

How School Districts Can Lead the Way on Indoor Air Quality

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**Campus Security
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Medicine has long been concerned with the impact of air quality on human health. Medieval doctors hypothesized that “bad air” was the cause of plague epidemics, and in the 19th century, an extended stint in cold, clean mountain air was considered the gold standard “cure” for tuberculosis. While modern science has since disproved many dubious medical claims over the years — drinking mercury is a bad idea — research continues to support the concept that air quality is key to wellness.

Indoor air quality, of course, suddenly became everyone’s concern at the beginning of the COVID-19 pandemic, when workplaces, shops, restaurants, and schools were shut down as part of a strategy to reduce the spread of the virus, which we now know is primarily transmitted by microscopic airborne particles. It has been proven that high-efficiency particulate air (HEPA) filtration can significantly reduce concentrations of disease-causing particles. This finding is particularly relevant at a time when K–12 students across the United States are going back into classrooms even as the virus continues to circulate, possibly at rates as high as they’ve ever been.

Recognition of these ongoing risks is the motivating force behind President Biden’s Aug. 16 fact sheet, “Back to School 2022: Giving Every School the Tools to Prevent COVID-19 Spread and Stay Safely Open All Year Long.” The document lays out the administration’s comprehensive strategy for getting children back in school safely, a top priority as the nation now contends with learning loss and a student mental health crisis as secondary effects of the pandemic. Alongside vaccination and testing, the White House strategy places special emphasis on improving indoor air quality for reducing community spread.

As part of this focus on air quality, schools can receive funding from the American Rescue Plan (ARP) and other federal sources to make indoor air quality improvements. Notably, funding isn’t limited strictly to improvements that help reduce COVID-19 transmission. For instance, in addition to purchases of portable HEPA air filtration units and MERV-13 filters for HVAC systems, ARP funds can be used to buy carbon dioxide monitors and air flow capture hoods, or to service or upgrade HVAC systems to be consistent with industry standards. The criteria, as laid out by the Department of Education, are quite broad, and the funding could be just the thing that many schools need to not only help prevent coronavirus spread, but to significantly upgrade their indoor air quality and protect students from the full gamut of indoor contaminants.

As the EPA’s Clean Air in Building Challenge notes, occupants of a building can be exposed to a variety of non-COVID particles, aerosols, and other contaminants that affect their health. In addition to mild irritations like headaches, sinus congestion, fatigue, nausea, dizziness, eye irritation, coughs and sore throats, unhealthy air is linked to respiratory infections, coronary artery disease, stroke and cancer. It also worsens, particularly in children and the elderly, conditions like asthma and cardiovascular disease.

Between ongoing COVID-19 risks and the mounting evidence around the effects of poor air quality on human health, it’s no wonder that the administration has announced plans to recognize school districts that are leading the way in indoor air quality over the next few months. With the process and criteria still under development, there’s still time for school districts to take advantage of federal funds, shore up their indoor air quality efforts, and get recognized by the Department of Education. Here are some basics to help schools get started on such efforts:

Ventilation: Bringing in clean outdoor air is key. Indoor air moves less than outdoor air, so virus particles hang in the air in greater concentrations. Ventilation strategies that bring in more outdoor air can disperse viral particles and lower the risk of people inhaling them or getting infected through their eyes, noses or mouths. Fans and well-functioning HVAC systems can also play a role by pulling in clean outdoor air and sending it to rooms without windows or good ventilation. For energy efficiency reasons, new buildings are often constructed to seal air in, so to create ventilation either their HVAC systems must be active, or their windows opened. Older buildings, on the other hand, may be less well-sealed but often have outdated air handling systems — or lack such systems altogether.

Air filtration: Using high-quality air filters like HEPA- or MERV-13 filters, connected to capable HVAC systems or portable air purifiers, to remove virus particles from indoor air is another valuable tool to fight disease spread. Filtration can be used to supplement ventilation or, when implemented correctly, to replace ventilation when it's not possible or desirable to open rooms to the outside (e.g., during times of extreme temperatures, wildfire smoke or outdoor air pollution). Schools tend to need filtration equipment as many classrooms are equipped with windows that don't even open at all. In these cases, portable air cleaning devices with powerful fans can make a significant difference in reducing virus particles in the air. HEPA filters, for instance, are at least 99.97% efficient at capturing human-generated particles associated with COVID-19.

Air disinfection: By inactivating airborne viruses through methods like ultraviolet germicidal irradiation (UVGI) systems, schools can add another layer of protection in indoor spaces. UV disinfection technology is particularly useful in crowded areas with poor airflow, in settings with vulnerable populations, or in areas where people aren't wearing masks because they're eating and drinking — all of which describe K-12 schools.

In a portable air purifier, there are a few things to look out for. Of course, the device should be equipped with an H13 HEPA filter, but there are other considerations to be aware of that can impact the performance of the device and the success of your air purification efforts. A strong fan, for instance, is critical to move lots of air, fast, and in turn efficiently purify larger spaces. The noise of the device is also important, as loud purifiers are liable to be shut off on account of being a distraction. There are also features that, while they don't help stop COVID-19 transmission, are nice to have for different reasons, like an activated charcoal filter, which absorbs noxious odors, chemicals and gases, or a negative ion chamber, which revitalizes the air with negative ions. Research has found that exposure to negative ions can improve cognitive performance and promote antimicrobial activity, among other benefits.

In short, ARP funding is a unique opportunity to foster happier, healthier, more productive students, teachers and staff. But it won't be around forever. K-12 school leaders should seize the opportunity now to support and uplift their schools through modern air ventilation and filtration technologies.

Marshal Sterio is the CEO of Surgically Clean Air Inc., a Toronto-based manufacturer of portable systems that purify air by supplementing existing HVAC systems. The company's products are market leaders in dental practices, currently protects over 30,000 dental operatories, thousands of schools and are used by Fortune 500 companies, Major League Baseball clubs, the NBA, the NHL and thousands of other organizations.