

## Podcast Transcript: The Exposome and Health (Part II)

[Theme music]

**Ashley Ahearn (AA):** You're listening to Environmental Health Chat – a show from the National Institute of Environmental Health Sciences that explores the connections between our health and our world.

I'm Ashley Ahearn.

[Music fades out]

Ok, we're back with our second episode exploring the exposome. This term refers to all the environmental exposures and the body's response to them that an individual experiences throughout their life. But as you heard in our previous episode featuring Dr. Doug Walker at Emory University, studying the exposome is about widening the lens beyond what you might think of as the more traditional environmental exposures scientists have studied over the years...

**Doug Walker:** When we are discussing the exposome, we're not just referring to the chemical exposome, but also many other factors that can affect your health, for example, stress or socioeconomic factors, dietary factors, many, many others.

**AA:** Exposomic research is a booming field within the environmental health sphere. Scientists from all different backgrounds are contributing their expertise to creating a more holistic approach to studying the exposures we face throughout our lifetimes. But, despite the broad definition of the exposome, there was something missing.

**Melanie Pearson (MP):** The part that was missing for us really was the community's perspective.

**AA:** Dr. Melanie Pearson, works with Walker at the NIEHS-funded Emory HERCULES Exposome Research Center. She leads the center's community engagement core. The center has an advisory board made up of community members who live in the Atlanta area and care about environmental health. The board noted that definition of the exposome will be different based on the local context of each community.

**MP:** And it was this board that suggested that we needed to incorporate community perspectives into the exposome definitions. They really felt like it could help contextualize the environmental exposures and factors impacting health for both science as well as the communities and those affected.

**AA:** Perhaps easier said than done, Pearson thought. How do you present a kind of broad – maybe a bit wonky – idea like the exposome to people who don't study public and environmental health for a living?

**MP:** I was a little bit nervous – well I was more than a little bit – I was definitely nervous about this in the beginning, because you know, the exposome, it's an odd word and a complex definition and idea, I had though. But in fact, when we shared it with community partners early on in the development of the HERCULES Center and planning for it, there was a lot of

excitement around it. They felt like it matched the lived experience of communities facing environmental contamination.

**AA:** The exposome concept resonated with people. They were already aware that they faced exposures from a variety of different sources every day. And those exposures affected their health and wellbeing. Here was a way to think about all those exposures holistically.

**AA:** So, what to do with that excitement? How to focus it and incorporate it into environmental health research to improve the science and better serve communities?

That's where Pearson's superstar stakeholder advisory board came through with another great idea: The Exposome Roadshow. Community groups can apply to participate in the program and if they're selected, they begin a collaboration with Pearson and her colleagues at the HERCULES center with the goal of using science to make positive change for their community. It starts with turning to the community and asking them to share their thoughts and concerns.

**MP:** And then we simply ask them the question of what in their environment is affecting the health in their community?

**AA:** To jumpstart the community conversations, Pearson and her colleagues begin with an analogy to help explain the concept of the exposome...

**MP:** This analogy is essentially thinking about trees in a forest, and all the things that can affect an individual tree in a forest, as well as the entire forest, all the factors that can impact that tree's health. So, we talk about things like weather and disease, and even road construction, predators, all of the things that can affect an individual tree's health. And then we also talk about the things that can positively impact that tree's health, which also is part of being in a community of trees, and the information that they receive from other trees and the sharing of resources. And then from there, we also talk about the tree rings, and how the tree rings can reflect the health of that tree, similar to how biomarkers can reflect the health of an individual. And from this analogy, we then ask folks to think about themselves as a tree and their community as a forest and all the things that affect both their personal health and their community's health.

**AA:** So that's phase one, everyone brainstorms – throws out ideas – and some ideas are really specific, and others are really broad...

**MP:** So, somebody might say pollution is affecting our environment. Whereas another person might say the bad air coming from this industrial source. Or somebody might say, we don't have access to sidewalks, or there's a lot of crime or drug deals going on our streets, or things like that, right? It can be very specific. Some can be more policy level some might talk about local government and whether there's a lack of transparency or responsiveness from that government. Others talk about individual behaviors. So, they might talk about eating, they might talk about access to healthy foods.

**AA:** Community members also rank and score all the ideas in terms of importance. Then Pearson and her team take a systematic approach to analyzing the results. Ultimately, they present them back to the community visually using concept mapping.

**MP:** And the really great part of this is it's all in their voice. It's all their words. It's all the names and labels that they've chosen. And it's just really a way to summarize it and visualize it for them and bring it back to them and to be able to have conversations around it.

**AA:** Pearson and her team check in with their community liaisons to make sure they've accurately captured what the community members said. And then, at the next meeting, they look for consensus around one top environmental health threat that has been identified. If the community agrees on a clear winner, it's on to phase two...

**MP:** Then we provide them with funding for a three-month period to come together and plan. What is it they want to do? What ideas do they have about how they can address this? Who else do they need to bring into the conversation. And then once they've developed what we call their action plan, they submit that to us, and then they get additional funding for the next year to implement this action phase plan. And we also provide them technical assistance during that time. The last phase is what we call the sustainability phase or the sustainability grant. And in that phase, that's really where we ask the group to start thinking about how they're going to maintain and sustain their efforts.

**AA:** Pearson and her team will continue to provide technical assistance and support after the official collaboration has finished. The Exposome Road Show and Community Grant Program have supported several successful community-led efforts.

One participating community chose to focus on local air and water pollution. During their action phase they learned how to request government documents about what was in their water and ultimately conducted their own sampling, with the help of Pearson and her team.

And then on the air pollution side, community members said they were tired of bad odors coming from nearby industrial facilities.

**MP:** And they really wanted to document these odors. And so, they investigated themselves and discovered an app – which is now much more widely used, but at the time had not been – called Smell MyCity.

**AA:** The app allowed people to report the time and location of odors as well as any physical symptoms that they associated with that odor. Participants submitted hundreds of reports. Then, in partnership with HERCULES scientists, the community received a pilot grant from the HERCULES Center to monitor the presence of hazardous volatile organic compounds – or V-O-Cs – in the air.

**MP:** And because they had mobilized the community and had the community recording all of these odors, they were able to correlate when the air samples showed high levels of VOCs to individual reports of what the odor smelled like.

**AA:** The community representatives presented their findings to their city council and ultimately got the zoning codes changed to prevent any new industrial facilities from being built close to residential neighborhoods.

**MP:** But then also working with their city, they brought this to the industrial facility that was the source for this [odor]. And in conversation with city officials and the community, the industrial facility decided to do its own mitigation to reduce these odors.

**AA:** Pearson is so proud of the success of that community, and others, that have collaborated with the HERCULES Exposome Research Center.

She has been engaging communities around the concept of the exposome for years now, and she says the people she gets to work with are what inspire her above all else.

**MP:** I'm so impressed. I mean, these are residents who have full time jobs, full lives, families, all these other responsibilities, and, I'll say it's not easy on them, they are acting as community scientists, they're helping collect air samples, they're collecting water samples, they're requesting government documents, they're meeting together. I'm mainly awed by these groups that come together and commit themselves to working together and figuring out a way to improve their quality of life and their health overall.

**AA:** Exploring the exposome can inspire scientists in many different ways – but for Pearson, the magic happens when the science is done in partnership and service to communities – especially those that are disproportionately exposed to different environmental threats and social stressors over their lifetime.

**MP:** So, the exposome to me, in some ways, is operationalizing environmental justice and then my part of it is bringing it full circle, right? And bringing it back to those affected communities so that those affected communities can be the ones to drive the change.

**[Music comes up]**

**AA:** I'm Ashley Ahearn. Thanks for listening to Environmental Health Chat.