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Policymakers at All Levels Can Work Toward Better Indoor Air Quality

In a Nutshell

- Poor indoor air quality may lead to various negative health outcomes, including headaches, fatigue, respiratory illnesses, heart disease, cancer, cognitive problems, and the spread of infectious disease.
- Policymakers interested in improving indoor air quality have a variety of options, including modifying building codes, offering improvement grants and incentives, setting guidelines and best practices, and funding research and development.
- Policymakers at all levels can contribute to improving indoor air quality, with small- and large-scale investments depending on the available resources.

The magnitude of the COVID-19 pandemic was the result of a perfect storm of global, political, and environmental factors. While there is only so much any single state can do to protect against global viruses like COVID-19, policymakers can prepare for the impact of future diseases on Michigan residents. A key focus of these efforts should be indoor air quality.

People spend roughly 90 percent of their time indoors, with daily life shifting more heavily toward indoor activity in recent years. Given the time we spend indoors, particularly in Michigan where the seasons often necessitate indoor activities, the impact of indoor air quality is often overlooked. Indoor air quality has received considerably less attention than the quality of outdoor air from policymakers over the years. This is problematic given the degree to which our exposure to contaminants in the air largely happens indoors and the impacts of those contaminants have on our health and well-being.

While the COVID-19 pandemic brought some attention to indoor air and the higher likelihood of contagious disease spreading inside, efforts to improve indoor air quality have remained limited. As policymakers consider ways to improve individual health, the economy, and educational outcomes, indoor air quality is an area with significant upside and flexible policy options.

The Air We Breathe Indoors Matters

Indoor air quality (IAQ) is broadly defined based on the concentration of contaminants in the air. This includes airborne viruses and other infectious agents, carbon dioxide, particulates, and pollutants. These contaminants enter buildings from a variety of sources, including people, fuel-burning appliances, building materials, cleaning supplies, heating and cooling systems, tobacco products, and outdoor air (e.g., radon, pesticides, exhaust, etc.). In addition to the way contaminants enter buildings, the other key variable is how long they remain in the building before the contaminated air is cycled out or decontaminated.

Poor IAQ leads to various negative health and economic consequences. General exposure to poor IAQ can lead to headaches, fatigue, trouble concentrating, and eye, nose, throat, and lung irritation, while increasing the

risk of heart disease, stroke, and respiratory infections. Specific types of exposure can produce more serious long-term conditions such as high levels of moisture leading to asthma and asbestos and radon causing cancer. In schools, lower IAQ is associated with higher rates of absenteeism. Poor IAQ also has a direct impact on cognition, with multiple studies finding a negative impact on test scores, both when evaluating carbon dioxide levels and broader contaminants. Additionally, most contagious disease transmission occurs indoors, particularly in the case of airborne viruses, as most pathogens struggle to survive and spread among people outdoors.

While there is substantial research on the impact of specific indoor air quality improvements, demonstrating the causal link between improvements and outcomes, the broader economic research on the total potential impact from better IAQ is a bit more limited. That said, one estimate of the impact of improving indoor ventilation in the workplace found a potential nationwide savings of \$50 billion (in 2024 dollars) just in avoided sick days. Another study estimated the potential economic value of IAQ improvements in the workplace at over \$130 billion per year nationwide (in 2024 dollars).

Each individual contaminant brings different risks depending on the concentration and duration of exposure. Some specific contaminants, most notably radon, have official requirements, but this is the exception not the rule. Similarly, most building codes contain ventilation standards but are lacking in their ability to address IAQ outcomes. Various governmental and private organizations have worked to propose guidelines related to safe levels of given contaminants, but there has not been widespread adoption or implementation at the federal or state level of IAQ guidelines as a whole, as only a couple of states have broad IAQ regulations or guidelines.

Better Quality Indoor Air is an Investment in the Future

Improving IAQ has the potential to produce a wide range of educational, economic, and health benefits. Improving IAQ will likely lead to direct health benefits, which would reduce health care expenditures and improve quality of life, both in the short- and long-term. These benefits are likely to, in turn, make people more productive, as they will miss fewer work- and school-days and live longer, healthier lives. Relatedly, improved cognition in schools due to higher quality air will produce better educational outcomes. It stands to reason that the cognition effects of better air quality are generalizable, which would mean increased productivity in many other contexts.

Those benefits can all be produced by improving the “pollutant” aspects of IAQ, but they can also be realized when thinking about how improving IAQ reduces contagious disease spread. As we saw during the COVID-19 pandemic, contagious diseases can quickly lead to massive disruptions in everyday life above and beyond medical complications. Even without imagining another novel virus, the seasonal flu and common colds are incredibly disruptive.

Improving IAQ is not just an investment in a healthier, better educated, and more productive population, it is also a preventative measure to protect the state against the second- and third-order effects of pandemics and outbreaks of novel and well-known diseases, allowing businesses and schools to remain open in the face of airborne viruses.

Policies for Improving Indoor Air Quality

Policymakers interested in improving IAQ have several options, depending on the level of investment they are willing to make. These options can also focus primarily on public buildings and those with the highest density or extend to nearly all indoor spaces. Improving IAQ has a variety of components, including source control, improved ventilation, disinfection, and air cleaning and filtration, all of which can be utilized to reduce or eliminate the concentration of various contaminants depending on the circumstances. The specific technical approach to improving IAQ in a specific building will vary, but the state and local governments can promote better IAQ with several different policy tools.

Building Codes: The most effective, yet costly, approach to improving IAQ is through state and local building codes. In Michigan, this state has the authority to set standards for new and modified buildings to limit the use of certain materials and mandate certain technologies to ventilate or filter air. Even targeting the high-

est impact buildings could prove to be very costly for builders and deter new development and renovations – something the state may not be eager to do as it tries to promote affordable housing that can be impacted by building code stringency. However, working toward IAQ in building codes is something the state could do, especially on a longer timeline. It may not make sense to mandate expensive retrofitting, but setting standards for new buildings may prove to be cost effective and is something worth studying in more detail. Other states also allow more variation through local building codes, so another option would be to open the door for local governments to set higher IAQ standards.

Incentives and Grants: While the heavy handedness of building code mandates may be undesirable, incentives and grants for building improvements would be much easier to implement. Offering grants or tax incentives for building improvements that improve indoor air quality is an option that allows for flexibility and prioritization, allowing policymakers to manage program costs and target the highest value buildings for upgrades. For example, the Fiscal Year 2024-25 School Aid Budget contained \$50 million for a Healthy School Grants Program that offered funding for a variety of improvements including “[i]ndoor air quality improvements, including HVAC and air-conditioning needs.” More funding for this program and other programs that apply to a wider range of buildings could jumpstart IAQ improvements around the state.

Guidelines and Best Practices: Policymakers can also make an impact by establishing guidelines and best practices related to IAQ. The state’s capacity to study, evaluate, and set standards for IAQ would be beneficial to local governments and private entities that want to invest in better IAQ but do not necessarily have the expertise to carry out full scale analyses. Even when the expertise is available, it is inefficient for county governments, school districts, and businesses to duplicate the same work of setting targets and figuring out the best way to implement them when the state could act as a central “clearing house” to streamline that process. This can be an established process for improvements or guidelines for specific building types. Similarly, establishing programs that identify which buildings meet the standards (similar to Energy Star certification) would provide the public with information about the air they are breathing in different settings even if no entity is required to meet the standards.

Research and Development: Policymakers can also support research and development work to improve technologies and/or drive down costs of IAQ improvement technology. Beyond the straightforward support for this work, policymakers showing support for IAQ improvement projects will likely generate interest from non-profit and private sector investors if they see commitment from governmental entities to mandate or promote improving IAQ.

All Levels, Any Amount

Unlike some policy areas, improving IAQ is one where all levels of government can get involved and can contribute to the solution. Similarly, investment and policy change can be heavy-handed or limited, depending on policy preferences and the available resources. Improving the quality of indoor air in one school or office building is a positive step and does not require changes across the board.

A school district can prioritize building upgrades on their own, either with existing operating funds or via bond proceeds for new capital investments, regardless of whether a neighboring district sees the value in IAQ improvements. The state can offer incentives to owners of commercial office space without forcing anyone to make changes, and the incentive program only can be as large as policymakers are comfortable making it.

It would be helpful for the state to take on some of the coordination, standard setting, and clearinghouse functions, but beyond that, any entity that wants to promote better IAQ can do so. The time may come when it makes sense to mandate IAQ standards, but significant work can be done without taking that step.

Conclusion

Poor IAQ leads to various negative health and economic consequences, including the spread of infectious disease. Various governmental and private organizations have worked to propose guidelines related to safe levels of given contaminants, but there has not been widespread adoption or implementation of IAQ guidelines as a

whole at the federal or state level.

Improving IAQ will likely lead to healthier, better educated, and more productive people, and will be a hedge against future outbreaks of infectious disease.

Policymakers at all levels of government can contribute to better IAQ through various approaches that do not require massive investments or one-size-fits-all mandates. The state could explore building code changes – for all buildings or specific “high value” ones such as schools, childcare settings, and busy office spaces – but many less stringent options are available to promote better IAQ. Grants and incentives, guideline and best practice development, and research and development support from state and local governments, as well as non-profit and private sector entities can all contribute to improving IAQ across the state.

ABOUT THE AUTHOR

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Karley Abramson joined the Research Council in 2022 as a Research Associate focusing on health policy. Previously, Karley was a nonpartisan Research Analyst at the Michigan Legislative Service Bureau where she specialized in the policy areas of public health, human services, education, civil rights, and family law. Karley has worked as a research fellow for various state and national organizations, including the National Institutes of Health and the ACLU of Michigan. She is a three-time Wolverine with a bachelor’s degree in sociology, a master’s of public health, and a juris doctor from the University of Michigan.

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