School Infrastructure and Its Impact on Childhood Asthma

Population Health Sciences

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School should be a place for children with asthma to learn, socialize, and play freely, without fear of triggers, just like their peers. However, a history of underinvestment in school infrastructure means that in many areas, including here in Philadelphia, many school buildings are old or in need of structural repair. Exposure to molds, dust, and pests can exacerbate asthma symptoms for students while creating challenges for the entire school community.

Asthma is the most common chronic disease of childhood, affecting nearly 5 million children in the United States and accounting for over 700,000 emergency room visits per year. We often talk about asthma as a cause of missed school days, particularly for kids with uncontrolled symptoms. When I started my training as a pediatrician, I thought that if we could improve a child's asthma, we could get them back to school. But through my conversations with patients and learning more about the issue locally, I have come to better understand how kids miss school because school itself may be triggering their asthma.

One of my teen patients shared that she had stopped going to in-person school altogether because she had so many asthma flares when attending in-person. Unfortunately, she's not the only patient I have who has opted for online or home schooling due to uncontrolled asthma. And the research bears this out, demonstrating an association between school exposure and childhood asthma morbidity.

To fully combat childhood asthma, it is crucial to address environmental triggers where children spend most of their time, including schools.

Targeting the built environment to help mitigate asthma triggers

PolicyLab research has shown the promise of targeting environmental triggers in a child's home to reduce asthma-related hospitalizations and health care costs. CHOP's CAPP+ initiative eliminates mold and other triggers inside West Philadelphia houses. The impact of CAPP+ on the lives of the families that it has served is just one example of how home-based environmental interventions can have a positive impact on asthma.

Similar interventions targeting asthma triggers in the home have found success in reducing asthma morbidity and provide a framework for extending this type of community-based asthma management to other places where children spend their time—especially schools.

Research has shown that poor school infrastructure is associated with health outcomes in children with asthma. Structural school repairs to eliminate asthma triggers, akin to home-based repair interventions that have already been studied, may help mitigate asthma disease burden.

Opportunities for decision-makers at different levels

School infrastructure is one important area that stands to significantly impact childhood asthma morbidity, and improving it requires addressing the historic and ongoing underinvestment in public school systems. Additionally, there are policies at the state and local level, alongside collaborations between community organizations and school systems, that provide opportunities to leverage schools for child lung health.

For school administrators, partnering with community organizations dedicated to child environmental health and asthma can help to improve asthma at schools. Some opportunities include:

1. **The Environmental Protection Agency's (EPA) Indoor Air Quality "Tools for School" Action Kit**

   The EPA has developed a framework for school indoor air quality management that has been implemented in thousands of schools nationwide. The "tools for schools" action kit provides schools with a plan to improve indoor air problems related to mold, radon, pests and other parts of the school environment that impact asthma.

2. **The American Lung Association's Open Airways for Schools (OAS) Program**

   OAS is an evidence-based educational program for children ages 8 to 11 provided at schools. It teaches children with asthma how to avoid triggers, detect warning signs and seek treatment. Schools can have their staff, like school nurses, get trained as OAS facilitators. While this program does not improve infrastructure, it can help support students with asthma while at school.

3. **The Philadelphia Regional Center for Children's Environmental Health (PRCCEH)**

   PRCCEH provides resources for educators and school leaders, as well as parents and child care providers, to help mitigate the impact of environmental risks to child health.

There is recent and ongoing research evaluating other innovative asthma care strategies that leverage the school system, including asthma-focused community health workers in West Philadelphia schools.

Further opportunity to create healthier schools exists just outside the building walls, too. In urban areas, a substantial proportion of schoolyards is asphalt lots. Transforming asphalt urban schoolyards into green parks with tree canopy is one way cities can improve community well-being, including asthma. A 2022 PolicyLab study investigated the association between neighborhood greenery and asthma exacerbations and found that tree canopy could be protective for children with asthma. Beyond asthma health, greener schoolyards could serve as public parks, which may help advance overall child physical health, mental health and neighborhood safety.

Policies at the state and local level can intervene on a larger scale. There has been activity in the Pennsylvania legislature to invest in improvements to public spaces (including schools), and to task the state Department of Education with conducting analyses of all public school facilities and provide funding to address identified issues. Policies like these, along with adequate funding, to support school infrastructure could meaningfully improve childhood asthma. Action at all of these levels may have a chance to meaningfully improve childhood asthma.

Learn more about CHOP's Leadership in Equity, Advocacy, and Policy Track.

Correction: An earlier version of this blog post incorrectly listed exposure to asbestos as a trigger for asthma, and asbestos remediation as a mitigation opportunity.