CDC school opening guidelines ignore the critical role of ventilation and infection control in classrooms

Benjamin Mateus
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"When the building's air filters do not remove the particles from the air, the occupant's lungs become the filter." —H.E. "Barney" Burroughs, Building Wellness Consultancy

The importance of clean air in schools has been a chronic issue that has developed into a pressing concern. There are significant health consequences for teachers and staff, students and their respective communities as the Biden administration pushes for the resumption of in-person schooling as the COVID-19 pandemic continues.

The US Government Accountability Office (GAO) has found that 54 percent of public school districts require the overhaul or replacement of multiple building systems or features in their schools. It is estimated that around 41 percent of school districts need to update or replace their dilapidated heating ventilation and air conditioning (HVAC) systems, which represents about 36,000 schools across the country.

According to the National Air Filtration Association website, in the section on air filtration for schools, they write, "Every child and school employee should have the right to an environmentally safe and healthy school that is clean and in good repair." They underscored that schools are even more densely populated than a typical commercial building, making the "bio-burden" much more significant and leading to some of the worst air conditions in any environment.

To effectively remove infective particles, the repair or replacement of ventilation systems is critical, but it is only one part of a constellation of measures that must be met before schools are reopened. This includes reducing regional cases of COVID-19 to exceptionally low levels, a vast acceleration of the production and distribution of vaccines to inoculate the population, the establishment of a rigorous, well equipped and trained contact tracing infrastructure that can do rapid testing of individuals and their contacts and, if necessary, close schools and communities to bring the pandemic under control. Until then, schools should remain closed and students taught remotely.

It is highly significant that the recently published CDC guidelines, which claim that schools are safe for in-class instruction, have sidestepped the issue of school ventilation, essentially burying any discussion into hyperlinks and technical jargon aimed at preventing teachers from making the appropriate and essential connections between the mode of transmission of the virus and the need for highly efficient HVAC and filtration systems.

It cannot be emphasized strongly enough how important it was to identify aerosolization as a critical mode of transmission for the SARS-CoV-2 virus. This key understanding helped to explain what was occurring in recent superspreading events, where a few individuals infected many others, even across large rooms.

In an important Lancet article published in July 2020, the author, Dr. Kevin Fennelly, wrote, "These data show that infectious aerosols from humans exist in a wide range of particle sizes that are strikingly consistent across studies, methods, and pathogens. There is no evidence to support the concept that most respiratory infections are associated with primary large droplet transmission. In fact, small particle aerosols are the rule, rather than the exception, contrary to current guidelines." These particles are known to linger in the air for several hours.

This tremendous leap forward in our understanding of the pandemic dynamics confirmed that preventative measures had to address this critical issue: the ventilation of indoor spaces. More precisely, infection control is essential to making schools safe.

Yet, in its push to support the Biden administration's efforts to open schools rapidly, the CDC has altogether negated the nature of aerosolization of the virus. Its guidelines make no mention of these transmission mechanisms. The CDC has nimbly backpedaled to emphasizing respiratory droplets and surface contamination as primary modes of infection. Its schematic makes this evident: universal masking, the physical distancing of six feet when possible, handwashing and respiratory etiquette.

These are by design. The acknowledgment of airborne routes of spread would necessitate ensuring that physical conditions of schools were thoroughly assessed and addressed before approving any reopening plan. A national call to refurbish

school districts' facilities to bring them up to code would be the primary focus over the intervening months as schools shifted to complete remote learning until the fall or when deemed safe. An independent body would be elected to oversee these efforts, and public updates would be held on their progress.

But the Biden administration is doing the opposite. While the rhetoric coming out of the White House may have been altered, the Democratic president is pursuing the same policy as the Trump administration by forcing teachers and students back into the schools so parents can go to work to produce corporate profit.

The guidelines set by the CDC are not based on science and public health needs. In reality, they have been politically manipulated to give the Biden administration and its allies in the American Federation of Teachers (AFT) and National Education Association (NEA) a pseudo-scientific cover to open schools and beat back the resistance of teachers.

Under the CDC guidelines, cleaning and maintaining healthy facilities and contact tracing have been, in essence, promulgated to auxiliary roles. Under the very brief subsection on "cleaning and maintaining healthy facilities," they allow the following few words, "Improve ventilation to the extent possible such as by opening windows and doors to increase circulation of outdoor air to increase the delivery of clean air and dilute potential contaminants."

The absurdity of this proposal can be seen in Philadelphia, where Democratic officials have proposed to install window fans in classrooms, a move that has provoked the ire of educators who have defied back-to-school orders.

The deplorable state of many of these HVAC and filtration systems is the result of insufficient funding. Whatever pittance Biden and the Congress provide to schools, it will not overcome the decades of bipartisan budget cuts, including under the Obama-Biden administration. While both parties handed trillions to Wall Street, they intend to continue the systematic defunding of public education and the diversion of public funding to for-profit charters and other school privatization schemes.

More than just requiring highly efficient HVAC systems, ventilation rates need to be calculated for the type of activities that are taking place in classrooms. Additionally, to ensure there is adequate ventilation that reduces the risk of transmission, schools must limit the number of people that can occupy that space.

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) is also recommending doubling air exchanges per hour from three to six to ensure as much of the particulates in the air are removed. HVAC systems need to be able to accommodate the demands placed on them by high-rated filters that are very effective in preventing the passage of microscopic particles from being recirculated back into the classrooms.

Another key to having efficient well-working systems requires hiring trained technicians who can make necessary inspections and maintenance. Untrained technicians may close air dampers to adjust for excessive hot or cold days, impacting their ability to conduct appropriate air exchanges for class sizes. Sometimes these dampers are left closed for years.

Necessary and immediate steps for infection control, per ASHRAE, include assessing and repairing existing HVAC units, installing carbon dioxide (CO2) sensors in classrooms and providing MERV 13 filtration or better where feasible.

CO2 is exhaled along with aerosols containing SARS-CoV-2 if the person is infected and contagious. The measurement of CO2 levels can be a proxy for the in-door concentrations of SARS-CoV-2 levels. Studies have been conducted on classroom CO2 levels by using activity-dependent settings to ensure adequate infection control and a measure of proper ventilation.

Research from around the world has found that carbon dioxide levels in classrooms are notoriously high. "Poor ventilation is an age-old problem that pre-dates the current COVID-19 crisis. Many classrooms did not have HVAC units operating at the minimum required ventilation rates even before the pandemic," said Christopher Ruch, director of training at the National Energy Management Institute. "The benefits of adequate ventilation, including reduced absenteeism, improved cognitive retention, and improved productivity, have been well documented in multiple publications. This issue needs to be addressed regardless of the COVID-19 pandemic."

A more recent 2019 study of California schools found that in 85 percent of 94 newly installed HVAC systems in K-12 classrooms did not provide adequate ventilation, meaning fresh outdoor air was not coming into rooms. This detrimentally impacted student performance, respiratory health, leading to missing classes, as well as transmitting airborne diseases.

As the Los Angeles Unified School District and the United Teachers Los Angeles maneuver to bring students and teachers back to the classrooms, these same districts face funding shortages for these necessary upgrades. Low-income students are more likely to attend schools with crumbling infrastructure and poor air quality. This will only further exacerbate the community transmission.

The Biden administration intends to throw tens of millions of children and teachers into 120,000 school buildings five days a week. The assertion that schools are safe havens and that children are low risk are bald lies repeatedly being hurled at the working class. Teachers must arm themselves with the correct information and fight against this criminal enterprise.