

## Podcast Transcript: Community-based Research for Structural Change

[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.

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Dr. Mónica Ramírez-Andreotta's roots span both sides of the U.S.-Mexico border. Her father worked as a miner and built medical facilities and public health infrastructure to serve people in Sonora, Mexico, and the border region near Tucson, where she grew up.

During the summers, Dr. Ramírez-Andreotta would go to Mexico to visit her relatives. Looking back on it, she remembers noticing differences in environmental and public health between the two countries.

**Mónica Ramírez-Andreotta (MR-A)** Growing up, in a way, you could argue that my roots are kind of light in both countries. And that maybe it kind of fractured my identity a little bit, which is something that I work through as a human and scientist, but that also exposed me to a lot of different ways of living.

**AA:** Her upbringing inspired in Dr. Ramírez-Andreotta a strong sense of justice and an urge to fight for those who face adversity

**MR-A:** So, I think the environment in which I grew up in I bared witness to social and environmental resiliency and degradation. And then combined with working with my dad to address border health really changed the way I experienced and saw health. Health no longer was synonymous with biomedical services; it was about human health and wellbeing.

**AA:** Now, as an associate professor of environmental science and public health at the University of Arizona, she uses participatory research to engage communities and work together to push for cleaner, healthier environments where they live.

And for her, that work started in the dirt.

After completing her master's, she got a job as a research translation coordinator at the Superfund Research Program Center at University of Arizona, which is funded by the NIEHS.

At the time, the U.S. Environmental Protection Agency had just listed a Superfund site near the community of Dewey-Humboldt, Arizona. An iron mine and smelter had been in operation in the area for years, releasing arsenic and lead among other contaminants into the environment. Dr. Ramírez-Andreotta decided to attend one of the kick-off community meetings the EPA held about the Superfund site.

**MR-A:** And I was in the meeting, sitting in the back, and just writing down people's questions. And a good number of them were about soil quality, if they could grow food, And so after the

meeting I went up to a couple of those individuals and said, "I'm in this position. But I'm also thinking about going back to school, and you have really important questions. We don't have specific data, but would you want to work together on it?"

**AA:** The people she met there seemed open to collaborating, and eager for more information that could help them protect their health.

**MR-A:** So, I was listening to these stories and bearing witness to their experience, not only environmentally but socially and the inner dynamics, and that's where I started Gardenroots, or my Ph.D. project.

**AA:** Gardenroots is a grassroots community science project where Dr. Ramírez-Andreotta trained people in the Dewey-Humboldt community to collect soil, water, and plant samples for analysis. She wanted to work together to help answer their questions and understand whether residential areas had been impacted by the Superfund site and what happens to the contaminants of concern once they enter the environment.

But at its core, it was about putting community members in the driver's seat.

**MR-A:** They got to decide where they were collecting soils at their home, what plant samples they wanted to collect based on their cultural practices or consumption practices.

**AA:** It was important to Dr. Ramírez-Andreotta that her collaborators weren't just involved in gathering data, they posed the initial research question for the study, received their data, and then were engaged in interpreting the results.

**MR-A:** We'd have ongoing informal science education activities. And they got all their data back, we reported all the data back in a way that was digestible, we had multiple community meetings to share the data. And then, you know, they'd ask new research questions afterwards.

**AA:** The research built on itself because of its collaborative nature. The people who were gathering samples from their homes and gardens were able to steer the course of the research to be responsive and tailored to their needs and concerns. Another term for this kind of approach: participatory research.

**MR-A:** Participatory research is an umbrella term for various research methodologies, all of which share a philosophy of valuing local people and communities as beneficiaries, contributors, users, and stakeholders of the research.

**AA:** Through this work, Dr. Ramírez-Andreotta gained an understanding of best practices in participatory research that can lead to broader, more systemic – or structural – change for environmental justice communities: Basically, how can science help disadvantaged communities and change the power dynamic in our society? She co-authored a paper with Leona Davis that combed through hundreds of case study articles and identified three common participatory research practices that led to structural change. Here we go:

Number one: community members hold formal leadership roles. Number two: project design includes decision-makers and policy goals. And number three: long-term partnerships are sustained through multiple funding mechanisms.

**MR-A:** And so ultimately, to think about recommendations for the future is for a researcher to establish structural change as a goal of participatory research. To also evaluate and assess the outcomes of the work you're doing to see if you're providing a benefit to the community. So, you're evaluating your work while you're doing it. And ultimately, acknowledge the role of cultural knowledge brokers – individuals who share a community experience and also understand the science – because this can enhance the rigor and relevance of the work and in that knowledge brokering effort.

**AA:** Dr. Ramírez-Andreotta speaks Spanish and used that skill to share information with her the community collaborators. She'd translate the findings, ask them for their feedback in their language, and then translate that feedback into English to be incorporated into the finished product.

So, when she talks about having quote 'roots that are light in both countries,' as she mentioned in the beginning of the episode, or a quote 'fractured identity' – because of her bi-cultural upbringing – in a way, she turned that into her superpower as a scientist and it helped her connect with her collaborators.

**MR-A:** The biggest thing I would highlight is just truly, truly meeting people where they are, and listening. And going into these spaces with cultural humility and acknowledging local community members as experts in their own right because they're the ones living there and have what others have called the exposure experience.

**AA:** Ok, so back to Dewey-Humboldt. At one of the meetings where she and her colleagues were sharing the results of the soil and water and plant samples they'd been gathering with community members, some concerning findings emerged

**MR-A** And what was interesting is they were looking at their data and some of the people that were on their public water utility had arsenic concentrations above the maximum contaminant levels set by the Safe Drinking Water Act. And so they came together to acknowledge that and then they went and talked to others in their community, and they put pressure on the Arizona Department Environmental Quality, to say, 'hey, I have my Gardenroots results right here, it's showing that my arsenic concentrations above the MCL [maximum contaminant level].'

**AA:** Sure enough, the Arizona Department of Environmental Quality did their own testing and confirmed that the public water utility was indeed providing water with arsenic levels that exceeded safety levels. The Department issued seven notices of violation to the utility.

**MR-A:** So that's an example of the power of doing these participatory projects and the power of data sharing or, in this case, data report back. I'm very passionate about addressing injustices, and the burden of proof being placed on the general public, when it should be handled by those who are perpetuating the harm and perpetuating the injustice in our society.

**AA:** Dr. Ramírez-Andreotta says more scientists and public health researchers need to embrace a systems thinking approach – ask the big picture questions about why certain communities are disproportionately exposed to environmental contamination. By teaching people how to interpret their own data, you as a scientist, are building their capacity to make big changes for themselves and their communities.

**MR-A:** When you take on and decide to do this kind of work, you need to confront what creates the injustice. So, what does that mean? It means you've got to look at the social, cultural, and political contexts which perpetuate the injustice. And so, if you take a systems thinking approach, you're really thinking about how it's interconnected, and it works together. And so, in a way, you know, I would argue that a system thinking approach gets you closer to transformation and transformative efforts.

**AA:** And it's a special kind of scientist who really embraces this kind of work, Dr. Ramírez-Andreotta says, because it involves not only thinking outside your role as a scientist, it also involves reaching out and collaborating with other scientists from different disciplines who can bring their expertise to the table.

**MR-A:** Which is why Superfund Research Program is pretty cool, because it tries to create transdisciplinary research teams. You have your biomedical and toxicological researchers, your environmental scientists and remediation strategies, combined with community engagement and translational efforts, data management efforts, right, all of this to come to create these hubs to address these wicked problems posed by hazardous waste.

**AA:** Dr. Ramírez-Andreotta's work with Gardenroots has since expanded to other communities. Her research on participatory science and how it can affect systemic change will hopefully help other public health researchers form deeper, more effective collaborations with environmental justice community members in the future. Because, as she sees it, science is for everyone.

**MR-A:** If you engage those who are closest to the challenge in the solution generating dialogue you have a better chance of addressing the issue and it helps move towards structural change. And so, with democratizing science, the idea is that we're all scientists, right? Acknowledging that it is really important, we make observations, and we can all contribute to our understanding of the world around us.

**[Music comes up]**

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