



December 5, 2022

The Honorable Michael Regan
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Mail Code 1101A
Washington, DC 20460

RE: Request for Information: Better Indoor Air Quality Management To Help Reduce COVID-19 and Other Disease Transmission in Buildings: Technical Assistance Needs and Priorities To Improve Public Health: Docket ID No. EPA-HQ-OAR-2022-0794

Dear Mr. Regan:

On behalf of the Asthma and Allergy Foundation of America (AAFA), the leading patient organization advocating for people with asthma and allergies, and the oldest asthma and allergy patient group in the world, I am writing in response to the Environmental Protection Agency's (EPA) Request for Information: Better Indoor Air Quality Management to Help Reduce COVID-19 and Other Disease Transmission in Buildings.

The COVID-19 epidemic has brought indoor air quality into the spotlight. The recent White House Indoor Air Quality Summit organized by the White House COVID-19 task force noted there are additional benefits to addressing indoor air quality (IAQ) beyond COVID-19, including for conditions like asthma. AAFA was invited by the task force to attend this meeting and present the ancillary benefits of improved IAQ. At AAFA, we have long advocated for improved indoor air quality due to the ongoing impact of indoor air on the health of people living with asthma and allergies. People spend an average of 90% of their time indoors and, according to the EPA, indoor air is more polluted than outside air.¹ Evidence also shows that poor indoor IAQ increases risks of severe asthma attacks and allergic

¹ <https://www.epa.gov/iaq-schools/why-indoor-air-quality-important-schools#:~:text=EPA%20studies%20of%20human%20exposure,times%20E2%80%94%20higher%20than%20outdoor%20levels>.



reactions.² To address some of the persistent disparities in asthma's impact on children and adults in the United States,³ we must address the factors creating and exacerbating risk.

While AAFA advocates for the highest standard of indoor air quality in all buildings, for the purposes of this RFI, our comments will focus on indoor air quality in schools.

The Importance of Indoor Air Quality in Schools

Clean air in every school should be a national priority for all K-12 schools and childcare facilities. Improving IAQ in schools is especially important. Since children spend much of their time in the school environment, school indoor air quality can significantly influence their respiratory health. According to the EPA, approximately 53 million children and 6 million adults in the United States spend a large portion of their days in schools.⁴ Research links key environmental factors to health outcomes and students' ability to perform. Improvements in school environmental quality can enhance academic performance, as well as teacher and staff productivity and retention.

Poor indoor air quality is a particular health concern for those with asthma and allergies because indoor triggers increase the risks of severe asthma attacks and allergic reactions.⁵ Nearly one in 13 school-aged children have asthma, which is the leading cause of school absenteeism due to chronic illness. There is substantial evidence that indoor environmental exposure to allergens (such as dust mites, pests, and molds) plays a significant role in triggering asthma symptoms, and these allergens are common in schools.⁶ Other factors that contribute to poor indoor air quality in schools include:

² Tiotiu AI, Novakova P, Nedeva D, Chong-Neto HJ, Novakova S, Steiropoulos P, Kowal K. Impact of Air Pollution on Asthma Outcomes. *Int J Environ Res Public Health*. 2020 Aug 27;17(17):6212. doi: 10.3390/ijerph17176212. PMID: 32867076; PMCID: PMC7503605.

³ Asthma and Allergy Foundation of America, (2020). [Asthma Disparities in America: A Roadmap to Reducing Burden on Racial and Ethnic Minorities]. Retrieved from aafa.org/asthmadisparities

⁴ Environmental Protection Agency. Indoor Air: Improve Indoor Air Quality in Schools. http://www.epa.gov/airquality/community/details/i-schools_addl_info.html

⁵ Environmental Protection Agency. Questions about your Community: Indoor Air. <http://www.epa.gov/region1/communities/indoorair.html>

⁶ Environmental Protection Agency, About IAQ Schools. <https://www.epa.gov/iaq-schools/about-iaq-schools>



- **Poor Ventilation & HVAC Systems** – Inadequate ventilation results in high levels of harmful airborne particulates and carbon dioxide levels. It also leads to mold and bacteria growth.
- **Aging Buildings** – Many school buildings have not been updated for decades. As a result, many schools have problems with leaks, water damage and excessive moisture – which lead to dust, mold and other airborne irritants that contribute to poor indoor air quality.
- **Schools Located Near Sources of Pollution** – Schools that are located in busy cities or near highways or highly trafficked roadways face significant fumes from exhaust and gases like carbon monoxide. Like other factors affecting school indoor air quality, school location plays a role in exacerbating racial and ethnic disparities in asthma for children. For example, 15% of schools serving mostly children of color are near major roads, compared to only 4% of schools serving predominantly white students.⁷

The aging infrastructure of our public school system is one of the top causes of poor IAQ in schools. In 2017, the American Society of Civil Engineers (ASCE) gave U.S. public schools a D+ on its Infrastructure Report Card. Annual funding to maintain school buildings falls about \$38 billion short. The report card notes that 53% of the nearly 100,000 public school buildings need repairs, renovations, and modernizations just to be considered in “good” condition. School districts with more low-income and minority children are more likely to report their school buildings as being in “poor” or “fair” condition.⁸

AAFA periodically releases our *State Honor Roll™ of Asthma and Allergy Policies For Schools*: a report that checks how every state compares against 23 key public policies for people with asthma, food allergies, anaphylaxis and related allergic diseases in U.S. elementary, middle and high schools. Four of the core public policy standards relate to school environment and IAQ. Unfortunately, even prior to the COVID-19 pandemic, the 2019 State Honor Roll™ report identified significant

⁷ Hopkins, J.S. (2017, February 17). The invisible hazard afflicting thousands of schools. Center for Public Integrity. <https://publicintegrity.org/environment/the-invisible-hazard-afflicting-thousands-of-schools/>

⁸ <https://2017.infrastructurereportcard.org/>



policy gaps related to indoor air quality requirements in schools. Only 11 states met all four of AAFA's recommended standards related to IAQ.⁹

We therefore offer the following suggestions in response to the RFI:

3.1 In your opinion, what approach(es) could the Federal government consider deploying to move decision makers/owners/managers toward making and sustaining improved ventilation, filtration, and air cleaning practices to reduce the risk of disease transmission?

AAFA supports several steps that the EPA has already taken to advance clean air in schools, including:

- Releasing the [IAQ Tools for Schools Action Kit](#) which helps schools improve indoor air quality.
- Providing technical assistance
- Identifying IAQ champions
- Sharing critical information and best practices through the School IAQ Network
- Releasing the "Clean Air in Buildings Challenge," a call to action and a set of guiding principles and best practices to assist building owners and operators with reducing risks from airborne viruses and other contaminants indoors.

However, despite these efforts, poor air quality in schools persists, particularly in many low-income communities. A 2020 US GAO report found tens of thousands of schools needed updated or all new ventilation systems.¹⁰

It is time for a more robust system of strategies that would encourage schools to improve indoor air quality and recognize the schools that invest and improve in their indoor air quality. AAFA supports a comprehensive, public-private

⁹ Asthma and Allergy Foundation of America, (2019). [2019 State Honor Roll of Asthma and Allergy Policies for Schools]. Retrieved from aafa.org/advocacy/state-honor-roll/

¹⁰K-12 Education: School Districts Frequently Identified Multiple Building Systems Needing Updates or Replacement; GAO-20-494 Published: Jun 04, 2020. Publicly Released: Jun 04, 2020, found at <https://www.gao.gov/products/gao-20-494>



partnership to achieve this goal. A combination of strategies and incentives should be explored. We recommend that EPA consider the following:

- The Administration should convene a multi-agency task force to closely coordinate policies to improve indoor air quality in schools. EPA, the Department of Energy, the Department of Education, CDC and other agencies should better coordinate to advance a more effective system of policies to improve indoor air quality in schools. For example, the Coordinated Federal Action Plan to Reduce Racial and Ethnic Asthma Disparities has successfully focused support for community-level interventions on the preventable factors, including indoor environmental exposures, that underlie persistent and pervasive disparities in asthma outcomes. A similar multi-agency task force should be created to focus on coordinating federal strategy and policies related to indoor air quality in schools.
- EPA should convene a group of expert advisors to regularly update science-based guidelines and standards regarding indoor air quality in schools and to explore the merits of a certification program for schools that achieve a certain level of compliance with standards and guidelines. **Such a** program could grant an EPA-recognized status to a school that meets predetermined, standardized criteria, and regularly meets requirements for recertification.

Understanding, acting effectively on, and evaluating IAQ remains exceedingly difficult and at times highly controversial. Certification has great potential to improve the assessment and improvement of indoor air quality. Achieving certification—and widespread publication of those schools that are certified—would help improve awareness about indoor air quality in schools and empower parents with information to engage with their school system.

Critical to the development of any certification program would be the need to implement the program equitably and to help those schools in most need. In AAFA's 2020 report, "Asthma Disparities in America: A Roadmap to Reducing Burden on Racial and Ethnic Minorities," we note that racial and ethnic inequality in education today is rooted in the



country's history of systemic racism and racial segregation.¹¹ Policies and practices to reduce the racial education gap, increase achievement and opportunities for minority children, and ensure healthy environments in schools have the potential to reduce health disparities, especially for children with asthma, but these policies and practices must be implemented carefully and equitably.

3.2 In your opinion, what are the near-term indoor air quality related actions that could help schools respond to a COVID-19 disease surge? What specific supports for improving indoor air quality could be helpful to the school community?

Fortunately, the American Rescue Plan Act included funds that can be used to improve indoor air quality in schools. ARPA provided a total of nearly \$122 billion to State educational agencies (SEAs) and local educational agencies (LEAs) to help schools return safely to in-person instruction, maximize in-person instructional time, sustain the safe operation of schools, and address the academic, social, emotional, and mental health impacts of the COVID-19 pandemic on students. Maintaining healthy facilities and improving ventilation are permitted uses of ARPA funds. Because of the crucial importance of healthy school air not only regarding COVID-19 but also for the millions of American children with asthma, ARPA funds have been critical to improving indoor air quality in schools.

The Department of Education recently released information, "Improving Ventilation in Schools, Colleges, and Universities to Prevent COVID-19."¹² The information outlines ways in which education funds from ARPA may be used to improve indoor air quality for in-person instruction, including through:

- Inspection, testing, and maintenance of current ventilation systems and approaches
- Purchasing portable air filtration units, such as HEPA air filters
- Purchasing MERV-13 (or higher) filters for your HVAC system and ACs

¹¹ Asthma and Allergy Foundation of America, (2020). [Asthma Disparities in America: A Roadmap to Reducing Burden on Racial and Ethnic Minorities]. Retrieved from aafa.org/asthmadisparities

¹² U.S. Department of Education, "Improving Ventilation in Schools, Colleges, and Universities to Prevent COVID-19." <https://www.ed.gov/coronavirus/improving-ventilation>



- Purchasing fans
- Repairing windows and/or doors so that they can open to let fresh air in¹³
- Servicing or upgrading HVAC systems consistent with industry standards
- Purchasing equipment to run outdoor classes
- Purchasing carbon dioxide (CO₂) monitors, air flow capture hoods, and anemometers for custodians and building personnel to assess ventilation
- Paying for increased heating/cooling costs due to increased use of heating/cooling systems
- Other spending that supports inspection, testing, maintenance, repair, replacement, and upgrade projects to improve the indoor air quality in school facilities, including mechanical and non-mechanical heating, ventilation, and air conditioning systems, filtering, purification and other air cleaning, fans, control systems, and window and door repair.

Additional actions for improving indoor air quality that could be helpful to the school community include immediate awareness programs about indoor air quality in schools as well as more wide-spread guidance about best practices for improving air quality in schools. To this end, a learning collaborative led by EPA could be established to disseminate best practices and provide technical assistance to improve air quality in schools. Finally, it would be helpful for EPA to track and monitor more closely the use of ARPA funding for this purpose. Knowing the extent to which schools are using ARPA funding to improve indoor air quality is important information to collect.

3.3 In your opinion, over the longer term, how can ventilation, filtration and air cleaning improvements be prioritized and made standard practices in building design, construction, commissioning, renovation, and operations and maintenance efforts (e.g., building code adoption, training or other efforts to sustain proper practices such as operation and maintenance of HVAC systems as designed, weatherization and other retrofit programs)? What policies and or practices need to be put in place to support such efforts?

¹³ It is important to note that security policies at schools vary and may impact a school's ability to open windows and doors.



AAFA is increasingly concerned about the use of unproven technologies to address poor indoor air quality in schools. In 2021, a Lancet COVID-19 commission task force called various air-cleaning technologies – ionization, plasma and dry hydrogen peroxide – “often unproven” with a potential to create “harmful secondary pollutants.”¹⁴ According to a recent report by the Center for Green Schools, schools have been “bombarded with persistent salespersons peddling the latest air and cleaning technologies, including those with minimal evidence to-date supporting safety and efficacy.”¹⁵ Funds intended to improve the safety of children returning to school should not be diverted to technologies that may even harm children’s health.

The proven measures that should be taken to address airborne transmission risk include properly sized and maintained ventilation (mechanical and natural), mechanical filtration (including portable HEPA filter units), and germicidal ultraviolet light systems,¹⁶ all of which are consistent with the Department of Education’s permitted uses of ARPA funds. AAFA urges EPA to underscore that schools should reject unproven technologies being marketed to improve indoor air in schools and to ensure that schools have appropriate guidance from EPA about proven technologies.

3.4 In your opinion, what is an effective approach for a building recognition program (e.g., pledge campaign, performance tiers, certification program)? What do you think are the primary incentives for decision makers to invest in ventilation, filtration, and air cleaning improvements and upgrades? What are the obstacles that decision makers may be facing? What approaches can help ensure buildings and organizations of all types can participate in a building recognition program? How can equity be integrated into a building recognition program so that it recognizes various types of significant improvements while

¹⁴The Lancet COVID-19 commission task force on safe work, safe school, and safe travel. “Designing infectious disease resilience into school buildings through improvements to ventilation and air cleaning.” (April 2021).

<https://static1.squarespace.com/static/5ef3652ab722df11fcb2ba5d/t/60a3d1251fcec67243e91119/1621348646314/Safe+Work+TF+Designing+infectious+disease+resilience+April+2021.pdf>

¹⁵ The Center for Green Schools, “Report shows how schools improved air quality during the pandemic.” (April 2021). <https://www.centerforgreenschools.org/report-shows-how-schools-improved-air-quality-during-pandemic>

¹⁶Centers for Disease Control and Prevention, “Ventilation in Buildings” (Updated June 2, 2021). <https://www.cdc.gov/coronavirus/2019-ncov/community/ventilation.html>



taking into consideration diversity in the quality of existing buildings and differences in available financial resources? Could tiered recognition help address this equity consideration and what tiering approach should be considered?

As discussed in our response to Question 3.1, a public-private partnership between expert stakeholders and the EPA should explore the feasibility of a voluntary certification program for clean air in schools. Obstacles that decision-makers could face include identifying appropriate incentives for school participation in the certification program, sustainable resources for schools to improve indoor air quality, and equitable application of the certification program across all schools that would like to apply.

Local schools rely on local dollars. The poorest communities with the highest proportions of at-risk children (both COVID and climate) have the schools in the poorest conditions and facility staff with the fewest professional credentials and resources, with little or no access to outside consultants. Rural or remote schools also have challenges in finding and hiring experts, regardless of ARPA funding.

Despite increasing evidence that structural determinants contribute to poor health in racial and ethnic minority populations, the majority of interventions ignore the socioeconomic and political context in which health disparities exist. Solutions that focus only on individual-level determinants are limited in scale, sustainability, and ability to affect population-level change.¹⁷ A certification program must place special emphasis on communities that have historically experienced disparities and should provide additional supports and technical assistance for these communities. Advocates for better asthma outcomes have long understood that reaching vulnerable populations requires systemic and institutional policy changes, both small and large.

3.5 In your opinion, what are key characteristics of a building recognition program that would be needed to document credible efforts toward improved ventilation, filtration, and air cleaning in buildings? What would be the

¹⁷ Asthma and Allergy Foundation of America, (2020). [Asthma Disparities in America: A Roadmap to Reducing Burden on Racial and Ethnic Minorities]. Retrieved from aafa.org/asthmadisparities



principal IAQ parameters, measures, or other characteristics that could be included? How could these parameters, measures or other characteristics be assured or verified? What are ways to effectively recognize organizations that have taken action across a large portion of their building stock or occupied spaces within their buildings and or expended significant resources in their efforts? How frequently would a building need to be re-certified? What else could be noted about a building recognition, labeling or certification program?

The Advisory Committee on school indoor air quality that we encourage EPA to form should determine the certification program components. Many models of certification exist. Four examples include:

- LEED: To achieve LEED certification, a project earns points by adhering to prerequisites and credits that address carbon, energy, water, waste, transportation, materials, health and indoor environmental quality. Projects go through a verification and review process by GBCI and are awarded points that correspond to a level of LEED certification¹⁸
- Joint Commission: Based on evidence-based standards, The Joint Commission offers many certifications, ranging from stroke and cardiac to orthopedic and rehabilitation, with many options for various disease-specific programs.¹⁹
- ONC's Health IT Certification Program: The program is composed of functional requirements known as "certification criteria." Developers certify their Health IT Modules by demonstrating conformance to these certification criteria, using test procedures (that may have associated test tools and/or test data) approved by the National Coordinator.²⁰
- AAFA's asthma & allergy friendly Certification Program: AAFA developed and adopted evidence-based standards for several building materials and air care products with a focus on their capacity to reduce asthma and allergy triggers in indoor spaces. The standards are reviewed and approved by a multidisciplinary team of health care professionals. To

¹⁸ <https://www.usgbc.org/leed>

¹⁹ <https://www.jointcommission.org/what-we-offer/certification/what-is-certification/>

²⁰ [https://www.healthit.gov/topic/certification-ehrs/certification-health-it#:~:text=The%20ONC%20Health%20IT%20Certification,and%20Human%20Services%20\(HHS\).](https://www.healthit.gov/topic/certification-ehrs/certification-health-it#:~:text=The%20ONC%20Health%20IT%20Certification,and%20Human%20Services%20(HHS).)



achieve this certification, products must be independently tested and meet or exceed every standard outlined for that product category.²¹

Certification programs vary in cost, oversight body, criteria used to certify, and incentives for participation. Careful study is required to determine the best model that will encourage schools to participate while providing meaningful standards for improving indoor air quality.

3.7 In your opinion, what changes would you recommend to the Clean Air in Buildings Challenge best practices document to improve public engagement and participation by a broad set of stakeholders?

- If the White House and EPA seek to “recognize” achievement in school or building IAQ, there will need to be concrete steps and measures, or benchmarks, that are clear, easy to follow, and accessible to parents and communities at the local and state level.
- Education and training for parents and communities is critical.
- EPA could consider developing and administering a professional certification based on metrics and other benchmarks for ventilation/IAQ in schools. The challenge with all IAQ work in schools (or other settings) is that there are no public agency certifications for qualifying vendors/consultants in the field, and no facility or IAQ metrics in EPA’s guidance.
- Stakeholder input and consensus building will be critical to the development of any certification program. Local and regional listening sessions with school and community leadership and parents could be helpful to understanding the barriers and challenges that could exist.

3.9 What else would you like to note about opportunities and issues that could improve indoor air quality in the nation’s building stock?

The current focus on indoor air quality brought about by the COVID-19 pandemic is important. We should leverage the interest, momentum and funding to ensure that changes address the ongoing impacts of poor indoor air quality, including

²¹ <https://aafa.org/programs/certified-asthma-allergy-friendly/>



for children with asthma. This means that funding and initiatives must be sustained over time – the current ARPA funding is a welcomed option but will not be sufficient to fund efforts to upgrade and maintain facility operating systems in the long-term. It could also mean examining the need for indoor air quality standards similar to the National Ambient Air Quality Standards set by EPA under Clean Air Act authority. AAFA therefore supports robust funding for EPA to expand its role in improving clean air in schools, and sustained focus on this crucial area.

EPA should also consider including a diverse set of stakeholders when forming advisory boards or task forces when tackling issues such as IAQ. Some examples include educators, school administrators, school nurses, medical experts in respiratory health, experts in health education and disparities, air care industry experts, and interested non-profit organizations.

Thank you for the opportunity to provide these comments. We look forward to working with the EPA to improve indoor air quality and to promote health in schools. Please do not hesitate to reach me at kmendez@aafa.org with any questions.

Sincerely,

Kenneth Mendez
President and Chief Executive Officer
Asthma and Allergy Foundation of America