



[00:00:00.000] - Ana Pomales

Hello everyone, and welcome to another episode of the CDC's Environmental Health Nexus podcast, where we explore critical topics in environmental health. Today, we have the pleasure of speaking with Ms. Ana Pomales, an Environmental Health Scientist with the Water, Food, and Environmental Health Services Branch at the CDC's National Center for Environmental Health. Ana, thank you for joining us today.

[00:00:24.940] - Ana Pomales

Thank you for having me.

[00:00:26.930] - EH Nexus Host

Let's start by getting to know you a bit better. Could you share with us a brief overview of your role and what you do as an environmental health scientist?

[00:00:36.960] - Ana Pomales

Yeah. My name is Ana Pomales, and I am an environmental health scientist with the Water, Food, and Environmental Health Services Branch of the National Center for Environmental Health. In this role, I work with national, state, and local health agencies and other organizations on the design and implementation of projects to assess and evaluate environmental health issues or

health hazards. Right now, for example, I'm working with a team to develop a process for assessing evidence-based practices in environmental public health. We're working with environmental health practitioners to identify the resources and conditions that are needed for implementing practices in the field. And we really are defining a practice as the implementation of an activity, intervention, program, project, campaign, or forum. The practice can be in any environmental health focus area, such as private well water quality, and vector control. And it really is important that we are working with environmental health program partners at the state and local level because they really are the ones that have the information and know what is working and what is not working in their communities. Also, previously, I worked for the Agency for Toxic Substances and Disease Registry, which is also part of the Centers for Disease Control.

[00:02:09.330] - Ana Pomales

And there, I was working on assessing public health impacts of contaminated waste sites and working a lot with community members to address questions and concerns about environmental investigations and potential impacts to people's health.

[00:02:25.240] - EH Nexus Host

Environmental factors have such a profound impact on human health. What inspired you to pursue a career in this field? And how do these environmental elements affect our well-being?

[00:02:36.450] - Ana Pomales

So environmental health evaluates the conditions of our environment and how these environmental conditions impact human health. To talk about environmental health, we need to talk about a couple of concepts that are central to the topic. The environment really is everything around us. It's the air we breathe, the water we drink, the food we eat, and the places where we live, work, and play. An environmental hazard can be a chemical substance like Per- and polyfluoroalkyl substances like PFAS. It can also be a biological agent or a microorganism like legionella bacteria, or a physical condition such as extreme temperature that can cause harm. Environmental health hazards can be natural, such as arsenic in drinking water or radon in indoor air, or they can be manmade, such as chemical substances that are often found in contaminated waste sites. Regarding the relationship between environmental hazards and health effects, that relationship is very complex. Sadly, there are still many gaps in our knowledge of how the environment affects human health. For some health effects, we know more than others. For example, we know that poor air quality can trigger asthma attacks. We know that blood lead in children can cause developmental disabilities, and that some people, like the elderly and infants, are at higher risk for heat-related illnesses during heatwaves.

[00:04:14.900] - Ana Pomales

But for other health conditions such as multiple sclerosis, Parkinson's disease, and certain cancers, we suspect there is an environmental component to disease, but we really have not found that direct link between the environment and the disease. In general, when we talk about health effects, it really depends on a number of factors. So health effects will depend on the type of substance or the hazard, the concentration of the substance, and the frequency and the duration of the exposure, meaning how often you're exposed and for how long. Is it days, weeks, or years? It is important to know that not everyone who is exposed to a toxic substances will develop the health effects. And similarly, and in most circumstances, scientists aren't really able to determine if someone's disease is related to a past exposure, which we know this can be very frustrating, especially for patients looking for answers.

[00:05:26.970] - Ana Pomales

You mentioned and asked what motivated me to pursue the field. And I will say that I really just wanted to learn no more about environmental and health relationship. During my undergrad studies, I took chemistry, mathematics, and physics courses. I also took electives in Environmental and Social Sciences, and I worked in a pharmacology lab, which I enjoyed a lot.

[00:05:53.270] - Ana Pomales

And environmental health truly draws from all these disciplines, but also offers the opportunity need to specialize and acquire important skills like data analysis. It really is a foundational area of public health and has the potential to improve people's lives at the population level.

[00:06:14.060] - EH Nexus Host

Given the complex nature of environmental health, collaboration across different disciplines is crucial. Could you tell us more about how scientists like you work together with experts from other fields to address these intricate environmental health challenges?

[00:06:29.640] - Ana Pomales

Yeah, This is such an excellent question because environmental health truly draws from multiple disciplines and integrates laboratory, natural health, and social sciences to identify, prevent, and mitigate environmental hazards. One example is I worked on a blood lead prevalence study where we were investigating the impact of a former lead manufacturing facility on children's blood lead in a neighborhood. The facility had operated for many, many years and had been the source of lead emissions. So this project required the close coordination and teamwork of environmental scientists, clinicians, epidemiologists, field technologists, and communicators, among other

professions. Since we wanted to identify and to know the levels of blood lead in children and identify the sources of exposure, we needed to get the data on both of these at the same time. So we had multiple teams working on the project composed of a nurse or physician, a field technician, and a communicator who were working together to collect soil and indoor dust samples, to draw a blood sample, and to administer a questionnaire to the parent or the guardian of the child. So in these teams, each member had a unique and important role in the work needed to understand if and how the children were being impacted by lead and where the lead may be coming from.

[00:08:18.470] - Ana Pomales

They also provided guidance and assistance to the families that were impacted. So in this way, laboratorians work to identify the concentrations of lead in the soil and blood. We had environmental scientists identifying the sources and areas with lead contamination, and we were working with the epidemiologist. We're looking at the patterns and associations between the levels of blood in children and risk factors for lead, like age of the child, year of residence was built, and household remedies among others. Also, we work with community members, very close with them who helped us establish relationships with the community and ensure that we communicated effectively about the work we were doing, why we were doing, and how it may impact them.

[00:09:14.810] - EH Nexus Host

It's clear that environmental health is a diverse field with many career paths. What are some of the different professional opportunities available in this field, and why is this diversity so important?

[00:09:27.720] - Ana Pomales

Some colleges and universities have degrees in environmental health or public health, but this is not necessarily a requirement to work in the field because the field draws from so many disciplines, people with educational backgrounds in chemistry, engineering, physics, and the health and medical sciences work in environmental health. People may also consider seeking professional credentials like the Registered Environmental Health Specialist and Registered Sanitarian credentials for environmental health professionals. Also, like we were talking earlier, the social sciences play a huge role. In my environmental health career, I've worked with communicators, anthropologists, and social workers, among other professionals. So there is a role in environmental health for almost everyone, if not everyone.

[00:10:24.650] - EH Nexus Host

Technology has been transforming many areas of science, and environmental health is no

exception. How has technology impacted your work and what future advancements are you particularly excited about?

[00:10:37.910] - Ana Pomales

Technology and informatics play a huge role in environmental health. New technologies will allow us to improve our measurements and knowledge of contaminants in the environment, as well as the types and levels of chemicals in our bodies. Technology will also have find new and more efficient ways of remediating environmental contamination and reducing our exposures to environmental hazards. I am pretty excited about the increased availability and use of health conditions and environmental health data. NCEH's environmental health capacity and environmental tracking programs focus on the development of information systems and the use of data to really identify, characterize, and find ways to to mitigate environmental hazards. So for example, think about what we can do with data about water quality or air quality. And what if, along with that environmental data, we also have access to health-related data about asthma, heart disease, and population characteristics. So all of this data can help environmental public health programs, identify communities that are at a higher risk of exposure or disease, help develop programs and services in response to community needs and environmental characteristics, and learn more about the relationships between the environment health.

[00:12:09.110] - EH Nexus Host

For those interested in a career in environmental health, what advice would you offer? What skills or attributes do you believe are key to success in this field?

[00:12:18.580] - Ana Pomales

I always recommend people that are interested in the field to assess the skills that come naturally to them and the type of work environment that that they enjoy. So some people thrive working in laboratories, and others enjoy working in the field, collecting soil samples or water samples. Others enjoy visiting, inspecting facilities. So Some people prefer working in front of a computer analyzing and visualizing data, while others prefer working with people at community health events. So since environmental health encompasses so many topics and areas, including food area, food safety, water quality, emergency response and preparedness, and people work in many different environments, I would really recommend anyone to identify like the topics and the classes that they find interest, but also the type of environment that they see themselves working in and that fits their personality. I would also say that hands-on experiences at a health department, even if it's just shadowing professionals in the field, can also provide great insights to determine which area of environmental health would be a good fit.

[00:13:41.950] - EH Nexus Host

Thank you, Ana, for sharing your valuable insights with us today. To our listeners, thank you for tuning in to this episode of the EH Nexus podcast. Stay with us for future episodes as we continue to explore the vital topics in environmental health.