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Leveraging Air Pollution Research Advancements for Environment Health Policy Decisions

By *Health Effects Institute*

Event Background and Synopsis

New and emerging air pollution monitoring, modeling, and remote-sensing technologies are rapidly becoming available. Such advancements are expanding opportunities for researchers to work directly with communities to conduct impactful work that informs policy actions and addresses environmental injustices at all levels of government. Addressing inequities in air pollution exposure and its health effects will require action-oriented research that is only possible when there is close collaboration between communities and scientists.

This was the impetus for a December 7, 2022 White House [Evidence Forum](#) hosted by the Health Effects Institute, the White House Office of Science and Technology (OSTP), and in collaboration with the Office of Management and Budget (OMB). As part of the White House's [Year of Evidence for Action](#) launched in April, the event showcased how researchers can ensure their work is relevant and useful for policy decisionmaking around air pollution exposure and health inequities.

The forum opened with remarks from Dr. Arati Prabhakar, assistant to the President and Director of OSTP, who spoke about the need to bring communities together with new tools for studying air quality to create practical, scalable solutions that address inequities in air pollution exposure and related health impacts. To make progress, Health Effects Institute CEO Dan Greenbaum said that it is time to move past describing the problems and focus on building enduring partnerships between community organizations who are closest to the problem and scientists who can document the issues and inform policy outcomes. He also emphasized the importance of tracking progress to assess whether policy actions are reducing disparities.

Following these opening remarks, the forum featured presentations from researchers who apply air quality science and technology data and tools to environmental justice policy questions and researchers who have successfully worked with local and state officials to enact evidence-informed

and community-centered environmental justice laws and policies. The event also featured panel discussions that included the speakers as well as Federal agency and community leaders who use air pollution science for decision making.

Key Insights

Collaborative research approaches can reveal and help alleviate disparities

Dr. Paloma Beamer, professor in the [Mel & Enid Zuckerman College of Public Health](#) at the University of Arizona, and Dr. Rachel Morello-Frosch, professor in the [School of Public Health](#) at the University of California-Berkeley, gave presentations on their air pollution research while emphasizing new opportunities and approaches for advancing the study of air pollution associated inequities.

- Beamer emphasized the importance of holistically working with communities to achieve their environmental justice goals. She referenced a new [framework](#) her team developed for conducting exposure studies with communities. Rather than a traditional linear approach, this framework uses a circular model (Figure 1) that includes building sustainability and capacity in communities and diversifying research leadership.

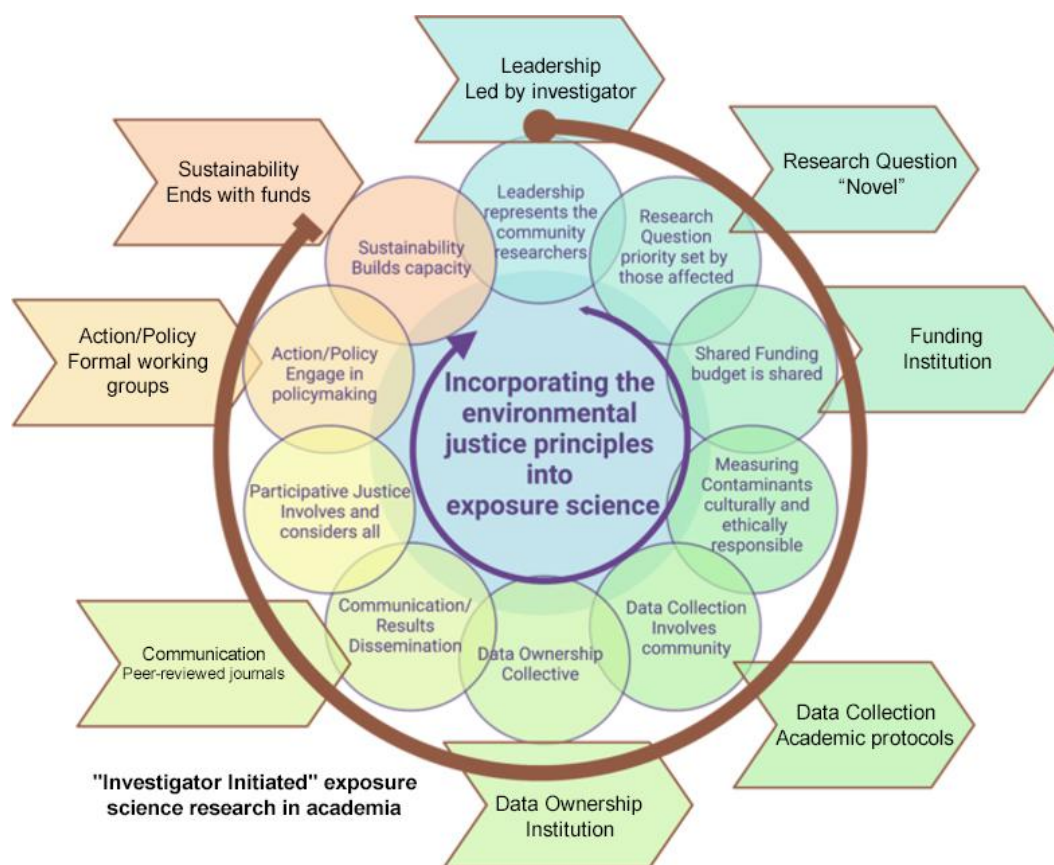


Figure 1. Roadmap for redefining exposure science strategies.

- Beamer described untapped opportunities to improve air quality by addressing contaminated soil and suggested working with small businesses to map potential sources of exposure and inform people of hazards. Outdoor contaminants can impact indoor air quality; a [study](#) conducted by her group showed that 60-90% of the non-volatile contaminants, such as lead found in house dust, come from outdoor sources including air and tracked-in soil.
- Morello-Frosch discussed the role that historical racial segregation has played in creating environmental inequities. “These legacies of discrimination have implications for the disproportionate impacts of air quality among certain marginalized groups in particular,” she said. For example, a [study](#) from her group linked air pollution with lower birth weight and found stronger associations with African American women compared to other races.
- Natural experiments offer valuable opportunities for studying air pollution, but Morello-Frosch emphasized the importance of leveraging new technology for more granular measurements of air pollution. “Averages can, in some ways erase the extremes,” she said. “And these extremes are what fence line communities care about the most, particularly in areas that have disproportionately high levels of air contaminants.”

Coalitions, persistence, and a proactive mindset are key to making change

[New Jersey’s environmental justice law](#), enacted in 2020, is a landmark law that links environmental injustice directly with policy outcomes for communities by defining overburdened communities and preventing additional permitting for industrial facilities near these communities. Dr. Nicky Sheats, director of the [Center for the Urban Environment](#) at the John S. Watson Institute for Urban Policy and Research at Kean University, and Dr. Ana Baptista, New Jersey Environmental Justice Alliance trustee, were instrumental in advancing this effort. They discussed lessons learned from the process and the innovative ways in which community input was combined with research to inform impactful environmental justice policy.

- Baptista emphasized that the success of this legislation was only possible because of a coalition formed by New Jersey environmental justice organizations, who worked closely with trusted researchers experienced in assessing cumulative impacts.
- One of the challenges in developing the law was defining what constitutes an overburdened community. This was accomplished by combining community input with the latest scientific data and methodologies and drawing lessons from the ways in which environmental justice communities were defined in other contexts. The coalition also performed its own mapping to identify communities and set some normative thresholds.
- Sheats pointed out that persistence was key. “Our research as an environmental justice community started way back in 2007,” he said. “At that time, there wasn’t adequate data from the state government, and we had to convince the scientists from the state EPA office to gather this data. The communities needed action before the science was done.”
- Sheats also highlighted a New Jersey policy recommendation that would mandate that power plants whose emissions detrimentally impact environmental justice communities be required to reduce those emissions. This policy opportunity takes advantage of the current momentum to address climate change, an approach that could be used in other contexts to

reframe climate policy to go beyond mitigation and address disproportionate pollution impacts suffered in environmental justice communities.

To advance environmental justice, we must bring air pollution science and policy together

A curated chat with Marianne Engelman-Lado, acting director of the new U.S. EPA [Office of Environmental Justice and External Civil Rights](#), and Dr. Kristi Pullen Fedinick, executive director for the [Center for Earth, Energy, and Democracy](#), took a deeper look at the relationship between science and policy and recent developments in this sphere.

- Engelman-Lado emphasized that integrating environmental justice into government decision making must be based on transparency and engaging with impacted communities to understand the realities that they face and ensure that decisions based on research are responsive to community needs.
- In September 2022, the EPA announced the formation of its Office of Environmental Justice and External Civil Rights, dedicated to solving environmental challenges in underserved communities with an emphasis on action-based community engaged research. Engelman-Lado said the agency is poised to make unprecedented investments in air quality monitoring and improvement and also noted that building and tracking indicators of disparities will be key to advancing environmental justice goals.
- Pullen Fedinick noted that it is equally important for policy to inform the science as it is for science to inform policy. For policy to inform science, researchers need to get community input about what change they want to see and then work to fill the research gaps that could help inform policy to implement this change. For science to inform policy, researchers must move beyond identifying pollution-impacted populations and focus on understanding and defining the best available science that can be used to shape policies to protect those populations.
- Pullen Fedinick also said that scientists need to utilize their training and understanding of the barriers that exist, particularly within academic science, to remove barriers and facilitate the kind of rapid change that communities need.

Success will require new approaches and investments

During panel discussions, speakers identified new strategies, investments and other factors that would help advance air pollution research for informing environmental health policy decisions.

Collect more granular data and find better ways to use existing data and technology.

- Engelman-Lado said that one of the biggest barriers to transparency and truly action-oriented research has been the gaps in data at the granular or community level. Without that data it can be much harder to demonstrate and reflect the realities communities experience, and then shape policies that respond to them. However, the tide is already turning thanks to new environmental monitoring resources and investments in low-cost sensors and creative solutions that allow communities to take a lead role in data collection.

- Beamer echoed this sentiment by pointing to the need to collect data in communities that are experiencing these environmental injustices, so that policy guidelines and decisions can be based on models and assumptions that actually reflect their unique exposures.
- Several participants stressed the importance of considering cumulative impacts, both in the research approaches used to assess exposures and in the regulatory frameworks that aim to reduce pollution in overburdened communities.
- Pullen Fedinick called for more immediate decisions based on the data that is available. “Don’t wait for perfection,” she urged. “Take existing information that we have already [and] move the needle in ways that can protect people’s health today.”

Foster long-term, collaborative relationships between researchers and communities.

- Morello-Frosch emphasized that community engagement improves the rigor, relevance and reach of scientific work by making sure that data are relevant for the policy realm and engender action. She pointed out that the most fruitful partnerships occur when there is the time and ability to do relationship building and planning together.
- Pullen Fedinick said it is important to focus on what community groups really need and what questions they want answered. “There is a history of researchers parachuting in and asking questions that we think are relevant, or that funders think are relevant, but those aren’t necessarily the questions that need to be asked and answered,” she said. “Ask them what they need and find ways to be of service.”
- Beamer said that findings will be more authentic and better represent community priorities if community partners have decision-making authority on studies, even if this slows down the research. She also emphasized the need for researchers to think about ways to ensure that community voices are heard by funders so that research will lead to action.
- In addition to working on research studies in partnership with communities, Baptista encouraged scientists to also think about their commitment to engaging in long-term policy and political advocacy efforts where their insights would be useful.

Expand community-based research with enhanced funding and training.

- To foster productive partnerships, Beamer, Engelman-Lado and others pointed out that academic researchers need more training on how to effectively work with communities in community-driven research, including the importance of approaching community perspectives with respect and humility.
- To facilitate the use of research in decision making, speakers underscored the need for scientists to better understand how policies are made and how risk assessments inform guidelines. Researchers also would benefit from training to understand how to tailor their research to meet decision-making frameworks under laws or regulatory processes.
- On the funding side, participants suggested an overall need to increase funding opportunities focused on fixing air pollution problems and disparities, targeting grants toward overburdened communities. Several participants stressed the need to invest in science that is both data and community driven, which should include funding to support

building and maintaining community partnerships. For example, Morello-Frosch said the community core portions of NIH-funded centers will require more financial support in order to make community engagement sustainable and put community partners on more equal footing with researchers.

Resources

Environmental justice readings recommended by the speakers:

- [An applied environmental justice framework for exposure science](#)
- [Community-Based Participatory Research: A Strategy for Building Healthy Communities and Promoting Health through Policy Change](#)
- [Critical Race Theory, Race Equity, and Public Health: Toward Antiracism Praxis](#)
- [Risk Assessment in the Federal Government: Managing the Process \(1983\)](#)
- [Street Science: Community Knowledge and Environmental Health Justice](#)
- [The Color of Law: A Forgotten History of How Our Government Segregated America](#)
- [Environmental Justice, Science, and Public Health](#)
- [Complete Guide to Planning in New Jersey \(Chapter 20: Environmental Justice\)](#)

Additional resources:

- [White House Year of Evidence for Action - Evidence Forums](#)
- [White House Fact Sheet: A Year Advancing Environmental Justice](#)
- [White House Fact Sheet: Inflation Reduction Act Advances Environmental Justice](#)
- [Science and Decisions: Advancing Risk Assessment](#)
- [Recommendations of the White House Environmental Justice Advisory Committee](#)
- [Community-Based Participatory Research for Health](#)

References

Ornelas Van Horne Y, Alcalca CS, Peltier RE, Quintana PJE, Seto E, Gonzales M, et al. 2022. An applied environmental justice framework for exposure science. *J Expo Sci Environ Epidemiol* 1-11; doi:[10.1038/s41370-022-00422-z](https://doi.org/10.1038/s41370-022-00422-z).