

## To safely reopen schools, we have to talk about indoor air quality and ventilation

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**A**s counties across California look to reopen schools for onsite instruction, education and public health officials need to ask themselves a very important question: Have we made sure all schools and classrooms have adequate fresh air ventilation to reduce coronavirus transmission? If the answer is no, students and staff will get sick.

Some help emerged from Sacramento last week: the Governor signed [Assembly Bill 841](#), which will tackle a slice of this. The bill creates the School Reopening Ventilation and Energy Efficiency Verification and Repair Program, directing upwards of \$600 million in energy efficiency funding to test, adjust and repair heating, air conditioning and ventilation (HVAC) systems in public schools over the next three years.

Our public school facilities are on the front lines of this pandemic. Physically closing school buildings in March was a necessary and swift tool for “extreme” physical distancing to combat Covid-19. We were instructed to keep space between each other and to sanitize frequently touched surfaces and our hands regularly. Six months into this pandemic, we’ve learned a great deal about the SARS-CoV-2 virus and how it transmits. We now know this virus can spread through the air.

With an airborne virus, the absolute riskiest places for groups of people are indoor environments that have very poor fresh air ventilation. This describes thousands of public school classrooms across California.

To reduce risk of spread when someone with Covid-19 enters the school building, school districts are being advised to increase levels of surface cleaning, ensuring frequent hand washing for students and staff, conducting daily symptom screening, requiring mask wearing, employing space utilization to physically distance students and staff, and ensuring higher levels of indoor air ventilation and filtration. Local school leaders are devising protocols and operations plans for each of these mitigation measures to their best of their ability. Researchers in the healthy buildings program at Harvard note in their risk mitigation guidance to schools, “Although it is unlikely that any given school will be able to incorporate every recommendation, we want to emphasize that these strategies work together as part of a multi-layered plan to reduce exposure and limit transmission of Covid-19 in schools.”

But when the California Department of Education’s school reopening guidance to schools was written (back in June), we didn’t yet understand how pervasive airborne transmission is. Everybody thought a main way it spreads is by touching a doorknob that an infected person sneezed on. But the science is clearer every day: surface transmission risk was exaggerated and airborne (known as aerosol) risk was under-estimated. In early August, a prominent aerosol specialist at the University of Colorado-Boulder, looked at the research and estimated that aerosols make up about 75% of transmissions. In a high profile July 2020 open letter to the WHO, 239 scientists from around the world argued that mounting evidence supports high transmission through aerosol particles. The letter called on the WHO and other leading health entities to take airborne transmission more seriously and to adjust their recommendations accordingly.

Why does this matter for California schools? Because we have plenty of evidence that thousands of California schools already have poor indoor air quality and will likely not be able to improve fresh air ventilation without making time-consuming and costly repairs.

Over the past decade, indoor air quality specialists from the Lawrence Berkeley National Laboratory and UC Davis have consistently found that many public school classrooms in California fail to meet fresh air ventilation standards. In a 2013 study, Lawrence Berkeley researchers found that the majority of classrooms they visited — included 95% of the Central Valley classrooms they studied — were not adequately ventilated. In a joint 2020 study, Lawrence Berkeley and UC Davis researchers found that only about 15% of classrooms they studied met the state's ventilation standard. That is not a typo.

Left unaddressed, these findings call into question the wisdom of reopening schools for face-to-face instruction inside classrooms.

How did the world's 6th largest economy find itself in this situation? In 2018, Stanford researchers reported that state funding for K-12 facilities has fallen dramatically since 2008 and wide disparities exist in school facility funding exist from school district to school districts that are related to the wealth of local communities. If you don't properly maintain and upgrade buildings, problems occur.

The bill has come due for California to attend to its school facilities problems — problems that this pandemic has laid bare. A 2020 study by the Public Policy Institute of California found that statewide, 38% of students go to schools that do not meet the minimum facility standards.

The passage of AB 841 will help. But keep in mind that it's a drop in the bucket compared to the needs out there; \$600 million won't go that far across California's 10,000 schools and their countless buildings. State coffers for school facility modernization work are otherwise empty — voters rejected the March 2020 statewide bond. At least for now, the vast majority of the burden for ensuring healthy school buildings will fall on local school districts.

On the horizon is potential help from Washington, D.C. The House just passed the Heroes Act 2.0, which includes \$5 billion to support emergency facilities repairs for schools to address coronavirus-related needs nationwide including allowable uses for improving sanitation, personal hygiene, air quality, hand washing stations, outdoor spaces and purchasing personal

protection equipment. But it's still a long and questionable road to getting this bill through the Senate and approved by the White House.

Fixing the pervasive problems in our public school facilities will require long term action. If we're going to get kids and teachers back in classrooms, job one has got to be improving fresh air ventilation to reduce the spread of the Covid-19 virus.

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