

Air Quality Affects Early Childhood Development and Health

Learn how communities are taking practical steps to support children’s development, health, and well-being.

Clean air is an essential part of a healthy developmental environment, and ensuring that all of us have clean air to breathe in all the spaces where we spend time—indoors and out—offers a vital opportunity to support children’s healthy development.

Beginning before birth, children’s health and development are powerfully affected by influences from their developmental environment—including the air they breathe—with implications for their lifelong health and well-being. Babies and young children are not only exposed to more indoor air pollutants, but they are also more affected by this pollution than most adults because they breathe more rapidly and inhale a larger volume of air relative to their body size. And, their respiratory, reproductive, endocrine, immune, digestive, and neurological systems are still developing.

The flip side of this increased sensitivity is the powerful opportunity it presents to support healthy development by improving indoor air quality during pregnancy and early childhood. Practical, actionable solutions exist, and many communities are already successfully implementing such strategies with positive effects. **The examples that follow provide insights on how policymakers and community leaders can take steps to improve indoor air quality—with broad benefits for children, their caregivers, and public health overall.**

IN THIS SOLUTIONS SPOTLIGHT

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Improving Indoor Air Quality and Supporting Healthy Development



Eliminating Children’s Exposure to Diesel Emissions

[The Healthy Air Is Healthcare campaign](#) is helping rural and low-income school districts in Georgia make the switch from diesel to electric buses. Providing electric buses for students to ride to school can reduce exposure to toxic diesel emissions, which can affect children’s developing biological systems and lifelong health. The campaign provides health care professionals with support and resources to help them advocate for electric buses in their local school districts, recognizing that health care providers are often trusted members of their community. To help secure funds, Healthy Air Is Healthcare also supports everything from technical needs to grant writing. **As of November 2024, 20 school districts in Georgia have secured funding for electric school buses.**



Reducing Indoor Air Pollutants in Childcare Centers

Particulate matter (PM) exposure has been associated with a number of adverse health effects, including worsening of asthma in children. To help improve air quality at childcare centers, the Philadelphia Department of Public Health distributed 8,330 [portable air filters](#) to centers in neighborhoods burdened by higher levels of pollution. The department also trained staff on the benefits of air filters, to encourage their use, and ensured the providers knew when and how to correctly replace the filters. A 2023 study found that the air filters significantly reduced indoor levels of fine PM (PM2.5) at the Philadelphia centers. Efforts are now underway to replicate the project on a larger scale. **Reducing PM exposure in childcare centers—as these filters do—supports children’s health in the moment and across their lifespan.**



Identifying Air Quality Issues in Classrooms

One key step toward improving indoor air quality is understanding what substances are contaminating the air in a given space. In 2022, Boston Public Schools launched a project to [install indoor air quality sensors](#) in all schools across the district. These cost-effective sensors provide real-time data on measures like air particles, carbon dioxide, and carbon monoxide in classrooms. The data allows schools to quickly identify, review, and respond to indoor air quality issues. As a result, the district has repaired ventilation systems, identified activities that may be worsening indoor air quality, such as spraying aerosols, and increased ventilation during busy school events, among other actions. Teachers have also been empowered to monitor the data, which is posted on a public dashboard, so they can report issues in their classrooms and make adjustments. **Children spend a significant amount of their time at school, so improving classroom air quality is an impactful way to support lifelong health and well-being.**

Policy Snapshots: More Examples of Solutions in Action



In Minnesota, a [law requires](#) diesel school buses to park and load away from school air intake systems and limit idling as much as possible. This law helps prevent diesel fumes from worsening the air quality inside schools.



[A coalition in California](#) has distributed more than 1,000 air filters to Bay Area homes to help reduce the health impacts of wildfire smoke. The coalition recognizes that not everyone is impacted by wildfire smoke equally, so it focuses its efforts on children and adults with asthma.



New schools in New York must be built at least [500 feet away from a highway](#) to help reduce children’s exposure to air pollution. Exceptions are made in New York City, but those schools are required to install filtration systems.

→ Read the full paper

For the full paper on which this guide is based, see [Air Quality Affects Early Childhood Development and Health](#)

Additional sources consulted in the creation of this Solutions Spotlight:

[2024 Minnesota Statutes](#) – Minnesota Legislature

[Electric School Buses Drive Progress on Climate Solutions in Georgia](#) – Drawdown Georgia

[Electric School Buses for Healthier, Quieter Rides to Schools](#) – Mothers and Others for Clean Air

[Hochul signs law inspired by I-81 in Syracuse to ban new schools near highways](#) – Syracuse.com

[Indoor Air Quality Sensor Dashboard](#) – Boston Public Schools

[Is Your School District Ensuring a Clean Ride for Kids?](#) – Mothers and Others for Clean Air

[Portable air filters in daycares can reduce indoor pollution by 83%: Study](#) – Environmental Health News

[Providing Free Air Cleaners & Asthma Education to Address Health Disparities](#) – Public Health Institute