COVID-19

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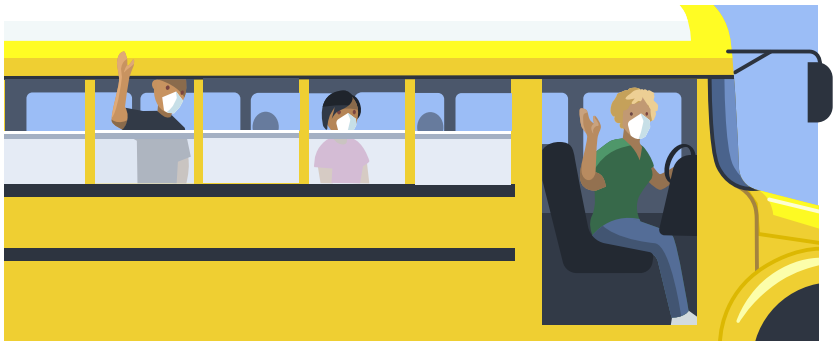
Reopening America's Schools: A Public Health Approach



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JULY 2020

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COVID-19 and Schools: What We Know

Schools play an essential role in the educational and social development of children and in the functioning of the economy. We need to reopen schools this fall, but we have to do it carefully, prioritizing the safety of students and their families, teachers and staff, and the broader community. Not every school will be able to reopen, and almost every school will have to make changes—but we can provide millions of schoolchildren a safe, quality education if we follow common-sense guidelines.

Public health expertise can help staff and educators reduce risk of COVID-19 transmission. In particular, staff and educators should review U.S. CDC guidance, and calibrate their precautions according to the severity of the local epidemic, tightening restrictions when there is community spread and only relaxing them if there are few or no cases. In addition to the spread of the virus in the community, staff and educators must also consider how many people gather together in schools, in what proximity, over how much time, with what level of ventilation, and with what proportion wearing masks. Younger students, who are less adaptable to remote learning than older students, may be prioritized for in-person school attendance.

This document addresses some frequently asked questions from educators. The bottom line is that there is no route to zero risk of COVID-19 in the near future, but we can reduce the risk with careful planning and precautions. If we follow the best available information, we can open sooner and safer.

Susceptibility, severity of illness and transmission of COVID-19 in children

Main message: Based on the best evidence currently available, children may be somewhat less likely than adults to get COVID-19, are definitely much less likely to become severely ill if they do get it, and appear to be less likely to spread the virus that causes COVID-19, to others than adults are. However, children of all ages have been diagnosed with COVID-19 and, although rare, some have become severely ill and a small number have died. Measures to reduce children's risk include making sure they wash their hands, physically distance themselves from others outside the household, and wear face coverings when appropriate.

To advocate for reopening schools, it is necessary to first establish ways to make students and staff safer within in-person school settings. Though many unknowns remain, it is possible to draw some conclusions from the best science and data currently available about infection dynamics in children.

SUSCEPTIBILITY OF CHILDREN TO COVID-19

Susceptibility refers to how likely children are to get COVID-19. It is distinct from severity of illness, which is how serious the infection can be, although the two may be difficult to separate in some instances. For reasons that are not perfectly understood, some viruses cause varying rates of infection for different age groups. One unproven theory is that recent respiratory infections, such as colds, that are sometimes more common in children, may provide some "crossover" protection.

There are three main ways to learn which age groups may be more or less susceptible to COVID-19. One way is to analyze the number of cases that occur in different age groups. The second is to look at population studies testing representative samples, which can provide more accurate infection rates. The third is to evaluate contact tracing studies and determine the determine how likely people in different age groups are to become infected after being exposed to someone with COVID-19.

Case incidence is lower in children

Looking at case incidence alone, the infection rate among children is significantly lower than those among both young and older adults. The U.S. CDC reported in a recent Morbidity and Mortality Weekly Report (MMWR) that in the U.S., from Jan. 22 to May 30, 2020, only 1.5% of confirmed COVID-19 cases were among those 0-9 years of age, and 3.7% were among those 10-19 years of age. Taking the proportion of people in the U.S. that make up these age groups into account, the overall incidence of COVID-19 cases was 51 per 100,000 population among children 0-9 years old and 118 per 100,000 among those 10-19, compared to 492 per 100,000 among those 30-39 years old and 902 per 100,000 among those over 80 years old. Another MMWR, from April 2020, focused specifically on patients under 18 years old and showed that nearly a third of cases under 18 were 15-17 years old, with younger children less likely to be affected. These data show that children make up a much smaller fraction of those being diagnosed with COVID-19. Reports from other countries follow similar patterns. A lower rate of reported COVID-19 among children, however, does not mean a lower rate of infection. Children may be more likely to have asymptomatic or milder disease and therefore may be less likely to be tested for and identified as having COVID-19. Children may have also been shielded from infection after school closures, although age-dependent modeling data suggests that this alone does not account for the lower incidence of cases in children.

Population studies support lower susceptibility

Data from population studies that test for either active infection or antibodies indicating previous infection can be revealing. There are early data from these types of studies to support the hypothesis that children are less susceptible to COVID-19. In Iceland, which has tested 15% of its total population for active infection, children were half as likely to be infected as adults in both targeted and general population testing. In Iceland's general population screening, no children under the age of 10 tested positive, despite nearly 1% of

the overall sample testing positive. Looking at seroprevalence studies involving antibody testing, a study from Switzerland showed that children 5-9 years old were one-third as likely to have a positive antibody test as adults 20-49 years old. The difference in antibody positivity rate between 10-19 year olds and adults 20-49 years old was not statistically significant. Other population antibody studies, from Spain and the Netherlands, have also shown a significantly lower seroprevalence among those younger than 20 years old. Data from some studies, such as this study from the United Kingdom, show no difference in positivity rates between adults and children. Nevertheless, most results suggest lower seroprevalence and incidence of active infection among children. A number of population studies are ongoing and will continue to produce additional insight.

Contact tracing suggests lower susceptibility

There have been several published and preprint studies on results from contact tracing efforts. The most recent study from China showed that those under 20 years old had less than one-quarter the odds of contracting COVID-19 from an infected household member compared to older adults. A preprint systematic review and meta-analysis analyzed six other studies from China and one each from Australia, Taiwan and Japan. In the meta-analysis, children and young people under 20 years old had about half the odds of contracting COVID-19 compared to adults. Some of the studies showed no difference in infection rates between adults and children after exposure to an infected person, but the overall results point to lower susceptibility in children and young people under 20. There were no studies showing higher susceptibility among children or young people.

The current evidence suggests that children, and especially young children, are less susceptible to COVID-19 than adults.

SEVERITY OF COVID-19 INFECTION IN CHILDREN

Of the three—susceptibility, severity of illness, and transmission—the lower severity of illness among children has the strongest supportive evidence base. Severity of illness can be measured by looking at the number of patients in a given age group requiring hospitalization or intensive care unit (ICU) admission, or who die from COVID-19, as well as looking at the proportion of patients reporting asymptomatic or mild disease.

Hospitalization, ICU admission and death are less common for children with COVID-19

Hospitalizations, ICU admissions, and deaths have been consistently less common among children than among adults in the U.S. and elsewhere. The U.S. CDC reports that rates of hospitalization and ICU admission are lower among children than among adults. Underlying health problems remain a significant contributor to more severe disease among children with COVID-19.

It is conceivable that children presenting to hospitals with COVID-19 may be more likely to be admitted due to a lower threshold to admit and monitor this vulnerable population. Accounting for such a bias would likely show even lower severity of illness among infected

children. A small minority of cases in children have resulted in death. In the U.S., the pandemic has affected closing in on 3 million people, yet the number of deaths in those under age 15 remains very low—less than 30 as of June 20, 2020—with underlying conditions playing a central role in these relatively isolated poor outcomes.

Asymptomatic or mild COVID-19 is more common in children

Higher rates of asymptomatic or mild infection among children have been observed for other respiratory infections, including severe acute respiratory syndrome (SARS). In most countries, limitations on testing asymptomatic people preclude greater insight into the true proportion of asymptomatic COVID-19 infections among children and into whether the proportion of asymptomatic cases is higher among children than adults. Nevertheless, data on the small numbers of more severe cases shows that there is a larger proportion of asymptomatic or mild infections among children than adults. A systematic review and meta-analysis looking at the best evidence available through mid-April determined that up to 80% of infected children had mild disease, and other individual studies continue to show that children are more likely to experience milder, if any, symptoms. There is general consensus, based on accumulating evidence, that children are less likely to suffer severe illness from COVID-19.

Multisystem inflammatory syndrome (MIS-C) in children is rare

Health authorities continue to collect information on cases of MIS-C, which has been temporally associated with COVID-19 and is potentially a delayed immune complication of COVID-19 in children and those under 21 years old. Fortunately, cases remain exceedingly rare, affecting two per 100,000 compared to COVID-19 infection which affects 322 per 100,000 for the same age group. Among those who are diagnosed with MIS-C, outcomes remain good despite high severity of illness.

Although children of all ages have contracted COVID-19, the illness is much less likely to be severe in children than in adults.

COVID-19 TRANSMISSION BY CHILDREN TO OTHERS

Higher social contact rates among children have been the basis for school closures to reduce influenza transmission during epidemics. This justification is grounded in the role that children play in transmitting influenza to others. In prior epidemics of respiratory illness, including the flu, whooping cough and others, children have been identified as the main drivers of infection transmission. The same may not hold true for COVID-19, which would eliminate a major argument that has supported school closures for influenza and other infectious diseases.

Tracing and testing reports support lower transmissibility from children

Currently, limited evidence suggests that children may play a smaller role in transmission of COVID-19 than adults. There are several reports to support this assertion, including tracing secondary infections when children are known to be the index case. In an early

study from France describing a cluster of COVID-19 cases linked to a hotel in the French Alps in February, a 9-year old child who contracted the disease from an adult at the hotel subsequently visited three schools and a ski training class. The child accumulated more than 172 contacts while symptomatic, all of whom were contacted. Of the 73 contacts who were tested because they had symptoms or higher-risk exposure, only one tested positive for COVID-19. Another tracing and testing report from Australia showed that an investigation of 735 classmates and 128 school staff who were close contacts of 18 school-based cases in March to mid-April, did not identify who may have been infected as a result of school exposure.

Other studies have indicated that children are more likely infected by their parents or other adults in the household rather than the reverse. In one study from Germany, evaluation of transmission chains showed that 81% of children with COVID-19 were most likely infected by a parent. There is also evidence from the U.S. gathered in day care facilities that have remained open throughout the pandemic. Though not scientific studies, the YMCA and New York City Department of Education, which have served tens of thousands of children and thousands of staff, have not yet reported any clusters or outbreaks.

The data on transmission of COVID-19 from children are limited, and there are reasons to remain cautious: the amount of virus detected in infected children has been shown to be similar to that in adults, and the amount of virus detected in asymptomatic people has been shown to be similar to that in symptomatic patients.

The role of school closure in controlling COVID-19 transmission

Main message: Schools around the globe closed in response to the COVID-19 pandemic. The impact of this measure on reducing transmission was probably smaller than many of the other public health and social measures deployed at the same time. In a growing number of countries, schools are reopening, often with some limitations and largely without, thus far, appearing to have caused increases in new cases. Schools have rarely been the sites of outbreaks or contributed substantially to COVID-19 transmission. Careful preparation and planning for localized closures may be necessary for some time.

Closing schools can reduce transmission of some respiratory infections, and has been considered an effective tool in previous influenza outbreaks and epidemics. There is even a suggestion that implementing this measure early in a local influenza epidemic can be more effective. During the 1918 Spanish influenza pandemic, local decisions about school closure varied; some cities proactively closed schools and others kept them open as long as possible. In St. Louis, where officials closed schools before the epidemic peaked and kept them closed for 143 days, the mortality rate was only one-third of that in Pittsburgh, where leaders reactively closed schools well after the epidemic peak and reopened them just 53 days later. Compiling such experiences and drawing lessons relevant to the COVID-19 situation can be misleading because of differences between transmission dynamics

and other interventions from setting to setting. In addition, the transmission dynamics of coronaviruses, including the virus that causes COVID-19, are different from seasonal or pandemic influenza. Schools in affected parts of China were not closed until relatively late into the SARS epidemic in 2003, and this action did not appear to have affected the epidemic curve. A systematic review completed in 2014 concluded that school closing can contribute to reducing transmission of infections to which children are as easily infected as adults and for which the basic reproduction number (R0) is only moderately high (R0<2.0); the basic reproduction number is the average number of people infected by each infected person. These conditions do not appear to hold for COVID-19. A rapid review published in April estimated that school closing alone could be expected to reduce COVID-19-related mortality by only 2% to 4%. Other public health and social measures targeting adults more broadly are likely to be much more effective at controlling COVID-19 and should also be in place.

Despite these observations, many schools in the U.S. and around the world have been closed in the context of the COVID-19 pandemic. UNESCO reported that as of June 26, 114 countries still had nationwide school closures in place as part of their response to the COVID-19 pandemic. Combined with subnational and local actions, school closure affects more than 67% of students worldwide at this time of this writing. Sweden stands out as one country considerably affected by COVID-19 in which day care centers and primary schools remained open for children up to age 15. The move was part of a controversial strategy to avoid the strict lockdowns that had been implemented elsewhere. Keeping schools open was justified on the basis of evidence that children are less likely to be infected, become severely ill, or transmit the virus. Over a period of two months during the epidemic in Stockholm, very few children were identified with COVID-19 infection, and the cumulative incidence of hospitalization for COVID-19 illness in children was only 9 per 100,000, which was 25 times lower than for adults. Similarly, there was no evidence that schools contributed to transmission among students, teachers or the general population. However, the bold strategy designed to avoid the effects of a strict and comprehensive package of public health and social measures likely contributed to higher case numbers and fatalities in Sweden compared to neighboring countries.

Over the past two and a half months, schools have reopened to varying degrees in more than 75 countries. Many are resuming on a limited basis and with specific preventive measures in place. Denmark and Finland were among the first European countries to reopen schools, in mid-April and May, respectively. Media reports and case counts confirm that both countries have continued to control transmission since taking this step. In an increasing number of countries where cases were already trending downward before schools reopened, there is no evidence of a resurgence associated with reopening. In several countries, however, reopening was followed by highly publicized closures of individual schools in response to cases or significant risk of exposure among staff or students. In South Korea, many schools reopened in late May. Days later, 251 schools near Bucheon, South Korea, closed again after an outbreak was detected at an e-commerce distribution site in that community. In South

Africa, schools reopened even though case counts were still climbing. Two weeks later, 61 of the 1,509 schools in the Western Cape Province were closed temporarily to allow for contact tracing and disinfection. These school closures were prompted by individual cases, small clusters, or community-wide outbreaks. Transmission among students or between students and staff has only rarely been documented.

Nonetheless, schools can be sites of significant transmission. In Israel, schools began to reopen in early May and by May 17, all limitations on class size were lifted. On June 1, a sizable outbreak was identified, linked to a single secondary school outside Jerusalem where 116 students and 14 teachers were infected. The epidemiology of this outbreak has not been published, and it is unclear whether students were significant sources of transmission. In any case, this school-based outbreak contributed to further spread in the surrounding community. These experiences suggest that schools can be reopened cautiously, particularly those that enroll young children. In a recent preprint article, investigators conclude that large scale reopening of schools in settings where community transmission is relatively low (such as Norway and Denmark) can be accomplished while controlling or suppressing the epidemic. However, school reopening could contribute to increasing the epidemic growth rate in countries where community transmission is relatively high (such as Germany). Education and public health authorities should carefully consider the risks and potential benefits of schools reopening in their communities. Specific considerations, some of which are described below, might further reduce the relatively low risk of transmission within schools. Above all, close surveillance and planning for how to respond when cases occur among staff, students and the broader community, including criteria for closing schools on an individual or local basis, should be applied to further minimize the risk.

Potential impacts of school closures due to COVID-19 and how to reopen schools safely

Main message: School closures due to COVID-19 have had major negative effects on students, educators, families and communities. Some guidance is available from federal and state public health authorities as well as from expert professional societies within and outside of the U.S. Many countries have reopened their schools to at least some degree, providing examples of various approaches to educating students while reducing the potential for the spread of COVID-19. There will be significant economic costs associated with the safer reopening of schools which should be balanced against the educational, social and other costs of keeping schools physically closed.

POTENTIAL IMPACTS OF SCHOOL CLOSURES DUE TO COVID-19

Worldwide, it is estimated that at their peak, school closures due to COVID-19 affected 90% of the world's student population, or 1.6 billion students in 194 countries. In the U.S., K-12 school closures were mandated in 48 states, the District of Columbia, and all five permanently inhabited U.S. territories. This is estimated to have resulted in the closure of

124,000 schools, affecting 55.1 million students. A minority of states have not mandated closure or have already lifted closure orders. In Montana and under the Bureau of Indian Education, school closures are determined at the district level, and in Idaho, schools have been allowed to seek district approval to reopen. In the vast majority of states, schools have been ordered closed through the end of the 2019-2020 academic year.

School closures have significant negative impacts on education. Data on changes in scholastic performance due to absenteeism, summer vacation, and weather- or disaster-related school closures inform assessments on the impacts COVID-19-related school closures may have. Some models suggest that elementary and middle school students could return to school in fall 2020 with a 30% reduction in learning gains in reading from the prior year compared to a typical school year, and that learning gains in math could be even further reduced. School closures are likely to increase performance gaps between high- and low-achieving students. During summer closures, high-achieving students tend to maintain or even improve their performance while low-achieving students tend to fall further behind. Although such predictions may not be fully borne out if distance learning has allowed students to keep up, a national survey of 1,720 educators suggested that more than one fifth of students are not participating in distance learning, and that truancy rates are highest in the poorest communities, among students who may have the greatest educational needs.

Another analysis has suggested that learning loss will likely be greatest among low-income, Black and Hispanic students, with these students falling behind by up to one year of educational time. On a global scale, experience with other health emergencies has shown that the impact on education is most devastating in countries with the poorest learning outcomes. During the ebola epidemic in Sierra Leone, school closures were associated with increased rates of teen pregnancy which, in turn, reduced the likelihood of girls returning to school after the epidemic. There are other potential adverse consequences of school closure, including unintended strain on the healthcare system due to child care responsibilities of healthcare workers, mental health effects on students and parents, increased social isolation of students, gaps in child care in homes with working parents, increased child exposure to violence, and lack of access to adequate nutrition for students who rely on school meal programs. Such consequences can have direct negative impacts on scholastic performance and also indirectly augment learning losses; the negative impacts of stress and poor nutrition on learning are well documented.

GUIDANCE ON THE SAFE REOPENING OF SCHOOLS

The national conversation on schools in the U.S. has now focused on how they may reopen safely and effectively. Dr. Anthony Fauci, Director of the National Institute of Allergy and Infectious Diseases at the National Institutes of Health and a member of the White House Coronavirus Task Force, has indicated that school reopening decisions should be based on regional COVID-19 statistics and that creative modifications to the standard school environment and schedule may be necessary. To guide the safe reopening of schools in the U.S., recommendations have been published at the federal level and by some state

departments of public health and/or education. At the federal level, CDC recommends that jurisdictions consider reopening **child care programs** and **schools** if reopening is consistent with state or local orders, there are mechanisms to protect children and employees at risk of severe illness, and there is capacity to screen all students and employees for symptoms and a history of exposure upon arrival at school. If child care programs or schools reopen, the CDC offers **guidance for administrators on how to plan, prepare and respond to COVID-19**.

CDC recommendations are divided into four scenarios: if a person confirmed to have COVID-19 enters the school, if there is no community transmission, if there is minimal to moderate community transmission, and if there is substantial community transmission. Topics covered include triggers for school dismissal, teaching healthy hygiene habits to students, disinfecting surfaces in the school, monitoring and planning for absenteeism, and strategies for continuing education and other support programs for students in the event of further closures. Many state-issued guides, such as the one from the **California Department of Public Health**, reference CDC guidance and cover similar topics but in greater depth, with suggestions of specific actions to help achieve a list of goals. In collaboration with medical and public health experts, the **Massachusetts Department of Elementary and Secondary Education** has developed guidelines that are a mix of recommendations and requirements. To avoid interruptions in learning, Massachusetts districts and schools will be required to submit reopening plans that address three possible scenarios: full in-person education with new safety requirements, a hybrid of in-person and remote education, and continuation of remote education. Some states emphasize the practicalities of formulating and executing a school reopening plan at the local level. For example, the **Pennsylvania Department of Education** stipulates that each school create and publicly post a reopening plan that includes specific elements, and secure approval of the plan from the school's governing body before reopening. Other states, such as Texas, have yet to publish guidelines.

Some guidance on how to reopen schools safely is available from expert/professional societies. The **American Academy of Pediatrics** has suggested factors that should be considered when schools reopen. Considerations include issues touched upon in other guidance documents, including the importance of addressing students' mental health issues. Additional suggested considerations include: anticipation of lost educational time and appropriate adjustment of instructional plans so that further stress is not put on students; the creation of an individual educational plan for each child with a disability in order to compensate for lost instructional time and support services; and limited extensions for families to submit required public health-related paperwork (such as vaccination records) given potential delays in accessing routine care during the pandemic. Outside the U.S., German pediatric, infectious disease and public health societies have published **recommendations for the reopening of German schools without "excessive" restrictions**. These recommendations include several departures from U.S. federal guidance. One is the suggestion that if someone with an elevated risk of severe COVID-19 lives in the same household as a school-age child, child, an individualized safety plan should be developed in consultation with medical experts. Another is the recommendation that an individual

confirmed COVID-19 case within a school should not lead to closure of the entire program, but instead to a detailed analysis of the chain of transmission and a balanced approach to infection control. Another is the stipulation that children over the age of 10 wear face masks when out of their assigned classroom seats.

WHAT SCHOOLS THAT HAVE REOPENED HAVE DONE

As schools have reopened in many countries, varying measures have been put in place to reduce the potential for the spread of COVID-19 in and outside schools. Initial reopenings have commonly included only a subset of students. In many countries, the youngest children have gone back to school first. Rationales for this include difficulty engaging young students in distance learning, an effort to unburden caregivers at home, and evidence that the risk of severe COVID-19 illness may be lowest in the youngest school-aged children. In many European countries, students in "key transition years," including those in their final years of primary or secondary school, have returned to school as well. In China and South Korea, students in their final year of secondary school returned to school first.

The health and safety guidelines introduced in different countries have been varied. Many countries have implemented temperature checks for staff and students on arrival. Class size has been reduced in some countries but not in others; in some schools, physical barriers have been set up around desks. Students are sometimes required to wear masks. Efforts to avoid people congregating include staggered start and end times of the school day, designated doors for entrance and exit, unidirectional hallways, teachers rather than students switching classrooms, and meals served in classrooms rather than in cafeterias. There has been fairly uniform implementation of hygiene measures such as frequent hand-washing. Staggered schedules, under which students attend school in-person or online depending on the day, have allowed schools to reduce class sizes while continuing to teach all students. This has been adopted in Germany and France and is recommended for consideration in the U.S. The Department of Education in the United Kingdom has recommended assigning a small group of students to each other and to one teacher, keeping the group together throughout all learning and play activities, and disallowing mixing between groups. In a number of countries, parents have been allowed to opt to keep their children home.

EDUCATIONAL AND ECONOMIC IMPACTS OF REDUCED CLASS SIZE

Physical distancing is a primary measure to reduce the spread of COVID-19. If physical distancing is to be practiced within schools, the number of students in each classroom may need to be limited. Such measures may have educational advantages. A number of studies have examined the relationship between reduced classroom size and student achievement. One of the most influential studies, conducted in Tennessee in the 1980s, showed that reducing large class sizes increased student achievement by an equivalent of at least one additional month of schooling. Students whose scholastic performance typically lags behind that of their peers may benefit the most from reduced class sizes. There are significant economic costs associated with reduced class sizes. However, these are just some of the

staggering costs associated with reopening schools safely and effectively during the COVID-19 pandemic. The costs associated with reducing class sizes may be worth the benefits of keeping students, school employees and communities safe in some epidemiologic scenarios.

Frequently Asked Questions from K-12 Staff and Educators

1. **Can a school test all students and faculty and then, if they are free of COVID-19, proceed as normal?**
   Tempting though it may be to consider a school a bubble, there is no practical way to keep the virus out completely. Even in a school that tests every student, staff member, and educator daily, some tests would be falsely negative, and a previously exposed person could become infectious in the hours between testing and going to school. Complete and frequent testing of staff and students is difficult, expensive, and of unproven value. Schools must function as if the coronavirus could arrive at any moment and operate in such a way as to reduce transmission when it does. CDC has guidance for administrators on testing in K-12 schools and institutions of higher learning.

2. **Should students who live with elderly family members or other medically vulnerable people attend school?**
   Parents and students will have to weigh the risks carefully and consider which they can reduce. If students can stay separated from medically vulnerable household members by limiting interactions and using a different bathroom, they may be able to attend school while limiting the risk to their family. On the other hand, in the case of an older child who can attend school remotely, it may be preferable to forgo in-person attendance and reduce the risk of spread in the home. The higher the incidence of COVID-19 in the community, the greater the risk.

3. **Should older or medically vulnerable staff take special precautions?**
   Unless there is very little or no transmission of COVID-19 in the local community, older staff and educators and those who are otherwise vulnerable to severe disease should be offered reasonable accommodation to work remotely. This is the cost of doing business in the age of COVID-19. The CDC has published guidance about groups of people who should take extra precautions.

4. **To what degree should schools incorporate distance learning?**
   Students vary in their ability to learn remotely. High school students may be more adaptable to online learning, whereas students in elementary or even middle school may learn better in person. Educators will have to weigh direct (COVID-19) and indirect (non-COVID-19, such as food insecurity) risks to health, the level of community transmission, and the educational and other costs of replacing in-person classes with remote learning sessions. In response to the pandemic, there are many new online resources for distance learning, for example from the Smithsonian, the U.S. Department of Education, and Google. Schools should have plans in place to shift students from in-person to online

learning as needed, if local guidance is to close schools or if individual students need to remain home. In advance of the academic year, schools may also choose to offer families a choice between in-person and virtual education.

5. **What steps can school buses take to operate safely?**
   When possible, school buses should keep their windows open to increase ventilation. Interiors should be disinfected regularly and modified to reduce the need for touch e.g., with doors that are opened by the driver, not the students. The driver and all riders should wear masks, and, ideally should have assigned places on the bus, one person per seat and skipping rows (though this may not always be feasible). The CDC has prepared additional guidance for bus transit operators.

6. **What policies should schools adopt about wearing masks?**
   Face coverings help reduce disease transmission. The more people wear masks, the better. Although it may be challenging to wear masks all day (particularly for younger children), school staff should wear face coverings and students should be taught to wear them and encouraged to do so, particularly when physical distancing is not possible. Teachers with young students or students with disabilities may opt to use masks with clear "windows" that allow pupils to register their facial expressions and read their lips. Schools can also offer "mask breaks" throughout the day, as long as students are physically distanced, ideally outside. Face coverings should not be placed on children younger than two years old, anyone who has trouble breathing, or anyone unable to remove the covering without assistance. The Minnesota Department of Health has created some materials to help explain and make masks, and the Nemours Foundation has developed some strategies for for helping kids get used to wearing masks.

7. **What are strategies for ensuring students observe physical distancing requirements?**
   There is no definitive appropriate minimum physical distance—six feet is safer than 3 feet, but both are safer than no distancing. People should aim to physically distance at least 6 feet. To help students maintain physical distancing, schools can install visual cues such as informational signs and markings on the ground to indicate appropriate spacing. Schools can also emphasize distance messaging thorough videos, public announcements, and positive reinforcement. Making hallways and parts of classrooms or larger rooms one-way for foot traffic may also reduce risk of spread. For younger students, educators have developed games using hula hoops, measuring tapes, and balls to teach physical distancing in a fun and engaging manner.

8. **Can classrooms be rearranged to reduce transmission?**
   Instead of organizing students in a circle or in small groups, they should be seated in rows, appropriately physically distanced, and facing the same direction. Teachers should also consider assigning seats so students are consistently in the same orientation and proximity to one another—old-fashioned arrangements, but a practical way to reduce risk of spread. If windows can be open or air systems set to increase the amount of outside air, this may further reduce risk.

9. **Should teachers explore alternatives to holding class indoors?**
   If conditions allow, it is much safer to hold class outdoors. Doing so reduces the risk of transmitting the virus through the air and through contaminated surfaces. To spread students out further, schools may consider repurposing well-ventilated auditoriums and gymnasiums for additional classroom space, and reaching out to community partners about unused local spaces.

10. **Should the structure of individual classes be changed in light of COVID-19?**
    To the extent possible, students should remain in small groups rather than mixing and forming different class units throughout the school day. This will limit the potential of spread from any infected student to a smaller number of students and staff, and minimize disruption to the entire school if someone becomes infected. The Brooklyn Lab Charter School developed toolkits on how to modify classrooms and schedules to reduce risk.

11. **Do educators need to use special shared equipment and supplies?**
    To reduce the risk of transmitting the virus via a surface, classes should reduce their reliance on common supplies and equipment. For example, students should use individually assigned art supplies rather than sharing them. In all classes, shared equipment should be disinfected after each use.

12. **What other steps can schools take to reduce the risk of COVID-19 being transmitted via surfaces?**
    Schools can adopt simple practices and changes in physical design to reduce risk of transmission. Students should be required to perform hand hygiene (either hand-washing or using alcohol-based hand sanitizer with greater than 60% ethanol) on arrival at school, before eating, upon putting on or removing their face coverings, and at dismissal—and schools should ensure they have sufficient supplies of hand soap and hand sanitizer to meet that need. Educators should alter spaces to reduce the number of surfaces that multiple people need to touch, for example by propping doors open so they don't need to be handled. And surfaces that are touched commonly should be disinfected regularly (e.g., every two hours during the school day and at the end of the day). Even if there is no COVID-19 in the school, doing this will reduce spread of other illnesses, such as the flu, and reduce absenteeism.

13. **Are there other important measures schools should consider to prevent mixing and congregating of students and faculty**?
    The CDC advises schools to stagger pick-up and drop-off times to reduce crowding and mixing at the beginning and end of the day. Schools may also want to consider moving to a split-shift schedule and staggering school days or weeks entirely, with half the students attending in-person on even days or weeks and the other half following the reverse schedule. It's important to consider closing all common staff break areas and keeping staff from interacting unless they can physically distance.

14. Can schools safely offer recess and physical education?

Physical activity is important to maintaining health and wellbeing—but it can be difficult to maintain physical distance, and breathing hard may increase the risk of viral transmission. To reduce risk, students may play outdoors in smaller groups, masked and observing physical distancing guidelines. Schools should also consider limiting physical education to lower-risk activities (e.g., running) rather than higher-risk activities (e.g., wrestling). Smaller children may need to be supervised to reduce risky contacts. One school in China used a form of cardboard tube hat to remind students to stay apart! Schools should also consider closing shared recreational facilities and instead have instructors come to classrooms to limit mixing. The Society of Health and Physical Physical Education Instructors (SHAPE) America has created resources for physical education.

15. How should performing arts groups rehearse and perform?

In light of evidence that singing may contribute to COVID-19 transmission, the National Federation of State High School Associations issued guidance that discourages indoor group or ensemble singing until mitigation techniques have been tested and proven effective and recommends that instrumental groups be limited in size to meet physical distancing requirements. The American Choral Directors Association has issued guidance recommending that choirs rehearse and perform in small, physically distanced groups, and outdoors if possible.

16. Can schools continue to offer field trips, special assemblies, and other extracurricular activities?

Schools have to weigh the educational and social benefits of such activities against the increased risk of disease transmission. Even an outdoor activity might require travel to and from in a small shared vehicle. And some team sports may be too risky. Generally, schools should suspend activities that require unnecessary intermingling, although it may be reasonable to make some exceptions, for example a walking or cycling trip that starts at the school. Outdoors is far, far safer than indoors.

17. What safety precautions should cafeterias observe?

There is currently no evidence that COVID-19 is spread through food, but sharing plates and utensils and congregating in large groups increases risk. Cafeterias should replace buffet-style offerings with individually-plated meals or grab-and-go options and use disposable dishware if at all feasible. Students should eat in classrooms rather than in large common areas. Schools should consider staggering mealtimes to limit the number of students congregating at any given time, and can also install physical cues such as markings on the floor and signs on the wall to guide appropriate physical distancing for students waiting in line to pick up food. Frequently touched surfaces should be disinfected often. The CDC has prepared additional guidance specifically for school nutrition professionals, who should wear face coverings, practice physical distancing and routinely clean and disinfect kitchen surfaces.

18. Can schools welcome outside visitors as normal?

No. Schools should discourage any nonessential visits and require everyone who enters the school—parent or other relative, delivery person, maintenance worker—to wash hands or use hand sanitizer and wear a face covering. Temperature checks for visitors are less likely to be a useful screening tool, although some schools may choose to conduct them.

19. What should a school do if a student or staff member tests positive for COVID-19?

Administrators should prepare for infections in their staff and student body with detailed and rehearsed protocols, and should designate a COVID-19 space separate from where routine medical care is provided. Any sick people should be advised to stay home until they meet CDC's criteria to discontinue isolation, and people who had close contact with an infected person should quarantine for 14 days after the last possible exposure. This underscores the importance of observing physical distancing measures, because doing so will prevent the disruption of many people needing to be quarantined. The CDC has developed additional guidance for preparing when someone gets sick.

20. What policies can a school adopt to encourage sick students and faculty to isolate at home?

When an infected person stays at home, it helps protect the entire school community. Schools should take steps to make this as easy as possible for students and staff members who feel ill by suspending requirements that students provide doctor's notes for their absences and by providing all staff with paid sick leave and requiring contracted service providers at the school to provide for paid sick leave. If students need to isolate at home, they should also be provided the opportunity for consistent ongoing education through virtual learning.

21. Should schools continue to hold in-person classes if there is extensive spread of COVID-19 in the community?

Probably not. When there is substantial disease spread, most or all schools should suspend in-person classes until the outbreak is better controlled. (There is no generally accepted definition of extensive spread. One example would be a threshold of 5% of people tested for the virus found to be infected and the proportion is rising, or more than 10% of tested people are infected, regardless of the trend). Even if children are less likely to spread the virus and to become seriously ill from it, staff will need to travel to and congregate in the school, so continuing school in the face of high community transmission of COVID-19 may be unwise. The CDC has prepared guidance to help weigh the tradeoffs of school closure. Schools should follow guidance from their county and state health and education authorities on whether to continue or halt in-person classes and be ready to shift to online education if needed.

22. What can staff do to decrease their risk of being infected?

School staff should be protected as much as possible. They should be well equipped to wear face coverings, practice good hand hygiene and physically distance throughout

the day. Adjusting floor plans, classroom layouts and student traffic flows that reduce transmission risk by decreasing close interaction, increasing ventilation and creating physical barriers should be considered. Older and medically vulnerable staff should take extra precautions. The highest risk to staff is from other staff, so eliminating common break rooms and ensuring distancing among staff are important steps to increase safety.