decisions around reopening school buildings, keeping them open, and operating them safely. The first recommendation is that school districts should weigh the relative health risks of reopening against the educational risks of not providing in-person instruction. Given the importance of in-person interaction for learning and development, districts should prioritize reopening with an emphasis on providing full-time, in-person instruction.

The NAS report also included a recommendation that partnerships be established between school districts and local public health officials to assess school facilities to ensure that they meet the minimum health and safety standards necessary to support COVID-19 mitigation strategies including mask wearing, providing healthy hand hygiene solutions, physical distancing, limiting large gatherings, creating small cohorts of students, proper cleaning, and ensuring proper ventilation and air filtration. The final recommendation was that districts make informed decisions about school reopening and safe operation based upon the research on what is known involving children and transmission of COVID-19 and the role of reopening schools in contributing to the spread of COVID-19 in communities.

VBCPS worked to provide an option for in-person learning and sought to reopen safely using a data-driven approach. The VDH, as well as local health officials, supported and informed these efforts, as delineated in the published Fall 2020 VBCPS plan.

In September, guidance was released from the CDC and the Virginia Department of Health, recommending that schools consider a myriad of issues in making reopening decisions. Three primary indicators[3] were case incidence (per population), test positivity, and the school's ability

[1] https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/clinical-guidance/covid-19-planning-considerations-return-to-in-person-education-in-schools/Accessed 12.20.20.

[2] National Academies of Sciences, Engineering, and Medicine 2020. Reopening K-12 Schools During the COVID-19 Pandemic: Prioritizing Health, Equity, and Communities. Washington, DC: The National Academies Press. https://doi.org/10.17226/25858

[3] https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/indicators.html Accessed 12.22.20

to implement mitigation measures including masking, contact tracing, etc. Even for schools at the highest risk in several categories, October VDH guidelines allow for schools to offer in-person instruction for the youngest and most vulnerable students. If a school can effectively implement mitigation strategies, VDH recommendations (Sept) supported in-person instruction.

The CDC continues to state that even when a school or school division is at "highest" risk of transmission it does not mean that the school cannot re-open for in-person learning: "*While the risk of introduction and subsequent transmission of SARS-CoV-2 in a school may be lower when indicators of community spread are lower, this risk is dependent upon the implementation of school and community mitigation strategies. If community transmission is high, but school and community mitigation strategies are implemented and strictly followed as recommended, then the risk of introduction and subsequent transmission of SARS-CoV-2 in a school will decrease*."[4] The VDH asserts "the indicators serve as the starting point to make determinations on what to do in a school, but should not dictate the decisions that school districts make to best serve their individual communities."[5]

Much has changed since July; the relevance of the data that was once used by VBCPS to inform school opening has come into question and greater clarity on the effectiveness of mitigation strategies and the safety of school reopening has been achieved. Studies on transmissibility, susceptibility and infectivity, expert consensus, and expert policy support reopening schools for an in-person instruction option. Protocols for safety and mitigation strategies are in place, as well as adequate testing in Hampton Roads, and VBCPS has prepared, having learned, experienced, and tested much from when schools were originally closed.

The harms of closure

While we support a full virtual option for families who desire it, and request that everything possible is done for staff who wish to stay virtual for their own health needs, we unfortunately affirm that the situation for many children and families has only become more dire. As we have progressed through this pandemic it has become more apparent that there are very serious risks to the health of children themselves as individuals. Educators, families, and medical professionals have been first-hand witnesses to the detrimental effects of school closures.

First, let us acknowledge the cost that school building shutdowns are having on families. We have seen our patients' parents—mainly women— quit jobs because children could not thrive in virtual learning without intense parental support, or even with it, and this pattern is reflected nationally.[6] Reports indicate nationwide that more than 1/3 of women between the ages of 25 and 44 say they are not working due to child-care issues, compared to 12% of men.[7] As physicians, we are aware that a significant number of healthcare providers, including nurses locally in

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[4] https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/indicators.html Accessed 12.20.20

[5] https://www.vdh.virginia.gov/content/uploads/sites/182/2020/10/10.20.20-K12Education-Guidance_Reinstating-Community-Mitigation-Measures.pdf Accessed 12.25.20.

[6] https://www.bls.gov/news.release/empsit.nr0.htm Accessed 12.23.20

[7] Review of Economics of the Household under the title "Estimating the Immediate Impact of the COVID-19 Shock on Parental Attachment to the Labor Market and the Double Bind of Mothers" (October 2020) https://doi.org/10.21034/iwp.33

Hampton Roads, have quit their jobs or drastically reduced their hours in order to be at home with their children. Though a school's primary purpose should be for education, it cannot be denied that society has relied upon our schools to provide families support that cannot be obtained elsewhere, especially for working families who cannot afford or are otherwise unable to place their children in private school, secure alternative childcare arrangements, telecommute, or quit their jobs. Many local and national healthcare providers report seeing families send their children to learning centers, relatives' homes, friends' houses, etc. where there is more risk of COVID spread due to poor mitigation, without the benefit of education.

Most importantly, children bear the cost of school closures and many will be harmed permanently. Virtual learning is not able to fill the place of in-person learning for most students. We already know that excessive screen time is harmful: American Academy of Pediatrics guidance from 2016 states "A growing body of evidence suggests that the use of media while engaged in academic tasks has negative consequences on learning."[8] Children and teens in virtual learning are easily distracted by simultaneous phone use, internet browsing, and social media use that occurs when not in a classroom with a teacher who can monitor screen time. While some children may be able to succeed in virtual classrooms, far more are experiencing aggressive moods, inattention, and apathy in academics. Many are "ghosting" (logged in, not present), not participating, or not logging on at all.

Compared with 2019, the proportion of mental health–related visits for children aged 5–11 and 12–17 years increased approximately 24% and 31%, respectively[9] and we have seen increasing emergency room visits for mental health emergencies in children and teens in Hampton Roads. The pre-pandemic mental health crisis had already left providers without ample resources for families, and now many counselors in our area have waiting lists—some in excess of a thousand. ER colleagues have witnessed intentional medication ingestions, decreased reporting of child abuse[10] (but more serious cases when they do present), increased suicidality, depression and anxiety, as well as violence and alcohol and illicit drug use. Increased number of children are seen in the ER at Children's Hospital of the King's Daughters and admitted to the hospital with suicide attempts and completions, aggression requiring hospitalization, and as gunshot victims. While we will have emerging data on this for years to come, this crisis is so glaringly obvious that it is arguable that school closures should be considered the greatest health emergency facing children right now.

This tragic situation is not just seen in Hampton Roads, but worldwide. The World Health Organization[11] reports that the loss of in-person instruction has had a significant and negative impact on children. The adverse childhood experiences include potential abuse and neglect

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[8] https://pediatrics.aappublications.org/content/138/5/e20162592 Accessed 12.27.20.

[9] Leeb RT, et al. Mental Health–Related Emergency Department Visits Among Children Aged <18 Years During the COVID-19 Pandemic — United States, January 1–October 17, 2020. MMWR Morb Mortal Wkly Rep 2020;69:1675–1680.Accessed 12.24.20.

[10] Schmidt S, Natanson H. With kids stuck at home, ER doctors see more severe cases of child abuse. *Washington Post*. April 30, 2020. Available at: https://www.washingtonpost.com/education/2020/04/30/child-abuse-reports-coronavirus/. Accessed 12.25.20

[11] https://www.who.int/docs/default-source/coronaviruse/risk-comms-updates/update39-covid-and-schools.pdf?sfvrsn=320db233_2 Accessed 12.20.20

(psychological, physical, and sexual) and the potential for increased household dysfunction (domestic violence, substance abuse, and mental illness). In Virginia the Department of Social Services has seen a change in the number of calls to the Child Abuse and Neglect Hotline as well differences in reporter sources as the referrals from school personnel decreased by over 85%.[12] The lack of in-person instructional opportunities can significantly impact child development, producing neurobiological effects (e.g. via the toxicity of chronic stress), psychosocial effects (e.g., lack of socialization), and health risk behaviors (e.g., smoking, obesity, substance abuse, and promiscuity). There are also serious long-term consequences such as disease and disability (e.g., major depression and suicide) and social problems (e.g., homelessness, criminal behavior, and family violence). An Australian study found a 104% increase in children hospitalized with anorexia[13] likely due to increased isolation and lack of support systems, and there are examples of studies and reports on each of these effects in the literature.

At the time of this writing, guidance (as reviewed below) has changed dramatically to reflect that scientific evidence indicates that closing schools only causes harm to children without any added benefit to the community.

Examples of evolving guidance

When considering an update to VBCPS' school plan, it is useful to look at the evolution of guidance from major medical centers around the country who have "think tanks" in place. While we wish that there were high-quality longitudinal studies that we all strive to obtain as medical providers, such comprehensive long-range studies are simply not available when a situation is so novel. Therefore, we must rely on a compilation of available research, expert opinion and consensus, and review and evaluate the guidance --- internationally, nationally, and locally. Much of what we knew in July (based on international data and childcare that had stayed open) remains true. The biggest change is that institutions are encouraging that schools move away from "adherence" to external community metrics and look to how to keep schools open safely. The question has become not whether schools should open or close, but how they can safely stay open as we strive for "pandemic resilience."[14]

On November 5, 2020, researchers at the Children's Hospital of Philadelphia (CHOP)[15] stated "*In this revision of our original guidance from August 2020, we have updated our recommendations to reflect the challenges schools are facing following reopening in the fall. We have intentionally moved beyond the absolutism of case incidence and test positivity thresholds that—although were helpful for knowing when/how to start school in late summer (at a time when school outbreaks were insufficient to guide decision-making)—are no longer the most pressing questions for school leaders*."

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[12] Email Communication via Joanna Pitts BSN, RN, NCSN, CNOR; School Health Nurse Consultant; Virginia Department of Health; Division of Child and Family Health, 12.30.20.

[13] Haripersad et al, *Archives of Disease in Childhood,* 7/24/2020 Outbreak of anorexia nervosa admissions during the Covid-19 Pandemic

[14] https://globalepidemics.org/2020/12/18/schools-and-the-path-to-zero-strategies-for-pandemic-resilience-in-the-face-of-high-community-spread/

[15] https://policylab.chop.edu/sites/default/files/pdf/publications/PolicyLab-Executive-Summary-Evidence-Guidance-In-Person-Schooling-COVID-19-Nov-2020.pdf Accessed 12.20.20

The CHOP article provides a series of questions that may be used to guide decision-making when switching from in-person to virtual learning including:

1. Did your school have difficulty implementing and maintaining all aspects of its school safety plan?
2. How effective has your collaboration with local public health authorities been when there has been a student or teacher who is found to be COVID-positive?
3. How quickly is disease transmission and test positivity accelerating in your region?
4. Has there been evidence of in-classroom transmission within your school?
5. Has there been evidence of increasing linked transmission in your school or other schools in your region despite high levels of compliance with safety measures?
6. Are there populations to consider for prioritized maintenance of in-school instruction (e.g., children with learning differences or special needs)?

On December 18, 2020, Harvard released an update of their guidance, also recognizing the need to get away from absolutism: "In July, we published guidance for school leaders making decisions about school re-openings that offered a tiered structure for thinking about risk at different levels of community spread. We recommended that schools be closed once the average daily case rate rose above 25 cases/100,000 people, at the county level. Since July, our scientific understanding of COVID has increased significantly, as has our understanding of degrees of risk in schools, and **we can now recommend that schools be open even at the very high levels of spread we are now seeing, provided that they strictly implement strategies of infection control.** Evidence supports the view that student, staff, and educator risk can all be brought to acceptably minimal levels with robust infection control practices when implemented in a collaborative and transparent way among all stakeholders, including educators and other school personnel, administrators and district leaders, families, and students."[16]

A statement released by The European Centre for Disease Prevention and Control (12/23/20) states "There is a general consensus that the decision to close schools to control the COVID-19 pandemic should be used as a last resort. The negative physical, mental health and educational impact of proactive school closures on children, as well as the economic impact on society more broadly, would likely outweigh the benefits." [17]

Transmissibility and school burden

Why did guidance evolve? It is because there is increasing evidence that epi-school transmission (transmission in the school) is not occurring in the way that was first feared.

Nationally, and locally, data supports that K-12 schools represent only a small fraction of COVID-19 outbreaks, which are defined as two or more cases connected to a single place[18]. Data

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[16] https://globalepidemics.org/2020/12/18/schools-and-the-path-to-zero-strategies-for-pandemic-resilience-in-the-face-of-high-community-spread/ Accessed 12.22.20.

[17] European Centre for Disease Prevention and Control. COVID-19 in children and the role of school settings in transmission - first update. Stockholm; 2020. Accessed 12.25.20.

[18] https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/contact-tracing-plan/outbreaks.html

collected from almost 200,000 children in 47 states during September revealed only 1.3 infections per 1,000 students and 2.2 infections per 1,000 staff members.Even in high-risk areas of the country, the student rates were well under half a percent. School-based data from Texas collected over a week period of time in September showed 1,490 cases among students from a population of 1,080,317 students, or a rate of about 0.14 percent. The staff rate was even lower at 0.10 percent. Dr. Emily Oster, an economist who led the data collection, stated "*These numbers are not zero, which for some people means the numbers are not good enough. But zero was never a realistic expectation. We know that children can get COVID-19, even if they do tend to have less serious cases. Even if there were no spread in schools, we'd see some cases, because students and teachers can contract the disease off campus. But the numbers are small—smaller than what many had forecasted*."[19] Dr. Redfield of the CDC has referred to Oster's data, as it is the most complete database to date. This data is not perfectly collected, but combined with evidence elsewhere[2021], along with experiences in states across the country who have remained open during low AND high transmission periods, we have an emerging picture that children are not driving transmission in schools or in the community.

A private 1-12 school in Virginia of over 1000 students which fully opened in September and remained open until 12/18/20, has provided compelling data supporting mitigation strategies as a means to minimize spread within schools. This school has conducted over 10,000 Covid-19 tests by testing all students and staff every two weeks. Testing has revealed 21 total cases, 19 positive student tests (0.19% test positivity rate) and 2 positive staff tests (0.02% test positivity rate). Additionally, there were 4 self-reported cases (2 students and 2 staff). Of the identified positive cases, none have been definitively traced back to in-school transmission and no outbreaks have occurred despite levels of case incidence and test positivity rates to "highest" levels equal to what was seen in Virginia Beach during this time frame. The lack of increase in cases within this school despite the increasing cases in the community indicates that mitigation strategies are able to protect students and staff.[22]

The Duke School of Medicine and the Duke Clinical Research Institute developed the ABC Science Collaborative in response to COVID-19 and its impact on schooling. Today, Duke and the University of North Carolina School of Medicine are working together to lead the program, which receives its funding from the National Institutes of Health.[23] In their "FAQ" section they list that it is clusters/transmissions that can trigger discussions about schools opening and closing, not a community metric, and say " based on early data, the number of cases of secondary transmission inside traditional public North Carolina schools is less than one per 1,000 students. Furthermore, on average, it appears that each child infected with COVID-19 transmits to 0.1 other students and that there is even less child-to-adult transmission."

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[19] https://www.theatlantic.com/ideas/archive/2020/10/schools-arent-superspreaders/616669/ Accessed 12.20.20

[20] https://doi.org/10.1101/2020.10.10.20210328 Accessed 12.23.20.

[21] https://www.rivm.nl/en/novel-coronavirus-covid-19/children-and-covid-19 Accessed 12.27.20

[22] Confidential communications; data to be published in coming months. 12.27.20.

[23] https://abcsciencecollaborative.org/about/ Accessed 1.1.21.

Around the world, studies[24] have shown that infected adults pose a greater infectious risk to children than children pose to adults. Children play only a minor role in the transmission of COVID-19 as a result of demonstrating consistently lower susceptibility to acquiring the virus ("poor catchers") and having a lower infectivity ("slight spreaders"). UNICEF, in a report published in mid-November, Averting a Lost COVID Generation,[25] acknowledges that while children can transmit the virus to each other and to older age groups, "*there is strong evidence that, with basic safety measures in place, the net benefits of keeping schools open outweigh the costs of closing them. Schools are not a main driver of community transmission, and children are more likely to get the virus outside of school settings*."

Expert opinion. Even Dr. Anthony Fauci has openly recognized that school spread is not what was feared back in March 2020. In an interview on ABC News on November 29, 2020, Dr. Anthony Fauci, the Director for the National Institute of Allergy and Infectious Disease, said "*Obviously, you don't have one size fits all. But as I said in the past and as you accurately quoted me, the default position should be to try as best as possible within reason to keep the children in school, or to get them back to school…. So, my feeling would be the same thing. If you look at the data, the spread among children and from children is not really very big at all, not like one would have suspected*."[26]

Nina Schwalbe, a principal fellow at the United Nations University International Institute of Global Health, and an adjunct assistant professor at Columbia's Mailman School of Public Health, pointed out that New York City's own data on its partial reopening show similar results: Schools reflect the prevalence of the virus in the community, but do not drive community spread. She states "according to New York City government data provided to me (I served as a resource for the school district in an informal, unpaid capacity), the city performed more than 74,000 tests in 1,224 schools during a three-week period in October, and just 45 students and 63 staff members tested positive. The percent of students and staff estimated to have had COVID-19 during this period is nearly 40 percent lower than the estimate for the general New York City population for the same period. In other words, both teachers and kids are at less risk of getting COVID-19 in school than they are elsewhere in their day-to-day lives."[27]

We acknowledge that transmissibility data is imperfect; this is why it is prudent to have a virtual option for those families who desire it, and to protect staff with proper PPE and distancing. Though one may argue that we cannot conclude as strongly as we would like that there is low/no spread among children in school even in the face of high community disease burden, it is important to note that there has not been evidence that staff are at higher risk in school than they are in the community. In fact, a study of 120,075 workers from various sectors showed that

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[24] European Centre for Disease Prevention and Control. COVID-19 in children and the role of school settings in transmission - first update. Stockholm; 2020

[25] https://www.unicef.org/press-releases/unicef-calls-averting-lost-generation-covid-19-threatens-cause-irreversible-harm Accessed 12.20.20

[26] https://abcnews.go.com/Politics/week-transcript-11-29-20-dr-anthony-fauci/story?id=74446435 Accessed 12.20.20

[27] https://www.theatlantic.com/ideas/archive/2020/11/ease-restrictions-schools-dont-close-them/617146/?utm_medium=social&utm_term=2020-11-19T16%3A11%3A56&utm_content=edit-promo&utm_source=twitter&utm_campaign=the-atlantic Accessed 12.25.20

education workers had no statistically significant increased risk of contracting severe COVID-19 disease than did stay-at-home workers.[28] Furthermore, the effectiveness of recommended mitigation measures has been demonstrated among health care workers. For instance, in a survey of 2,195 dentists performed in June 2020, COVID rates were so low (0.9%) that it was concluded that even in a high-risk occupation like dentistry, the risks associated with nonclinical activities and community spread might pose the most substantial risks for the exposure of dentists to COVID-19, not dental practice itself.[29]

Progression in other states

States had varying reactions to school closures—some closed schools for a threshold of 3% test positivity, and others opened fully without any mitigation factors. Considering the states that had stricter metrics for opening, there has been a major shift in their strategies for school reopening as they moved into late fall/winter 2020, based on the advice of their Health Departments. In November, the Regional Coalition of Northeast Governors – which includes the governors of Pennsylvania, New York, New Jersey, Connecticut, Delaware, Rhode Island, Massachusetts – issued the following statement: "*Medical research as well as the data from Northeastern states, from across the country, and from around the world make clear that in-person learning is safe when the appropriate protections are in place, even in communities with high transmission rates. In-person learning is the best possible scenario for children, especially those with special needs and from low-income families. There is also growing evidence that the more time children spend outside of school increases the risk of mental health harm and affects their ability to truly learn*."[30] These governors and their health departments have recognized not only the damage of long-term closures, but the ability for schools to stay open safely with mitigation in place.

Evidence-driven decision making

We support that all school systems including VBCPS continue to look to data, local, and national guidelines to inform decisions, as delineated (in part) above. Evidence supports that districts progress away from the now-dated approach of using "trigger point metrics" to make determinations about in-person instruction and, instead, employ a model of "stay open safely."

Data and guidelines support VBCPS in the following approach:

1/At higher levels of community spread, higher mitigation strategies should be employed, with attention to school burden, contact tracing, audits or evaluation to ensure adherence to mitigation, (eg masking, cohorting) and focus on staff safety and support.

2/Schools should stay open safely unless mandated to close by the Governor, who is privy to hospital data and statewide VDH recommendations. A virtual option should be available at least until the end of the 2020-21 school year for families who request this.

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[28] https://oem.bmj.com/content/oemed/early/2020/12/01/oemed-2020-106731.full.pdf

[29] https://pubmed.ncbi.nlm.nih.gov/33071007/

[30] https://www.media.pa.gov/pages/Education-details.aspx?newsid=989 Accessed 12.20.20

3/As much as possible should be done to support safe in-person instruction. Cases are expected to appear in schools, and this may require closure of individual classrooms or quarantine of close contacts, as directed by the local health department. These decisions are health-based and should be made by the health department and administration working together, as has been historically done for all other communicable diseases and health threats or concerns. If there is evidence of increasing school burden (high absenteeism, transmission rates in a school due to poor mitigation, inability to staff due to quarantine) then administration may choose to close a school temporarily.

In summary, there is now more substantial data about the risks regarding the transmission of COVID-19 from in-person schooling than we did at the onset of this pandemic. We now have clinical data supporting that young children are less susceptible and infectious than adults in regard to COVID, making it behave very differently than influenza, which was what initial guidance was loosely based upon. Data indicates that schools do not drive the spread of COVID-19 especially when other aspects of the community are open, such as in Virginia currently. In schools internationally, across the country, and locally, evidence indicates that in-school transmission of COVID-19 is low when schools implement strong mitigation strategies. Additionally, there is no evidence to suggest that students or staff are at any increased risk in school than they are in any other part of society (except, perhaps, total self isolation). **The question, therefore, should be not whether or not schools should be open, but how to stay open safely.**

Given the past success in VBCPS with mitigation strategies, collaboration with the VDH on contact tracing, and the monitoring for in-class transmission, data and guidance supports the reopening of VBCPS schools for in-person instruction for the remainder of the 2020-2021 school year.[31].

As recommended by the Virginia Department of Health, it is prudent to have a 14 day wait period before beginning in-person instruction for the majority of students after the holiday break, since many families will have traveled or participated in high-risk activities. Many private schools and some public districts are also choosing delayed reintroduction of in-person students to avoid impact on their general operations. Schools should prioritize the return of all students after the wait period, as supported by the guidance in this document (in VBCPS, secondary 7-12 are already 'phased' via a hybrid program). Of course, children who are deemed high-risk or who reside with high-risk individuals may need to continue with virtual instruction, and staff should be given the proper protective equipment and options for alternative work environments as needed. While all of this may be challenging, it has already proven to not be insurmountable. While acknowledging the gravity of the pandemic, we must not allow children to continue to needlessly suffer lasting harm without any benefit to their families or the community.

[31] *This document is provided for educational purposes, to relay international, national, and local data and guidance; we recognize that final decision making rests with VBCPS and administration in conjunction with the health department.*

Transmissibility[1]

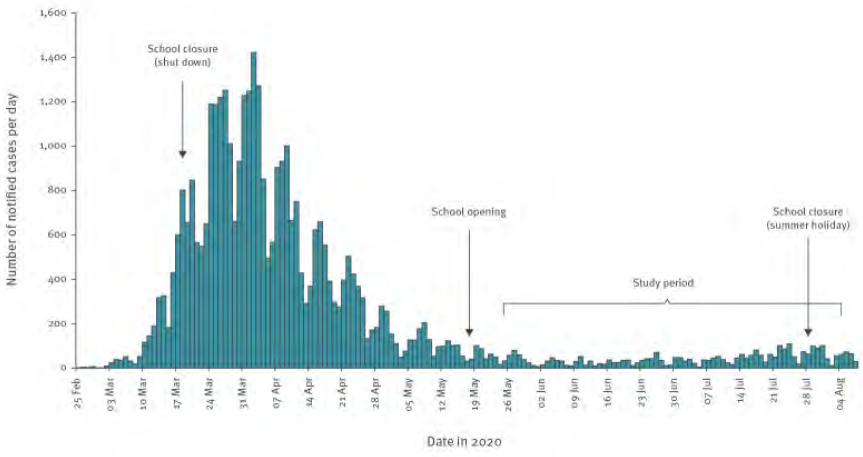
-Within Schools

- Buonsenso et al. October 11, 2020. **SARS-CoV-2 infections in Italian schools: preliminary findings after one month of school opening during the second wave of the pandemic** https://doi.org/10.1101/2020.10.10.20210328
    - 1350 cases of SARS-CoV-2 infections in Italian schools (involving 1059 students, 145 teachers and 146 other school members).
    - 1.8% of schools have had at least one case. In 90% of schools reporting at least one case, only a single case was reported.
    - Only in one high school a cluster of more than 10 cases have been described (P 0.015).
    - **This supports low transmission of SARS-CoV-2 within schools, at least among younger students.**

- Danis et al., April 11, 2020. *Clinical Infectious Diseases*, (study period February 2020), **Cluster of Coronavirus Disease 2019 (COVID-19) in the French Alps, February 2020**. https://doi.org/10.1093/cid/ciaa424
    - One infected student (9 years old) in the French Alps attended three different schools while having symptoms. None of the 112 contacts became infected.
    - **Children are at low risk of spreading the virus.**

- Ehrhardt, J. et al. *Euro Surveill.* Sept. 10, 2020; 25(36): 2001587. **Transmission of SARS-CoV-2 in children aged 0 to 19 years in childcare facilities and schools after their reopening in May 2020, Baden-Württemberg, Germany**. doi: 10.2807/1560-7917.ES.2020.25.36.2001587
    - Data was collected from SARS-CoV-2 infected 0–19 year olds, who attended schools and childcare facilities to assess their role in SARS-CoV-2 transmission.
    - Data was collected after these establishments' reopening in May 2020 in Baden-Württemberg, Germany.
    - Mitigation measures did not include consistent face mask use or physical distancing in childcare facilities and primary schools. There was "some" face mask use in secondary schools.
    - **Child-to-child transmission in schools and childcare facilities is uncommon and not the primary cause of SARS-CoV-2 infection in children.**

[1] These studies were done during varying mitigation --eg different degrees of masking in countries and schools. Masks cut down on transmission (so conclusively that those studies are not included here) so it is noteworthy that even with inconsistent mask use, in-school transmission has been found to be very low.



- Fontanet et al. June 29, 2020. **SARS-CoV-2 infection in primary schools in northern France: A retrospective cohort study in an area of high transmission.** https://doi.org/10.1101/2020.06.25.20140178
    - A seroprevalence study (using antibody tests which detect the presence of past infection) of primary school pupils, teachers and family (n=1340) in an area that had undetected transmission February -March in northern France.
    - Prior to school closure, 3 students with COVID-19 attended three separate schools; there were no secondary cases identified among teachers, students or staff.
    - The teachers were only marginally affected, with just 3/42 (7.1%) teachers infected in total, a similar figure to the number of parents of non-infected children in the study who were infected by the virus (6.9%). For non-teaching staff, the proportion of infection was 1/28 (3.6%).
    - This study did not identify any secondary transmission of the virus to other children at the school, or from children to teachers.
    - **This study supports child-to-child and child-to-adult transmission is uncommon.**

- Heavy et al. *Eurosurveillance*, May 28, 2020, (study period March 2020), **No Evidence of Secondary Transmission of COVID-19 from Children Attending School in Ireland.** https://doi.org/10.2807/1560-7917.ES.2020.25.21.2000903
    - In Ireland, 6 cases (3 students and 3 staff) were identified to have COVID-19.
    - The one case of transmission that was observed was between two staff members and occurred outside the school environment.
    - There were no confirmed cases of transmission amongst 924 child contacts and 101 adult contacts at their schools.
    - **This study supports child-to-child and child-to-adult transmission is uncommon.**

- Ismail et al., December 9, 2020, *Lancet Infectious Diseases*, **SARS-CoV-2 infection and transmission in educational settings: a prospective, cross-sectional analysis**

of infection clusters and outbreaks in England https://doi.org/10.1016/ S1473-3099(20)30927-0

- Prospective, cross-sectional analysis of SARS-CoV-2 infections and outbreaks reported among staff and students from June-July 2020 in England.
- Mitigation generally included: smaller classes separated into distinct social bubbles that do not mix with other bubbles in the setting, physical distancing, and frequent handwashing. Mask use was not consistent.
- The number of events (cases, outbreaks) was very low; with an estimated 1.1 events (95% CI 0.75-1.4) per 1000 settings per month in early year settings, 6.5 events (95% CI 5.3-7.9) per 1000 settings per month in primary schools and 4.5 (95% CI 2.7-7.1) per 1000 settings in secondary settings.
- **This supports low transmission within all school settings.**

	Number of settings open per day			Number of confirmed events			Confirmed event rate per 1000 settings per month (95% CI)			
	Minimum	Maximum	Median (IQR)	Single case	Coprimary cases	Outbreak	Single case*	Coprimary cases	Outbreak	Total
Early years	28 000	43 000	38 000 (35 500–41 500)	21	3	16	0·63 (0·40–0·94)	0·079 (0·016–0·23)	0·42 (0·24–0·68)	1·1 (0·75–1·4)
Primary	6900	18 100	15 600 (13 450–17 300)	69	6	27	4·8 (3·8–6·0)	0·38 (0·14–0·84)	1·7 (1·1–2·5)	6·5 (5·3–7·9)
Secondary	2900	4400	4000 (3700–4200)	11	0	7	2·7 (1·4–4·9)	0	1·8 (0·70–3·6)	4·5 (2·7–7·1)

Events rates are given to two significant figures and are reported for all early years, primary, and secondary school settings, including those for students with special educational needs or disabilities, but not for settings for mixed age groups spanning multiple primary and secondary years. SARS-CoV-2=severe acute respiratory syndrome coronavirus 2. *Includes coprimary events.

Table 1: **SARS-CoV-2 infection rates for single cases, coprimary cases, and outbreak events in educational settings in England, June 1–July 17, 2020**

- Larosa et al., *Eurosurveillance,* December 10, 2020, **Secondary transmission of COVID-19 in preschool and school settings in northern Italy after their reopening in September 2020: a population-based study.** https://doi.org/10.2807/1560-7917.ES.2020.25.49.2001911
  - Schools in Reggio Emilia province opened as community rates began to rise sharply. All in-school contacts were traced and tested.
  - 31,000 students began attending school in September
  - Mitigation included: masking, *(except when students are seated at their desk and are not speaking AND except in preschools or elementary schools where wearing the mask is never mandatory*), spacing, minimization of crowding in halls and doorways, cohorting and cancellation of extracurricular activities. Hybrid models were used if space did not permit full classes at 1m.
  - There were 48 index cases with 1200 contacts (1198 tested) and 38 secondary cases (SAR 3.8%).
  - The SAR in elementary schools was 1/266 after 1 index case (0.38%)
  - The SAR in middle and high schools was 37/572 after 25 index cases (6.46%).
  - Total among students: 43 index cases, 38/994 secondary cases (3.8%)
  - Total among staff: 5 index cases, 0/199 secondary cases (0%)

- **This supports low transmission within the school setting for students and staff.**

- Macartney et al. *The Lancet Child and Adolescent Health*, August 3, 2020. **Transmission of SARS-CoV-2 in Australian Educational Settings: A Prospective Cohort Study** https://doi.org/10.1016/S2352-4642(20)30251-0.
  - This study reports contact tracing results for 1,448 contacts of 12 children and 15 adults who attended 15 schools and 10 ECEC sengs in New South Wales (NSW) while infectious.
  - Staff to staff transmission (4.4%) was higher than staff to child (1.5%), child to staff (1.0%) or child to child (0.3%).
  - Most infections in children were ultimately attributed to sources outside of school.
  - **This study demonstrates that transmission within the school setting, especially from children, is low.**
    **Children <12 are not required to wear a mask and children >12 are not required to wear one unless 1 m distance cannot be maintained: https://www.coronavirus.vic.gov.au/face-masks-study-and-school*

- Magnusson, K et al., November 3, 2020. **Occupational risk of COVID-19 in the 1st vs 2nd wave of infection** https://doi.org/10.1101/2020.10.29.20220426
  - Nurses, physicians, dentists, physiotherapists, bus/tram and taxi drivers had 1.5-3.5 times the odds of COVID-19 during the 1st wave of infection when compared to everyone in their working age.
  - **Teachers had no or only a moderately increased odds of COVID-19.** Occupation may be of limited relevance for the odds of severe COVID-19, here studied as hospitalization with the disease**.**
  - **This study suggests that teachers are not at a significantly increased risk of contracting COVID-19.**
    **To our knowledge, Norway does not consistently use masks in schools; mask use would cut down risks further given their known efficacy for stopping spread:* https://www.fhi.no/en/news/2020/bruk-av-munnbind-i-skole-og-barnehage/

- Public Health Agency of Sweden, 2020, **Covid-19 in Schoolchildren.** https://www.reuters.com/article/us-health-coronavirus-sweden-schools/swedens-health-agency-says-open-schools-did-not-spur-pandemic-spread-among-children-idUSKCN24G2IS
  - Comparison of COVID-19 incidence in children in Sweden (where primary schools and daycares remained open, as well as other aspects of society) vs. Finland (where all schools and daycares were closed, except children of essential workers in grades 1-3, and more widespread lockdowns were implemented).
  - From the period of February 24th- June 14th, 2020, there were 1,124 confirmed cases of COVID-19 among children in Sweden, around 0.05% of the total

number of children aged 1-19 years. Finland recorded 584 cases in the same period, also equivalent to around 0.05%.
    - Despite 5-fold higher incidence in the entire population in Sweden, the incidence of COVID-19 among children aged 0-19 did not differ between Sweden and Finland.
    - In Sweden the risk of COVID-19 among teachers (even when community rates were high) was not different compared to other professions.
    - **This data suggests that teachers are not at an increased risk of contracting COVID-19, even when community transmission is high.**

- Yung et al., *Clinical Infectious Diseases*, June 25, 2020, (study period February-March 2020, Singapore), **Novel Coronavirus 2019 Transmission Risk in Educational Setting** https://doi.org/10.1093/cid/ciaa794
    - Schools were open and terminal cleaning, reduced student mixing, staggered recess and cancellation of sports were implemented.
    - Nationwide surveillance identified 3 school-aged children because they were contacts of adults.
    - A 12 year old student in a secondary school had 8 symptomatic contacts- all tested negative for SARS-CoV-2.
    - A 5 year old student in preschool had 34 symptomatic contacts- all tested negative for SARS-CoV-2.
    - In one preschool: 16 adult staff tested positive (who subsequently infected 11 of their own household members, so were deemed infectious). 77 children tested (8 symptomatic, 69 asymptomatic)- all tested negative for SARS-CoV-2.
    - **This study suggests children play a minimal role in school transmission and that other viruses can play a more significant role in child symptoms.**

-Within the Household

- Isphording et al., *IZA Institute of Labor Economics*, October 2020. **School Reopening after Summer Breaks in Germany Did Not Increase SARS-CoV-2 Cases**. https://www.iza.org/publications/dp/13790/school-re-openings-after-summer-breaks-in-germany-did-not-increase-sars-cov-2-cases
    - This study examined the impact of back to school from staggered summer breaks on infection risk among children and adults in Germany, by comparing districts with different opening dates.
    - Utilized official daily counts of confirmed coronavirus infections by age groups across all 401 German counties.
    - Three weeks after the end of summer breaks, cases have decreased by 0.55 cases per 100,000 inhabitants or 27 percent of a standard deviation.
    - This study found lower rates at the population level and among children aged 0-14 after return to school (possibly due to lower out-of-school mixing and travel) and no significant changes in rates for ages 15+.

    - The study concludes that **"school re-openings in Germany under strict hygiene measures combined with quarantine and containment measures have not increased the number of newly confirmed SARS-CoV-2 infections.**"

- Maltezou et al., Journal of Medical Virology, August 7, 2020, **Transmission Dynamics of SARS-CoV-2 Within Families With Children in Greece: A Study of 23 Clusters.** doi: 10.1002/jmv.26394
    - Study of 23 family clusters of COVID in Greece from Feb 26 - May 3. Family clusters (2 cases within one family) containing at least one child in the family were included.
    - The 23 family clusters included 109 family members (66 adults and 43 children)
    - An adult was the first case 91% of the time and a child was the first case 9% of the time.
    - Transmission of infection occurred from an adult to a child in 19 clusters; in 12 clusters transmission occurred from an adult to another adult.
    - There was no evidence of child-to-adult or child-to-child transmission, although in 14 clusters there was close contact between infected children and non-infected adult household members.
    - **This study demonstrates that risk of transmission from child-to-adult and child-to-child is low.**

- Yoon et al., August 4, 2020, **Stepwise School Opening Online and Off-line and An Impact on the Epidemiology of COVID-19 in the Pediatric Population.** https://doi.org/10.1101/2020.08.03.20165589
    - Descriptive study seeking to correlate pediatric cases with the gradual reopening of schools (with significant mitigation efforts) in South Korea.
    - Although 45 children in 40 separate schools were diagnosed with COVID after school opening, only one secondary case occurred in a classroom.
    - There were no secondary cases among K students, other elementary students, or 13-18yo (there, middle and high school).
    - **Schools were able to successfully reopen without a notable increase in the total number of cases in children, nor in the percentage of total community cases that were in children.**

Susceptibility of children to COVID (chance of acquiring the infection)

- Posfay-Barbe et al., June 1, 2020, *Journal of the American Academy of Pediatrics*, (study period March 10-April 10, 2020), **COVID-19 in Children and the Dynamics of Infection in Families** https://doi.org/10.1542/peds.2020-1576
    - Among 40 household clusters involving pediatric patients (< 16) with COVID

in Switzerland, children were the suspected index case in only 8% of these clusters.
    - In 79% of cases the children were infected by an adult in the household.
    - **Children are at low risk of acquiring and spreading SARS-CoV-2.**

- RM Viner et al. September 25, 2020. ***Susceptibility to SARS-CoV-2 Infection Among Children and Adolescents Compared With Adults :A Systematic Review and Meta-analysis*** doi:10.1001/jamapediatrics.2020.4573
    - Children, especially <14, are less likely to acquire COVID by 44%.
    - In this systematic review and meta-analysis including 32 studies, children and adolescents younger than 20 years had 44% lower odds of secondary infection with SARS-CoV-2 compared with adults 20 years and older; this finding was most marked in those younger than 10 to 14 years.
    - **Children are at a lower risk compared to adults of acquiring and spreading SARS-CoV-2.**

- Zhu et al. Dec. 06, 2020. *Clinical Infectious Diseases*, **A meta-analysis on the role of children in SARS-CoV-2 in household transmission clusters.** [2] https://doi.org/10.1093/cid/ciaa1825
    - A meta-analysis of the published literature on household SARS-CoV-2 transmission clusters (n=213 from 12 countries) that investigated prevalence of pediatric index cases in household transmission clusters of SARS-CoV-2 as well as the secondary attack rate (SAR) of different age groups.
    - Only 8/213 (3.8%) transmission clusters were identified as having a pediatric index case.
    - **Pediatric cases only caused 16/398 (4%) of all secondary cases.**
    - The secondary attack rate (SAR) in pediatric household contacts was lower than in adult household contacts (RR, 0.62; 95% CI, 0.42-0.91)
    - **Meta-analysis suggests that children (<18 years old) are less susceptible to SARS-CoV-2 infection and unlikely to spread the infection compared to adults.**

    -

- Daner et al., June 5, 2020, **The Role of Children in the Spread of COVID-19: Using Household Data from Bnei Brak, Israel, to Estimate the Relative Susceptibility and Infectivity of Children** doi: https://doi.org/10.1101/2020.06.03.20121145

[2] Meta Analysis = Examination of data from a number of independent studies of the same subject, in order to determine overall trends= represents findings from multiple studies

- Epidemiologic data from a household study of 637 households - all the household members were tested, and at least one member had tested positive for COVID-19.
- Key findings: children are less likely to become infected compared to adults (25% of children infected over all households vs. 44% of adults infected over all households, excluding index cases)
- The chance of becoming infected increases with age.
- **Children <20 years are approximately ½ as susceptible to acquiring COVID compared to adults.**

Detrimental effects on the health of children from school closures

--Mental health (depression, anxiety, suicide, socialization)

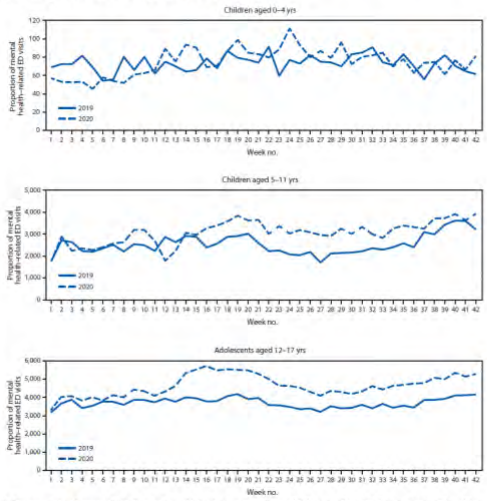
- Jones, Carolyn. May 13, 2020, *EdSource.Org*, **Student Anxiety, Depression Increasing During School Closures, Survey Finds**
  - A summary of survey findings from school psychologists.
  - More students are reporting mental health needs due to school closure. Many students with mental health needs are going unnoticed, whose symptoms would have been recognized if they were in school.
  - Many adolescents cannot have confidential discussions via virtual visits due to other people in the home or fear of others listening.
  - **School closures are associated with negative effects on mental health in students.**

- Lee, Joyce, April 14, 2020. *The Lancet*, **Mental Health Effects of School Closures during COVID-19**. doi: https://doi.org/10.1016/S2352-4642(20)30109-7
  - This review highlights an increase in depression and anxiety among teens: 83% of adolescents in a UK study said the pandemic made their conditions worse. 26% said they were unable to access support.
  - This review also discusses how suspension of ancillary services, such as speech therapy and social skills training, have negatively impacted children with developmental disorders.
  - **School closures are associated with an increase in anxiety and depression among teens and a lack of access to support services.**

- Leeb RT, et al. November 13, 2020. *MMWR Morb Mortal Wkly Rep* 2020;69:1675–1680. **Mental Health–Related Emergency Department Visits Among Children Aged <18 Years During the COVID-19 Pandemic — United States, January 1–October 17, 2020**. http://dx.doi.org/10.15585/mmwr.mm6945a3

- Beginning in April 2020, the proportion of children's mental health–related ED visits among all pediatric ED visits increased and remained elevated through October.
- Compared with 2019, the proportion of mental health–related visits for children aged 5–11 and 12–17 years increased approximately 24% and 31%, respectively.
- **During the time period when the majority of schools in the United States were closed (April- October 2020), there was a significant increase in mental health-related ED visits.**

FIGURE 2. Weekly proportion of mental health–related emergency department (ED) visits* per total ED visits among children aged <18 years, by age group — National Syndromic Surveillance Program, United States, January–October 2019 and 2020



* Proportion of mental health–related ED visits = number of ED visits for children's mental health/total number of pediatric ED visits x 100,000.

- Loades ME et al. November 2020. *J Am Acad Child Adolesc Psychiatry,* **Rapid Systematic Review: The Impact of Social Isolation and Loneliness on the Mental Health of Children and Adolescents in the Context of COVID-19**. https://doi.org/10.1016/j.jaac.2020.05.009
  - Children and adolescents are probably more likely to experience high rates of depression/anxiety during and after enforced isolation.
  - This may increase as enforced isolation continues. 63 studies reported on the impact of social isolation and loneliness on the mental health of previously healthy children and adolescents (n = 51,576; mean age 15.3 years). Social isolation and loneliness increased the risk of depression, and possibly anxiety at the time at which loneliness was measured and between 0.25 and 9 years later.
  - Duration of loneliness was more strongly correlated with mental health symptoms than intensity of loneliness.
  - **Isolation during school closures is associated with higher rates of depression and anxiety in children and adolescents.**

- Perlis *et al.*, Nov 2020, ***The COVID-19 Consortium for Understanding the Public's Policy . Preferences Across States,*** **THE STATE OF THE NATION: A 50-STATE COVID-19 SURVEY REPORT #23: DEPRESSION AMONG YOUNG ADULTS**
    - Part of a 50-state, 8-wave survey conducted across 50 states from April-Oct 2020 by a consortium of researchers from Northeastern, Harvard, Northwestern, and Rutgers.
    - Four survey waves of Americans aged 18-24 in May, June, Aug, Oct 2020 (over 9000 total).
    - Prevalence of major depressive symptoms was consistently high over all four waves.
    - Over 47% reported at least moderate symptoms of depression in October.
    - Generalized anxiety symptoms increased since June and were over 40% in October.
    - Sleep disruption was the most common symptom, but decreased mildly from May (75.4%) to October (72.2%).
    - 32% of individuals reported thoughts of being better off dead or of self-harm in May, a 10-fold increase from that reported in 2013-4; this increased to 37% in October 2020.
    - Results were not concentrated among a particular subgroup or region, though those with economic or property loss appear to be particularly at risk.
    - **During the time period when the majority of schools in the United States were closed (April- October 2020), there was a significant increase in prevalence of symptoms of depression, generalized anxiety, sleep disruption and thoughts of self-harm.**

- Woolf SH, Chapman DA, Lee JH. December 17, 2020, *JAMA*, **COVID-19 as the Leading Cause of Death in the United States**. doi:10.1001/jama.2020.24865
    - For children ages 5-14, the chance of dying from COVID-19 was found to be 1 in 1,000,000 or 0.0001%.
    - For children ages 5-14, the chance of dying by suicide is over 9 times greater compared to the chance of dying from COVID-19.
    - For individuals ages 14-24 years, the chance of dying from COVID-19 is 1 in 100,000. In this age group the chance of dying by an accidental drug overdose is almost 7 times higher and the chance of dying by suicide is 10 times higher.
    - **The chance of acquiring and dying from COVID in children and adolescents is exceedingly low compared to the risk of death from mental health related issues like suicide.**

Table. Age-Specific Mortality Rates (per Million) for COVID-19 (March-October 2020) and Other Leading Causes of Death (March-October 2018)[a]

	Causes of death[b]										
					Unintentional injuries		Intentional injuries		Leading causes of infant deaths		
Age, y	COVID-19	Heart disease	Malignant neoplasms	Chronic lower respiratory disease	Transport accidents	Accidental drug overdoses	Suicide	Homicide	Birth defects	Short gestation	SUID
<1	7.4	51.6	8.6	2.9	15.5	1.6	0.0	46.7	773.7	682.2	603.4
1-4	1.0	4.8	13.1	2.0	17.5	0.3	0.0	15.6	15.9		
5-14	1.0	2.7	13.5	2.0	14.6	0.4	9.4	4.7	6.4		
15-24	9.9	13.8	20.9	2.8	108.3	66.1	97.0	72.1	5.5		
25-34	38.6	52.1	53.7	4.2	113.2	220.7	120.9	78.8	6.4		
35-44	109.9	169.1	172.0	10.1	93.8	234.0	128.1	54.7	7.2		
45-54	294.8	509.7	597.5	56.1	100.7	208.2	140.3	33.9	11.2		
55-64	683.3	1239.8	1802.4	285.8	105.0	161.2	139.8	23.7	17.8		
65-74	1574.6	2516.9	3702.0	809.9	99.2	50.8	114.1	15.7	13.4		
75-84	3832.4	6478.5	6845.7	2117.3	129.9	16.0	129.6	13.2	14.9		
≥85	10 699.7	24 530.2	10 442.4	4278.4	139.1	14.7	133.4	13.3	31.2		
Total	698.8	1287.7	1219.8	307.5	89.2	122.3	102.3	39.0	19.4		

Abbreviations: COVID-19, coronavirus disease 2019; SUID, sudden unexpected infant death (including sudden infant death syndrome).

[a] Table presents 8-month aggregate COVID-19 mortality rates during the period of March through October 2020[5] and mortality rates for other causes during the period of March through October 2018,[4] the most recent year for which detailed cause-of-death data are available.

[b] Causes of death are defined by *International Statistical Classification of Diseases and Related Health Problems* codes for heart disease (I00-I09, I11, I13, I20-I51), malignant neoplasms (C00-C9), chronic lower respiratory disease (J40-J47), transport accidents (injuries) (V01-V99, Y85), accidental drug overdoses (X40-X44), suicide (*U03, X60-X84, Y87.0), homicide (*U01-*U02, X85-Y09, Y87.1), birth defects (Q00-Q99), short gestation (P05-P08), and sudden unexpected infant death (R95, R99, W75).

-Child Abuse

- Kamenetz, Anya, April 28, 2020, **Child Sexual Abuse Reports Are On The Rise Amid Lockdown Orders.** *Information derived from RAINN, the Rape, Abuse & Incest National Network.*
    - The National Sexual Assault Hotline saw a 22% increase in monthly calls from minors under the age of 18 during the month of March 2020.
    - 67% identified their abuser as a family member and 79% of those said they were living with that family member.
    - **During the month of March (when most schools around the United States closed), there was a significant increase in calls to the sexual Assault Hotline. Schools are the first place that many children will disclose. Schools are the first places where behavioral change due to abuse often is detected.**

- Lawson, M., Piel, M., Simon, M. Child Abuse Negl. 2020 Dec;110(Pt 2):104709.**Child Maltreatment during the COVID-19 Pandemic: Consequences of Parental Job Loss on Psychological and Physical Abuse To Towards Children.** Doi: 10.1016/J.CHIABU.2020.104709.
    - A community sample of 342 parents (62% mothers) of 4-10 year olds living in the United States completed online questionnaires.

    - Parent job loss during the pandemic was positively associated with psychological maltreatment (r =.19, p<.01) and physical abuse (r=.19, p<.001) towards children in the past week
    - Younger children were more likely to be physically abused and psychologically maltreated during the past week at time of sampling.
    - Of parents that lost their job, 37.21% physically abused their children.
    - **Pandemic related job-loss is associated with an increase in physical and psychological abuse of children within the home. Schools are the first place that many children will disclose. Schools are the first places where behavioral change due to abuse often is detected.**

- Patrick et al., *Journal of American Academy of Pediatrics*, July 29, 2020, **Well-being of Parents and Children During the COVID-19 Pandemic: A National Survey**
    - Since March 2020, 27% of parents reported worsening mental health for themselves, and 14% reported worsening behavioral health for their children.
    - Worsening mental health for parents occurred alongside worsening behavioral health for children in nearly 1 in 10 families, among whom 48% reported loss of regular childcare, 16% reported change in insurance status, and 11% reported worsening food security.
    - **Parents and children are experiencing worsening mental health and behavioral health, respectively.**

-Obesity and decreased physical activity

- Franckle R, Adler R, Davison K. June 12, 2014. *Prev Chronic Dis;11:E101*. **Accelerated weight gain among children during summer versus school year and related racial/ethnic disparities: a systematic review.** doi: 10.5888/pcd11.130355
    - Systematic review of studies focusing on variations in weight gain among students during the summer compared to the school year, with a focus on racial/ethnic disparities and students who are at risk of overweight.
    - 86% of the studies reported accelerated summer weight gain for a portion of the study population
    - Weight gain was most significant in black, Hispanic, and overweight children and adolescents.
    - **Children are at risk to gain weight when they are not attending school.**

- Rundle et al., *Obesity*, March 30, 2020, **COVID-19–Related School Closings and Risk of Weight Gain Among Children** https://doi.org/10.1002/oby.22813
    - Rising rates of obesity are a major concern as many children are not getting the physical activity they need. Many are also eating out of boredom; sleep schedules are not consistent.
    - Children's screen time has increased. Many more are experiencing food insecurity and missed meals are associated with unhealthy weight gain.
    - **School closings increase the chance of unhealthy weight gain in children.**

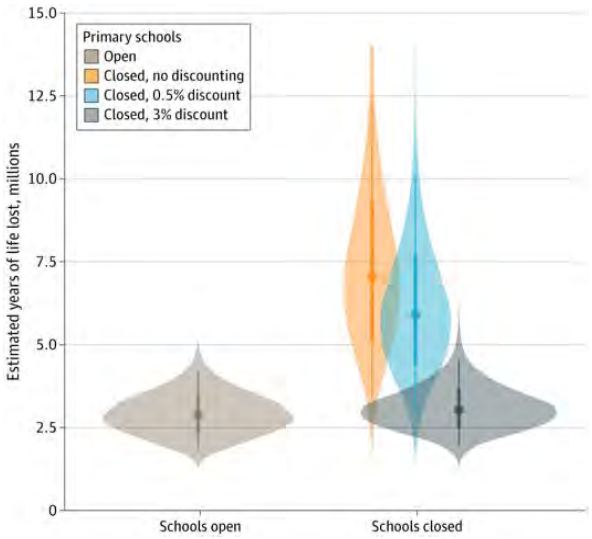
- Ruopeng, An, July 2020, *Journal of Sport and Health Science*, 9(4):302-312. **Projecting the Impact of the Coronavirus Disease-2019 Pandemic on Childhood Obesity in the United States: A Microsimulation Model** doi: 10.1016/j.jshs.2020.05.006
    - Using a microsimulation modeling approach, this study projected the change in U.S. kindergarteners' BMI and childhood obesity under the COVID-19-induced uncertaines.
    - Simulation results indicate that compared to the control scenario without COVID-19, **childhood obesity prevalence under COVID-19 is expected to rise, and the magnitude of the increase is proportional to the length and severity of the pandemic, in particular the longer schools are closed.**

- von Hippel PT, Workman J. *Nov. 2016*. From Kindergarten Through Second Grade, U.S. Obesity (11):2296-2300. **Children's Obesity Prevalence Grows Only During Summer Vacations**. doi: 10.1002/oby.21613.
    - A nationally representative complex random sample of 18,170 U.S. kindergarten children were followed from the fall of kindergarten in 2010 through the spring of second grade in 2013.
    - All of the increase in prevalence of obesity and overweight occurred when in-person school was not in session; no increase occurred during any of the three school years.
    - **Children are at risk of becoming overweight and obese when they are not in school.**

Lost learning/permanent harm

- Christakis et al. Nov. 12, 2020. **Estimation of US Children's Educational Attainment and Years of Life Lost Associated With Primary School Closures During the Coronavirus Disease 2019 Pandemic.** doi:10.1001/jamanetworkopen.2020.28786
    - Decision analytic modeling study using publicly-available data and literature on the effect of an additional year of education on life expectancy to estimate the association between school closure and educational attainment, and educational attainment and life expectancy.
    - Based on school closure during the 2020 pandemic among children aged 5-11, mean loss of final educational attainment was estimated to be 0.15 years for boys and 0.12 years for girls, which was associated with a projected mean of 0.31 years of life lost for boys and 0.21 years of life lost for girls .
    - An estimated 5.53 million (95% CI, 1.88-10.80) years life lost (YLL) may be associated with school closures while 1.47 million additional years of life may have been lost as a result of schools remaining open due to increased pandemic spread.
    - Authors suggest the consideration of school opening with safeguards to reduce transmission as an important consideration for long-term outcomes.

- Comparing the full distributions of estimated YLL under both “schools open” and “schools closed” conditions, **the analysis observed a 98.1% probability that school opening would have been associated with a lower total years of life lost than school closure.**

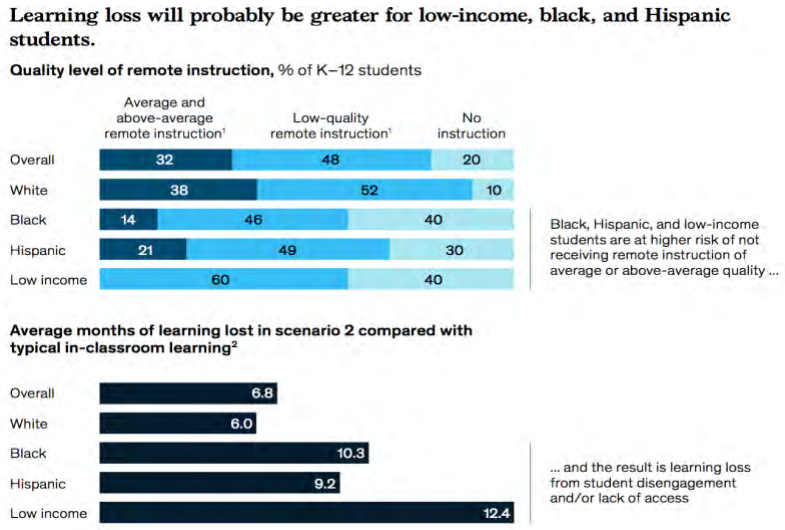


- NWEA(Northwest Evaluation Association) Nov. 2020. **Learning During COVID-19: Initial findings on students’ reading and math achievement and growth.** https://www.nwea.org/research/publication/learning-during-covid-19-initial-findings-on-students-reading-and-math-achievement-and-growth/
  - Analyzed tests given to appx. 4.4 million U.S. students in grades 3-8 this fall and found that most fell short in math, scoring an average of 5 to 10 percentile points behind students who took the same test last year.
  - Black, Hispanic and poor students fell the furthest behind.
  - **Evidence suggests students' achievement in math has decreased since the beginning of the pandemic.**

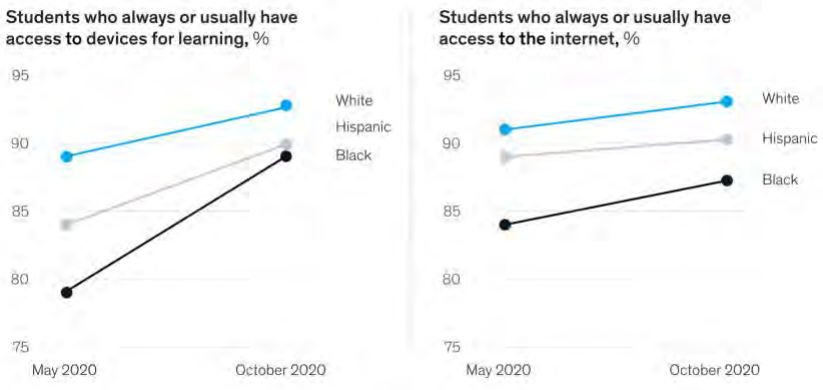
Inequity- gaps widening

- Dorn, E., Hancock, B., Sarakatsannis, J., Viruleg, E. June 1, 2020. **COVID-19 and student learning in the United States: The hurt could last a lifetime.** *McKinsey & Company*
  - If in-person classes do not fully resume until January 2021, Hispanic, Black, and low-income students will lose 9.2, 10.3, and 12.4 months of learning, respectively. If in person classes do not resume until Fall 2021, these inequities are projected to increase.
  - If in-person classes do not resume until January 2021, the average student is projected to lose $61,000 to $82,000 in lifetime earnings. This cost is projected to be worse for black and Hispanic Americans.

- Resuming in-person classes in January 2021 (as opposed to Fall 2021) is projected to save an average of: 5.6 months of learning loss, 452,000 additional high school drop-outs, and approximately $85 billion in annual earnings.
- **Blacks, Hispanics and low-income students are at most significant risk of learning loss, loss of lifetime earnings and dropping out due to COVID-19.**



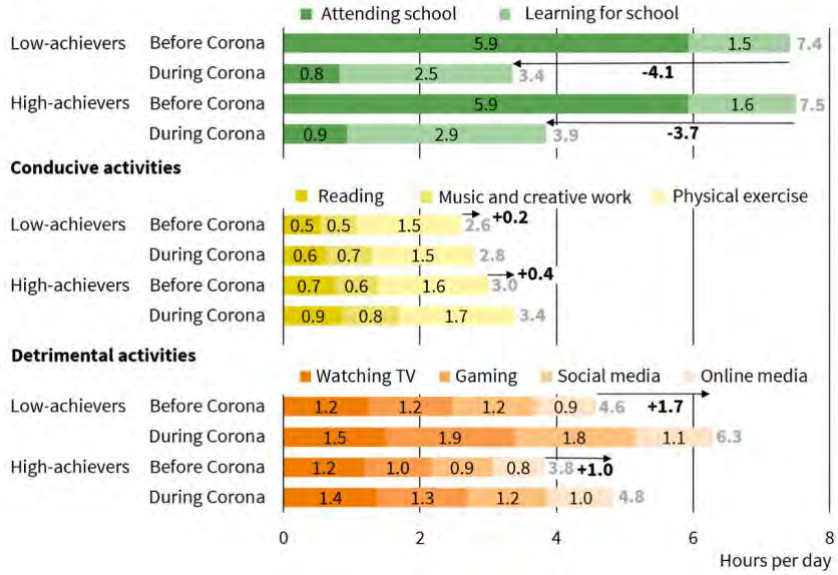
- Dorn, E., Hancock, B., Sarakatsannis, J., Viruleg, E. Dec. 8, 2020. **COVID-19 and learning loss- disparities grow and students need help.** *McKinsey & Company*
  - Blacks and Hispanics have less access to computers and the internet.
  - Blacks and Hispanics are twice as likely to have no live access to teachers.
  - **Blacks and Hispanics are more likely to have inadequate access to the Internet and devices for learning compared to Whites.**



- Grewenig, E et al., November 2020, CESifo Working Paper 8648. **"COVID-19 and Educational Inequality: How School Closures Affect Low- and High-Achieving Students"**
  - Overall, students' learning time more than halved from 7.4 hours per day before the closures to 3.6 hours during the closures. This reduction in learning time was significantly larger for low-achieving than for high-achieving students.

- Low-achieving students spent 6.3 hours per day (increase of 1.7 hours compared to pre-COVID) during the school closures on activities deemed detrimental to child development (watching TV, playing computer games, consuming social and online media). High-achievers only spent 4.8 hours (an increase of 1 hour compared to pre-COVID) on these activities.
- **The learning gap between low- and high-achieving students has significantly worsened during COVID-19.**

Figure 1 Activities of low- and high-achieving students before and during the school closures



Impact on the family

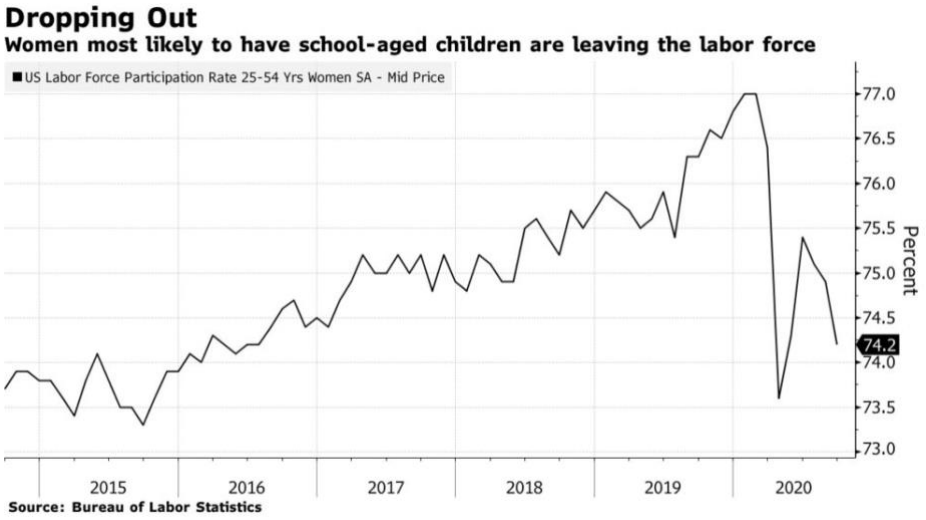
-Food Insecurity

- Feeding America 2020: Update Oct 2020: **The Impact of the Coronavirus on Food Insecurity in 2020** https://www.feedingamericaaction.org/the-impact-of-coronavirus-on-food-insecurity/
  - Food banks nationwide have seen an increase of more than 6 million children compared to before the pandemic, for 17 million kids, many of whom are unable to access free lunches at school.
  - 1 in 4 children is at risk of hunger during the pandemic.

-Parental Job Loss/ Forced resignation for childcare needs

- **Bureau of Labor Statistics**, U.S. Department of **Labor**, 2020.
  - As of October, 2.2 million women have dropped out of the workforce since February 2020.
  - The number of women working has fallen to the lowest level since 1988.

- In one sense, these women are solving a practical problem: Nine months since the country's schools shut down, over 50 % of American kids are still learning entirely online and someone needs to look after them.
- **Of those not working, women ages 25-44 are almost three times as likely as men to not be working due to childcare needs.**



- Heggeness, M. (U.S. Census Bureau). Nov. 2020. *Review of Economics of the Household, vol. 18.* **"Estimating the Immediate Impact of the COVID-19 Shock on Parental Attachment to the Labor Market and the Double Bind of Mothers"**
  - While there was no immediate impact on detachment or unemployment, mothers with jobs in early closure states were 68.8 percent more likely than mothers in late closure states to have a job but not be working as a result of early shutdowns.
  - There was no effect on working fathers or working women without school age children.
  - **Women with school-age children are more likely to not be working compared to fathers and working women without children.**

Lack of benefit of school closures

- Forbes et al**,** Nov. 2, 2020. **Association between living with children and outcomes from COVID-19: an OpenSAFELY cohort study of 12 million adults in England**. (preprint) **doi:** https://doi.org/10.1101/2020.11.01.20222315

  - This study investigated whether risk of infection with SARs-CoV-2 and severe outcomes differed between adults living with and without children.

- Among 9,157,814 adults ≤65 years, living with children 0-11 years was not associated with increased risks of recorded SARS-CoV-2 infection, COVID-19 related hospital or ICU admission but was associated with reduced risk of COVID-19 death (HR 0.75, 95%CI 0.62-0.92).
- Living with children aged 12-18 years was associated with a small increased risk of recorded SARS-CoV-2 infection (HR 1.08, 95%CI 1.03-1.13), but not associated with other COVID-19 outcomes, including severe disease and death.
- Living with children of any age was also associated with lower risk of dying from non-COVID-19 causes. Among 2,567,671 adults >65 years there was no association between living with children and outcomes related to SARS-CoV-2.
- For adults living with children there is no evidence of an increased risk of severe COVID-19 outcomes.
- **This study demonstrates no consistent changes were observed in risk of COVID-19 following school closure.**

- Hsiang et al, 6/8/2020, *Nature*, 12/22/2020, (study period February-April 2020), **The effect of large-scale anti-contagion policies on the COVID-19 pandemic.**
  - The authors apply techniques from econometrics in order to quantify the impact of an-contagion policies on the growth rate of infections in six countries: China, South Korea, Italy, Iran, France, and the United States.
  - **School closures were not found to have a significant impact on the epidemic growth rate in almost all settings**.

- Insights for Education, Oct 2020, '**COVID-19 and Schools: What We Can Learn from Six Months of Closures and Reopening**?'
  - Data from 191 countries from a 7-month period (2/10-9/29) show **no consistent association between school reopening status and COVID-19 infection rates**.
  - Most countries in the second wave of pandemic have reopened schools.
  - Staying open is the new priority. Countries currently maintaining closures are generally lower-income countries still in the first wave of the pandemic.

- Hobbs, Charlotte et al. Dec 18, 2020. **Factors Associated with Positive SARS-Cov2 Test Results in Outpatient Health Facilities and Emergency Departments Among Children and Adolescents Aged <18 years - Mississippi, September- November 2020.** https://www.cdc.gov/mmwr/volumes/69/wr/mm6950e3.htm?s_cid=mm6950e3_x
  - Researchers surveyed 397 patients younger than 18 who had tested positive for the virus in emergency departments and outpatient health facilities during Sept., Oct., and Dec.

- Attending in-person school or child care during the 2 weeks before the SARS-CoV-2 test was not associated with increased likelihood of a positive SARS-CoV-2 test result (aOR= 0.8, 95% CI, 0.5-1.3).
- **Attending in-person school is not associated with an increased risk of testing positive for COVID-19 in children <18 years.**

- Qualtrics, '**COVID-19 School Response Dashboard**' https://covidschooldashboard.com/
  - Data on almost 200,000 students in 47 states from the last two weeks of September revealed an infection rate of 0.13 percent among students and 0.24 percent among staff.
  - **This suggests infection rates remain low when schools are in session.**

Guidelines/ Professional Society Recommendations/ Position Statements

- Allen et al. Harvard Global Health Institute
  - July 2020**, The Path to Zero and Schools: Achieving Pandemic Resilient Teaching and Learning Spaces** https://globalepidemics.org/wp-content/uploads/2020/07/pandemic_resilient_schools_briefing_72020.pdf
    - Recommendations for metrics for reopening schools and prioritization of lower grades
  - Dec 2020**, Schools and the Path to Zero Strategies for Pandemic Resilience in the Face of High Community Spread** https://globalepidemics.org/2020/12/18/schools-and-the-path-to-zero-strategies-for-pandemic-resilience-in-the-face-of-high-community-spread/
    - Updated data on in-school transmission and recommendations for mitigation approaches in communities with high COVID rates
    - "We now recommend that schools be open even at the very high levels of spread we are now seeing, provided they strictly implement strategies of infection control."

- American Academy of Pediatrics
  - 6/26/20, **COVID-19 Planning Considerations: Guidance for School Re-entry** https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/clinical-guidance/covid-19-planning-considerations-return-to-in-person-education-in-schools/
    - Strong emphasis on return to in-person education. AAP guidelines also discuss the importance of attending to students' nutrition and mental health needs, maintaining onsite school-based health services if available, and maintaining a balanced curriculum with continued physical education and other learning experiences rather than an exclusive emphasis on core subject areas.

- Brief section offering guidance on distancing, bussing, hallways, playgrounds, meals/cafeteria, cleaning/disinfection, testing and screening, masks and PPE, on-site health services, student with disabilities, behavioral health, mental health of staff, food insecurity, immunizations, sports and PE.

  - 7/10/20, **Pediatricians, Educators and Superintendents Urge a Safe Return to School This Fall** https://services.aap.org/en/news-room/news-releases/aap/2020/pediatricians-educators-and-superintendents-urge-a-safe-return-to-school-this-fall/?fbclid=IwAR1tt_UzuCDCycu9n58_Uwf19iO3YEQZSQAZZ0Zo9I0exI_ZKoMtZDqVJAw
    - The AAP, American Federation of Teachers (AFT), National Education Association (NEA), and the School Superintendents Association support having children return to school safely in the fall for in-person learning
    - Statement discusses the importance of in-person learning for children and calls for resources needed to do so safely.

- American Association of Child and Adolescent Psychiatry (AACAP), July 15, 2020, **Needs of Students During the COVID-19 Era.** https://www.psychiatry.org/newsroom/news-releases/needs-of-students-during-the-covid-19-era-american-academy-of-child-and-adolescent-psychiatry-aacap-and-american-psychiatric-association-apa-detail-steps-necessary-for-safely-reopening-schools-this-fall
  - Joint statement from American Psychological Association (APA) and AACAP regarding return to school, emphasizing:
    - **School attendance is essential for healthy development.**
    - Mental health support is needed for students, teachers, and families
    - Special attention to children with special needs (emotional, learning, physical disabilities; foster care; poverty; English language learners)

- Children's Hospital of Philadelphia (CHOP) **Updated October 2020 guidance**. https://policylab.chop.edu/reports-and-tools/policy-review-evidence-and-guidance-in-person-schooling-during-covid-19-pandemic
  - Based on emerging data, schools do not appear to play a major role in COVID-19 transmission.
  - States that to date (11/5/20), there have been very few documented in-school transmissions, although data are extremely limited; where data are available about mitigation strategies used, these transmissions have been associated with lack of masking.
  - **Updated guidance suggests to focus instead on whether in-school transmission is occurring; that is, whether being in a school building increases COVID-19 risk for educators or students above what they would**

experience in the community. Guidance has "intentionally moved beyond the absolutism of case incidence and test positivity thresholds"
    - Provides a series of questions that may be utilized to guide decision making.

- Duke School of Medicine and the Duke Clinical Research Institute: **ABC Science Collaborative**, October 2020. https://abcsciencecollaborative.org/faq/#transmission
    - Developed in response to COVID-19 and its impact on schooling. Duke and the University of North Carolina School of Medicine are working together to lead the program, which receives its funding from the National Institutes of Health.
    - Suggest that clusters/ transmissions should drive discussions about school openings and closings and not community metrics
    - "Based on early data, the number of secondary transmissions inside traditional public North Carolina schools is less than 1 in 1000. Furthermore, on average it appears that each child infected with COVID-19 transmits to 0.1 other students and that there are even less child-to-adult transmissions."

- European Center for Disease Prevention and Control. **COVID-19 in children and the role of school settings in transmission- first update.** Stockholm. 12/23/20. https://www.ecdc.europa.eu/sites/default/files/documents/COVID-19-in-children-and-the-role-of-school-settings-in-transmission-first-update_0.pdf
    - Younger children appear to be less susceptible to infection, and when infected, less often lead to onward transmission than older children and adults.
    - School closures by themselves are insufficient to prevent community transmission of COVID-19 in the absence of other interventions/ restrictions.
    - Educational staff and adults within the school setting are generally not seen to be at a higher risk of infection compared to other occupations.
    - **There is a general consensus that the decision to close schools to control the COVID-19 pandemic should be used as a last resort**. **The negative physical, mental health and educational impact of proactive school closures on children, as well as the economic impact on society more broadly, would likely outweigh the benefits.**

- National Academy of Sciences (NAS) July 15, 2020. **Reopening K-12 Schools During the COVID-19 Pandemic Prioritizing Health, Equity, and Communities** https://www.nationalacademies.org/our-work/guidance-for-k-12-education-on-responding-to-covid-19
    - Set of recommendations designed to help districts and school divisions successfully navigate decisions around school reopenings and keeping them operating safely.
    - Young children specifically will be most impacted by not having in-person learning.
    - Recommends that school districts should weigh the relative health risks of reopening against the educational risks of not providing in-person instruction.

- Recommends prioritizing reopening with an emphasis on providing full-time, in person instruction.
- Recommends schools partnership with local public health officials to assess school facilities to ensure they meet minimal health and safety standards to support COVID-19 mitigation strategies.
- Recommends districts make informed decisions about school reopening and safe operation based upon the research.

- US CDC, 10/29/20, **Operating schools during COVID-19: CDC's Considerations** https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/schools.html

- US CDC, 12/2/20, **Options to Reduce Quarantine for Contacts of Persons with SARS-CoV-2 Infection Using Symptom Monitoring and Diagnostic Testing** https://www.cdc.gov/coronavirus/2019-ncov/more/scientific-brief-options-to-reduce-quarantine.html
  - Local public health authorities determine and establish the quarantine options for their jurisdictions.
  - CDC currently recommends a quarantine period of 14 days. However, based on local circumstances and resources, the following options to shorten quarantine are acceptable alternatives:
    1. Quarantine can end after Day 10 without testng and if no symptoms have been reported during daily monitoring. *Residual post-quarantine transmission risk: estimated ~1%, with an upper limit of ~10%.*
    2. When diagnostic testing resources are sufficient and available, then quarantine can end after Day 7 if a diagnostic specimen (performed no more than 48h before the end of quarantine) test negative, and no symptoms reported. *Residual post-quarantine transmission risk: estimated ~5%, with an upper limit of ~12%.*

- United Nations International Children's Emergency Fund (UNICEF), Nov. 18, 2020. **Averting a lost COVID generation: A six-point plan to respond, recover and reimagine a post-pandemic world for every child.**
  - **"There is strong evidence that, with basic safety measures in place, the net benefits of keeping schools open outweigh the costs of closing them. Schools are not a main driver of community transmission, and children are more likely to get the virus outside of school settings."**

Useful terms to know

Epidemiological Link (Epi-Link): When one infection connects to another infection, and may indicate the source of transmission.
Community Epi-Link: When infection occurs in the community (soccer game, party, holiday celebration). For example, if two classmates had a sleepover and both got infected - both cases would be classified as Community Epi-Link cases - even though they are in the same class.

School Epi-Link: COVID-19 infection occurs in a school. For example, a student tests positive. Those identified as close contacts (classmates & teachers) are quarantined. If one of the quarantined people becomes sick - they are identified as a School Epi-linked case.

Outbreak: Outbreak is defined by two or more lab confirmed cases in a defined area of exposure (epi-linked) - such as a school. In the event that any public school has an outbreak, that school will be listed in the VDH School Outbreak dashboard.

Quarantine: Recommended for those who have been exposed to a positive case. The goal is to stop further spread if they become symptomatic or contagious after exposure. Those under quarantine should stay home for 14 days from their last contact with the sick person and monitor their health for COVID-19-like symptoms.

-from https://cpschools.com/return-to-school-plan/metrics/ Accessed 12.29.20.

Given the rapidly changing pandemic and new data, there is no complete list of studies anywhere. This list is current as of 1.1.21 and is meant for educational purposes.