

Emerging Issues for Schools as They Reopen

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COVID-19 UPDATE: Comprehensive testing and evaluation of test results, allowing us to better determine the lifecycle and contamination dynamics of COVID-19, have not been achieved in the United States. Therefore, necessary but disruptive limitations, including school closings, continue. This paper reviews considerations for responsible school facility reopening.

FOREWORD

The date of this publication is important because the extent to which we understand COVID-19 and especially its impact on school systems and children, rapidly changes. Therefore, we will be updating this document. With imminent increased testing and research, our understanding will be enhanced.

For health information, local health, state, federal or international authorities should be considered. This means local municipal, county or parish health departments, state departments of health and/or education, the Centers for Disease Control, the National Institute of Allergy and Infectious Diseases and the World Health Organization.



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District Responsiveness to Local Thresholds of COVID-19

The nature of the incidents of COVID-19 cases in the local community has influenced decisions regarding facilities reopening versus distance learning. This makes sense from a public health and educational perspective and is typically driven by a district's relationship to local public health authorities. The challenge has been when districts must modify their operations, making flexibility of plans important. Districts need to move quickly as local health dynamics change. As a result, schools' relationships with the local public health authority often seem to have become more significant than federal and state policy.

Reopening Challenges

As schools throughout the United States have reopened this fall, several opportunities, concerns, and new perspectives have emerged.

Facility Fresh Air

In addition to personal protection, it's now understood that it is also important that the ambient air in the facility be fresh and the HVAC system able to dilute the SARS-Co-V-2 virus burden. Responsive air exchange significantly complements the value of personal protection such as distancing, face masks, activity limitations, and general personal hygiene.

Success and Failures of School Reopenings in Other Nations

In a number of nations, school facilities were reopened last spring, employing a variety of policies and controls. Responsible research has been completed regarding the outcomes. Some serious failures have occurred, but many reopenings have apparently been successful. It's critical that we continue to learn from these experiences.

Financial Reimbursement Options for American Schools

Potential reimbursement from both public sources and private insurance claims are possible, perhaps probable, but school districts must proactively record and archive their financial losses and unanticipated expenditures. As opportunities for reimbursement evolve, we will attempt to keep school districts informed of emerging financial resources.

Communicating in Crisis

In our work with school districts addressing COVID-19, the most disturbing issue has involved emotion-driven communication challenges. It simply isn't enough for a district to do the right thing; the district must masterfully communicate with and be able to articulately justify its conduct to deeply concerned faculty, students, and public.

Most school administrators are excellent communicators, yet given the technical and medical realities and unknowns of addressing a pandemic, support in technical aspects of a policy and public relations communications challenges may be necessary.

Additional information, resources and white papers addressing the previous four topics are available on our website, ENVRC.org.



What We Believe



If schools follow responsible best public health practices, operational changes can, with difficulty, be put in place allowing controlled reopening of school facilities. We agree with the American Academy of Pediatrics, reopening school decisions must subordinate to our evolving understanding of health and safety risks related to both school facility closure and reopening.

This unique novel virus confused and initially stunned the world's most respected medical virologists and public health epidemiologists. Contradictory messages flowed from respected public leaders and health experts alongside promotions of controversial products and erratic perspectives from bloggers. Amid this confusion there was/is the reality of COVID-19 disease and death.

Today, after nearly half a year of intense analysis, we understand some of the characteristics of exposure to SARS-CoV-2 and preventive approaches to avoid COVID-19 disease. There will always be risk but it can, to a large extent, be controlled through responsible management typically allowing at least partial school facility reopening.

The following considerations are important:

1. Collateral Damage with School Facility Shutdown is Serious

Following the 2002 SARS epidemic, the Centers for Disease Control conducted meta-research involving hundreds of analyses regarding the damage from prolonged school shutdowns. There were serious physical and mental health casualties alongside tragic developmental damage and community disruption. Presumably, the COVID-19 pandemic will continue well into the future and eliminating our established educational infrastructure in perpetuity is unacceptable.

2. Universal Precautions Are Necessary

The public health concept of “universal precautions” must be followed. This means that everyone should be considered capable of contaminating others. Individuals that show no symptoms may contaminate others. The testing protocols we presently employ often provide false-negative results. People can contaminate after negative test findings.

When precautions are established to ensure safety, they must apply to everyone. All human cross-contact should be considered a potential risk and responsible personal conduct and facility management apply to everyone.

3. Identification and Isolation

The infrastructures for both identifying and responding to a COVID-19 are unquestionably effective in restricting contamination. The introduction of cyber-monitoring for identifying contact points may be of special value in schools. Also, the protocols for isolation have become more effective and humane. The reopened schools must have procedures for identifying and temporarily isolating individuals considered at risk. Similarly, if there is parental concern regarding crosscontamination, possibly relating to a vulnerable student or an at-risk adult at home, a protocol for isolation options typically involving remote learning should be available.

4. Hygiene

Insisting upon and vigorously promoting hygiene etiquette is important and is becoming understood and accepted. Clear warnings and hygiene supportive signage along with the self-reporting of potential contamination are important. Some signage examples are available at ENVRC.org.

5. Facility Controls

The rapid spread of contamination in certain facilities, including hospitals and communal living situations, demonstrated that management of the facility, including personal distancing, cleaning protocols, and most especially, controlled ambient air are fundamental to limiting risk. Facility managers can work with options in assuring distancing. This may involve scheduled partial attendance,

seating, movement distancing, and the construction of barriers. There are numerous publications to support the above. Facemasks and personal hygiene guidelines are critical.



The most complex, and potentially the most significant aspects of school facility management involves ambient air controls and the dilution of occupant emissions of the SARS-CoV-2 virus. Over the last six months, research has made it clear that while sanitation-oriented actions such as wiping down potentially touched surfaces are important, the control of personal emissions and ambient air represents the greatest opportunity to limit contamination. This may be a special problem for many school facilities constructed between 1950 and the 1990s.

We initially did not understand the significance of dilution of ambient air in limiting exposures. We have discovered high levels of contamination in buildings where hygienic controls were enforced but mismanaged airflow supported spreading the virus. Similarly, tightly packed groups in outside environments, where ambient air was naturally diluted typically resulted in limited contamination.

In our view, this is a highly significant issue that must be addressed within the school facility to allow reasonably safe reopening. Public health sensitive air handling must be introduced and maintained in the school setting.

Several years ago we published a widely distributed book, the *Renaissance of the American School Building* which strongly promoted enhanced and public health sensitive

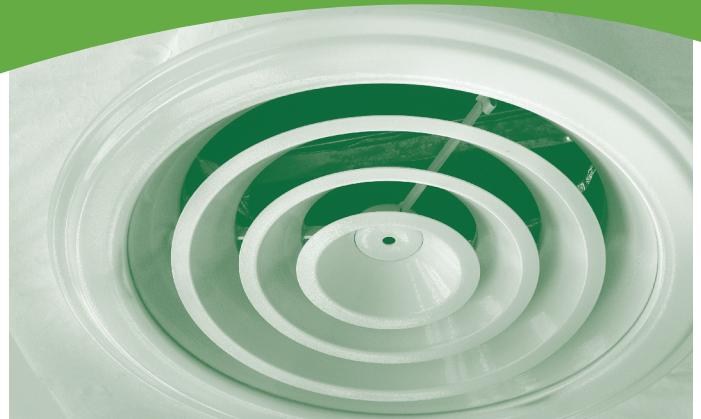
air exchange in modern schools. The incidence of influenza (a viral disease) was much higher in these buildings than the pre-1950s schools with large windows that could be opened and plenums over the door to permit air exchange. Keep in mind that this book was published before the COVID-19 pandemic.

Recent research by industrial medicine researchers at the University of Minnesota have found that simply upgrading air exchange in itself does not necessarily limit the risk of COVID-19 contamination. The use of air purifiers and appropriate diffusion of makeup air into air handling systems needs to be carefully introduced. It is likely that the “sealed-up” construction design of schools built post-World War II will represent the greatest challenge in securing a safe reopened school environment.

6. Relationship with the Public

In June, a survey of parents was conducted asking opinions regarding school re-openings in Texas and there was an almost perfect 50-50 split regarding reopening. It also was clear that most parents trusted the school district to make the right decision. The majority of the public likely will have confidence in the path chosen by the local school district within the parameters of state regulation, **if the decision and procedures are explained.** On-going contact with the public will be important as is a commitment to flexibility if situations and our understandings of risk evolve.

Most districts have experimented with distance learning options and it will be important to share learned experiences within and among school districts. Early on, two major school districts, Arlington, Texas, and Boise, Idaho stated that they would offer an option to parents for selecting in-person or remote learning. In both cases, many parents requested advice from the district to advise them on making their decisions. With advice from the local public health authorities, the district presented the options to the parents along with descriptions of the safeguards they would implement for in-place learning and for responding to changes in the incidents and/or prevalence of COVID-19 in



their local areas. Our impression is that their approach is being well accepted, and makes sense to us from a public health perspective.

It's important to also recognize that the school district is in a position to optimize the sharing of information compatible with the local public health authorities. Local schools represent a trusted and relied upon institution within their community. Working with public health, the school can serve to safeguard, not only students and their families, but the community.

7. Learning Experience

There are two monumental dynamics occurring throughout the world regarding COVID-19, as it impacts the lives of every child. The school can help the student understand these dynamics to great educational benefit.

The first dynamic is the nature of the human immune system and the importance of responsible public health policy. The lives of every student will be profoundly changed because of the characteristics of the pandemic and the demonstrated limitations of our initial public response. The second dynamic is the powerful positive and negative role internet/cyberspace has played in both spreading misunderstanding and promoting enlightenment regarding this complex but critical event.

In our view, it will be the school that can recast the events of both these dynamics in educational patterns that will ultimately enrich students and the public. Perhaps, in a way, this suffering and destabilization may provide something of value to our children as they come to terms with a changing world.

“Fresh Air” and COVID-19 in Schools

A day after a massive outdoor gathering in Minneapolis of protesters Minnesota’s Health Commissioner went public with dire warnings of the imminent spreading of COVID-19 among the tightly packed often unmasked protesters. The state offered immediate emergency COVID-19 testing which many of the socially conscious protesters accepted. There were no unexpected increases in transmission.

Almost simultaneously an epidemic of COVID-19 occurred in a Chicago area hospital that had implemented stringent hygienic controls in terms of wiping down surfaces, enforced use of masks, and social distancing. The difference was the consequence of the contaminated hospital air inhaled verses the fresh outside air to which the protesters were exposed. The virus contaminants had been diluted by fresh air to the point where there had been no observable contamination.

Our natural immune systems simply are profoundly more effective when potential air born toxins are diluted. How the air quality in schools is managed will significantly impact the health and safety of occupants when schools are reoccupied.

Perhaps the most ominous risk in the reopening of American schools will be the limitations of fresh air introduced into school buildings constructed between the 1950s and late 1980s. Before World War II, American schools were constructed with large educator operable windows, radiators and windows over the doors for cross ventilation. Ceilings were elevated, allowing more space per occupant. The result was fresh air deluding burdens of air born toxins in addition to providing a far more comfortable general environment.

With the baby boom beginning in 1946, the rapid construction of needed school property worked to a profoundly lesser standards regarding fresh air. Windows were typically inoperable by educators; air was distributed from a single source. Required “makeup air” thresholds, or the amount of fresh air introduced into the system, were consistently reduced. Beginning at a 50% ratio it was dropped in the 1960s to 33% and then to 10% during

the late 1970s oil crisis. Schools could save money through reduced heating, but the result was unpleasant stale air and a demonstrated increase in the spread of disease, especially influenza viruses—more commonly known as the common cold. Occupants of the new postwar buildings simply got sicker than those in older more sensitively ventilated schools.



The new virus, SARS-Co-V-2, which causes COVID-19, will also be influenced by air exchange. As one public health planner put it, “No matter how much Lysol they rub on railings and doorknobs, bad air will still contaminate.”

Responding to this concern will not be a simple matter of contracting with a heating and ventilation company to increase air exchange. Medical engineers at the University of Minnesota have modeled the results of air exchange and burdens of SARS-Co-2. It’s become clear that simply increasing the flow will not automatically result in safer ambient air. Simply increasing the flow rate can make things worse if not done correctly by creating highly contaminated dead zones.

A public health orientation needs to be inserted into the air quality challenges and design. Many school buildings have been upgraded over the last decade and we are learning how to effectively work with electronic air filters and other devices in rooms in conjunction with systems to purify and better introduce and disperse makeup air.

Having worked with hundreds of school properties regarding health concerns, we believe it is critical that any reopening plan takes air exchange and projected dilution of potential virus burdens into consideration.

COVID-19 Resources

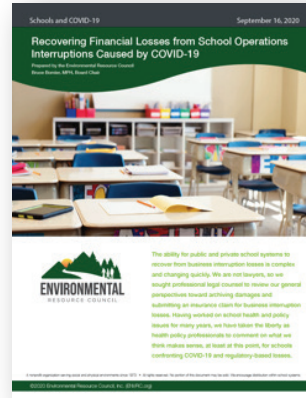
We update our material periodically (including our COVID-19 posters), but as pointed out, it is important to take direction from local, state, federal, and international public health authorities. It's also critical to understand that our insights into the nature of COVID-19 will quickly evolve, and school leadership must be flexibly responsive as we grow in our understanding of the nature and consequent risks and remedies.

This document as well as several other materials and posters are available for download on our website, ENVRC.org, at no cost.

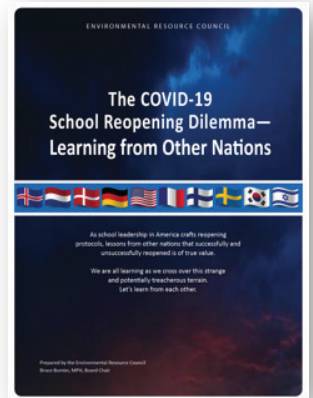
School COVID-19 posters free for download or available for order.



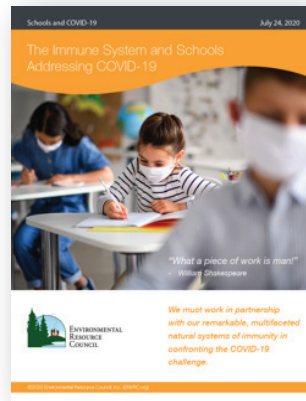
Perspectives on and options for financial recovery from COVID-19 related losses



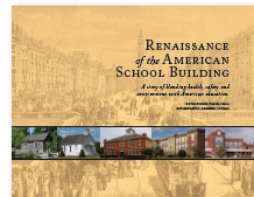
A review of how other nations have managed school re-openings and the results of their approaches



A description of how our natural immune systems compliment school hygiene controls



The communications imperative for school leadership addressing COVID-19



The book, *The Renaissance of the American School Building* can be downloaded on our website.

