CDC Ebola Response Oral History Project

The Reminiscences of

Joel M. Montgomery

David J. Sencer CDC Museum

Centers for Disease Control and Prevention

2016

Joel M. Montgomery

Interviewed by Sam Robson
May 10th, 2016
Atlanta, Georgia
Interview 2 of 2

CDC Ebola Response Oral History Project

Q: This is Sam Robson here with Dr. Joel Montgomery. Today's date is May 10th, 2016, and we're here in the audio recording studio at CDC's [Centers for Disease Control and Prevention] Roybal Campus in Atlanta, Georgia. I'm interviewing Joel as part of the Ebola [Response] Oral History Project. It's our second interview. Our first one, we covered Joel's life and career up through basically his work in Viral Special Pathogens [Branch], coming out of EIS [Epidemic Intelligence Service]. Today we'll be digging into his experience with the West African Ebola response. But first, actually, Joel, I wanted to ask you if you could briefly summarize the work that you did in Peru and Kenya previous to this response.

Montgomery: Sure. I guess I'll start with Peru and go forward. The work in Peru, I think it was 2006 that I went to Peru, and we were there for five years. I was actually there, it was a collaboration with the US Navy, which at the time it was Naval Medical Resource Center Detachment, now it's called the Naval Medical Research Unit 6. It became a "full command," to use Navy lingo. But I was there actually funded by the Influenza Division. At the time, it was organized completely differently than it is now, as you can imagine, the flu division. In fact, I think at the time it may still have been the flu branch. It was much smaller. This was really pre-H5N1 and all that, obviously.

I was out there with the US Navy, and my role out there was leading their emerging infections program. We spent five years in Peru, I was there with my family. At the time we moved out, it was my wife and my son, Van, our son, Van. But I ran their emerging infections program, and we worked on a number of different diseases, including influenza. Working throughout Peru, but from the Amazon to the Andes to the coast. Doing a lot of work on influenza and other respiratory diseases, but we worked on other pathogens like rabies, and you name it. Anything that popped up, dengue, we would work on it. But we also did a fair bit of work in Bolivia, in Paraguay, in Ecuador, and throughout the region, all the way up into Central America, we were doing some work on surveillance, capacity-building training.

I, again, ran their emerging infections program and built up the program they had. Hired basically Peruvian staff, epidemiologists, physicians, veterinarians, laboratorians, and staffed up that program. Again, was there for five years.

Q: Okay, and how about Kenya?

Montgomery: Kenya, we went straight from Peru to Kenya. We arrived in Kenya in—I think it was probably August of 2011, and we were there for four years. So back in August, 2015. My role there was also running their emerging infections program, very similar platform, but restricted more to really just Kenya, so most of our work was in Kenya. Although we did launch a few projects in Tanzania and we did some outbreak

response in Ethiopia, and some work indirectly in Somalia. But I ran their emerging infections program. Again, it was really a similar focus as what we had in Peru, so looking at burden of disease, what are the causes of the burden of disease, what's the etiology, and evaluating interventions.

My role there actually evolved over time. When I first arrived, I was head of their emerging infections program, and then became the Global Disease Detection division director. The structure of the Kenya country office also evolved over time. Eventually, Kevin [M.] De Cock came back from Center for Global Health. He was the director here of CGH [Center for Global Health] for a few years. He came back to Kenya, became the country director, and he ended up making me his principle deputy. It was a fair bit of additional administrative responsibility. I would say I moved out of being a scientist to be more of an administrator. He traveled quite a bit too, so I ended up being acting country director quite a bit when he was on travel. It was a bit more of a role of responsibility over time. But it was fine. It was a good experience. Obviously, learned a wealth of information from Kevin. He's a good mentor, a good leader.

Q: Do I have it right that you were focusing, to at least some extent, on children under five?

Montgomery: Yeah, we did. We had two big population-based surveillance sites—one in Kibera, one of the largest slums in East Africa, following a population of about thirty thousand people with an associated clinic. Then we had a sister site in western Kenya. So

really looking at differences in disease transmission and burden in urban versus rural sites. A lot of it was children under five, big percentage of the population that we were following were children, and children specifically under five because that's where you see the heaviest burden of respiratory and diarrheal disease. Then, of course, because we had these two clinics that we were working with and partially funding, the healthcare was free, so a lot of the moms would bring their children in for free health care at these clinics. It was really understanding what the burden of disease and etiology of disease was and is in children under five, with an eye towards implementing and evaluating interventions, be those pharmaceutical interventions like vaccines, or drug interventions, or non-pharmaceutical like water sanitation, education, these sorts of interventions. That's really what it was. It was an eye towards intervention and leading to, ultimately, policy change in the Ministry of Health in the government of Kenya.

Some examples of that, we were very engaged with the flu division, and they had a vaccine clinical trial, a demonstration project in Kibera. Then, because it was so successful and we actually demonstrated a reduction in flu burden, the government eventually adopted a vaccine policy. It's still being developed and in process, but it at least got them thinking that flu is actually a legitimate cause of respiratory illness in the populations of Kenya. Before that, they really thought flu is not a problem here, but it's a significant burden. That was just one example.

Another example is really looking at typhoid fever, *Salmonella* typhi, and the cause of typhoid fever. Again, up to this point where we had done the studies in Kenya, typhoid

was really not thought to be a problem in Africa, but really areas like Asia and the Asian subcontinent. But in fact, we did demonstrate heavy burden of typhoid fever. There's a vaccine for typhoid, so at some point, we hope that the country will consider that a major cause of fever and illness in children under five, and will adopt a vaccine strategy. But right now they don't.

Q: Thank you. I remember, and correct me if I'm wrong a little bit. I think in 2012 there were Ebola outbreaks maybe both in DRC [Democratic Republic of the Congo] and Uganda, or maybe one of them was Marburg. I can't remember.

Montgomery: Yeah, there was a Marburg outbreak, it was probably 2012 in Uganda. I forget exactly where in Uganda.

Q: Were you involved in that at all?

Montgomery: No, we weren't involved in that, because the Viral Special Pathogens Branch has a fairly robust activity in Uganda in laboratory capability plus response activities. So we didn't—we were there. In fact, there was, during that outbreak, we had a couple of suspect cases in Nairobi. In fact, I recall one day we did get a call from Kenyatta National Hospital and the Ministry of Health, and they said they had a female that came in from a local—she actually was, I think, a hotel worker, in downtown Nairobi. She developed fever, hemorrhagic manifestations. Of course, everyone knew of

the outbreak that was going on in Uganda. They panicked. Put her in a cab, brought her over to Kenyatta National Hospital. Unfortunately, she died on the way over.

It was myself and another colleague of mine and one of our Kenyan colleagues, we suited up to collect a sample to test her. She ended up being negative. Nonetheless, it actually pointed out a weak link in their system: one suspect case of Marburg, they panicked. The hospital, no one in the infection control unit would even go near this body. It caused a huge problem and highlighted an extreme weakness and limitation in their response capabilities and training in infection control. But no, I was not involved in the actual response in Uganda.

Q: Okay. Just briefly, do you know if they were able to address those shortcomings in any way, so far? I know that's still in the recent past.

Montgomery: It certainly has improved because of a couple of reasons: one, the West African outbreak. Obviously, everyone now has heightened awareness and preparedness. Then I think the Global Health Security Agenda has also helped contribute to the preparedness. Because Kenya is a Global Health Security Agenda Phase I country. They have received resources, plus we had already a fairly robust CDC country office there. We were able to divert some of our resources to help support their rapid response, infection control activities through their FETP [Field Epidemiology Training Program] program, but other activities we have at the hospital. So I think there have been

improvements because of just awareness, because of the West Africa outbreak, and then also Global Health Security Agenda has helped a lot.

Q: Thank you. But prior to the Ebola epidemic in West Africa, did you know much about West Africa, generally?

Montgomery: Not really. I had been to West Africa only once before. This must have been—we may have talked about this before, I don't recall. This was probably in 2003 when I was an EIS officer during the height of the monkeypox outbreaks. I'm not sure if you're very familiar with the monkeypox outbreaks that we had in the [United] States, but this started in—it was about 2002, 2003, we had some suspect rash illness cases in the Midwest. They ended up being diagnosed as monkeypox, after there was some concern that it was actually smallpox. Long story short, those outbreaks were associated with prairie dogs that became infected following contact with West African rodents. They were housing these prairie dogs, or they were at least in the same bedding, in the same facilities as a number of other West African rodent species that had been imported in from West Africa, as what—they're called "pocket pets," these exotic pets that people keep. The primary reservoir was thought to be the Gambian rat, the pouched rat, which is from West Africa. It's a big—literally, it's over a foot long, just its body. With the tail it's two feet long. Turns out they're really highly intelligent rats, as far as a rat goes. They train them to sniff out mines. But they're big, and they also eat them, too, in West Africa, as there's a substantial amount of meat.

Anyway, I'm digressing a bit. The epi-work that we did, and we did this in—and I'm blanking on the state now, I can't believe I've just forgotten the state in the Midwest where they had the prairie dog facility that had the outbreak.

Q: Iowa? Minnesota? Wisconsin?

Montgomery: I think it was Iowa, actually. I can't remember. That's horrible I can't remember, it's just—

Q: It's okay.

Montgomery: But what I do remember is that the Gambian rats, and there were a bunch of others—door mice—a bunch of other species of small animals were all traced back to Texas. That's where I come in, because originally Texas. A good friend of mine happened to be in Viral Special Pathogens, he's also Texan. He's actually still here at CDC, he's head of ESHCO [Environment, Safety, and Health Compliance Office] here in OSSAM [Office of Safety, Security and Asset Management], safety. But Darren and I went to Texas and investigated this linkage back to this pet importer in San Antonio. The guy had imported all these rodents from Ghana. We did an investigation of his facility, it was in San Antonio, Texas. The guy felt horrible because he realized he was the reason why there were all these monkeypox—no one died, but it caused a huge kerfuffle in the US because they thought it was smallpox.

We traced the rodents back all the way to Ghana. We went back to Ghana and did an investigation there, both an ecological study trapping rodents, but also doing a serological serosurvey among humans to see what the prevalence was of monkeypox in this population. It was a pretty interesting study. But that was my foray into West Africa and Ghana, right there on the coast, but into some of the central part of the jungle in Ghana. It's quite a beautiful country. But I think that was my only time to West Africa, was Ghana.

Q: Thanks for that. As I mentioned, we're filling little gaps in. You've had an interview with Mark Honigsbaum before, and a previous one with me, so I'll probably skip around a little bit chronologically here.

Montgomery: Sure.

Q: But you have talked to me at one point—and we don't have this on tape—about a certain mototaxi driver who might have—you suspected might have seeded the outbreak in Monrovia. Can you describe that again?

Montgomery: Yeah, I was just talking to someone the other day in CGH about this. Going back to Lofa County when I was there, Brett Peterson was a colleague that was out there with me. We were there, we were some of the first ones deployed there, as we talked before. We were trying to finish up the contact tracing. And there was this one individual that was a confirmed case, she had taken a mototaxi, as you said, from Lofa

County down to Monrovia, by way of the Firestone [Natural Rubber Company factory]. He was actually taking her to the Firestone isolation facility because that was the only isolation facility that was in existence at the time.

He transported her from Lofa County, which, by motorcycle, is about a two-day trip. So he was exposed to her for a long period of time. In fact, I think they stopped a couple of spots along the way and stayed with family. Her family, his family. Eventually, she was confirmed as a case. And most certainly transmitted it to him, because she was riding on his back the entire way. Anyway, we desperately tried to find him. It was cc: Ministry of Health [and Social Welfare], and we were actually working with Samaritan's Purse because they had contact with him at one point, and we lost him. We lost him in, I think it was—the name of the area in [Monrovia] is Chickensoup Factory. It was either Chickensoup Factory or Fish Town, but Fish Town I think is actually central. It was Chickensoup Factory is where we lost him, because there was a chicken soup factory in the area, that's why they call it—at any rate, we lost him. I suspect, as do several of us, one, he was obviously a person of interest, he was likely exposed and eventually became a case, and probably infected more people in Monrovia. The big question is, was he the source that sparked off a lot of the cases in Monrovia? He was one, I'm sure, of several. I'm sure that he became a case, and I'm sure he did transmit. Because this was in the early days when people were not really that worried about it, about Ebola. It was, again, way before the peak in June, July. This was in April. Yeah, this was in April. So I'm sure he seeded a number of cases in Monrovia, unfortunately. With contact tracing, it's not a hundred percent. You lose people. At the time, there was not a lot of enforcement by the

Ministry of Health because they weren't—cases had really ended. So they were not really worried about it.

In fact, I'll never forget. I asked a driver at the embassy, she was driving me somewhere, back to the embassy to have a debrief with the ambassador. I asked her, I said, "What do you think about this Ebola outbreak?" She said, "It's old news. It's over with now." She said, "We're making too much hype over it. It's gone. There aren't any more cases. We just need to move on." Three months later.

Q: No doubt.

Montgomery: Yeah. That was definitely a misstatement. But it was an interesting perspective. It reinforces the fact that we probably could have found some of these folks if there had been more push from the Ministry of Health, the government. But I think they really were not as concerned about it because cases had essentially ended. And that was true in Guinea, and there were no cases in Sierra Leone at that time.

Q: Was CDC worried about it?

Montgomery: Oh, yeah, we were. We were really concerned about this guy, and we were trying to find him desperately. But we had no way to find him, because we just lost him into the community. We were trying with Samaritan's Purse, in fact I think they found at a location they thought he was by rumors, from community rumors, but he was gone

when they got there. They just couldn't find him. Also, early on in the outbreak, people were scared and they were fleeing to the bush. My guess is he just took off and hid somewhere to avoid the authorities. Who knows where he ended up going. But I suspect he became a case and seeded other cases, other infections.

Q: Thanks for filling that in.

Montgomery: Yeah.

Q: Another question I have is, you were involved with some of the early discussions leading up to the building of ELWA [the Ebola treatment unit at Eternal Love Winning Africa Hospital], the first ELWA, with Samaritan's Purse in Monrovia.

Montgomery: Right.

Q: Can you describe that a little bit more?

Montgomery: Yeah. We spent a fair amount of time with the staff at Samaritan's Purse early on, like you said. In fact, it was, I guess, after we had spent a fair bit of time out in Lofa County, we got out there because they were transporting us in their helicopters. We came back to Monrovia, they were in the process of considering building an isolation facility. We went over to see what they were doing and to give some early guidance, and to see how they had the layout of the facility. I think the reality is, they were doing the

best they could with limited to no knowledge of how you manage an isolation facility, having never done it before—talking about the Samaritan's Purse staff—having never really done it before. The best they would have was TB [tuberculosis] cases, which is, it's different.

They were doing their best with what they had, reading books and looking at manuals. There were some manuals they could follow—the CDC and WHO [World Health Organization] has a viral hemorrhagic fever manual, and you can get some instruction on how to set up a flow, an isolation facility. So they weren't just making it up on the fly, they were actually trying to use materials and documents that had been previously published. Then we also had our colleagues from MSF [Médecins Sans Frontières] that gave them some ideas, because they clearly had some gaps in their design of that isolation facility, some real limitations, and some areas where you could have potential cross-contamination because they were not necessarily keeping clean and dirty completely separated. Because there's got to be a directional flow, right? You go from a clean area to a dirty area, and then you go to the decontamination and then you're out. And they had some areas where dirty could go back into clean. And that's not what you want.

So it was actually—what's his name? Brantly?

Q: Kent Brantly, yeah.

Montgomery: Kent Brantly. I spent a fair bit of time with him, actually talking with him. He told me, he said, "I'm really scared that we're going to get a case here and we're not going to know it, and we're going to get exposed." [laughs] Guess what happened? So a lot of the staff were really nervous, but the reality is, they didn't have a choice because the cases were showing up, and they were going to show up. They were going to show up, and they did show up. Samaritan's Purse was known for their health care. It was just a matter of time. So they had to at least prepare. You've got to give them credit for at least preparing. Could they have done more? Certainly. I don't know if we ever really will know exactly how they became exposed. I think the most likely guess is they were exposed in the community, from these social events. Someone was symptomatic and just wasn't admitting it. Maybe it occurred in an isolation facility breach in their protocol—who knows if we'll ever really know the full truth. But yeah, we did help them with their initial setup of the facility there.

Q: Thanks for that as well. I want to ask about people you've worked with throughout your three deployments. It didn't go to four over the last few months, did it?

Montgomery: It did not. No it didn't. No, it stayed at three.

Q: Got you. Okay.

Montgomery: I almost went back out, and I probably still will go back out, because we're doing a lot of follow-on work on laboratory capacity.

Q: Oh, cool.

Montgomery: And we're really considering Liberia as another Global Disease Detection country, so we may ramp up activities there in the coming months.

Q: I'm going to make a note. You had mentioned at some point a guy from South Africa, and I'm probably going to butcher his name—Adriano Duse?

Montgomery: That's actually pretty close. Adriano Duse, yeah.

Q: Can you describe seeing this guy again in West Africa? Because it had been, what, Namibia when you—

Montgomery: No, it was actually Angola.

Q: Angola, sorry.

Montgomery: Yeah, it was during those Marburg outbreaks. That was the last time I saw him. I think that was the last time I saw him. Yeah, it was just—we weren't surprised, because that had been—that was eleven years earlier, so he had changed a lot. I had clearly changed a lot. It was good to reconnect, and it took us a few minutes—we're like, oh, wait. Because we spent a fair amount of time together in Angola during the Marburg

outbreak in the isolation ward in the triage facility that we set up, doing infection control training. We spent a fair amount of time together in Angola. That was, I guess, in the Angola outbreak, Marburg outbreak. He was with—who was he with in South Africa now? I'm blanking which group he was. It wasn't University of Pretoria. It may have been NICD [National Institute for Communicable Diseases]—I forget what agency he was with there. Some governmental organization. And he was focused on hemorrhagic fevers. In Liberia, he was actually with the mining industry, so he was part of their occupational health group. He had a little bit different role. But he was brought in as an expert on hemorrhagic fever because of his experience in South Africa in working a few different outbreaks of Marburg and Ebola. He was doing a fair bit of contact tracing training, infection control training, because that's his expertise is infection control. He was doing a fair bit of that with the Ministry of Health, with WHO, but also with—I'm blanking on the group now, the organization he's with, it's a private group. Not the mining industry, but another group. If you did a Google search, you could find it, because I'm just completely blanking on the organization. But yeah, we spent a couple of weeks together in Liberia, but I think it was just one deployment, actually. I'm trying to think if I saw him twice, but I think it was just once. That was on the—was it the second or first deployment? That must have been the second deployment. I think it's the second deployment. It's all running together now.

Q: Was he helping at all with your infection prevention stuff?

Montgomery: Yeah, we were obviously comparing and sharing notes, because really, during the second outbreak, that was really when we were ramping up infection control. The first outbreak it was just too early, there weren't that many cases. It was really more about community education and getting contact tracing going in the communities and the rural parts of Lofa. The second investigation, the second deployment was really more about furthering the community education and contact tracing, but really trying to get a handle on infection control. That was really becoming a primary focus, infection control, because that's clearly where the breakdown occurred. That was infection control in the healthcare facilities, but also in dead body management.

The two main sources for infection are at hospitals and clinics, and then dead bodies. There's transmission in households from sick patients, but it's more common in a healthcare facility, and then a dead body, and dead body preparation actually, because as you know, the virus can stick around until the body's completely decomposed. There's a lot of exposure during that process of preparing the body for burial. There's a lot of infection control training on that process.

Q: Actually, it is kind of a scientific question I have about the body, and I haven't asked this of anybody yet. I was wondering whether it's innately the corpse itself which is infectious, or whether it's because the corpse gets covered in bodily fluid, the vomit, the diarrhea, etcetera, in the period immediately preceding death?

Montgomery: Yeah. It's both, because obviously there is a lot of external contamination from bodily fluids, as you said, so that is all infectious material. But then internal fluids that are still in the body, in the intestines, that material is still infectious. And the other bodily fluids that may drain out when you're preparing the body, those are all infectious. They're all highly loaded with virus, because the virus is—a lot of viruses are tropic, certain tissues or organs. That means they have a focus. Like Zika is neurotropic, so it targets the brain and nerve cells. Ebola, it infects a whole range of cells. You find a lot of it in the liver and certain other tissues, but you find it basically everywhere, in skin, and of course all the excreted bodily fluids—tears, semen, everything, blood. A body is infectious externally, but also internally. If you were to open the body up, or remove any bodily fluids, those are highly infectious.

And they can last. I think they looked at that. We've looked in this current outbreak, or I guess now former outbreak, to look and see how long a body is infectious. But they've done some experimental studies with animals, non-human animals, to look and see how long it's infectious post-death. They've sampled from gorillas that have died in DRC, in Uganda, that have been dead for weeks in the jungle, and they're still infectious. There's actually one small study where they took a tube of blood of Ebola and put it on a counter, ambient temperature, room temperature, and it was still infectious after a month. It's highly infectious material. It is a wimpy virus, you expose it to sunlight. In desiccation, it does die pretty quickly. But if it's in a substantial amount of fluid, it can stay infectious for a long time.

Q: Yeah, the question had come up, because I was thinking about differences in the few patients who were treated in Western systems, and what differences arose because of their much higher level of care than somebody in, say an ETU [Ebola treatment unit] in West Africa, because they're being probably more constantly cleaned or their corpse is a little less infectious, for instance, once someone passes away, as someone did in Dallas.

Montgomery: You mean in West Africa versus—

Q: Versus in the United States, actually, like the guy who died in Dallas.

Montgomery: Right.

Q: Just looking at the different ways in which the level of care you give someone has larger effects.

Montgomery: Right. I think, too, there's different cultural practices, obviously, in West Africa and other parts of Africa and the Americas and Asia, too, on a body, you know, post-mortem, versus here. I mean, here's it's very sterile. When someone dies here, even a loved one, they're whisked away to the morgue and they're embalmed or cremated. You have little to no contact to the body post-mortem. Right after death, yes, but beyond that, no. And once a body's been embalmed and cleaned, and those are all done under highly controlled environments, so there's good infection control practices. Because Ebola aside, other infectious materials that are there. But in West Africa and other parts

of Africa, it's the family generally that's left with preparing the body. You've learned all this—there's extreme contact with the bodily fluids because they're preparing the body for burial. There's no one else—I mean, there are persons who sell caskets and those, but it's limited. It's limited hands-on. They don't have morticians like we have here, necessarily. Just different practices. Different cultural practices.

Q: Right. Right. Okay. One thing I want to make sure we get to is, in your third deployment—and I suppose it was October 2014?

Montgomery: I think that's right.

Q: You worked as a liaison with the Department of Defense.

Montgomery: Right.

Q: Can you describe that work?

Montgomery: Right. I was sent out a third deployment, and that was about the time that we as a US government were considering sending out military to help out with the response. It was unclear what their roles would be, exactly. We knew we needed hands, we needed extra deployed assets to help out with all sorts of activities. But it was really the first time the US military had ever been really deployed for such an event. The military has been deployed for other humanitarian assistance disasters: earthquakes,

floods, tsunamis, we were heavily involved in the tsunami response in Southeast Asia, and other things like deploying medical ships for care and treatment post-disasters. But never really for a big epidemic like this. So it wasn't real clear what they were going to be doing.

There were several needs. One was building treatment units, ETUs. That was kind of the natural. Because you think about it, you've got the Army Corps of Engineers, you've got the construction battalions, you've got all these different groups that that's what they do. They build stuff, and they're very good at it. That was one thought, is they could do that. They also have laboratory assets, field deployable laboratory assets. That was another piece. The one thing that I think a lot of us overlooked, with the exception of a few, was the military also has fairly well-trained clinicians for care and treatment in severe, austere conditions that a lot of folks don't, besides some groups like MSF, some others that are used to operating in those sorts of environments. Unfortunately, they were never really tapped to help out with some of the care and treatment, because there were serious concerns about the optics. If one of the US military personnel members got infected and died, that would cause everything to shut down.

My job—because of my former attachment to the US Navy, I guess they thought I'll have the most experience working with DoD [Department of Defense], and that was probably the truth, kind of understanding how they operate, because this is a different culture. US military is very different than US CDC. My job was to work with them, and I blazed my own trail because there was no guidance given. We knew we were going to have upwards

of 3,500 deployed military personnel from the—what was the group now? I'm blanking on the group that was there.

Q: The 101st Airborne?

Montgomery: The 101st Airborne—thank you—Division was going to be deployed with their general, and in fact, that's what happened. They scaled up, it started out pretty small. Dozens, went up to hundreds, by the time I left it was in the thousands. I think they had a total of 3500 staff members deployed. A lot of them were clinicians, a lot of them were laboratorians, and then of course a whole cadre of logisticians and frontline staff to do whatever needed to be done. They ended up building ETUs and doing a variety of other things. They didn't do any care and treatment. They also stood up these area medical laboratories, AMLs, and I helped with them to identify locations to stand up these AMLs. These forward-deployed laboratories to provide diagnostic support for remote regions, and also ETUs that are in remote locations, where there were no laboratories set up.

I went in basically to give them guidance and be that touch point between CDC and DoD. I spent a fair bit of time flying up-country in their little Ospreys, which was fun. But doing a lot of air time, traveling up-country to look for locations for setting up laboratories and ETUs. Then the last piece that we really wanted them to contribute to, and that was specimen transport. Specimen transport, and also deploying some of our staff out to remote locations. But I couldn't convince the general, General [Gary J.]

Volesky, I couldn't convince him to ship specimens. I tried in vain, and actually went through the whole infection control procedure, and the IATA-approved shipping containers, International Air Transport Authority. Shipping containers that are basically shatterproof and contain—they're meant for transporting infectious materials in airlines. We showed him how these containers work. He said, "You can show me all day, and I believe it. I understand the science. But you've got to convince up the chain this is okay." And what he meant by "up the chain" was the commander of AFRICOM [United States Africa Command], and ultimately the secretary of defense. Because he said, "Look, if for some reason one of my guys gets infected, it's going to all come apart." And I said, "I get it, I just—" So we never were able to convince them to use—and I had most of his staff trying to convince him too, on my behalf, that they should do this. Because that was a huge limitation, with specimen transport. It's still a problem now. But we never were able to get the US military to transport specimens.

The other thing we had asked for them was to transport some of our staff members on some of these remote location assessments, so identifying new hot spots, and going in, identifying cases and ultimately getting some of these suspect cases, the ETUs, and get them out of the community, so kind of your classic Ebola response; identifying cases, putting them in isolation and following the contacts. We could get them to drop our staff nearby these villages, but they wouldn't pick them up. These folks were stranded out there, and they would, in some cases, have to walk for a couple of days to get out of the jungle, because they would not pick them up. Even though we explained, "Look, you're not infectious if you're asymptomatic." He said, "I don't care. We're not doing it." And

we never could convince them to do that. But they did help with laboratory and ETU development or setup.

Q: Right. I remember you saying at some point, you were willing to say, "We'll spray them down with bleach, even."

Montgomery: Right. We walked them through that. Yeah, they just—we just could not convince them. They were too worried about the optics. Too worried about contaminating one of their planes. One of their Ospreys or helicopters. And too worried about one of their service members getting infected and dying. We just could not get them around that.

Q: Did you or others make efforts to reach out to the AFRICOM commander, even the secretary of defense?

Montgomery: Yeah, it was towards the tail end of my deployment where I finally made headway to getting General Volesky, trying to convince him to let us use his helicopters and Ospreys to transport specimens. It just never got to that level. We finally did convince—like I say, we did convince them to take some of our staff out to the field, but they wouldn't pick them up. That was sort of the tail end of my deployment and working with DoD, because he didn't arrive until about midway through my time, the third deployment. The general before him, General—I'm forgetting his name now—he was actually very accommodating. But he had very little assets—he didn't have very many assets when we were there. He didn't have any air assets when we were there. I think he

got it, and I think we could have convinced him to do it, but he didn't have any helicopters or Ospreys at the time. It wasn't until Volesky came in with 101st Airborne Division that we had all these. It was interesting. It's definitely a culture unto itself. They have a pretty amazing operation, and they can move stuff. But they were just too worried about the infection. Their guys were deathly afraid of getting infected.

Q: Did you talk to soldiers about that at all?

Montgomery: Yeah. We had a lot of conversations. In fact, at the time, we were also—it was me and Hans Rosling. I don't know, have you heard about him?

Q: I don't know.

Montgomery: He's a big name in epidemiology. His claim to fame—he's been on a lot of TED [Technology, Entertainment, Design] Talks. He's got, actually, a software program that is—what is it called? If you Google him, you'll find him. It's Hans Rosling. Hans Rosling is his name, actually. Hans and I ended up talking quite a bit. He's Dutch. The Ministry of Health and WHO asked him to come out because of his expertise in epidemiology. He was kind of a consultant for WHO and the Ministry of Health. Hans and I also tried to convince the US military what they needed to do. The point was, we've got to have isolation facilities. We've got to get people out of the community, that's the only way we're going to stop this outbreak. We need to have places for people to go. We got eight specimens, we've got to get the lab stood up.

We were trying to convince the US military of all these things to do. They were hearing it, we were giving these education seminars to their staff, their soldiers, etcetera, etcetera. I think they understood it. Some people just can't wrap their head around it and just get beyond. Even though they know how to prevent infection, the outcome with infection, it's just too grave. People are just too scared. That happened to a lot of our staff, frankly. They were just deathly afraid to be there.

But yeah, we tried in vain. They did build ETUs because the risk there was pretty low, but specimen transport and transporting our staff was a little bit too much for them.

Q: Do you think it would have changed the response, had they been willing to do that?

Montgomery: I think it would have helped a lot. Yeah, it would have helped a lot. Specimen transport, we could have gotten results much quicker. And getting our staff out to the field spots to identify our hot spots, out to locations, and get them back in a timely manner would have helped. They'd have identified cases. Would it have flattened the curve? The reality is, the curve was already on the downward trend when they got there. It had really already peaked in July or August, they got there in October, September-October, so it was already on a downward trend. Did it speed up the downward trend? Maybe, where they did get some ETUs built. But by then, there was a lot of other groups building ETUs as well, the Cubans, the Chinese, a lot were building ETUs throughout Liberia. Again, not to minimize what the military did.

It was a good experience. I think it was a good learning experience for them. If this is to ever happen again, there's probably a lot of lessons learned from this. It took forever to get them out there, that was the one problem. It took weeks to get them out there, to convince all the way up to the Obama administration to get them out. If they had come sooner, we could have gotten ETUs built sooner. And that would have made an impact, I think a much bigger impact, than when they did arrive.

Q: Wow. Yeah, important to note. I remember, let's see, I think it was September 16th that Obama came to CDC and made that announcement, but I'm sure conversations about that were happening long before then.

Montgomery: Oh yeah, they were happening way before that, yeah. They were happening in—because I was out there with Jordan [W. Tappero]—this was in August. We were talking about it in August, early August. So yeah, we were talking about it weeks before. We were trying in vain to get them to come out.

Q: Okay. Thanks for describing some of that.

Montgomery: Sure.

Q: I have another question. Because you were coming from Kenya, there were—were there a fair number of Kenyan FETP people who went to West Africa?

Montgomery: When I was there on the first deployment in April, we ended up—I was trying to get some of our FETP residents to come out then. But it was actually—the concept was foreign, bringing FETPs from Kenya all the way out to West Africa. I was thinking it for two reasons: one, it would be great experience for the Kenyans. I was thinking kind of selfishly for the Kenyans. Great experience for them to come out in the event this does become introduced outside of Liberia. Not to mention, we've got Ebola right next door, in Uganda. So, good experience for their training. I was really strongly advocating for them to come out in April. We ended up getting two residents out, plus one of their staff epidemiologists out in May. They were there for four or six weeks. I think that was—those were the first FETP residents that were deployed to the West Africa outbreak, were from Kenya. Then it ushered in a whole bunch of others.

We didn't really ask. We just paid for their trip out. We told them we were doing it at headquarters. We thought about some of the issues, about if you were exposed, issues with quarantine. But their government didn't think anything about it, because at the time the outbreak was pretty small. It was just Liberia and Guinea. They did it merely for the experience, and because they wanted to help, too. But then these other issues crept into the equation. What if they get exposed? Are they going to be stuck there? What's our responsibility? That all crept in and confused and got—it just complicated everything. We finally worked through it, but it was not an easy process. After May or June, when the outbreak really started ramping up, people were getting concerned. But they had a great experience. In fact, one of the staff epidemiologists, he went back on a second

deployment, and stayed for—I think he was there for six or eight months helping out with contact tracing and infection control. He was there for quite a while.

Q: Do you know him very well?

Montgomery: I do. I know him pretty well. Shikango Otipo is his name. We spent a fair bit of time when we worked together in Kenya. I'd actually recommended him as he would be an ideal person to come out on the first deployment. It was him and two other residents, and they came out. I think Shikango just really—I knew he would do well there because he's a smart guy. But he did so well that they asked him to come back. Then there were a number of other Kenyans that were deployed after that as part of a kind of a South-South collaboration, it really had nothing to do with CDC. They were providing medical care and support, actually, and infection control training and other things too. But he was leading some of those efforts.

Q: Do you have any idea how many FETP people might have eventually worked on the response?

Montgomery: Gosh, I'm trying to think. From Kenya alone, or from just—

Q: I mean from Kenya.

Montgomery: From Kenya? It was probably, I would say, maybe a dozen or so? I can't give you the exact number. It wasn't a huge number. There were a lot of clinicians that were deployed. Some were FETP, some were FETP alums. But I think it did—again, not taking credit for it, but I think it did actually—we had a lot of FETPs from China, we had FETPs from Thailand, we had FETPs from Guatemala. We had a lot of FETPs that ended up converging on the response.

Q: You had some Congolese, right?

Montgomery: Yeah. There were FETPs from all over the world. They ended up going—of course, in the region, too, just in the immediate region, we had a lot of folks coming over. But I would say it was probably ten or twelve residents, active residents that went out, I think. That may be exaggeration, because I'm getting it mixed in with all the clinicians that were deployed from Kenya. Because there were a lot of Kenyans that were deployed to West Africa in the end, quite a few.

Q: Sure. Like non-FETP and non-CDC-affiliated, really?

Montgomery: Yeah. Yeah.

Q: Got you.

Montgomery: But I think it was good. It was a really good experience for them. In fact, when they came back from that deployment, there was—when they came back, they actually put them in self-quarantine for, I think, two weeks, which was unfortunate, or three weeks. It was unfortunate. But they did. And they had to follow instruction from their leadership. But they actually became the experts. A lot of the Ministry of Health and leadership in Kenya turned to them for guidance and leadership on preparing for Ebola, in the event it was introduced into Kenya. It was pretty amazing how that impacted their careers.

Q: Cool to learn about. Let's see, are there any other local NGOs [nongovernmental organizations], any individuals specifically who you worked with really closely, who come to mind and who you could describe a little bit?

Montgomery: Obviously, during any of the deployments?

Q: Any of the deployments, yeah.

Montgomery: Yeah, I mean, the one—and this is probably overdone, but the one, Samaritan's Purse is, I think, the most obvious. I worked most closely with them. And that relationship went through some rocky period, actually. Really, when—

Q: Kent Brantly?

Montgomery: Kent. Thank you. I keep blanking on his name.

Q: Oh, that's cool.

Montgomery: When Kent got infected, the relationship between CDC and Samaritan's Purse, it went—it actually became a little bit estranged. Because it seemed like they were trying to cover up something. But I don't think that was the case. I think they were just—they were worried about what it would do to their operation. But I've got to tell you, early on in the response, they were incredibly important and invaluable to the response, because we would have had no way to get up-country, had it not been for Samaritan's Purse. We wouldn't have been able to move around Lofa County without all their transport. They were incredibly important early on in the outbreak investigation. There were a number of other NGOs we worked with, from MSF—a lot of good, early conversations in Lofa County with a small team that was deployed. I'll never forget as I was leaving Lofa County the day that we had identified a place to set up that isolation facility, I was talking with a lead, their medical lead there, and she said, "We're going to build this isolation facility, and no one's going to come because the cases are over." And I said, "I don't know. Let's hope for that. But I'm afraid maybe there may be another outcome here."

Anyway, it was pretty—it was a weird situation. But MSF and Samaritan's Purse, IMC [International Medical Corps], and there was just tons of NGOs that we worked with while we were there that were incredibly important. Some of them I've seen at various

places since then, and we just have this connection now, having been deployed there. You just have this weird connection with these people.

Q: Anyone specifically you're thinking of?

Montgomery: Yeah, I'm trying to remember his name now, with IMC, the Medical Corps, International Medical Corps. I can see—Sean, and he's of Indian descent. I can't believe I'm blanking on his name. We spent a fair bit of time together.

Q: That's alright. It can be added to the transcript.

Montgomery: Yeah. I can find his contact information later. But Sean, we spent a fair bit of time. I've seen him in several meetings. I saw him at a meeting in Senegal, a World Bank meeting, so we reconnected there. And I saw him in [Washington], DC, it was in an Ebola summit at the White House, or next door. And just see them in random places, and we'll never forget each other. You develop a bond in those kind of situations. But there are a lot. There's a lot of NGOs that we worked with. I would say, though, MSF, Samaritan's Purse and IMC were the biggest NGOs we worked with that still have close connections with them.

Q: For whatever reason, I haven't heard as much about IMC.

Montgomery: Yeah, they actually were pretty front and center in Liberia, setting up isolation facilities in Bong County and a couple of others. They were actually instrumental in providing a lot of care and support. And really making a difference because they were getting cases out of the community and getting them into the isolation facility. They did a fair bit. It's unfortunate you don't hear more about them. They're certainly not as well-known as MSF, but this was new to them. This was new territory. They had never done this before. They basically learned on the fly. They learned a lot from MSF. In fact, early on in the outbreak, MSF was very reluctant to have other groups set up isolation facilities. Then, as it progressed, they said, you know what? We don't have the bandwidth. There's no other option. We've got to do this. So IMC, they stepped in and stood up and actually did a really good job. You have to give them a lot of credit because they were doing something they'd never done before and risking their lives. But they did it. Yeah. You don't hear as much about IMC as you do MSF, but they were doing a fair bit of care and treatment for—and the ETUs.

Q: Right. Important to hear. Important to note. Take me up to now, if you don't mind.

Montgomery: Up to now? Up to now has been interesting. I've been back now since August of 2015, so what is that? Going on nine months now?

Q: Something like that.

Montgomery: Yeah. I keep saying I'm new back to—I can't say that anymore, actually. I have to stop myself, because it'll be a year before I know it that I've been back in Atlanta. It's amazing how fast the time goes. My new position as branch chief for Global Disease Detection, we're currently engaged in ten countries, from Guatemala to China. We are in a rapidly-evolving state in our development as a branch and as a program. The funding we have for this branch and the work we do in these ten countries, it's a congressional line-item budget. Global disease detection and emergency response appropriations. It's about forty-five million dollars that we get that comes to CDC, and that helps support a number of activities.

Most of it is the Global Disease Detection activities that we implement in, right now, ten country offices. It also supports other centers within the agency: NCEZID [National Center for Emerging Zoonotic Infectious Diseases] and NCIRD [National Center for Immunization and Respiratory Diseases], through what we call "technical support corps." It also supports our sister branch, the Emergency Response and Recovery Branch, so it supports emergency response. It supports the GDD [Global Disease Detection] ops center, operations center, so that helps support event-based surveillance. The work they do on scanning the media and rumor reports, that sort of thing. It also supports—they have a contingency fund, they support deployment. But we get, of the forty-five million dollars, unfortunately we only get about thirty-seven million dollars that actually comes to us that helps support those activities plus the ten country offices because of different working capital funds and other OD [Office of the Director] taps that are taken from that money.

We are supporting the ten country offices, with about—ultimately what we ended up getting for countries is about twenty million dollars. That's what we actually have for operational costs for ten countries, including just running the country office plus all the activities that we implement. Twenty million dollars for ten countries is actually not a lot of money. We need a lot more. Just to put it in perspective, to run a country office like Kenya, for example, which has a pretty big footprint, the operational budget and implementing activities, it's around eight million dollars, six million dollars. Six to eight million dollars. So there's clearly insufficient funds to maintain an office. We have to have all additional soft funding and other support, to help implement activities. Influenza Division does contribute quite a bit to some of these platforms. They contribute heavily to the Kenya office and a bunch of other countries in which we work.

This branch, over the years, we never really had a science-driven focus. It's always been about standing up specific pillars within the platform: One Health, influenza, FETP, laboratory. It's not been so much about the science of what we're doing. My background is in science and public health research, so what we're really trying to do with the branch now is really push the public health research, the science of global disease detection. With these ten countries, we're looking at how can we really help support burden studies, etiology studies, getting back to what I was doing in Kenya. How can we actually implement and evaluate interventions, and how can we actually make a change? How can we reduce the burden of disease and improve the public health outcomes of those countries, by helping them think through policy decisions?

We're moving towards what we call "implementation science," so taking data that we're collecting and taking it to action. So understanding burden of disease and ultimately making a policy change. That's a bit of a departure from what we've done in the past. To that end, we're actually having a meeting in June, a three-day meeting. We're going to have all the countries in, all their country directors, all the deputies, their medical epidemiologist, their laboratorians and key local staff, they're going to come in and we're going to sit down for three days and talk about the scientific strategy for the program. So hopefully, really lead towards developing real network projects.

For example, one thing that we really hope to come out of this is a network project focused on acute febrile illness, so understanding what is the primary cause, or the primary causes, of acute febrile illness globally. Going back to the Ebola outbreak in West Africa, maybe but probably, if we had had an acute febrile illness surveillance platform in West Africa and a few key countries, we probably could have picked up Ebola earlier on. If we had capacity for laboratory diagnostics, we probably could have diagnosed at least what it wasn't. We would have had a maybe quicker alert to the outbreak than we did. Maybe we could have really minimized some of the cases and deaths that occurred. That's just an example of one. But for me, that's based on science. That's public health research, asking questions and building capacity while you're doing it.

For the past eight months, I've been really trying to drive that agenda and really trying to refocus this so we can have more sustainable funding. It's been fun, it's been a challenge. It's been, I think, way more challenging than my two overseas posts. Because ten countries, working with a variety of different people, and working—I've never really—I was in Atlanta early on in my career, but I was, and still am, but a peon. Now we're working across multiple centers dealing with high-level leadership. It's a challenge, it's fun. I like it. It's actually good to work across the agency. But it's got its challenges, its moments. But I was telling someone just yesterday, I love getting up in the morning and coming in because I have a great team. I've got a great group that I work with, and it's fun.

Q: Glad to hear that it's working out, after coming back after almost ten years.

Montgomery: Yeah. It's been an adjustment for me and my family, being back here. The kids still miss Kenya a lot. My wife misses it a lot, too. But anyway—

Q: Okay. Is there any other—you got about ten minutes until your call. But is there anything else you wanted to mention about Ebola, specifically?

Montgomery: That captures a lot of it. Like I said, next steps there, we're continuing. We have an Ebola-Affected Country's Office platform within our division. Barb [Barbara J.] Marston runs that. She's focusing on Guinea, Sierra Leone, and Liberia, and really trying to build up capacity. That's bleeding into Global Health Security Agenda

implementation. I'm working with her too, because some of her staff are actually out of my branch, the lab folks. But we're really looking, could we position a Global Disease Detection Center to cover all the topics that I just talked about with this new agenda in West Africa? And which country would be ideal? For me, it's—I'm obviously biased, but Liberia, for a number of reasons. We've got a lot of investment there. A lot of USG investment, not just CDC, but DoD, NIH [National Institutes of Health], USAID [United States Agency for International Development], and the list goes on and on. It makes a lot of sense. Liberians love us. There's a lot of capability. There's a lot of potential there. It's English-speaking, so it's easier. We can hire Francophones, too, to work in the region. So I'm pushing for Liberia as a GDD site. I think there's a lot we can continue to do there, even beyond Ebola. There's clearly issues with Lassa and malaria and everything else, that we can continue to build an infrastructure. The hopes are we'll have some additional resources, the twenty million dollars spread to eleven countries doesn't go very far. We're also looking now south of the border, we're looking at some new collaborations in Peru, so that would be twelve countries with twenty million dollars. You just can't—to open up new countries, one of two things has to happen. We've got to get more money, or we've got to shut down some other countries to re-divert resources. We'll see.

Q: Okay, we'll see. Thank you for that, Joel.

Montgomery: Absolutely.

Q: This has been a privilege and a pleasure to sit here and listen to you.

Montgomery: Yeah, absolutely. Thanks again, Sam, I appreciate it.

END