

Asthma and Indoor Air Quality in Schools

A nationwide survey of school facilities found that California ranked last, having more unsatisfactory environmental conditions in schools than any other state.

— U.S. Government Accountability Office

“Students in my district are hospitalized three times more often than students in other districts in the county. I knew something had to be done, so I chose to focus on policy change. Policies that support children’s health are the driving force behind everything that I do.” — Laurie Bauer, RN, MSPH, District Nurse, Ravenswood City School District



Why Should We Be Concerned About Indoor Air Quality in Our Schools?

Asthma is the most common chronic disease among school-aged children and is a leading cause of school absences nationwide.¹⁻³ In California more than 6 million children attend the state’s public schools.^{4,5} During their time at school, children can be exposed to poor-quality indoor air, which can trigger asthma attacks, cause headaches, irritate the eyes, nose, and throat, and reduce the ability to concentrate—leading to missed school days and decreased performance.⁶⁻⁸ Many schools across the country and in California have been found to have poor-quality indoor air and other conditions, such as inadequate ventilation, that contribute to a poor-quality indoor environment.⁹⁻¹⁷ For example, one study found significant problems in California’s classrooms, including poor ventilation, poorly regulated temperature and humidity, air pollutants, floor-dust contaminants, and excessive moisture and mold.¹⁷

What Are the Major Indoor Air Quality Problems in Schools That Are Affecting Children with Asthma?

Research conducted in California and throughout the U.S., as well as in other countries, has connected poor-quality indoor air in schools to health problems, including asthma.

Ventilation

Inadequate ventilation contributes to poor-quality indoor air and is associated with negative health effects such as respiratory illnesses, allergies, and asthma.^{14,18-22} In addition, children in classrooms with inadequate ventilation miss more school²³ and perform less well on schoolwork and standardized tests. A number of studies in California and elsewhere have documented the widespread prevalence of inadequate ventilation in school classrooms. In fact, one study found that ventilation with outdoor air was inadequate during 40 percent of classroom hours in California. There is evidence that improving ventilation by replacing and upgrading ventilation systems improves air quality and provides health benefits.

Moisture and mold

Mold, bacteria, and dampness on surfaces or damaged materials in schools have been significantly associated with respiratory symptoms such as wheezing, coughing, or exacerbation of asthma, as well as development of allergy. Moisture-related problems can result from leaks under sinks, in roofs, and under floors or behind walls. Studies in California and elsewhere in the U.S. suggest that moisture-related problems are common in schools. One study of California’s schools found that 21 percent of portable and 35 percent of traditional classrooms had visible water stains on their ceilings. Research suggests that repairing moisture damage can improve children’s respiratory symptoms.

Finishes, furnishings, and cleaning and teaching products

Volatile organic compounds, or VOCs, are respiratory irritants emitted into the air by cleaning products, building and interior finish materials, furnishings, and some teaching supplies such as paints and markers. Exposure to VOCs in classrooms and other indoor environments has been linked to exacerbation of asthma and other respiratory symptoms. For example, one study found that schools with higher concentrations of formaldehyde or other VOCs had more students with current asthma. Recent studies throughout California have found high concentrations of formaldehyde and other VOCs in the air in a sample of traditional and portable classrooms. Research suggests that using building and interior finishing materials with low-VOC emissions can reduce the concentration of VOCs in classrooms. Additionally, cleaning products that contain bleach or are lemon- or pine-scented are of particular concern because they are commonly found in schools, and they emit chemicals that have been linked with respiratory symptoms and asthma.

Dust

Allergens and toxins can collect in dust on surfaces in schools. Dust in schools has been associated with increases in allergic sensitization, asthma symptoms, and asthma medication use. In schools, dust is found on surfaces such as bookcases and smooth flooring, as well as in carpets, rugs,

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curtains, and upholstered furniture. Carpets and rugs tend to increase air-quality problems: studies have reported that allergen levels in dust were higher in carpets and rugs than on smooth floors.

Pesticides

To date, few studies have investigated the link between pesticides and children with asthma. However, a growing consensus has developed over the last several years among health and school professionals, public and community health advocates, and even many legislators that school pesticide use can affect children's health. A study of portable and traditional classrooms in California found a number of pesticide residues in classrooms. Given what is known about the health risks of pesticides—for example, exposure can harm the nervous system—and concern about how pesticides may affect asthmatic children, many advocates are promoting the use of less toxic or nontoxic alternatives at schools.

What Can Be Done About Environmental Triggers in Schools?

Community Action to Fight Asthma (CAFA) is a network of asthma coalitions in California working to shape local, regional, and state policies to reduce the environmental triggers of

asthma for school-aged children where they live, learn, and play. A few examples of local and state policies related to environmental triggers in schools include the following:

- Create and enforce protocols to prevent and address indoor air quality problems.
- Increase resources for school facility maintenance and repair.
- Ensure that schools meet standards for ventilation and for the prevention and remediation of moisture intrusion.
- Require the use of building materials and furnishings that have low VOC emissions.
- Establish practices and protocols for reducing the presence of environmental triggers in schools by restricting the use of unhealthy cleaning supplies.
- Promote the use of integrated pest management to reduce children's exposure to potentially harmful pesticides at school.

Please visit our website at www.rampasthma.org to learn more about Community Action to Fight Asthma, connect with local coalitions, locate asthma resources across California, and sign up for our e-newsletter.

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