

CDC Ebola Response Oral History Project

The Reminiscences of

Elizabeth Ervin

David J. Sencer CDC Museum

Centers for Disease Control and Prevention

2016

Elizabeth Ervin

Interviewed by Sam Robson
August 31st, 2016
Atlanta, Georgia
Interview 1 of 1

CDC Ebola Response Oral History Project

Q: This is Sam Robson, here today with Elizabeth—Beth—Ervin. Today's date is August 31st, 2016, and we're here in the CDC [United States Centers for Disease Control and Prevention] Roybal Campus, Atlanta, Georgia, audio recording studio. I have the pleasure to interview Beth today for our CDC Ebola Response Oral History Project. Beth, thank you so much for being here.

Ervin: No problem.

Q: Would you mind pronouncing your full name for me and also telling me your current position with CDC?

Ervin: Sure. I am Elizabeth Ervin, I usually go by Beth. I work as a health scientist in the Viral Special Pathogens Branch here at CDC.

Q: Great. Thank you! Can you tell me when and where you were born?

Ervin: Sure. I was born in California in 1985, and grew up there, spent about the first twelve years of my life, and then moved to Tennessee, which is where all my extended family is.

Q: Tell me about the first few—twelve years in California. What was it like being there?

Ervin: Sure. My dad was a research scientist at UCLA [University of California, Los Angeles]. My mom did a couple odd jobs, but the job I remember most was when she went back to school to be a teacher. Then she started teaching at my elementary school, was actually my fifth-grade teacher, which is kind of fun. Yeah, California, I remember lots of beach time. I love the ocean. We went swimming a lot. My dad, because of his work, he traveled a lot and went to conferences and things. We tagged along with him on a couple trips, like to Hawaii and Australia and all over California. It was fun. [laughs]

Q: So your dad was a scientist. What exactly did he study?

Ervin: Something in the physiology department. I'm not even really entirely sure. Things I remember, he would bring home little bottles of medicines that he had been testing and things, and I would use these little bottles to play with my dolls, as like a tea set or some sort of [laughs] fun thing. That's what I remember. He brought home a baby goat once, which was fun. But as to exactly what he was doing, I'm not sure. [laughter]

Q: And what took you to Tennessee?

Ervin: Family, extended family. My dad's parents—that's where he grew up. He was born and raised in Lynchburg, Tennessee, which is where they make Jack Daniel's. It's a very, very small, small town. My grandparents were there up until when they died. My mom's parents had also moved to Tennessee while we were in California. Both sets of grandparents were there. My dad was kind of getting tired of the whole research and writing grants and that sort of stuff, and he decided he wanted to teach. He was looking at different universities, and ended up taking a position at Middle Tennessee State University, which is in Murfreesboro. That is also, coincidentally, where he did his undergrad [undergraduate studies]. He got to go back to—he was teaching actually with some of the professors that were there when he was there. [laughs] But yeah, we moved there in 1997.

Q: What kinds of things interested you, when you were growing up in Tennessee?

Ervin: Oh, boy. I think I was kind of all over the place, and especially in comparison with my brother. I have a younger brother. He, from the time he was like four or five years old—my dad was like, “That kid's going to be an engineer.” And that's essentially what happened. Whereas me, I was like, “I want to be an astronaut!” or “I want to be a marine biologist” or “an archeologist.” I wanted to go and find bones and clean bones and that sort of stuff. I was just kind of all over the place. [laughs] Tried a bunch of things. I did art, I did music. Music became something really big in my life. I was in the band starting

in middle school, and then also in high school. Marching band, concert band, orchestras, jazz bands, everything. [laughter]

Q: When you were like a senior, did you know kind of what you wanted to do? Did you have any idea?

Ervin: No. I applied to three different colleges. I applied to the University of Chicago, and my plan was if I was going there, I was going to study archeology. Then I had the University of North Carolina at Chapel Hill. I was like, if I go there, I'm going to do biology. And then Vanderbilt. I was like, if I go there, I'm going to study music. I got into all three, and then [laughs] I had to make a decision. I ended up going with the University of North Carolina. I was like, music, I love it, and I had a scholarship there. But I decided that it wasn't going to be my career, I think. I knew, at that point, that I just wasn't cut out to be a musician. It's a lot of work. And then Chicago, when I went to visit the university, it was so cold. That was the other reason. I was like, maybe archeology isn't for me either because it's really cold up here. So I ended up with Chapel Hill. [laughs]

Q: What was it like in Chapel Hill?

Ervin: Beautiful! The day that I visited, that's what really sealed the deal. It was this perfect walk around campus. It was spring and so all the leaves were in bloom and trees were in bloom, flowers and everything. I ended up meeting the flute professor there. I just

kind of was walking by, and I said, “Oh, I’m a prospective student. I’m considering applying. I would apply for a music scholarship,” that sort of stuff. He was like, “Great! Do you have your flute?” And I did. He ended up giving me an impromptu lesson, right there, and was wonderful and very encouraging. That’s what really led me to apply. Once I got in, I was like, okay, there are very nice people. Yeah. This is a good place for me.

Q: How did your education develop and your interests develop while you were there?

Ervin: Well, I started as biology and music. After my first year taking the chemistry classes that were required for biology, I kind of was second-guessing my choice. I didn’t know that that’s exactly what I wanted to do. My fall semester, sophomore year, I took an environmental science class, and I loved it. Absolutely loved it. Within a couple weeks, I was like, no, I’m not doing biology anymore. I want to do environmental science. And I switched and started working with the—he was a professor, but he was also in charge of the environment science program. There wasn’t a marine science focus at that time, but he really worked with me so that I could make that part of the environmental science with a focus in marine science. It was perfect. I got to take all sorts of cool classes and spent a spring break out on the coast, doing water samples up and down the estuaries. It was really fun. [laughs]

Q: What was the professor’s name?

Ervin: Oh, I can't even remember! But I can see him. I'll have to go back and look it up. But he was amazing. He's still there. And now he's officially in charge of the environmental science program, which is cool. I've gone back to him every like few years like, "Can you write a recommendation?" Not anymore, but that's what I was doing when I finished Peace Corps. [laughs]

Q: What happens after college?

Ervin: Okay! Senior year of college, I'm trying to figure out what I want to do. I thought I was going to pursue a PhD in coastal marine ecology. That was kind of like my favorite area of ocean science. It's not the deep-water. It's right on the edge, and it's where everything's mixing and happening, and there's a lot of change happening because of climate change, so there's a lot we don't know. It's just really interesting. That's where my long-term goal was, PhD in coastal marine ecology. But also, at this point, I had been overloading my schedule since freshman year, taking summer classes every single summer. Because I was doing the music major, a bachelor's in music, and then a bachelor of science. Each one requires like sixty-plus hours within that major. It was a lot of work, and I was tired. [laughs] So senior year, I'm like, I want to do a PhD but maybe not immediately. I feel like an internship would be really great, or some sort of break.

It was fall semester, it was probably right after school started, and I was going around to all these different lectures and interest meetings that they had for seniors about what you could do next year. I ended up going to a session on the Peace Corps, and it was this

woman who had just finished two years in Mozambique. She was in the agricultural sector of her group. She was like, “Yeah, we planted trees and we had community gardens and we did all this.” I remember sitting there and I was like, what? Two years and you can just play outside? This is amazing! I knew nothing about Peace Corps. I had no idea what its history was, what its purpose was, like nothing. I was just like, two years, that’s covered? They take care of your medical stuff? You get funded, essentially? I was like, this sounds really great. I looked up that night what Peace Corps is and what it does, and I found that there were three programs that had marine science. There was one in Thailand, in the Philippines, and in a couple of the smaller islands in the South Pacific. I was like, this sounds perfect! I applied that evening and started that process. I remember going to my interview, and I apparently did everything you’re not supposed to do. Because you’re supposed to go in and be like, I can do whatever! I’m totally fine with whatever you want, it’s okay. And I went and I was like, “I know you have these programs in these three countries. This is what I want to do. This is what I feel like I’m qualified to do. If you don’t have anything, I totally understand. Thanks so much.” And that’s kind of how I ended. But I got a call the very next day and they were like, “Okay! You’re going to Asia in August, and you’ll get more information later.” That’s kind of—that’s the deal.

Q: Did that line up with what you had like outlined for them?

Ervin: Yeah, completely. I was like, okay, cool! I know it’s one of these three places.

We’ll see, this sounds great. I remember calling my parents after I got that phone call. I

was like, “Hey, guys! Have you ever heard of the Peace Corps?” [laughs] It was like dead silence. And then my mom jumped up and she was like, “No! You can’t—what are you—what?” And I was like, “Well, yeah. I already interviewed. I think I’m going to join the Peace Corps.” Yeah. So that was kind of an adjustment. But turns out my mom had actually applied in the seventies. It was something that she had always sort of thought about and wanted to do. After the moment of shock wore off, I think they were a little bit more excited about it. [laughs]

Q: So tell me about the Peace Corps.

Ervin: Okay. So, I graduated. This is also kind of a funny story. They were like, “Asia in August.” But I had to finish up a couple summer classes to complete the environmental science degree. I had my music degree finished by May of my senior year, but I needed to take—it was like two more classes. So I did a study abroad, and I was in Cambridge, England, for the whole summer, 2008. I arrived in May—June, July. August 1st, I fly back to the United States. August 10th, I fly out to California. The 13th, I’m already in the Philippines. I don’t actually graduate, technically, until—I think it was like the 27th or something. It was at the end of August. So I started Peace Corps before I’d even really graduated. But they knew that, so it was okay.

We flew into Manila and spent, I think, two weeks there. Then they shipped us off to Batangas. It’s a pretty big city on the big island of Luzon in the Philippines. That’s where I spent three months for training. It was language and culture and some technical training

about the oceans and stuff, there in the Philippines. Then I got my site assignment. I was up in Zambales. It was also on Luzon, the big island, but about—between six and eight hours northwest of Manila, depending on traffic and your mode of transportation.

[laughs] Public transportation, obviously, took longer. Yeah! And I was working in Masinloc. That was the coastal community. Working with the local government unit, the LGU, and fishermen. They had, at the time, four marine protected areas already. They were actually the site of some of the first marine protected areas in the whole country. They have a very strong conservation program. I was there to help with site assessment. We did abundance and diversity studies of the different corals and the fish and cleanups, and then really it became a really big education program. I started working with the schools in my city. There was about eighteen elementary and middle and high school and that sort of thing. So, programs there. We did some—teach kids how to swim and adults how to swim and that sort of stuff. It was a whole gamut of environmental topics. It was fun! [laughs]

Q: Any memories that you look back on, that really stand out to you?

Ervin: So many. I think the most vivid memories are just how beautiful it is. Above water, underwater, the Philippines are gorgeous. It's just everything you think of, when you're like, beautiful tropical island. That is the Philippines. We would get out—that was our job, was to get out in these boats and then go off to the island and pick up our—the fishermen that were there. We would go then out some ways to either of the marine protected areas and jump in the water. It was—yeah, just—I can see everything. All the

colors, the temperature, everything. It was absolutely beautiful. That's probably the most vivid thing.

But then, of course, I had a host family there, so remembering them. My supervisor, and watching her daughter grow up over—I mean, it was only two years. But I've been following them on Facebook since, and we still communicate. Seeing her—she was like five when I got there, and now she's going into high school. It's amazing. So that's fun. It's kind of like having a family on the other side of the world, but some people that I can follow, that sort of thing.

Q: I know that you had been to England before. Had you been elsewhere outside the country, the US?

Ervin: Yes. I studied abroad twice as an undergrad [undergraduate student]. The first time, I spent a semester in Budapest, in Hungary. That was junior year, fall semester of junior year. Four months living in Budapest. I got to travel all over Eastern and Central Europe. Because we didn't have classes on Fridays. Every Thursday, me and my other friend, whose name is Bethany—so Beth and Bethany—[laughs] which was a wonderful travel companion—we would go to the train station. We would usually have some sort of idea of where we wanted to go, but essentially, we'd go and look and be like, what time is there an overnight train and where is it going? Shall we take it? Sure. So we'd get on a train and wake up the next morning in a new country and go explore for the weekend, and then come back to Budapest. I think that's what really like started—because that was my

first time traveling on my own before. I had traveled with my family, we'd been to Australia and Hawaii and all over the United States. It's kind of what rekindled my interest in traveling. Then went back to England, and at that point, too, I went to Ireland and Scotland, Wales, France. So I did some more traveling while I was there.

Q: What was it like being in the Philippines—I don't know if people still describe it as a developing country or not. But just managing differences in who you are and where you come from and people you're meeting and situations you're encountering?

Ervin: Yeah. It's challenging. The Philippines are, I think, a confusing country. Because there are places in Manila that are super nice, that rival anything that you find here in the United States. Then you go two blocks over and suddenly the buildings disappear and it's just like cardboard structures or sheet metal and that sort of thing. Opposite ends of the spectrum are just smashed up beside each other, and that can be very confusing. The people that I was working with at the government unit, they had been to university. They would read and write, everything was done in English at the government level. Because that's officially one of the national languages. But then you go out to the island and they can't read English, they certainly don't speak English. They don't even—they speak and understand Tagalog, which is the other national language. But there's this local dialect, too. The communication issues were a constant struggle for us, as well. Anytime the volunteers would come back together, a topic of a conversation was just like, how do these extremes exist in the same place? What are we supposed to do with this? It's certainly very challenging. But I think it's important too, because—and it was a good

skill. I think I learned more from my Peace Corps experience than I was able to give back, just because I was still learning. I was just out of undergrad. It was an incredible experience for me, and it really shaped and changed my focus, where I thought I would be going post-Peace Corps, which brings us into public health. [laughs] It was just an incredible learning experience. I don't have a good answer as to like why these things exist, but in terms of how you can take advantage of that, there's a lot that you could do, drawing on different resources of different people and that sort of stuff and bringing them together. It was really a lesson in—I don't know—creativity and problem-solving and that sort of thing.

Q: Do you remember a time when you solved a problem creatively?

Ervin: Oh, man! Yes. Okay. We were planting mangroves. That was on the docket. We had put in a proposal. I had written the proposal, turned it in, got the money. We were like, we're going to plant hundreds of mangroves. Because it's been decimated all up and down the coast and it's really important. We had already done this huge educational campaign about why mangroves are important, why they shouldn't be cut down. And yes, we understand that you need to build houses, but there's different resources. So, massive education campaign. And the final event was going to bring all of these community members together to plant mangroves. I remember talking to my fishermen. I was like, "Guys, your job is to tell me when there's going to be a low tide. When can we plan this event, where we have hundreds of people coming to plant mangroves?" And they were like, "Sure, sure. It's going to be low tide on this day, at this time." I'm like, "You're

sure.” They’re like, “Yeah, yeah, yeah! Of course, of course.” Like, “Okay, cool. This is what we’re going to do.” I had already been there, I think, a year and a half. This is one of my final projects. [laughs] The day comes, we get everyone together, we have this big ceremony at the start, and the mayor is there. We’re like, “Okay! Let’s go to the shore and plant our mangroves.” We get there, and it is definitely not low tide. It is high tide. It is up to our waists. I was so frustrated, at that point. That’s probably the most frustrated I had ever been in those two years. I was just like, how could you not know? You’re fishermen! Your daily life depends on the ocean. And this is something that’s been charted for hundreds of years. What happened here? There was this moment where I was like, [breathes] I could get mad, but I don’t have to. What can I do? I just took a deep breath. I turned to my supervisor, because she could tell. She was like, “It’s okay.” And we’re like, we obviously can’t plant these right this second. What can we do instead? And so instead, we were like, “We’re going to do a slight change of plans. Let’s figure out how we want to plant these.” It became more of a—instead of just everybody coming and willy-nilly, we were like, “Let’s see. There’s more land over here, so maybe we’ll be able to plant more over here.” We started dividing people up into groups, sort of organizing folks. By the time we got ready, a couple hours had passed. Then we’re like, “Let’s have lunch. Let’s have our snacks and merienda.” It’s actually very easy to waste time in the Philipp—people are totally fine with just hanging out and watching the waves come and go, which worked in our favor. By the time the tide did finally go out, I think it was better. We had everything organized. All the mangroves were now in their groups and we had people that were assigned specifically to these things and we were able to move them out. I don’t know if it’s really creative, but it was at least accepting what the

situation was and going with it, in a different direction than planned but at least still making it happen.

Q: Thanks for describing that, I think that gives me a picture of some of the things that you were doing and that's cool. So what happens after Peace Corps?

Ervin: Actually, while I was still in Peace Corps, I decided that public health was maybe a direction that I thought I would be going in. The environment is still something that is super important to me, but living and working with the fishermen and these community members, where yes, they understand that the environment is important but at the same time, they're trying to feed their families, they're trying to keep a roof over their heads. For the fishermen on the island, for their kids to go to school, they have to get in a boat every single morning and go across the water and then take a bus to get to school. That costs money. It wasn't very much money, it was like fifty cents each way. But for them, it was a lot. I couldn't fault them for that. I'm like, "No, you can't cut the mangrove down." And they're like, "But we need a roof." And I couldn't judge them for that. So that's where public health comes into something. I was like, maybe there's a way to do environmental protection that addresses all these needs first, but in a roundabout way, is still able to protect what we have and conserve and that sort of thing.

Also, one of my best friends from the time I was twelve when I moved to Tennessee, had just started working here at CDC. Like, we graduated at the same time, and I go off to the Philippines and she comes here to Atlanta. She had been telling me about what she was

doing with CDC and what public health is and could be. I started to look into it, whenever—you know, my monthly trips to Manila, when I had access to internet, and looking into it. I decided, okay, at least I should take the GRE [Graduate Record Examinations] and get that going. I ended up taking the GRE while I was still in Peace Corps. I flew to Cebu—it was only offered in two cities in the country. Peace Corps is very nice about taking these tests. They'll give you an extra day ahead of the test and then a day afterwards. I lined it up with a weekend, and I was like, I can get a vacation out of this. One of my other friends was also taking it at the same time. We met in Cebu and took the test. It went really well. That evening, we took a bus up to another tiny little island and went diving with thresher sharks. I have very fond memories of taking the GRE, [laughs] which is yeah, a little strange. I took the GRE, I started applying for schools before I finished, and then, by the time I left the Philippines in October of 2010, I had already finished my applications and was just waiting. I got to travel for a couple months before figuring out what I was going to do with the next couple years.

Q: What happens then?

Ervin: I leave in October and I go to Taiwan and Vietnam, Cambodia, Laos, Thailand, this whole tour of Southeast Asia. I come back to the US, it was Christmas Eve of 2010. And then it's just waiting. I find out like a month later that I got accepted to Columbia [University] and Emory [University]. Those were the two schools that I applied to. Visited both of them. Decided on Emory and started there in the fall of 2011.

Q: Tell me about Emory. Rollins School?

Ervin: Mm-hmm. Yes. Rollins School of Public Health, the global environmental program. At the time, that was exactly what I was looking for. I wanted something that still had an environmental focus but wasn't occupational, like more of an environment-environment, instead of built environment, that sort of thing. Because traditionally, that's what the environmental public health is, at least my understanding of it, was much more of building health, safety, and that sort of thing. I wanted more of the environment but from a public health perspective. And that's what the global program offered. It still meant that I could do—have a focus or study things internationally, and all the challenges that are there. But the environmental side of it included things like pollution and climate change and agriculture and that sort of thing. I only found two programs, it was at Emory and Columbia. That's why I applied to both of those. The program at Columbia, the sector—sort of focus that I was accepted into became more of a policy thing, whereas with Emory, it was more of a research base. I decided that I still wanted to learn more. I wasn't ready to be part of policy. I didn't feel like I knew enough. I wanted to stay on the research side of things for a little bit longer. That's why I picked Emory. And then also, of course, CDC was literally across the street, which certainly was a big pull for Emory. Yeah! It was great.

I started working—I actually got a job at CDC, in the Viral Special Pathogens [Branch], March of 2012. I was still in my first year but in the second semester. But then I went away for the summer, I went to Bangladesh for four months, for my practicum thing.

Came back and started working again with the Viral Special Pathogens Branch. They work on Ebola, Marburg, hantavirus, here in the United States, LCMV [lymphocytic choriomeningitis virus], Crimean-Congo hemorrhagic fever. It's all the scary viruses. I just found it really interesting. My job was literally to scan files. It was not cool. But it was still fun to go through some of these old files. We were looking at all the information from SARS [severe acute respiratory syndrome], the first SARS outbreak. My branch was the one that was doing a lot of the testing. It was just cataloging these historical records. It was so interesting. I was constantly going back to my supervisor, Barbara Knust, and asking her to explain, like, what these different pieces were. Because some of the old files included medical records too, pathology reports. Looking at all the different pictures and—it was really interesting. As part of Emory's school, you have to write a big practicum at the end of your two years. It's your big thesis. That's what you need to graduate. I ended up working on hantavirus surveillance data that VSPB [Viral Special Pathogens Branch] has been maintaining since 1995, and did a spatial analysis of hantavirus cases, in—I focused in California, Oregon, Washington, and Nevada. Because that's also the highest incidence. It's a very rare disease, so there's not a lot of numbers. But I was trying to maximize that. [laughs]

Q: What did you find?

Ervin: There's some environmental—like, it's not random. I think that's the bottom line, is that cases are not random. It does occur in clusters. I think the next step—really, what I was trying to do before Ebola happened—was define some of those clusters. What are

they? How do you describe them? Could something that is happening in the Southwest, is it the same environmental factors that's happening in the Northwest? How do they differ, compare, and that sort of thing? That's still yet to be determined. There's been some research. I think the environmental factors—it's very isolated. There are communities of either rodents or humans, we're not really sure yet, but there's certainly nonrandom distributions of incidents happening. So, [laughs] kind of interesting.

Q: Yeah! No doubt. Sorry, this is out of order, but can you briefly describe your Bangladesh experience?

Ervin: Sure. Bangladesh. I was—[laughs] Well, it was funny. Before I even started graduate school—this was right after I came back from the Peace Corps. I remember looking at a National Geographic article. It was focused on Bangladesh and had these beautiful pictures and imagery of the people, of the country—describing all the issues with overpopulation, overcrowding, and development that's happening at the same time. A lot of international companies are there for garment factories. It's a very interesting and beautiful place. Like the colors, these pictures are super vivid. I think it was like January, February of 2011. I remember being like, I need to go to Bangladesh. I really want to go there. That looks amazing.

When I started school—they start telling you very early on, “You need to start thinking about your summer project, where you want to go, what you want to do. You need to find a professor.” It's kind of like this, huhh! Okay! I paired off with another environmental

student. She and I were working through what we could do, and there was actually a program in Bangladesh that we found. And it was totally open-ended. They're like, "We have a partner in Bangladesh. They're very interested in working with us. We don't have a project in mind. So here's what you—you write the project. We'll review it. If it's accepted, you get to go." She and I were like, okay, let's do this! We did a bunch of research, trying to figure out like what some of the bigger problems were or questions concerning the environment in Bangladesh. And there's quite a few. One of the big ones is arsenic. It's a very low-lying area, and so there's a lot of saltwater inundation and runoff and things like that. So maybe in the nineties and since then, there have been a lot of projects for deep-water wells, going down and getting clean water. What they didn't know is that there's also a lot of naturally occurring arsenic in those deep-water wells. Unless it's super, super deep, then people were starting to get arsenic poisoning. And it was completely—nobody could have guessed that or foreseen it. But it was a problem that now Bangladesh was trying to deal with because the water wells that have been set up to give them clean water are now actually slowly poisoning them. Our question, too, was, okay. We know arsenic exists. What are some of the other contaminants that are there? Now that people are learning about arsenic, are they now reverting to other water sources? Like are they going back to the rivers and the surface waters? What sort of contaminants are there, and pathogens? We did a survey in four different sites around the country, some rural, some urban, like right outside of the capital, and took a whole bunch of water samples and did a lot of interviews and tried to figure out what people were using for water and if they knew about arsenic or if they knew about boiling their water, like what their just general knowledge, attitudes, and practices—I didn't know that term

until after this. But that's essentially what we were doing. [laughs] It was about two months of data collection, and then we stayed there and worked through some of the data and presented, while we were still in Bangladesh. And then, for the rest of the year, this other student and I worked on writing it all up.

Q: That's neat.

Ervin: Yeah! It was very interesting.

Q: Thanks for describing that. Let's see. When do you graduate from Rollins?

Ervin: May of 2013.

Q: May of 2013. What happens then?

Ervin: I graduate on—I think it was the 13th. The very next day, I flew out to Turkey for two weeks of vacation. I came back on a Sunday, and Monday, I started work as an ORISE [Oak Ridge Institute for Science and Education] fellow with Viral Special Pathogens. It was an immediate turnaround, which was awesome. Still working with the same group, in the same actu—like, in the epi [epidemiology] group, with Barbara and also with Craig Manning, who is our communications person for our branch. It was great. [laughter] At that point, we were working on—my thesis had been finished, but I was still trying to come up with the next step. What were the next round of investigations that we

could do? This was more of the environmental data and trying to really define why some of these nonrandom distributions were occurring and that sort of thing. At the same time, I was also working with Craig a lot on the website. We were trying to update the website, get it in the new format. I make maps, as well. GIS [geographic information system] is something that I was really interested in while at Rollins, and getting better at that. Doing spatial analysis, but also simple incidence maps and developing that mapping capability within the branch. That's what I was working on as well, when I first started.

Q: How do you get involved in the Ebola response?

Ervin: [laughs] Well, let's see. Fast-forward to March of 2014. I'm working in the Ebola group. Hantavirus is one of our things, but Ebola is the other part of it, Marburg. All of these different viruses. When there's any sort of suspicion of Ebola or a confirmed Ebola case, that news always comes to my group first here at CDC—generally. [laughs] We have the subject matter experts that are there. Typically—I hadn't been around for any Ebola outbreaks prior to 2014. But typically, VSPB will get involved. Often, they'll send laboratory support. There's epi response. It's really working with partners on how to do these outbreak investigations and that sort of thing. We get word that there's highly suspect—and then finally it's confirmed, and we get to mobilize, which was exciting. I had never seen an outbreak response with CDC, with anything. So that part was actually kind of cool. Pierre Rollin is in charge of our epi group within VSPB. He and Craig and our EIS [Epidemic Intelligence Service] officer at the time, Ilana Schafer, they got together, and then they pulled some other people outside of our group. It was a little—a

team of five. We found out—it was like on the twenty—I can't remember the actual date. But I know they were sent out on like March 31st, I think is when they were out the door. I was behind with Barbara and Stuart, our branch chief, Stuart [T.] Nichol. We were kind of managing the response from Atlanta. We were communicating with the teams every day, making sure they had the support they needed, making maps. I was making a lot of maps for Pierre, and then also for leadership here at CDC.

Q: Can you describe the maps?

Ervin: Sure. They were very basic, initially, because we were only getting information from—really from Pierre's contacts, who were communicating directly with him. He knew that the town of Guéckédou, that was important. Macenta, Nzérékoré. Trying to figure out where these places were in the world. There wasn't a lot of data on these countries, at this point, in terms of mapping. Road data was very, very sparse. It was just the major roads. Trying to map these things initially was really difficult because you only had the bigger cities. There just wasn't information on the smaller cities. It was kind of guesswork. We were mapping and showing that it was in that three corners of—or three countries. Right? It was exactly where Sierra Leone and Liberia and Guinea all come together. Those were where the first cases were found. Trying to plan ahead, the branch sent two people to Liberia after they reported a case, of somebody who had been traveling. Yeah, it was really interesting, [laughs] trying to follow all of that kind of thing. And then reporting back to—I think that was the other interesting part about the communication, was that it wasn't just to our field teams but it was also here at CDC.

Getting questions from both sides, and then trying to channel the questions so there wasn't like duplicate efforts going on or multiple people trying to work on the same answer but at different places. It was trying to streamline what was needed and who needed what when.

Q: Can you give me an example of one of those communication things you facilitated?

Ervin: Sure. At this point, I was much more just following directions. We had the—I always get their acronym confused—but Ray [R.] Arthur's group. [note: Global Disease Detection, GDD] Part of what they do is they collect information and alerts from around the world and they channel it to the right people and they verify that the reports that they're getting are true. Likewise, our group, we're communicating directly with our field team. Sometimes we were getting things about new sites of investigation that our field teams were like, no, no, no, that's not real, or oh yeah, we went there, it's fine, it's okay. Trying to circle back and keep up with the media but also keep up with what WHO [World Health Organization] is reporting, what the country was reporting, what our field teams were seeing. All of that was this constant—and they're a few hours ahead of us. By the time you woke up in the morning here, they had already spent half their day working. It was like, you get here and—coming in early, working late. It jumped from this nine to five, easy job to like eight to eight. It was still exciting—I mean, there was a lot of like, okay, what's going to happen? Every day was different. You didn't know what to expect. Sometimes you were talking with more media people and getting them information, sometimes it was more of your field teams or—and then at this point, we were starting to

prepare more people to go in the field. Training them. There's—Epi Info. This was the first time the VHF [viral hemorrhagic fever] app had been used. There was a programmer with the team in Guinea who was doing real-time changes and that sort of stuff. Trying to keep up with those edits back here in Atlanta, so that when we train people to go out, we have the most up-to-date version and that sort of thing. Yeah, it was this—we started running. [laughs] Very fast-changing.

Q: What happens next?

Ervin: Okay. Let's see. Through May and April, Stuart was here. And then he had some already scheduled trips, and so he took off in May. Barbara Knust had a baby, and Craig came back, and Pierre was still in Guinea. It was kind of this rotating group of people. Ute Stroehler, she's a laboratory virologist in VSPB. She and I were still trying to keep on top of these things and communicate with Stuart. He was in India at some point, and then he went to Greece. And Barbara was on maternity leave, and Pierre's in-country. We had like, all of our key players everywhere, across the globe. [laughs] Trying to work on that, on conference calls with WHO and MSF [Médecins Sans Frontières]. And then Dr. [Thomas R.] Frieden was wanting updates, and all of the leadership here. We needed to continually update them. Yeah, that was like May. It was just kind of all over the place.

And then June, Pierre comes back, Stuart comes back. So we have a stronger team here. June was kind of this like—we weren't sure what was going to happen. Cases were coming down in May in Guinea, and there hadn't been a case in Liberia for a couple

weeks at that point. Sierra Leone hadn't reported cases. But then, right at the end of May, that's when Sierra Leone reported their first case. A few weeks after that, Liberia started reporting cases again too. And then Guinea started to report a few more. So everything started to ramp up in June. That's when we were told, we're probably going to need more help than just our branch. This is when the EOC [Emergency Operations Center] started to come into conversations. Early July, the EOC is turned on and we are officially working as an emergency outbreak response for the whole agency.

Stuart started as the incident manager. I was the—his executive assistant, was the title. But essentially, I was trying to like—when he needed paperwork, make sure that the paperwork was there, and align his schedule, and kind of figure out everything that was happening, and work with the EOC—the different groups in the EOC and make sure that we understood what they were expecting. Because we had never worked in an outbreak or an emergency setting, and we're working with experts on emergency responses. Trying to figure out what their expectations were and communicating with them. It was very, very, very busy. Again, it was like more information coming all the time because there were so many more players. We needed to learn—really divide and conquer. The communications, Craig took over communications in West Africa, but we also had Dave Daigle, who was doing communications and media here in the United States. That required a lot of time and attention. Then there was Congress, the White House was getting involved. Washington was now coming online and asking for information. So creating slides for them on a daily basis, and of course, updating Dr. Frieden. Yeah, it was very busy. [laughs]

Q: Yeah. Sounds like it. I'm trying to phrase this the right way. [laughter] So you're working with one group of real, like, subject matter experts. And when you transitioned to the EOC, this group of experts is working with another group of experts in something else, something complementary but not the same. How did they work together?

Ervin: There were certainly some bumps. The challenge was really understanding—the virology—my group was coming from, this is how we understand the virus. And the emergency operations was coming from this—you know, it's a very top-down approach and structuring and being like, where? Logistics. That's their focus. Whereas my group was still like, well, transmission and contact tracing and this kind of stuff. It was sort of like missed—maybe miscommunications, but really a difference of focus and where each—yeah—group of experts thought we need to kind of put our attention on. Because again, normally, the Ebola outbreaks are very small. You go in and you can put in a couple epidemiologists who can very quickly attack and assess, and then we have our virologists, that are able—the laboratorians, that are able to test and get results out quickly. It's this very—kind of a concert of efforts and that sort of stuff. But when you scale it up, then you have so many more people. You have logistics and like, housing and transportation. These are things that we hadn't really ever dealt with. And “we” as in VSPB. Whereas the EOC was much better about that, and getting supplies and trying to be like, “What do you need? What do you need?” And we're like, “We need—we need people!” [laughs] Yeah, it was trying to kind of like merge what both groups knew

needed to be done and try to find an easy way of getting that through. And it took a while, took a couple weeks.

I think we didn't—we didn't get anybody in Sierra Leone until the end of July. And at this point, they were already—it was a mess. Austin Demby was the first one to go over. His report really was just so dramatic. It's really what was like, okay, we need to get this happening even faster and faster. Then we were able to bring over Trevor Shoemaker. He's also Viral Special Pathogens. He lived in Uganda for six years or so, and has been involved with every outbreak that's happened in Uganda since—while he was there. So he has a lot of experience doing Ebola outbreaks and Marburg investigations and that sort of stuff. He went over. They tried to set up some of the initial connections. And then Tom [Thomas G.] Ksiazek, who was a branch chief and is very well respected in the Ebola community, he went over as well, to assist. Finally, we were able to get the logistics of sending people over a little bit quicker. It took a while to really mobilize those systems, and streamlining that, too. But yeah, finally we were able to get people over on a constant basis. We're pulling from the entire agency, too, for deployers, which was good. Because my branch was already tapped out, at this point. If you could travel, you were over there or you had just come back. Or you were like me and not allowed to travel because I was a contractor [laughs] at that time. Yeah, it was all hands on deck, for sure.

Q: When you say sending people over, over where?

Ervin: To Guinea and Sierra Leone and Liberia.

Q: All of the places.

Ervin: Yes. Mm-hmm. I can't remember exactly when we started working on the neighboring countries, too. But then CDC had people in Senegal and in Côte d'Ivoire, and trying to get all of the region—Mali—just trying to set them up. Border control became a huge, huge part of this response too, and bringing on those skills and expertise of trying to understand how the borders work between these countries, which was a major challenge, especially in that three-country area. Because there's no—there's no fence, there's no wall. There's very few actual, designated—you know, "Let me stamp your passport and make sure—" People literally just hop in a canoe and go across the rivers, and you're in a different country. It's unregulated. That was how the virus was able to spread so quickly in all these different countries. But yeah, there was a focus on all the—the whole region, with different levels of effort depending on risk and that sort of thing, number of cases. [laughs]

Q: This is actually—strangely enough—or maybe it's just my memory. But I haven't heard too much about Austin Demby's report. Can you describe more about that and how it motivated new kinds of efforts?

Ervin: Yeah. He visited—so he's from Sierra Leone, which was great. He already had some connections with different parts of the Ministry [of Health and Sanitation] and knew the country really well. I think what was so motivating about his report is that he—

you know, he arrived in Freetown, but he immediately went out to the eastern part of the country, where all the cases were. He visited one of the major hospitals that was out there. His report, he described the state of the medical facility itself but then also the caregivers. At this point—because initially, the doctors in Sierra Leone thought that maybe it was Lassa fever, something that happened from time to time. They didn't realize that it was Ebola. Because why would they? It had never been there before. And there aren't a lot of doctors in Sierra Leone, per person. There were a lot of deaths initially in the nurses and the doctors that were out there. By the time he got there, I want to say there were only like two or three doctors and then a couple nurses. People were scared. He described bodies on the roads getting out there, and that just people were scared and that there was this really high level of tension and fear. His whole report was really like, we need to do something very quickly. We need people out here. We don't really have a good handle on what's going on. The reports that we're getting are confusing. You know, we don't know that all of this is Ebola. Chances are it's not. There's probably just—we know that there's a lot of disease anyway. So we really need to start triaging and getting actual Ebola patients for care and separating them from non-Ebola, to stop this transmission.” But yeah, his report was this red flag, like, this needs to happen right now. And that's absolutely what—we were like, okay! Let's go. We need to send people and get this going.

Q: Did it change what you were doing?

Ervin: Not really. His report came out, and that was more of kind of a logistics and an emergency management thing. My role was still to collect the information, to synthesize it, to make the reports either for leadership or for Washington or training materials, like pulling—just keeping information organized, essentially. At this point too, this is when the bed capacity started to become an issue in all three countries. That was something I was starting to work on with Martin [I.] Meltzer's group, and the modeling, and figuring out how many beds there were and trying to keep track of that. We were working with MSF to get their estimates and then also with the ministries to get estimates of the state-run or the country-run facilities, trying to keep on top of that—which sounds like an easy thing. “How many beds do you have in your facility, right now?” But we were getting different numbers all the time. It was a question of how many beds exist, but then how many beds are occupied, and how fast is the turnover, and all of these different questions. It was—yes. [laughs] There was a lot of guesswork, a lot of, “Here's a number,” and then scratching it out and putting in a new number and that sort of thing. But that was a big focus for a while, because we were trying to estimate—this was when we were approaching Congress for more funds and saying that we need help. Martin's group was able to do those modeling estimates and things. That paper came out and people took notice and were like, okay, this is a big deal, which was great. That was my—my job was like, information col—

Q: Yeah! Which is fascinating to me still. I want to make sure we're grounded in the timeline here, a little bit. Do you remember when Austin Demby's report might have been circulating?

Ervin: I think end of July.

Q: End of July. Okay. So you guys start talking about beds shortly thereafter, in August?

Ervin: I think so. Yeah. Yeah, because by August, the number of cases were already starting to really increase, especially in Sierra Leone and—Guinea was kind of steady, actually, throughout the entire two years. But Sierra Leone was this huge jump. And Liberia was steadily increasing too, at this point. It was definitely like August and then going into September.

Q: Were there any—this is a very broad question, but were there any patterns in the flow of information that you noticed?

Ervin: Yes. We were receiving information from a lot of different groups. And country-specific information, too, was different across the three countries. I remember getting regular reports from Sierra Leone with suspected and confirmed cases. I mean, it took a little while. I'm probably jumping forward a few months, when I'm talking about these patterns. But WHO was sending the official report. Everything that CDC put on their website, we were matching to WHO. We were waiting for them to release information. But while they were doing the official information, we were still getting reports from all the countries—ministries, so the ministries of health. To varying degrees, CDC was helping create these reports. In Guinea, they were using VHF [Epi Info Viral

Hemorrhagic Fever module] initially to create them, and Liberia, initially, as well. Ilana Schafer, the EIS officer who had worked on this app, she was in both of those countries to help set up that program. They were using that to generate their daily reports. And then Sierra Leone was a little bit different. They also ended up using VHF, but they were also creating daily reports. But the information that was included in these reports differed across the three countries. Sometimes you got confirmed cases, sometimes it was just suspect cases, sometimes it wasn't clear what they were reporting. The numbers often didn't add up, [laughs] within a single report. That created challenges back here because we would send that up the chain and they're like, "What? This doesn't make any sense!" All we could do was like, we can cite where we got it from, but this is the best information that we have. Then, once we started to get more CDC country teams, they were able to send reports as well. At this point, it was WHO, it was the official country report, and then it's our CDC team report. Then we're also still talking with MSF. We're getting numbers from them, and information about how many people they're treating and how many people they have in-country and that sort of thing. It was a lot of varying numbers that were never—they never matched.

Q: What do you do with that?

Ervin: You kind of just do the best you can. We made a point—we would have our WHO report, which would match the WHO numbers. But the numbers that we were reporting on a daily basis internally were based on the country reports. We decided that we would go with that. And that was something that VSPB has done in the past. That's just been a

general rule, is that we'll report exactly what the country is reporting because they're our partners, they're leading this. We're here to assist, so we go with their numbers. What goes live is what—WHO goes live, also kind of to show that we're supporting WHO's response, this is—you know, we're working together and we match. [laughs]

Q: Gotcha. So lots of different considerations in there.

Ervin: Yes! Yes.

Q: It sounds like the relationships with the various people reporting the numbers are also taken into account in what numbers you use.

Ervin: Yes. Definitely. We were trying to communicate regularly with all the different partners to make sure that the number—that we were, one, receiving reports regularly, but that if we had questions, we had somebody we could go back to and ask questions about. That ebbed and flowed depending on who was in-country when and who was here in the EOC. But certainly, the relationships were really important. Even at times when it was frustrating, it was often due to things that were beyond and above where these numbers were coming from. It was—yeah, there was a lot of politics and things that I learned about, and how these international agencies work, and then with local governments, and then at the country-level governments and things like that. It's all about relationships. Sometimes it works, sometimes they don't work so well. But you do the best you can. [laughs]

Q: When you look back at that, are there specific instances that come to mind that can illustrate—

Ervin: Maybe not so much while I was here in the EOC. But I do have—I definitely saw that happening on the ground in Freetown, in Sierra Leone, especially when I was working as part of the general epi in Freetown, in Western Area, in March of 2015. Every single morning we would come together. It's WHO, CDC, Sierra Leone, MSF, UNICEF. Any sort of group that was functioning and operating, they could send a representative to this epi meeting every morning. It was great. I had absolutely no problems with MSF or any of the individuals there or the country office. We could communicate. And DFID [Department for International Development] was there. They were helping run all the logistics and things. One-on-one, we could talk about anything. If I found any issues, such as a quarantined home didn't have food or we need to get more water to these people or we're worried about the security, or whatever it may be, or we've heard rumors of measles that's happening in the community—whatever it was, we could talk one-on-one with our partners. It was interesting because sometimes we could come up with plans and be like, okay, this is how we're going to fix this. The next day, a couple hours maybe even later, that plan would have to change immediately because something that had happened above us now dictated a new way—new standard.

Like measles, for instance. We came up with kind of a—for Freetown, if there were rumors, these are the people that we're going to contact. And we're like, cool. We're

going to put this into play because we definitely don't want a measles outbreak right now, that would be awful. So we were working on that. Then, maybe a day later, they're like actually, change everything, throw all of that out the window. We have a new system in place. And that had happened at the Ministry of Health level, so above where we were operating on the Ebola response. Which was fine. It was just a matter of like, we had to like shift everything, and suddenly new people to communicate with for measles and that sort of thing. Being on the ground required a lot flexibility. I think even in the EOC, it was kind of like taking what you get and using what you have. It's not going to be perfect. It's certainly not standardized, even though you really wish it would be. But yeah, you kind of just have to take what you get.

Q: To follow that thread for just a second, when things changed, when you were going to do this—it sounds like a campaign of sorts—against measles, and then things changed, did measles get left on the wayside a little bit? Or—

Ervin: That was the concern. I'm not sure. I don't know if it was that it was put on the back burner or that the outbreak just didn't happen and so we didn't need it. It was a big concern for—you know, MSF was really the champion of this, making sure that there was something in—like some sort of plan in place. But fortunately, it didn't seem to become a huge issue. Certainly in the areas that I were, we never saw any cases. Yeah, I'm not sure if it was just because there were no cases or because nobody was reporting them. I'm not sure. [laughs]

Q: Gotcha. Okay. Sorry, so back to EOC. How do things develop from there, when you're managing all the information, etcetera?

Ervin: It kind of became that. It was just like this—bring in all the data, write it up, try to synthesize it, understand it the best you can, put it back out. The other part that kept changing was not only the information and where it was coming from but who you were sending the information to. Our teams kept expanding in West Africa. But then we were also sending people to [Washington], DC. And we had people that were at WHO. We had more people to communicate with and different—like, Congress needed different reports. The National Security Council needed different reports from other people. It was trying to make sure that we had a track for all the different groups and kind of writing who needs to see what, when, and keeping up with that. That was constantly changing. But that essentially was what I was doing from like July until when I left in December. It was just this constant feed of information that was—that was coming and going, sort of thing.

Q: Are there instances that you remember from those few months, that when you look back, that just pop into your recollection?

Ervin: Well, things got better, at least for me, in terms of understanding and feeling comfortable with what I was doing, once—so, Stuart started as incident manager, and then he became the chief science officer—he was doing incident manager and chief science officer. That's way too much for one person to do. Inger Damon came in as the incident manager, and she's our division director. Stuart was able to take on the chief

science officer role and do that completely, which was great. I moved over with him. We moved offices, and we ended up in this office that had windows and we were able to put maps up. I think that's when everything became a little bit more routine. Because we had a space, rather than—I mean, when we first moved to the EOC, polio was there, I think—there was some—there was another response that was going on too. It was limited space. We kept moving around and trying to figure out like where we were. This new office, that's probably what I remember more than anything, is I remember that the maps were up and how often I was changing them and updating them and where our food stock were. [laughs] And the phones. That office is very vivid in my mind. [laughter] Spent a lot of time there.

Q: Spent a lot of time there, every day.

Ervin: Yes.

Q: And who were some of the people you worked with the most?

Ervin: Definitely—well, from my group, Stuart, Stuart Nichol. Then we had kind of a rotating team of laboratory-focused—because the EOC was divided up into different parts. There was an epi team, there was a lab team, there was the medical care—like, clinical care. That kind of changed throughout the response too, as we got bigger and bigger. But from my group, I was working a lot with Barbara Knust—she was leading the epi team, of course—and with the rotating team of laboratory leads. And then all the

people in logistics within the EOC, trying to make sure that they had what they needed and that we were getting—like, the teams were coming. That really became automatic. After the first couple months, that was not something that I or Stuart or any of us needed to handle. They were doing the recruiting on their own, the EOC was, and able to train them. So they took on training and deployments. That was amazing. They were able to do all of that. [laughs] So—yeah, but checking in with them. Of course, we had our—we had a daily meeting with Dr. Frieden for a while, giving him updates. So making sure that that meeting was ready. Inger had an executive assistant as well, so working with that person. Probably [laughs] worked with them more than anyone.

Q: Who was that?

Ervin: It varied. Rachel Holloway was the one, like right at the—she was there for most of it. So working with her, before I left for Sierra Leone. And before that—oh, I’m totally blanking. I can see her. She has very short hair. Ooh! I’ll—

Q: We’ll put it in the transcripts.

Ervin: Yeah. Okay. Okay. [laughter] Yes. Ah! Yeah, I can’t remember. But she was fabulous. Those two women were amazing, amazing. Yeah. We were constantly getting information, checking with them, and if they had a question about the science and Stuart was too busy, they would bring it over here and I would make sure that he would answer

it or [laughs] would make an answer and get his signature on it, and then would pass it back and that sort of thing. It was—yeah—a lot of just—yeah—[laughter] lot of reports.

Q: No doubt. So December, is that when things—when your role shifts?

Ervin: Yes. I was brought in December with a Title 42 contract, so term-limited. I got a five-year contract with CDC. More than anything, this meant that I could travel. Because this entire time, I just wanted to be out in the field. I felt like there was a lot that I could do—there was more that I could do and be more effective in the field than in the EOC. What we were doing in the EOC was important, but it was—it was all data that was being collected elsewhere, that didn't make a lot of sense. I wanted to be where it was happening and to get out there. This was my opportunity. December 1st was my first day, and December 2nd, I turned in all my paperwork for my passport. I was like, "I'm ready. Let's go!" I went for my medical clearance. I got all of this stuff lined up. When my passport arrived in the middle of December, I put my name down. I was like, "Send me out. I don't care where." [laughs] And, yeah. In those couple weeks, it was trying to figure out where I could go and what I could do. I wanted to do just general epi. I was like, send me out to the field. I want to be in the middle of nowhere. I can do this. I did Peace Corps. I got this!

But we also were trying to get some research studies up and running. And not just research, kind of like non-research, programmatic things as well. Because I work in Viral Special Pathogens—it made sense for VSPB to be involved. In January, I went out with

another deployer, Mary [R.] Reichler. We were meeting Nadia [Nadezhda] Duffy to start the Household Transmission Study in Freetown, Sierra Leone. This was a non-research study. We were trying to understand how Ebola is transmitted within a household. Is it that direct contact? Is it everything? Because really, there had only been one paper that described transmission within a small group. This was just going to add to that body of knowledge and hopefully provide real-time information for the response on—if things are looking like there is something different, we need to shift our response activities and that sort of thing. That was a goal and that's what we started, it was like the end of January, early February.

Q: When you say a non-research paper, does that mean that it was for the practical purpose and not for publication?

Ervin: There will be publications that come from it, but in terms of funding, research and non-research are—and I didn't know any of this. But there's two different pools, pots of money. Research requires all these different—like pre-signed, everybody's on agreement. Non-research is something that could be applied immediately and you can hit the ground running. It's a lot easier. And that's also where we stress that we were providing real-time information. It wasn't like research in that we're going to collect all this data, analyze it, put it out in a paper, and then you can use it, but this was something that we were going to constantly be working with the Ministry and giving them back information, so that they could—we could use it and we could change what we were doing, if needed, and that sort of thing.

Q: Do you remember where the funding came from for that?

Ervin: It was CDC—one of our—eHealth [Africa]. It was channeled through eHealth. We were able to—I think, I'm pretty sure—we were able to funnel money through eHealth to hire the interviewers and get equipment and that sort of thing, and then their salary. Yeah. I'm pretty sure it was—eHealth was our partner through that.

Q: Can you describe for me your part in the Household Transmission Study and what you were focused on? Probably a few things. But—

Ervin: Yeah. It was based on a questionnaire. The way the study was organized is that, once a case is confirmed, teams would go to that household. In Sierra Leone, when there was a confirmed case, there was an automatic quarantine of that case. Any contacts that had been assessed as a contact would be included in that quarantine. Or if they lived in a different household, it could be multiple quarantine sites. Essentially, the way the study functioned is that once a case had been confirmed, the team would go to that quarantine set and interview every single person who was willing to participate and ask them about their contact with the confirmed case. Then, every single day during that twenty-one-day follow-up period, the team would continue to go back to the household and check to make sure that all the contacts were healthy or not. If they were not healthy, then this is where the data analysis would come in. Because we could go back to that initial interview and say, this person got sick, what was their contact? Were they caring for the Ebola

patient? Or were they cleaning up after—like, vomit or diarrhea or anything like that? What was the contact? Is it something that we could expect? We were kind of making these high-risk contacts, just based on our initial interviews, and we were able to share that with the Ministry too and with the people that were automatically following up on these—the patients—or the contacts, on a daily basis. That was the premise of how the study was working.

The questionnaire had already been mostly developed by the time we got to Sierra Leone. Nadia, Mary, and I, we worked on—and then also Barbara Knust here at the EOC and some other folks—on tweaking some of the questions and getting it ready. We ended up deciding to do a tablet-based data collection. We started working with somebody from Helen Keller International who is a programmer. He was amazing in getting the program set up on Open Data Source and—ODK [Open Data Kit]—sorry, yeah—and then putting it onto the tablet. We were making sure that all the tablets worked, and I was helping with some of the questionnaire development at this point, but really more of training and tweaking the tablet. Making sure that all the tablets were charged and working and had the correct forms, and that the forms were working, and that the internet was—we could actually send data from the tablets. All of these technical things over here. Then, yeah, we finally did the training with all of our teams, going through how the tablets work. Because computer literacy, this was actually a challenge that we did not foresee. Some people had smartphones, some people had tablets already, so they know how to use the internet. But there were some people who had literally never touched a computer, ever. Working through computer illiteracy, trying to—it's a steep learning curve. Following

the teams around, going and visiting with each team, making sure that they're—they are inputting data as they should and that it makes sense and that they understand, answering any questions. And then making sure that they're charging the tablets every night so that they have a charged tablet. These sort of things, like we hadn't really anticipated. But it became like, ooh! This is actually an issue that we need to work on. Yeah. Because one of the things, like the tablet—you click on a question. You fill in a bubble. It's a touchscreen, so you can move the screen up by touching it. But what people were doing is they would touch a different bubble, so it would fill in a different bubble, and then they would move the screen up and you wouldn't see it. We had to be like, wait, wait, wait. Let's move it back down. Let's fill in the correct bubble. Now, touch a different spot and move the screen up. And that was hard. Checking people. Then the other challenging thing was that we were in direct sunlight most of the time. It was almost impossible to see the screens in direct sunlight, which was something else we hadn't anticipated. So it was training to be like, "It's okay to hold it up this way so that you can see. Hold it vertical so you can put a little shadow on it and actually see the questions." Yeah. All of that happened, and within like a two-week period.

Q: I'm interested—this is probably minutia, but I'm interested in how you would alter the questionnaires.

Ervin: Oh, this was more just rephrasing questions. When we worked with our—we did the initial training, we went through the questionnaire question by question. It's—you know, it's—ah! I did a questionnaire in Bangladesh, right? We learned there that you

really need to pilot these things, that you write a question, you're like, "This makes total sense! It's perfect!" And then you go out into the field and things that you had no idea about impacted that question, so that people were interpreting it completely differently. An example from the Household Transmission Study was a question about piped water. For us, we were thinking of piped water as indoor plumbing. You turn on a tap and there's water. But what piped water meant in Sierra Leone was actually these community wells that had a pipe. So people were like, "Yeah, I have piped water." You're like, "Really?" I remember going out, the first time I saw that question asked, and they're like, "Yeah, they have piped water." I'm like, "They don't even have doors or windows. Are you sure it's piped water?" And they're like, "Yeah, yeah, yeah. See right there. There's the pipe." That's when I was like—oh, light bulbs going off. Ding, ding! Ah! Okay. We didn't phrase this question appropriately. It worked in our understanding but not for the understanding of where we were. So we had to have a discussion about how we could change the question. Because at this point, we were already collecting data. This happened a few times, where we just needed to reform, reshape the question to make it make sense for what we were trying to collect versus what made sense—and how the words were being used. That was interesting. [laughs] It was never-ending.

Q: How do things proceed?

Ervin: I continued to work on the study until the end of February. At this point—I'd been in the country for about two months, and I still wasn't ready to come back to the EOC. I really wanted to stay. So I got an extension for another six weeks in the field until the 1st

of April. The Household Transmission Study was ongoing. But at that point, there was a new team coming in to replace me. I think Nadia had already left. Mary definitely had already left. And so we were bringing in new people. I thought, this is the perfect time that I can transition over to the outbreak response and do epi. And that's exactly what happened. I was able to get all the approvals in place. We had new people coming in. I could train them and pass the baton, essentially. They took off with that. I stayed in Freetown because I had already spent about six weeks there. I knew the key players. I had already started working—you know, developing relationships with the Ministry and with DFID and all these different people. It made sense. I, of course, wanted to go out into the districts and be out in the middle of nowhere. But it definitely made sense. I was able to spend about six weeks working in the rural areas of Freetown, Western Area, and Waterloo and Jui, going out there every single day and working with the DSOs, the district surveillance officers. Yeah. Literally every day, seven days a week, for the last like six weeks that I was there. It was wonderful. [laughs]

Q: Can you just tell me more about that?

Ervin: Sure. I spent, in total, eight months in Sierra Leone, from 2015 until February of 2016, going back and forth. And this was absolutely my favorite time, this single month, March, working in general outbreak response, for a number of reasons. I think my favorite part is certainly the people that I was working with. I was directly working with Sierra Leoneans. They're called DSOs, which stands for the district surveillance officer. A few of them had already been working as community health officers prior to the Ebola

outbreak. But the majority of them were medical students that had been hired. Because at this point, all of the schools had been shut down in Sierra Leone, from elementary school to medical school, everything. Nobody was going to school. People had started hiring the medical students in December of 2014 to help with Ebola. And it was perfect! You have these people that are—they're very smart. They now have nothing to do. [laughs] This is a way to employ them. But it's also—it was, I think, incredible training. Because they have some medical knowledge already, so they could do assessments in the field. They could talk to people about any medical concerns. They weren't doctors, but they had some training. And they were also just incredibly passionate about what they were doing. By the time that I joined the team in March, they had already been doing this for about three months, this work. And this work required them to be on call basically twenty-four hours a day. They had a phone that they needed to keep charged twenty-four hours. They were physically in the field seven days a week, so Sunday—every single day. We would meet around eight o'clock in the morning and wouldn't finish until maybe like six-thirty, seven o'clock at night. It required like a lot of movement. And it wasn't just the surveillance officers, but also they had motorcycle drivers too. It was this huge team of people. It was an incredible massing of people and hiring of folks that were incredibly dedicated. Working with them was amazing.

Q: Can you describe some of the individuals?

Ervin: Sure. Let's see. Well, I know so many. And I keep up with them too, which is fun. So we had—WhatsApp was—is very, very popular in Sierra Leone. Everybody has a

WhatsApp account. The DSOs in Jui have their own WhatsApp account and then the Waterloo DSOs also did. We were working with them. The other fun part about—they were assigned areas based on a number of things, but at least the DSOs in the Jui area, they actually lived in the Jui area. So it was perfect! Because they not only would go there every single day for work, but they already lived there. They knew a lot of people. And I think that was really smart. I don't know who made the assignments for whom—which DSOs needed to be where. But whoever thought about where people lived already and assigning them there, that really worked well and was of huge benefit.

There were two DSOs that lived in Jui. They independently—they're essentially medical stu—they were early twenties, very young. But they came up with this idea. They recognized that contact tracing wasn't happening as efficiently as they would like. They felt like they ended up doing a majority of the work that the contact tracers should have been doing. And they also felt like the communities were—they knew information and they weren't sharing it as quickly as they could have. Two of them were like, "We need to have a community meeting." And they talked to like—they're not the mayors of these little towns, but kind of like the leader, the village leader. And they organized this meeting and had people together. They officially invited CDC, so I got to go. It was great. They were able to work through some of the communication issues. And they did that completely on their own, only because—from seeing on a day-to-day basis that things weren't working as well as they could. I think it worked. We had different contact tracers the next couple weeks until I left. But I think that's an example of their personalities, their ability to get things done. They were very independent. I think they

learned a lot. They certainly seemed to take this on and take it as a personal responsibility for Ebola, even though, again, they had been doing this seven days a week for three months, day-on-day. And they were still very like, this is what needs to happen, this is why I'm here. Their sense of purpose and self was very inspiring.

Q: Do you remember any of the drivers, motorcycle drivers?

Ervin: Oh, absolutely. [laughs] Most of them were—they were just funny. They kind of lightened the mood. Again, with Jui—oh! And I have to describe our “office,” quote-unquote. Our office was behind an Ebola treatment center. The Chinese have a physical structure that existed pre-Ebola. And they converted it into an Ebola treatment center for the Jui area and ended up treating a lot of patients. They have a laboratory that I'm still working with as part of the Virus Persistence Study. But it's a beautiful facility. And then, right out behind it, is this gorgeous mango tree. It's massive. That was the site of the Jui DSOs. That's where we would meet, every single morning, and discuss all of our—any alerts that they had received overnight, our plan of action for the day, where we needed to go, which contacts we needed to follow up on, who was being released from quarantine. Anything that needed to be discussed was discussed there and at the office. It was great. Because sometimes we'd come back at lunchtime and be like, “Hoo! The office is hot! We need to turn down the temperature a little bit! Let's get some air in here.” It was a great place to sit and kind of regroup. And always here, the riders—that's what they called the motorcycle drivers—they would park their motorcycles in a line underneath the tree and they'd just kind of lounge about. I think they were good friends,

which was great. And then the DSOs were, also. The riders were always like joking and definitely keeping us laughing and—yeah. They were great. [laughter]

Q: What happens from then?

Ervin: Yeah, six weeks of working with them, and then I come back. I come back to the United States in April for three weeks. Then it's working with the Virus Persistence Study. That started to be developed and—it was already being developed while I was still in Sierra Leone. This is a research study. This is research-research. It's being done, worked on with WHO. We're coinvestigators. The principal investigator is Dr. Gibrilla Deen from Connaught Hospital. He's also very well connected with the Ministry of Health in Sierra Leone. I was only home for a couple weeks, and then I go back to Sierra Leone. And it's really to focus on this study specifically. It's a study with survivors. We started with males only. We were collecting semen in a pilot study of one hundred men. Recruitment started at the end of May. When I got there, it was May 5th or something. For those weeks up until when we started recruiting, it was all about training and making sure the site was ready, getting all of the supplies ready, and that sort of thing. Then training took a long time, took a couple weeks to make sure that everybody knew what their roles were. And, yeah! It's still ongoing. We're still working on virus persistence. I stayed there for two months, came home in July and August, then went back in September. Came back here in October, went back in November. It's an ongoing project that I think we've learned a lot from. Because now, at this point, at the beginning of Ju—no, in November, we expanded the study to include women. We moved from the pilot

into our main study. We have men and women and are collecting body fluids from a number of different places. It's not just semen. Obviously, we were collecting sweat and tears, saliva, breast milk if lactating, vaginal swabs, rectal swabs, blood, a whole bunch of things for testing. It's a huge project. [laughs]

Q: Can you talk a bit about the idea of doing a study versus a service to people?

Ervin: Yes. Sierra Leone, we are doing a study. We're doing research. I think it's a direct comparison to what Liberia initially started, which is a program, a service to male survivors, for testing and counseling. What we're doing is we're also testing, we're also counseling, but the hope is that the data that we're collecting, we're able to analyze and then use for all future Ebola outbreaks. This is really informing our body of work.

Deciding what is appropriate and when and where is something I'm still learning about. It's a hard question because research is obviously important. There are so many questions that we don't know, and the only way to get the answers is to collect data and analyze it and figure out what's going on. It's absolutely important. But then, at the same time, you have other human concerns. The survivors are dealing with so many different issues. I've talked to survivors that are part of our program who, when they got out of the ETU [Ebola treatment unit], they didn't have any family members left. They were kicked out of their apartments. They lost their home. They lost their job. Or they're suffering just from the effects of Ebola. There are still different sequelae that they're trying to deal with. From a strict, research point of view, we're supposed to capture that information.

But there's nothing that dictates that we have to assist or that we have to do anything. Of course, within our study, we've built in whatever safeguards that we could. But yeah, the program, on the other hand, that would be their focus, is trying to assist as much as you can. I don't think that there's—one is better than the other. I think there are different instances where they work and where it's appropriate. Both are important. But it's—yeah, it's a challenge to try and figure out what is the better action plan at the time.

Q: Can you describe some of the people you've worked with, with the [Virus] Persistence Study?

Ervin: Sure. Our main international partner is WHO. We've been working with actually a small group of WHO people, contractors and employees, that have come through. They are able to stay in-country for long periods of time, which I think has been so important. I'm sure you've heard from other interviews, one of the things that is against CDC in this whole outbreak is just how short people were being deployed and the rapid turnover and that sort of thing. It's a challenge. It's really, really hard. One of the benefits of WHO is that they can hire people for three and six-month contracts. When they sign up, they know they're going to be in-country for a long, long, long period of time. That, I think, was super helpful. It was great too, for me, because I got to know these people and still keep up with them, and are communicating as the study is still ongoing and that sort of thing. They've been great.

But the real highlight is the Sierra Leoneans that we were working with, our study staff. The Ministry of Defense is where the clinic is operating, where our study site is. It's all people as part of like the—the nurses and—they're part of the military of Sierra Leone. All of them either worked in an Ebola treatment unit while the outbreak was much higher or were Ebola survivors themselves. They offered such incredible perspective on—you know, they—this is another instance where the questionnaire had to be changed a lot once we got in-country and started to go through it and train people. We would ask a question and our study staff would be like, "Uh—" Either, "That doesn't make any sense," or "That's really not an appropriate question. You can't ask that." We got a lot of insights from them. They are also very well educated. They are professionals. They've already been working with Ebola patients while they were sick, and then survivors as they come back. They already have a lot of relationships with the Ebola community in Freetown. It was just like win, win, win, everywhere. They are amazing. In terms of training them, really it was just trying to get them to understand what the study was about, making sure they understood the objectives, and then what the different roles were. They were able to take it and run with it. They're amazing and definitely professional.

Here's a good instance. The way that the flow works is that a participant comes in, he registers with the receptionist, she checks him in. Then they go to the nurses initially for a questionnaire. Then they go to counseling, the first step of counseling, which is learning about the test—understanding what the test is going to be running, what samples are going to be collected, answering any questions. From there, they go to the sample collection tent and they give their samples. Then they come back to counseling to make

sure that everything's okay, that they're feeling comfortable, that they—still, if they have any questions now, that sort of thing. That's the last step, is this counseling. We did offer a stipend for their participation. They could get a new appointment and come back in two weeks. So that's the overall flow. We found, as we were working through this, that sometimes the bottleneck would be in the counseling. Because they go see the counselor twice. This is supposed to be a time where they can talk and ask any questions and have it be as involved as they want it to be, the participant wants it to be. Sometimes, we would have participants, after they came out of the sample collection room, would have to sit and wait a few minutes. For the most part, it was fine, we didn't have any issues.

But I remember this one day there was a participant who did come out. I remember seeing him come out of the tent and watching one of the—she was our hygienist. She cleans up after every single participant and make sure that it's up to code and all that kind of stuff. She had this look on her face—she was looking at the participant and was a little worried. Instead of going in and cleaning, she puts her bucket down and she walks around the participant to one of our nurses and says something to her. The nurse looks at the participant and immediately grabs him and puts her arm around him. And he seems to get more and more upset. She brings him into the nursing room—takes him in and talks to him. When he comes out, he seems okay, goes to counseling, and he goes home. I talked to the nurse after that—I called her over. I was like, “What happened? Are you okay? Is he okay?” And she said that he just had this moment where he got really scared and nervous. Then he was kind of mad at everything that was going on. He had only been discharged a couple months before. He had lost several members of his family. He was

struggling. But I think that was like—she took the initiative. The whole staff were cognizant of the participant, how he was feeling, and were able to respond to it immediately. They knew what they were doing. I was like, okay. I have complete confidence in you guys now. This is amazing. You're able to take charge and really solve problems before they even become problems. I think that was incredible. And that was just within two weeks of the study start.

Then, past that, whenever I go back—it's been a couple months since I've been back. I'll come back and forth, back and forth. The participants now have a very strong relationship with our study staff and vice versa. It's really fun to go back. They remember me, which is great. We give high fives and ask each other how everything's going and that sort of thing. Certainly, the people that are helping us with the study are amazing. That's been the most rewarding part of this whole experience, for sure.

Q: I know that picking one person or two people out of a bunch of people seems like—you worry about it because you don't want to leave anyone out. But is there an individual or two who you could just randomly pick out of the mix and tell me about?

Ervin: Sure. I'll tell you about my friend [name]. She is twenty-two years old. She just finished her nursing degree, now that school is back in session. I met her as part of the Household Transmission Study way back in January. It was training day—this was the first time we were meeting any of our study staff. She definitely was one of the most vocal people. I was like, whoo! This girl is sassy! She was just asking all these questions.

If something didn't make sense, she'd be like, "No, no, no, no, no. No. Can you—what?" [laughs] and would just call us out when something didn't make sense. That was first impression, being like, wow! Okay. She's really into this. And that's great. Okay. But turns out she lived right by the hotel where CDC staff was staying, at the Radisson [Blu Mammy Yoko Hotel]. So she walks to the Radisson that evening and finds us. Because me and Mary and Nadia were working on the questions, whatever. She comes into the atrium, and she was like, "Good. I was looking for you," and sits down and immediately starts to ask us more questions. She had taken the materials home and had reviewed it and had a bunch of questions about it. She sat herself down, was like, "I have questions. I need your help on this." And we were all like, "Oh! Okay." That was like, first interactions. She is just a go-getter and another testament to the strengths that her cohort—so all of her medical student friends and everybody her age, now they have such a wealth of experience in public health, not only in Ebola and outbreaks, but really in public health. This community-level, community-driven response—kind of approach to things. Since then, every time that I go back, I see her. I know her mom. I'll go visit her house. Her mom makes really good food. I'll have dinner at her house, with [name] and her mom. She's probably somebody that I talk to the most. We talk to each other on the phone still. Now she's trying to find graduate programs and different study-abroad opportunities and things like that. So trying to assist her with that. But yeah, she's probably one of my closest friends that I made while I was over there.

Q: Yeah.

Ervin: Yeah. She's still sassy. [laughter]

Q: This is a totally other track. But you mentioned that you're still working with the Chinese lab and ETU. Can you talk about that relationship that you guys have forged?

Ervin: Yeah! The first time I went to the Chinese facility was while I was doing outbreak response. I didn't have any connections with any particular individual. But it was just going to get results and making sure samples that we knew had gone to Jui, making sure that we were going to get those results and try and figure out if there were any issues and that sort of thing. Because the Chinese were not present at the morning meetings in Freetown. Sometimes, when we had questions, it would often come to me because I was going out there anyway, right beside, to go and talk to them. That's where it started. Then, once the Virus Persistence Study got up and running—and originally, it was without the Chinese involvement. We were using CDC's lab, that was out in Bo. But that laboratory—it was a field lab—needed to close. It closed at the end of October, I think, or November. Once we found out that it was closing, that's when we approached the Chinese to see if they would be interested. They had already been in Sierra Leone. They were already working with the Ministry of Health. They had this training facility—is what the hospital was designed for, as I understood. It was meant to be a place for the medical students to come for additional training as well as for treatment. The laboratory, they had just finished building the laboratory during the Ebola outbreak. It's a beautiful facility. It's very, very nice. It's a solid structure that was built for a laboratory, as

compared to what we were doing out in Bo. It was a house that had been retrofitted, and it was still amazing.

The Chinese—we worked with them—they took over testing in November. It's been an interesting partnership. Because there's a lot more communication issues than, say, with WHO. Certainly, none of us speak Chinese. The English that's spoken by the teams in the field totally varied. There might be one person who spoke English very, very well and then the others, who could speak a little bit here and there. But there's a lot of instances where we're sitting down at the table and we're like, "You will do this and I will do this. Yeah?" And they would repeat it back exactly. We're like, "Cool. We're totally on the same page. This is great. On Friday, I expect this from you and I will give this to you." And then, come Friday, [laughs] it didn't happen. We'd have to be like, "Let's try this again." But it was totally just a communication thing. It's been interesting working through that.

The other instance of communication is that once the initial team that we were working with returned to China, suddenly, they're in Beijing time. Then we have Barbara and myself and Stuart and Ute. We're here in CDC time. Then, there's WHO and Sierra Leone. You have all these different time zones. Communicating across this is a challenge and often meant that we would have to have phone calls here in Atlanta at like eight o'clock in the morning, which is like eight o'clock in the evening, Beijing, and whatever it is in Sierra Leone and WHO. Certainly, communication has been an ongoing process.

[laughs] But, yeah! It's good. They've been amazing partners. They've done a ton of testing. They've tested thousands of samples for us, at this point, which is amazing.

Q: Is there anything else that you haven't yet described about your work with Ebola?

Ervin: I mean, I have so many stories. But I think I've hit all the highlights, really.

Q: Yeah, yeah, yeah! Any stories that you feel like sharing for the historical record?

Ervin: I can tell you about a family that I worked with that was under quarantine.

Q: Yeah!

Ervin: When I started at the end of February and March, there had been a case that had just been picked up. She had died at home. Evidence said that—when the burial team came, they said that it looked like the body had been washed, that there had been oil put on it. Certainly, it looked to them like she had definitely been touched, even though at this point, this is a year into the overall West Africa outbreak and messages were everywhere about don't touch the bodies, call 1-1-7. So we knew that. We had that information from the burial team, when quarantine started.

In the household were a brother to the case, mother to the case, best friend, another—and then two boys, two young children. When we talked to the household—and the

household transmission team also was working with this family. We got a lot of detailed information about the contacts with the case patient and tried to understand who was high-risk and who wasn't. Consistently, they were like, "We didn't touch her. She died. She didn't have Ebola." They were pretty adamant about it, the first couple days that I went there. They were one of our more challenging quarantines because they just did not want to participate. This was also an instance where the community didn't seem to have a lot of support. The family inside quarantine was saying that community members were teasing them, were being mean, that they felt like they were on display. They were just not happy. We were trying to work with the community and do all these other things. But every day we would come and we would say, "How are you feeling? How are you feeling?" And every day, it was like, "Fine." They were pretty adamant about it. And the kids would kind of look at us and then walk away. Like they didn't want to have anything to do with us.

Then I get a call from one of the DSOs who says he got a call from a community member, from one of the guards, actually, that was standing outside the home, that he needed to come over. It was about eight o'clock at night, late, and there's no electricity out here. He goes over, and he sees that a four-year-old, the smallest boy, was vomiting and was pretty much convulsing. The DSO was really con—he was like, "He needs to go to care right now. I think the grandmother is sick, and I think the older brother is sick too. None of them will let me talk to them. They don't want an ambulance. But I've already called an ambulance, but it's not here. I don't know where it is." This kind of started this whole thing. Because anytime night fell, it was a logistical nightmare. DFID was pretty

strong, they would not send an ambulance after dark because the roads are horrible, you can't see anything. There's people out walking. It's a nightmare. When I first called DFID, they were like, "We don't have any ambulances out right now. We can't send them." I kind of talked with them. I was like, "What about this? What about that? There's an ETU just literally down the road. It wouldn't take very long. Do you have anybody?" Finally, they patched me through. I get the logistician for DFID. He was like, "Yeah, we can do this. We can definitely do this." It was great. I called the DSO again. He was like, "Okay. The ambulance is coming." They pulled out the four-year-old, the grandmother, and a nineteen-year-old. They take them to the ETU, and all three of them are positive. Unfortunately, the child did not survive the ride, and the grandmother didn't survive but just a couple hours after that, leaving the nineteen-year-old by himself at the ETU.

We continued to follow the family. The rest of them were fine throughout their quarantine period. We were checking on the nineteen-year-old every day at the ETU, just making sure that he was okay. We heard stories from the nurses that he was being very belligerent, that he was taking out his IV [intravenous therapy line], that he was mad about everything. We were worried that meant—because sometimes patients can become like that before they crash. But he actually survived. He survived. He was released and went back to the community. And the DSO—I was with the DSOs. We knew that the patient was coming back out. We're like, should we go? We should go welcome him home. This is important. Support him. So we go and see him, and he was so happy to see us. He immediately smiled, gave us all hugs, and was just—and then he started crying

and was talking about his experience in the ETU. We took pictures. He wanted pictures with all of us.

I thought that's where the story would end with us just being like, I'm glad he's okay, this is great. But fast-forward a couple months for our Virus Persistence Study, and he actually comes in for enrollment. I see him and he sees me, and we kind of look at each other. I quickly open my computer and I pulled up a picture of the two of us, several months before, after he was released. And I bring the computer over to him. And he sees it. He started to cry again and gave me another hug. It was amazing. So yeah, he enrolled and he's been part of our study. [laughs] Oddly enough, I was back in Sierra Leone the day that he was discharged from our study too, after he had had two consecutive negative tests on his semen. It had taken him months. I just happened to be there when he got his certificate. Again, he gives me a big hug. We take another picture. Yeah, it's amazing. I think that's been one of the more touching moments of it. You can follow him through and—he's trying to get a job now. His health is—he's much stronger than what he was. I ask him about his family every time I see him, the ones that are—that are here. He's trying to make it work, which is great.

Q: Thank you for sharing that. Are there other stories that you'd like to share, or other memories?

Ervin: Another memory would be my thirtieth birthday.

Q: Please!

Ervin: I had big plans for my thirtieth birthday. I thought I was going to be able to go to Miami with some of my friends and just go out dancing and be on the beach. Well, I ended up being in Sierra Leone for my thirtieth birthday. But it was far better. This was the Virus Persistence Study. We had just started enrolling our first participants, we were really excited about it. It was me and Barbara from CDC, and then we had two colleagues from WHO. Then we had the three doctors from our study. They were like, “You need to have Sierra Leonean food for your birthday.” I’m like, “Okay. Let’s do it.” This was May of 2015. Months before this, there were no restaurants that were open. Everything was closed because of Ebola. No restaurants. Grocery stores, yes, maybe. The market, sometimes it would be open. Things are slowly starting to open back up by this time in May. They’re like, “We have a favorite restaurant that is really good. We want to take you there.” We ended up going to this restaurant called D’s Bazaar. There’s like three staples in Sierra Leone. It’s crain crain, which is my favorite, and groundnut soup, and then cassava leaf. Cassava leaf, crain crain, and even potato leaves, they look very similar. It’s just mashed up green stuff with super spicy sauce. You put it on rice. And then groundnut soup is like peanuts and meat. It’s delicious, very good. Between that group of us, we just ordered all this food. We were the only ones in the restaurant. There was nobody else there. Because again, it just opened. Probably nobody knew. Still, movement was kind of restricted. You weren’t allowed to be out after dark and that sort of thing. We had this huge feast and then a dance party upstairs in this restaurant. It was

great. [laughs] That's how I rang in my thirties, said goodbye to my twenties, said, I'm thirty now. [laughter]

Q: What kind of music was it?

Ervin: Sierra Leonean.

Q: Yeah?

Ervin: Ooh! Yeah. It's like Nigerian. The style of dance is called azonto. You're seated very low, and it's very slight movements. I remember going—seeing a wedding that was happening and glancing over, thinking that people were standing around. I heard the music and just thought people were standing. But then I looked again and they were actually all dancing. But it's so slight that you can't really see it, initially. It's low, like in the hips and in the legs and—so very different from salsa or jazz, where it's these big, wild movements and that sort of thing. This was super controlled. It was amazing. Yeah, I was trying to get azonto lessons. But I'm not very good.

Q: Oh. You're just beginning.

Ervin: I'm just beginning. Exactly. Every time I go back, they test me out again. They're like, hey, another lesson. [laughter]

Q: That's amazing. You know, one question I actually had wanted to ask was, given your background in environmental health, I'm wondering if there are any reflections that you have on environmental health in this context, in the context of Ebola and Sierra Leone or the rest of West Africa.

Ervin: Well, certainly Sierra Leone—I think this whole region, deforestation is a big problem. A lot of people have quoted that as possibly being a reason why—you know, maybe that changed the bats' migration, if Ebola is, in fact, in bats. It's not proven. It's thought to be but we don't know exactly. Could that be a contributing factor to the kind of interactions that people are seeing with animals? Certainly, just in terms of satellite imagery—I remember looking for the first time at these three country areas. You can see the country outlines because Sierra Leone has deforested completely in this area. There's this vivid line where Guinea is here and Sierra Leone is here. And then Liberia also looks different. Certainly, there's a lot in play there. Then there's a lot of mining and construction everywhere. When you do leave Freetown, you can see that there was probably forest everywhere and now it's grasslands in some parts and just mounds of dirt in other places, from mining efforts and things like that. I think, yeah, there's—it's probably—and I can't compare to what Sierra Leone used to be. But certainly, the deforestation that's happening now and the runoff that's probably occurring as the rains happen—all the waterways along Freetown and up into Port Loko, you can kind of see across the bay during rainy season, it's this brown murkiness because everything's just running straight off. There's a ton of environmental factors that are probably not helping.

But again, people are trying—they're cutting down trees because they can sell it and they can make more money. Animals—like the chimpanzees, that's—there's a chimpanzee sanctuary. They talk about, when you go there, that deforestation is causing the chimps to go closer to people. Then people are harming them because they're stealing food or they can get money off of that. Those dense forests that once existed are slowly decreasing. Yeah. Pollution and—you know, as more and more plastics come, I think that inevitably starts to build, and it's really hard to get rid of.

Q: It reminds me of when you were talking about the mangroves and the very compelling reasons why the people would have to cut them down, but you have to find some sort of creative solution.

Ervin: Yeah. I think the environmental issues are definitely on the back burner, given that, at least with CDC's focus right now, there are so many—malaria is so high, the incidences. When you arrive in-country, you have to sign a piece of paper saying that you will take your malaria medicine and that you understand that if you choose not to, you'll be sent home, and that the incidence without taking malaria medicine is basically you're taking a fifty-fifty chance. Because it's so, so high. And it has one of the highest mother and infant mortality rates in the world. There's a lot that the country is dealing with, just on basic health. Then you have the environmental things that are on top of it, contributing to it. You know, all of the above.

Q: Well, unless there's anything else—

Ervin: I think that's it.

Q: Okay. I really appreciate you coming in and hearing your stories, hearing about your experiences, Beth. Thank you so much for being here.

Ervin: Thank you! This was fun.

END