CARB

October 2025

Benefits of Air Filtration in Elementary Schools

The Issue

Children living in communities overburdened with major air pollution sources are often disproportionately exposed to fine particulate matter ($PM_{2.5}$). While numerous studies link air pollution exposure and adverse lung health in children, there is limited evidence on the specific health benefits of improved air filtration in school environments.

To address this gap, the California Air Resources Board contracted with researchers at the University of California, Irvine, to evaluate the impact of using portable air cleaners in elementary school classrooms. Their study focused on communities in southern Los Angeles (LA) County near the Port of LA, which is an area significantly affected by air pollution.

The Method

During the 2022 to 2023 school year, elementary schools in Carson, Torrance, Harbor City, and Lomita received portable air cleaners as part of this project. Many classrooms already had HVAC systems equipped with Minimum Efficiency Reporting Value (MERV-13) filters prior to the project. Researchers monitored $PM_{2.5}$ levels in these classrooms and compared the effectiveness of portable air cleaners with and without HEPA-level filtration.

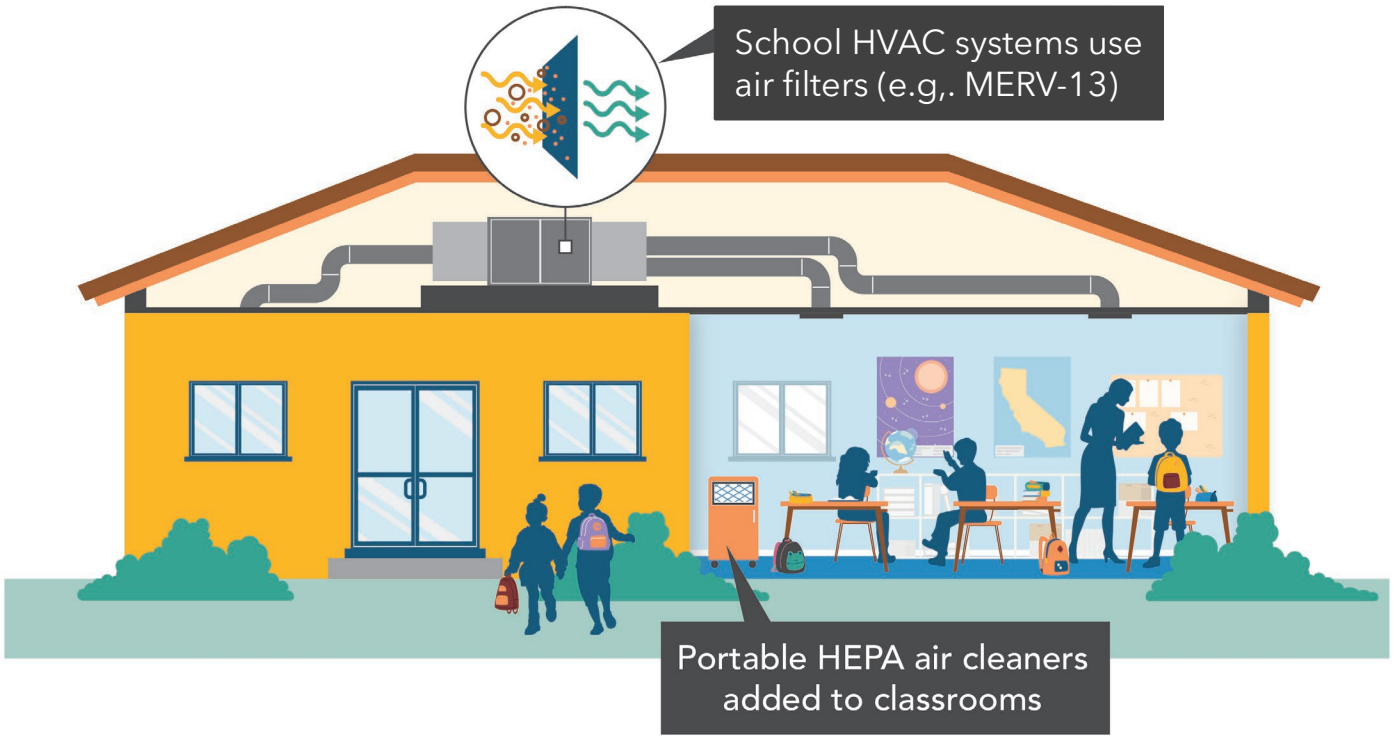
Key Findings

- The findings showed that using portable air cleaners with HEPA-level filtration in classrooms can reduce $PM_{2.5}$ levels by an additional 40% beyond the reductions achieved with HVAC MERV-13 filters alone.
- Additionally, classrooms in permanent buildings had average $PM_{2.5}$ levels approximately 20% higher than those in portable buildings, highlighting potential differences in ventilation performance between building types.

The Conclusions

The results generally support the benefits of enhanced air filtration in classrooms for reducing $PM_{2.5}$ exposures. Specifically, the project demonstrates that adding portable air cleaners with HEPA-level filtration to classrooms that are already equipped with HVAC MERV-13 filters can further reduce exposure to $PM_{2.5}$.

While the project did not find sufficient evidence to directly link improved air quality with student attendance and health outcomes, it clearly shows that meaningful air quality improvements are achievable in school classrooms, particularly in overburdened communities disproportionately affected by air pollution.



More Information

This is a summary of contract 20RD015. It ended in October 2025. This project was conducted independently and not in connection with any regulatory proposal or other action considered by CARB. Visit CARB Research or contact the Research Division for more information.