Podcast transcript: PFAS in Drinking Water: Responding to Community Concerns

[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]

The Cape Fear River Watershed is the home and water supply to more than a million people in North Carolina.

But in 2017, residents got some upsetting news.

There were chemicals in their water that could pose a risk to their health.

Dr. Jane Hoppin, a professor of environmental epidemiology at North Carolina State University, shifted into high gear to try and get folks some answers. But that turned out to be no easy task.

The family of chemicals is known as perfluoroalkyl substances, or PFAS.

Jane Hoppin (JH): Over 14,000 of these chemicals have been described. And they're a broad class of chemicals and their involved in so many of the products that we use every day that the creation of those products has led to contamination of drinking water, landfills, and other sources – and that's what we're most concerned about.

AA: Dr. Hoppin was director of the NC State NIEHS Core Center is leads a project within the university's Center for Environmental and Health Effects of PFAS, which is funded by the NIEHS Superfund Research Program.

These chemicals are widely used in our daily lives. They're in the non-stick liner on pots and pans, firefighting foams, stain and water-resistant fabric and fast-food packaging – among other things.

They've been produced for decades – and their composition has changed over the years from longer-chained more long-lived chemicals to shorter-chained molecules that break down more quickly in the environment and in our bodies.

A newer member of this family, which was designed as a replacement for the harmful chemical that used to be used Teflon manufacturing, is known as GenX. That's what showed up in the initial water sampling back in late 2016. It was being produced at an industrial facility about 100 miles up the Cape Fear River from Wilmington, North Carolina.

JH: So one of the things that happened initially is that once people found out that their water was contaminated, the uproar was sufficient to require the Department of Environmental Quality

here in North Carolina required the company to stop discharging to the river, which led to a very dramatic drop in the levels of Gen X and the drinking water.

AA: That was good news for public health, but the threat wasn't gone, and people still wanted answers.

JH: One of the key community concerns was, is this chemical in my body? And so, one of the things that we recognized was really critical is that Gen X at that point in time, we didn't know it's half-life – we didn't know anything about how long these chemicals would stay in people's bodies – so we wanted to move quickly.

AA: She and her colleagues wrote a time-sensitive grant to NIEHS and got funding to find out which PFAS chemicals people were exposed to and what the potential health effects could be. They teamed up with several local organizations, including the New Hanover County Health Department and the Cape Fear River Watch, a local NGO.

JH: We recruited 310 people and collected their blood and urine as well as tap water in people's homes to measure PFAS.

AA: And they started learning, and adapting how they conducted their research, right away.

JH: One of the things that we didn't do well in that initial blitz is that we didn't do well recruiting African American participants. So, in May of 2018 – so six months after the initial collection – we partnered with the local NAACP there and recruited 34 new participants at the health fair, as well as re-sampled 44 of our original participants. So that allowed us not only to have a sample that was more representative of the whole community, but also allowed us to see how fast these chemical levels were changing in people's bodies.

AA: From the very beginning of their research, Hoppin and her team heard one message loud and clear from the Community Advisory Board that helped guide their research: Keep us in the loop.

JH: They said, we want to know what you know, when you know it, even if you don't know what it means. Those are terrifying words for a scientist – because you want to tell people what it [research results] means.

AA: Now, traditionally in public health research, data is collected, analyzed, papers are published and then the community is informed of the results, and how to interpret them. That's not how things worked in the GenX Exposure Study – and Hoppin says she feels good about that. She and her team have prioritized outreach and community feedback throughout their work.

JH: The way that we have chosen to collect samples is to really have these pop-up events, whether we take over a health department or a church, and have people come in and get their blood drawn. But it also gives them a chance to talk to me, talk to other investigators about the study and it provides a resource for that.

AA: Throughout the course of their research, they held webinars – especially during COVID – and they regularly updated their website and shared test results immediately with participants.

They did a newsletter and held public meetings and panel discussions in partnership with several local groups.

And, I should add, that during our interview a phone rang several times in the background in Dr. Hoppin's office. She told me it's a special line for community members and study participants to call in with questions about the GenX Exposure study.

JH: We have a huge commitment to sharing study results. So, we measure PFAS in people's blood, we measure clinical outcomes. And we share results before we publish them, which is very different from a lot of things.

AA: This is truly science in action, responding to the needs and questions of a community. And sometimes it's messy and it's challenging – especially with a family of chemicals that is constantly changing and puzzling public health experts.

So, what did they find? Well, the first step was to understand the exposure: What was showing up in people's bodies?

Surprisingly, Hoppin and her colleagues didn't see GenX in their study participants – which Hoppin says is likely because the plant was forced to stop releasing it six months earlier when it was initially detected in the drinking water.

They also identified three new PFAS chemicals, but those levels dropped during the course of the study.

AA [on tape]: That sounds like good news.

JH: But then we also analyzed for the chemicals that everybody has in their bodies, and the levels were so much higher than the national average…which meant that half of the people in our sample were above the 95th percentile for the United States.

AA: She's referring to the older members of the PFAS family of chemicals that show up in almost all of our bodies, according to the CDC. Those levels were higher in the Cape Fear watershed residents.

JH: What we discovered, at that point, we detected at least 10 legacy or historically used PFAS in everyone's bodies. And so, these weren't exclusively related to the upstream manufacturing but probably a history of textile, furniture, airports, and everything else throughout the river basin. So it was kind of a mixed bag.

AA: Ok, so that's what the exposure looked like… now what could that exposure mean for public health?

PFAS chemicals have been linked to elevated cholesterol levels and problems with the thyroid and immune system, as well as hypertension during pregnancy.

Kidney, testicular, and breast cancer are also strongly associated with PFAS exposure. And, more recently, it's been linked to reduced response to vaccines. During COVID, communities that had higher levels of PFAS suffered higher mortality from the virus.

JH: I think now that we understand the extent of the contamination, and maybe the levels at which these chemicals have health effects, that there will be more regulation not only on the national level, but on the state level.

AA: There are currently no national drinking water standards for PFAS, though they are being drafted.

Dr. Hoppin hopes that as awareness of PFAS exposure rises in the public, people will push for better water treatment at the municipal level, but also in their own homes, by installing better filtration systems.

JH: Making sure that you have clean water is the most important thing. And if you're on municipal water, then you have a municipal water provider helping you do that. If you're on a well then that's either up to you, or here in North Carolina part of the consent decree with the company is that they have to help people remediate their water. And you can remediate your water through use of a number of filters, either whole house granulated activated carbon filter or reverse osmosis filters.

AA: People can also reduce daily exposure by getting rid of their non-stick or Teflon pans and avoiding water or grease-resistant packaging, clothes, and furniture.

Dr. Hoppin says that if you have been exposed to PFAS at elevated levels, the healthcare system *should* be set up to respond to that – and be on the lookout for the potential health effects that can come from that exposure.

JH: The reality is that doctors are busy people, doctors aren't trained in environmental medicine; healthcare providers in general aren't trained in environmental medicine. And so, there's a big need right now to help provide continuing medical education credits for healthcare providers, so that people get informed. And anecdotally I hear from our participants, 'I took I took my results to the doctor, and they didn't even glance at them.' So, I think health care providers could be a key part of this response.

AA: Hoppin helped author a 2022 National Academies of Sciences, Engineering, and Medicine report that provides guidance to clinicians on how to test and care for patients in PFAS-exposed communities.

By regularly testing for PFAS levels in the blood, and then being on the lookout for irregular thyroid activity or elevated cholesterol levels, for example, doctors could help their patients avoid longer-term and more dire health effects that are associated with PFAS exposure.

Dr. Hoppin and her colleagues worked with the North Carolina Department of Health and Human Services to develop materials that would help people communicate with their doctor about their PFAS exposure.

JH: And we created that as a one-pager that you could take to your doctor and have a conversation. We also include information on where people can get healthcare if they don't have access to insurance.

AA: The team will continue sharing their results with the Cape Fear Watershed community and publishing their findings in peer-reviewed journals.

JH: We are moving rapidly to look at thyroid hormones and thyroid disease, we have a paper we're working on looking at liver enzymes. So, we're moving into that space where we can start to analyze health outcomes, but you have to understand the exposure first, right? So that's where we've been really focusing.

AA: Ultimately, Dr. Hoppin hopes her research sheds light on the connections between PFAS exposure and health and inspires people to keep encouraging regulators and water providers to protect the public.

JH: We can do important things to remove chemicals from the environment. But for those of us who have high PFAS in our bodies, it's in our bodies now. And it's going to affect our health. And so how do people get the information that they need to make the best healthcare decisions? I feel like knowledge is power, and that as we work to share information people can make wise decisions for their health.

[Music comes up]

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