CDC Ebola Response Oral History Project

The Reminiscences of

Frank J. Mahoney

David J. Sencer CDC Museum

Centers for Disease Control and Prevention

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Frank J. Mahoney

Interviewed by Samuel Robson
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Interview 1 of 1

CDC Ebola Response Oral History Project

Q: This is Sam Robson, here today with Dr. Frank Mahoney. Today's date is June 3rd, 2016, and we're here in the audio recording studio at CDC's [United States Centers for Disease Control and Prevention] Roybal Campus in Atlanta, Georgia. I'm interviewing Frank as part of our CDC Ebola [Response] Oral History Project. Frank, thank you so much for being here with me today from Geneva. For the record, could you state your full name and your current position with the CDC?

Mahoney: Thanks for inviting me here. My name's Frank James Mahoney. I'm currently working for the Global Immunization Division. I am seconded to the International Federation of the Red Cross in Geneva, Switzerland.

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

Mahoney: I was born in Chicago, Illinois, in 1953.

Q: Did you grow up in Chicago?

Mahoney: No, I grew up in Texas.

Q: Grew up in Texas. What was that like?

Mahoney: It was different back then. I grew up in what was then the small town of Garland that later merged with Dallas. I went to college in Philadelphia, so that was a big change for me. Culture shock, moving from Texas to inner-city Philadelphia. I maintained some Texas roots, some family there. I get to go back every so often.

Q: Who was in your household when you grew up?

Mahoney: I'm the middle child in a family of seven. Four sisters and two brothers.

Q: Raised by parents?

Mahoney: Yeah. A big Irish Catholic family.

Q: What did they do?

Mahoney: My father was a businessman and my mom was a homemaker.

Q: What kinds of things caught your interests when you were growing up?

Mahoney: I was like most kids. I had a dad that pushed us to work from an early age. I had a paper route at age nine and caddied at a golf course most weekends as I got older—I hated it so much, and while I played golf as a young kid, I didn't like caddying, so it ruined my interest in the game. I haven't played since maybe middle adolescence. Like most kids, I played baseball, enjoyed fishing, and things like that.

Q: Did anything academic catch your interest, as well?

Mahoney: I was more interested in English literature versus the sciences during college. I was interested in medicine as a career but was an English major in college. I took a different pathway to get into medical school and had difficulty getting accepted. I applied in the Philadelphia area for three years, and wasn't accepted. During that time, I had jobs as a research technician in the medical labs [laboratories] in the Philadelphia area. I went back to Texas and applied for medical school.

I was living a bit of an alternative lifestyle in those years: I used to raise chickens, rabbits, and turkeys, and helped organize a community garden on abandoned lots in the inner city of Philadelphia. One of my research professors knew me quite well personally, and when I applied for medical school in Texas, I didn't know he was there. He was on the faculty, the admissions committee, and he told me later after I got accepted, he had said, "Oh, I know this kid. He's an amazing kid. He raises chickens in Philadelphia." He told me somebody else on the committee said, "If he can raise chickens in Philadelphia,

he belongs in our school." [laughter] Those were my background qualifications for finally getting accepted into medical school.

I wasn't interested in epidemiology in med school. In fact, it was probably one of my worst courses. I got interested in public health after my residency when I did clinical work in Micronesia for three years. I saw a lot of public health problems that as a clinician I wasn't able to prevent. At the end of my time working there, I thought to myself, what impact have I had on the health of the community? I thought, how could I have more impact?

Q: What brought you to Micronesia?

Mahoney: I had a National Health Service Corps scholarship and needed to pay back two years in hardship areas. During my residency, I spent a two-month rotation working on a small island in Micronesia and expressed some interest in working there after graduation to colleagues at the University of Hawaii. They called me in the middle of my second year of residency and said, there's this small island without any doctor and there's an urgent need, could you be available to come out and cover for us until they're able to staff it? My residency director thought it was an interesting opportunity and arranged it so that it would count as a two-month academic rotation. It was quite an experience and made my decision to go return and practice after I completed my residency.

I was doing my residency in family medicine at Baylor [University]. It was an intense program and we did rotations at the Ben Taub Hospital and Jefferson Davis Hospitals. I had a lot of experience from my internship doing C-sections [caesarean sections] and small surgical procedures. It was fortunate in that after I arrived on this small island, on the very first day, there was a young girl who I thought had a tubal pregnancy. She was diaphoretic and really in bad shape. I was scared to death taking her to the operating theater and was so thankful for the training I had during the previous year. She did have a tubal pregnancy and did fine after the procedure.

Q: Did you go immediately back there?

Mahoney: Yes. I finished my residency in '83, and then worked in Chuuk State from '83 to '86. Back in those days it was called Truk Island. One of the particular things that impressed me was the number young adults I managed with chronic liver disease. I saw a lot of young men and young women die of cirrhosis and liver cancer. Those were the years when hep [hepatitis] B vaccine had become available, so we were trying to get some vaccinations started in those islands. It was challenging. I met Mark Kane and Gary Schatz from the Hepatitis Division who were promoting vaccine introduction in the Pacific. I also met Mike O'Leary, who encouraged me to apply for the EIS [Epidemic Intelligence Service] program at CDC. I really didn't know anything about EIS, and I did a state-based assignment in Louisiana with Louise [M.] McFarland and Tom Farley. In Louisiana, we started some work on hepatitis vaccination in Southeast Asian children living in the New Orleans area, and I also started work on introducing hep B vaccine in

the Pacific Island communities. After I finished my EIS in ’91, I came and worked in the Hepatitis Division and continued that work through working in the Pacific, as well as on hep B vaccine introduction in the US.

Q: Can you remind me of what year it was that you got to CDC?

Mahoney: I did EIS in ’89 through ’91 with the Louisiana State Health Department and came to Atlanta in 1991.

Q: What happens then?

Mahoney: After seven years in Atlanta, I moved to Cairo and I took an assignment seconded to the US Naval Medical Research Unit Number 3 [NAMRU-3]. Jim [James W.] Le Duc was my supervisor in charge of the Division of Viral Disease in there. The division thought secondment of an epidemiologist to NAMRU-3 would foster better relationships between the DoD [Department of Defense] overseas labs and CDC. I worked at NAMRU-3 for six years. It was interesting times. The Navy in those years had a very active research and development program, so they were working on things like ETEC [enterotoxigenic *Escherichia coli*] and malaria vaccines. My focus was different compared to the very line-oriented researchers. Most of the Navy work was research on threats that could impact the troops in the field, and a lot of the approach was threat assessment and mitigation. I came in with the idea that there are even bigger emerging disease threats out there circulating in the resident communities. Our work focused on

surveillance networks in priority countries, and I had a number of great commanding officers who supported the work we were doing. We did a lot of work in Central Asia, as well as the EMRO [Eastern Mediterranean Regional Office] countries. It really expanded the breadth of the work that NAMRU-3 was doing and was an extraordinary partnership with NAMRU-3.

Q: Since you were expanding the focus from just the health of DoD staff to the community at large, were you also then involved in the community relations aspect?

Mahoney: We did a lot of work with communities. We got involved in some things that you would think are way off the radar screen for the Navy lab, but the Command was remarkably supportive. I can give you an example. In those years, Egypt had a serious problem with hepatitis C. They had the highest prevalence in the world. We were asked by WHO [World Health Organization] to participate in all these forums to help the country develop a strategy on how to prevent bloodborne pathogen transmission in the healthcare setting. We did a lot of work looking at the problem, doing studies on how people were getting infected. But it really wasn't addressing the issue of how to stop transmission. Eventually, as we were putting together a team to look at this, there was a lot of interest in AID [United States Agency for International Development] supporting something, to prevent transmission. We realized that it was much bigger than bloodborne pathogens and had a lot to do with basic infection control in the whole healthcare system. We uncovered some extraordinary problems as we did assessments throughout the country, including outbreaks of sepsis in newborn nurseries and surgical site infections.

We realized through a number of these studies that the country had a rapidly evolving healthcare system, but didn't have an appropriately trained workforce on how to safely practice medicine. All the data on hep C pointed towards wide-scale transmission during campaigns to treat schistosomiasis with tartar emetic injections transmission and ongoing transmission within the healthcare settings. We put together a large multi-disciplinary team and set up an activity outside of the NAMRU compound, including social scientists, epidemiologists, and infection control specialists. We started a program of training hospitals on good infection control practices and realized we had to train everybody throughout the health care system. We created a series of training modules and recruited a core team from each facility. At the time, infection control wasn't a recognized specialty in Egypt, and we had to create positions within the healthcare system to have hospital epidemiology or infection control practitioners. When we implemented the training modules, we'd invite the core team and those focal points responsible for the particular area of focus in the module. When we did work on employee health, we brought in a clinician doing employee health. When we did a module on supplies, we'd bring in the hospital administrator. It was an applied training, and the six hospitals would come in and get their training and "homework assignment" to apply after the training. During the actual didactic training, they would go out into the field and we'd have them collect information on the current practices; then they would come back and talk about that. After the one-week course, they would go to their facility and say, you learned all this information . Go back and work on this in your facilities. It was very amazing how they would come back and solve all these problems with their existing resources without

any additional budget. We gave them the knowledge base. Okay, you have to do this, and this, and this. They would come back and share with each other how they solved all these problems amongst themselves.

For a couple of years, I had been working on trying to get the government to do a hep B vaccination of the healthcare workers, but wasn't able to move the needle. When we did the section on employee health in the hospital setting and talked about hep B, without any funding or anything, every hospital was able to figure out a way to vaccinate their healthcare workers. They'd buy the vaccine from the EPI [Expanded Program for Immunization] program for pennies a dose. The employees would pay, and things like that. We did a lot of interactive work with the health care workers that really motivated them.

Our social scientist did some studies on, what would motivate HCWs [health care workers] to change their behavior? They said, anything that would negatively impact my health, my family, or my relationship with my husband. That would motivate them to practice safer medicine. The team then created these videos. Even on national TV, they created these small vignettes, in typically Egyptian fashion, that were very dramatic. There would be a carpenter doing work and he'd cut his hand, and then somebody else would come in and get exposed to blood using the same tools. This would be a two-minute nationally televised thing. It got the whole country talking about exposure to blood. For the nursing staff, the team created a video of a nurse that gets a needle stick and she subsequently gets hepatitis. The video had a scene where the mother-in-law's at

the door telling her son, "Bring my babies out of this house. They're going to get viral hepatitis from this woman." When I discussed the impact of the video with Maha Talaat, who was the person who ran the program, she said, "Dr. Mahoney, we had to stop using that video." She said, "Every time we showed it, all the nurses would start crying. It was just terrible." She said, "We didn't realize that the reality was, almost all of them had hepatitis C. It was too personal for them." They ended up not using it as much as they wanted. But it was that kind of approach, doing qualitative research, understanding how to do behavior change. That experience taught me the value of qualitative research and working with social scientists.

Q: What happens after Cairo, between '03 and 2014?

Mahoney: After my NAMRU-3 assignment, I worked at WHO. When I was with NAMRU, I did a lot of work with WHO and had very good relationships with the communicable disease program. I worked with WHO for four years on measles in the regional office of WHO. In that position, I was able to work across the Middle East in twenty-three countries and built a lot of relationships with people in most countries.

Q: I know that you started to work on polio at some point, as well.

Mahoney: I was working on measles in the EMRO, then I moved to flu [influenza]. I worked for the flu division in Indonesia for four years. I had been overseas for about sixteen years at that time, so they said, it's time for me to come back to Atlanta.

When I came back to Atlanta, I came to the Global Immunization Division and took an assignment in the polio program. It was right around the time when the IMB [Independent Monitoring Board] had done a report that was very critical of the polio program, and it had raised the interests of Dr. [Thomas R.] Frieden and the division and put us, really, under a spotlight that we needed to do more. I think the IMB said that polio should be declared a public health emergency. My supervisor asked me to write a plan for how to—if we're going to think about this in this way, we need to have a strategy and a plan. So I wrote a plan to scale up polio. In that plan, which we presented to Dr. Frieden, we recommended activating the EOC [Emergency Operations Center]. When we activated the EOC, I was the chief health officer for about twelve, eighteen months.

Q: Do you remember when this would have been?

Mahoney: I think it was between 2011, 2012. It was apparent certain countries were struggling. I was doing a lot of work in Afghanistan in those years. Then Dr. Frieden asked me to take an assignment to Nigeria. I was a little bit skeptical that I would be able to have much impact, but anyway, I agreed to go out for six months, and that extended for a couple years. I think what was helpful about that assignment was that I was working directly for CDC and not seconded through WHO. We set up a CDC office embedded in the [Federal] Ministry [of Health] and developed a robust program called NSTOP, National STOP [Stop Transmission of Polio] program. It was a useful program to fill in the gaps of issues that were not being addressed by the MoH [Ministry of Health], WHO

or UNICEF [United Nations International Children's Emergency Fund]. Working with WHO and BMGF [Bill & Melinda Gates Foundation], we established an EOC in Nigeria that was really helpful in coordinating the work, bringing the partners together.

One of the things that was particularly helpful related to the Ebola work in Liberia was the persons running the WHO polio response were Peter Graaff and Alex Gasasira. I had worked with both of them in the past and it was great to work with them in Liberia. We had really good working relationships and knew how to work well together. We could be very honest with each other, were very like-minded, and very applied in our thinking on how to solve problems.

Q: How did you get involved in the Ebola response originally?

Mahoney: I was first involved in Nigeria, when we heard about the hospitalization of Patrick Sawyer from Liberia. I went to Lagos to support the response and helped work through key issues early on. There were a lot of issues and the country teetered on having the outbreak get out of control. The issues were complex and the management of it was very confusing and ineffective. There were issues related to federal, state, who was in charge, where the resources were coming from. There was a lot of anxiety and different ideas on how to respond.

After Patrick Sawyer arrived, it was a couple days before they recognized he had Ebola, so a number of healthcare workers got exposed. We knew early on some of the HCWs

were going to be infected based on their exposure and we urged the government to find a place to manage patients. The governor wanted to build an EOC fifty kilometers outside the city. Somebody else got a contract to renovate a facility. It was all going to take too long. We were searching all around the city looking for a place to manage patients. The chaos of who was in charge of the investigation was also a problem. We recommended to the MoH that they bring in the polio EOC to help them manage, and we also recruited support from the FELTP [Field Epidemiology and Laboratory Training Program] to run the contact tracing. Those were extremely important and really helpful actions that the government took. Dr. Faisal Shuaib, deputy IM [incident manager] of the polio EOC, was assigned to lead the response. Coupled with the support staff of the EOC, the government organized a really well-tuned and effective management team. Within two days of Faisal's arrival, we had a very operational rhythm collecting data, setting up databases, and moving and making strategic decisions—moving things forward.

Regarding the issue of finding a place to manage patients, I went with the commissioner down to one of the academic hospitals. The commissioner was trying to get patients to leave the TB [tuberculosis] ward, which was a very suitable location. But the patients refused to leave. He was negotiating over a couple days but didn't have the capacity to kick them out. On that particular day, I wrote an email to Dr. Frieden. "We have eight people out in the community with fever, eight contacts of Patrick." I wrote to him, "I'm going down to the TB ward with the commissioner. We're going to set it up and we're going to park people there." That didn't work out, but while we were there, we found an abandoned hospital ward, which we cleaned out, set up with wash stations, and started

admitting patients. Eventually, the patients in the TB ward agreed to leave, and the MoH was able to move people into a cleaner environment. The place, the abandoned hospital ward, was really not very nice.

After I had worked on that response, Dr. Frieden asked me to go to Liberia in late August, so that's how I ended up in Liberia.

Q: Do you know where the TB patients ended up?

Mahoney: They went home. They were put on directly observed therapy. I think the government provided them some incentives. These were MDR [multi-drug-resistant] patients, so there was concern about sending them home. I think it was in their plan to send them home eventually anyway to transition to outpatient-based care, so they just accelerated that.

Q: Gotcha. It's not like they—

Mahoney: No, they weren't really left without—no. [laughter] I think the resistance for leaving was that it was a really relatively nice place. Clean hospital beds, and they were getting good care, good meals, things like that.

Q: Right. Were you in Nigeria when the cases jumped to Port Harcourt?

Mahoney: Yeah. I was, had to leave. Right around that time I had written to Inger [K.] Damon that we were tracking this contact, the diplomat, and that he had gone missing. I remember writing to her in one of my informal, more blunt sitreps [situation reports], that we were worried, and dot-dot-dot.

Q: Who was this diplomat?

Mahoney: He was with ECOWAS [Economic Community of West African States]. Patrick Sawyer was coming to an ECOWAS meeting, so he met Patrick at the airport. We had been in contact with him and talked to them about monitoring, and he just disappeared off the radar screen. We had another incident where a nurse left and went to another city. She showed up sick in a neighboring state. The state epidemiologist called to say he was going to manage—we said, no you're not. We said, do not do anything. We instructed them to isolate the patient with no touch care. We sent an ambulance to bring her to Lagos. It was about an eight-hour trip. I think it was a really smart decision because the local team had no experience dealing with Ebola. We had the WHO colleagues who were really helpful in developing capacity of local staff to manage patients.

Q: Right. Can you tell me about some of the people you worked with in Nigeria?

Mahoney: We worked with the FELTP. Patrick [M.] Nguku, [Ndadilnasiya] Waziri. I think one of the most unspoken heroes from my perspective is a guy named Peter [A.]

Adewuyi. He did a lot of the calling to the contacts. One of the thing I learned, when patients are contacts, contact tracing with Ebola, is that people really need to have somebody they trust to communicate with. This was certainly true in Liberia, as well. You don't just send a community worker who doesn't understand and may not have a medical background, which I think is the tendency, to have them do contact tracing. People are really scared, and they want to be talking to someone knowledgeable. Peter was particularly helpful in communicating. He actually stayed in the EOC the whole time, but somehow he got this duty of trying to convince the contacts to come in, and they would call him for questions and things. I think it was really rough on him because he developed good interpersonal contact, relationships with these people, and several of them died. He had been the one to convince them to come in. I think he did a yeoman's job, but it was really tough on him emotionally.

Q: Where had he come from, again?

Mahoney: He was with FELTP. He is a graduate of FELTP. He had been working in one of the states. We actually brought him to Liberia on the response, and he's there still, working on training the FELTP in Liberia.

Other people. Nasir Sani-Gwarzo was helpful. Of course Dr. [Abdulsalami] Nasidi was the first incident manager. A lot of the FELTP residents—a focal point from WHO named Musa, who was really good. The two key people, there was a guy named David Brett-Major from WHO, who was really—he was a clinician with Ebola experience, and

one of his colleagues from Uganda named Charles Nzuki. They were good mentors to the local teams.

Q: Can you tell me more about Dr. Nasidi? Dr. Frieden's told me a little bit about how in the beginning he wasn't as effective as you had hoped.

Mahoney: Dr Nasidi tended to get distracted. I was really frustrated. We were distracted by events that we shouldn't have been and would spend hours in the EOC talking about—one event was the disposition of a dead body that had come in a casket from Liberia—another event was, they were concerned about faith healers. Nasidi wanted to go visit these faith healers. Meanwhile, we had these people in the community incubating people and we still didn't have a place to manage them. It was really maddening to me that the EOC time would be spent on stuff that was so peripheral. Other issues included the press coming into the EOC. We'd essentially have an EOC meeting with the press in the room, and that's not really a good way to manage an outbreak. It was a bit maddening—the response was spending too much time in long meetings. When the polio team, when we changed the management of the EOC, it became a very crisp rhythm. We would spend less than an hour first thing in the morning, and the teams would go off and do their jobs. We did the information sharing late in the evening, like an evening review meeting every day. That really helped, having a better rhythm so that people weren't tied up in these long EOC meetings, doing stuff that really wasn't helpful in the response.

Q: What's the mechanism through which Dr. Nasidi was replaced? There's CDC and their authority, and then there's the government. Whose decision was it?

Mahoney: I am not sure, you'd have to ask—I think somehow we convinced the government that this change should be made, and I think it came from the president's office.

Q: Who was the next incident manager?

Mahoney: It was Faisal Shuaib.

Q: It was Faisal. That's right.

Mahoney: Yeah, yeah.

Q: That makes sense. Okay. You said, what is it, late August you went to Liberia?

Mahoney: Yeah. Then I went to Liberia. I was so pleased to see Alex and Peter there. Late August was a really harrowing time in Liberia. They had established an EOC by that time. Peter had just arrived to the response. I think one of the most important things we did then was organize a strategy meeting. There was a lot of debate among the partners about, what's the strategy? Should we establish holding centers? Should we be promoting home-based care? Should we be doing WASH [water, sanitation, and hygiene]? Should

we be doing other things? Peter and Alex and I, we were talking about it and I said, "We can't go on like this. We have to come up with strategies, fix it, and full stop. This is what we'll go with."

Peter did a great job in convening a meeting. He was the WR at the time. He convened a series of meetings with all the partners. It was MSF [Médecins Sans Frontières], CDC, government people. The ground rules of the meeting, we're going to come up with a strategy. We have to all agree on the strategy. No one has the option of not agreeing. If you don't agree with the strategy, then you have to come up with a better idea, and that we all agree on that. And we're not leaving until we do this. Whatever the strategy is, come hell or high water, if it works or doesn't work, we're going to go with it. We're not going to be second-guessed. This is going to be our strategy and we're not going to change. This is what we're going to do.

We debated a number of things. Home-based care. We debated quarantine versus non-quarantine. We debated ETUs [Ebola treatment units] versus treatment within the health system. All these things. We came up with an approach that said, we're not going to do home-based care. We're not going to do involuntary quarantine. We're not going to treat within the existing healthcare system. We're going to focus on four things. Rapid identification, isolation of patients. We're going to have safe transport to get them to the hospital. We're going to stop transmission in the healthcare system, whether it's an ETU or the normal healthcare system. And we're going to have safe burials, promote safe burials. It was very simple. Literally, within two or three days of that, we were watching

TV on CNN or something and [Barack H.] Obama says, “We’re going to send six hundred thousand home healthcare kits to Liberia.” We’re sitting there saying, what? We’re not doing that. [laughs]

It was so fortunate we had had this meeting. Because it was all these people trying to manage the response from outside Liberia, and all of a sudden we’re getting pushed—but what was helpful was DART [Disaster Assistance Response Team] was there, and the people from USAID [United States Agency for International Development] were there, and they pushed back, and that was great. These were their bosses in Washington telling them they need to implement this and President Obama said it on TV. And they held up with the response. They said, no, we’re not. That’s not our strategy. We’re not doing that. Similarly, people came in wanting to do WASH. WASH was going to solve this outbreak. And it wasn’t our strategy. There was constant NGOs [nongovernmental organizations] wanting to distribute hygiene kits and things. That’s good for cholera and other things, but it’s not going to stop Ebola and we’re not going to get distracted. I’m sure the WASH people, when they hear this, will not be happy. It wasn’t a principle strategy, and that was the focus.

A second thing, I think, was really helpful. At that time, we had an EOC—there were a couple things early on that were really problematic. The government was having the EOC meetings in the Ministry of Health. It was really problematic. People would go to the EOC, and then they’d go off and work in some other place. One thing I brought from the experience, both in polio and—you can’t work like that. You need an EOC, particularly

on a disease like Ebola. You have to co-locate people, and they have to be working with each other throughout the day. It was fairly dysfunctional early on, and the AID and the DART found a building so we could create a proper EOC and everyone could come co-locate there.

The rhythm of the EOC was constantly evolving. I think one of the second or other key interventions is that the EOC meetings, despite a lot of efforts to try to focus them and bring them down to a manageable size, tended to be really big. It was very difficult to track action items and do a punch list and say, this has to be done by that day. You would think that's what an EOC does, but it was just so big, so many partners, that it was not—it wasn't a good venue. I was talking to Alex and I said, "We really need a different forum to talk about strategic priorities and daily issues." So we created what I called the Gang of Six. It was an early morning meeting at 8:00 am with three people from the government, key people from the government. It ended up being more than three, but the incident manager, the person who controlled finance, and social mobilization. It was really the key leadership on the government side. And WHO, CDC, and AID, and sometimes we brought in and out partners when it was relevant, like UNICEF and MSF would come occasionally. That meeting every morning was really useful to clarify, what's the most important thing to do today? Then the government people would say, you do that, then we can talk about it and be held accountable the following day. Did that happen or did it not?

Q: Do you happen to remember when in the timeline the Gang of Six meeting started?

Mahoney: That was early. It was around that time. Maybe mid to late September.

Another of the things that was really helpful was the president of Liberia had formed a task force, and they were trying to manage the response with a cabinet-level team, and I think the military was involved. They had a really bad experience with using involuntary quarantine in West Point, and it created a lot of negative public reaction to the overall response. It seemed to me that the president recognized that they're not technical people and that she should leave this to the technical experts and let the—bottom line was, the EOC was managing the response with very minimal interference from political parties and political people. I did not work in Guinea or Sierra Leone, but it seemed to me like the DoD, the department, nontechnical people, were more involved in the response than in Liberia.

The other thing that was particularly good about the Liberia response was that they were able to adapt, constantly adapt, to the situation and what the strategy was, and how we're going to go about doing that. That was an important feature. As an example of that, we kept struggling with how to isolate patients. The first idea was, we're going to build more ETUs and things. It was clear we weren't able to do that quickly. Then, as well, the communities were starting to manage people locally. So we said okay, we're going to build community care centers that are kind of a step down from an ETU. Then we realized that that wasn't going to address the problem of outbreaks in the rural areas, where people were in isolated communities and it was really impractical. Then we came

up with the RITE [rapid isolation and treatment of Ebola] strategy. We were going to isolate in place and manage people in the field.

The EOC, it was a bit crazy for the partners because we were constantly adapting the strategy to the evolution of the outbreak. The DART would be prepared to support. The DART is Disaster Assistance Response Team, within the Office of Foreign Disaster Assistance. They're the big bank, helped support a lot of the work, and we were constantly changing our needs to the DART. Telling them what we needed to do, and then they would figure out a way to support that.

At one point, we were out in the field in a non-compliant outbreak community. The residents were not happy because patients had been sent to Monrovia and no one received any feedback on what happened to them. They were refusing to report new cases. When we visited the community we realized, if we could just renovate some local facilities, we could manage patients locally. It would be a very effective local solution where community members could stay in contact with their loved ones. The capacity to renovate locally was so slow. I was on a call with President Obama, and Dr. Frieden refers to it as Mahoney's presidential rant, but I was complaining to him about how—I think I interrupted him and said, "Look. We could solve this thing if we had the ability to flexibly spend money quickly in the field and manage the outbreak, but the processes are so slow." After the call, the team in Atlanta tried to come up with solutions and told me, "You can spend five thousand dollars without prior approval. and can get reimbursed with petty cash." Literally, I was out the next day in an outbreak community and found a

place to manage patients that needed renovation. We gave them a couple thousand dollars. Said, “Fix this window, build a latrine,” do this and that, “and we’re going to put patients in there.” Then I come back with my receipts to the embassy. [laughs] They said, we’re not giving you—you can’t do this. This is against State Department rules. I had to figure out another way to get reimbursed for those costs. Those are the things, lessons learned.

In terms of key people in Liberia, there’s so many of them. Really, one of the amazing persons was Mosoka [P.] Fallah, who was running the response in Montserrado County, the city of Monrovia.

Q: Can you describe him?

Mahoney: Mosoka is a wonderful person. He has an academic background and is an immunologist by training. He’s extremely good at working with communities and how to work with contacts. He’s the kind of person that can talk to communities and community leaders and convince people to do what’s important. We had a number of times when he just did amazing work in getting things done. Athalia [S.] Christie and a few folks, we had a team working with Mosoka that were really out in front—tracking the chains of transmission, the most urgent stuff to do. A lot of them worked with Mosoka, and he was a good mentor to a lot of our team.

Q: When I speak with others about your experience, a buzzword that comes up often is "microplanning" sessions. When people use that term, what do they refer to?

Mahoney: Microplanning is—it's nothing more than just sitting down and organizing what your response is. It's a term we use in immunization when we say, you have a goal of vaccinating all these children in your community. Let's make a map of the community. Where are the facilities? This community is going to be served by what facility? Once we had developed the strategy, the agreed-upon strategy, we thought that we needed to socialize it to all the counties. We did a series of meetings with the county health department heads and county teams. We did it in phases starting with the highest-risk counties. The focus on the training was what the county needed to do to stop Ebola. Let's sit down and make a plan on how you're going to do that. Where are the treatment centers going to be; if you need to build CCCs [community care centers]. At the same time, we were doing a lot of training, training the burial teams and stuff, so I think it was a way to get all the counties to have an organized response and do the right things.

CDC was sending out focal points. One of the things we decided early on was that what we wanted to do was have a lot of people in the field, and every county have a two-person CDC team to support the response, and we tried to overlap them. We would have those focal points helping implement the key parts of the strategy.

I think the microplanning sessions, it was a good tool for communicating with the teams on more of the technical aspects of what they needed to do. There was a lot of ongoing

work with infection control and standing up appropriate triage stations within the health system so that they recognized Ebola and would refer them for care and things like that at the same time. Concurrent with the microplanning was a lot of efforts to be pushing out the PPE [personal protective equipment] and to do the infection control training and things like that.

Q: Can you tell me more about the conversations that you had about quarantine? I know you've talked about the West Point quarantine and how that went awry. What were some of the conversations that you were in, some of the arguments that you remember hearing?

Mahoney: There was a lot of concern, a lot of debate with people about human rights, and said that people were being—we used what we called [voluntary] quarantine. We would encourage people to self-quarantine in their homes. Sometimes we would set up a place for them to go. Most people were very rational, and they agreed to it because they didn't want to be at home with their family members. If there could be a setting where they could get care and be appropriately monitored, they would actually be comfortable with that.

For example, in the last chains of transmission, we had a series of unfortunate events, I called it. We had a very complicated cluster with multiple people getting exposed. There was a transmission among young men in a really poor section of town called the Red Light District. They were a disenfranchised community and had a lot of mistrust of the government. There was a chain of transmission where we had a person that had gone to

Red Light collapse on the street, and two young men helped that person get into a taxi. We referred to them as the good Samaritans. We knew that the two young men were out there because of the contact tracing, but we didn't know who they were. It turned out they were members of a gang in Red Light. They all lived in a compound together and circled around a "godmother" named Spoiler. One of the good Samaritans got stabbed by a person named Time Bomb. After being stabbed, he wandered around the Red Light District for two days, visited several healthcare facilities and exposed a number of people before he died alone in a warehouse. The other good Samaritan developed symptoms and got admitted to an ETU. Contact tracing revealed a large number of young men who were exposed to the two young men. Mosoka and I visited them on several occasions and Mosoka convinced them to come in under voluntary quarantine to stay in one of the empty ETUs at the time. This was late in the outbreak, and we had unoccupied ETUs. There were like thirty-three of them, and they voluntarily stayed in the E|TU. CDC paid their family members a per diem every day because they weren't able to generate income if they were in this quarantine.

That was an example of a [voluntary] quarantine that worked out with both sides. Because of Mosoka's relationship with the community, he convinced them to come in, and they received good care and support for their families —it was incredible. When they left, there was all this interest in fostering their development as members of society, and social welfare people wanted to work with them.

Similarly, we had a patient that got admitted to a hospital and wasn't recognized as having Ebola, and she stayed in the hospital seven days. There were a large number of healthcare workers exposed to that patient. Again, I went and talked to them with Mosoka and he provided them with options of staying at home versus voluntary quarantine. The hospital provided a plan for them to stay along with meals and incidentals. The workers decided to go through the experience together and agreed with the quarantine. We visited them every day and became really close to them. One of our team members entertained them with songs and playing a ukulele.

Q: Oh, was it [A.] Scott Laney?

Mahoney: Yeah, Scott Laney had done a lot of the investigation work. When they closed down the quarantine, fortunately, amazingly, no one got infected, we had a barbecue and celebration. I cooked a big roast of lamb, and we had all this food and a big party. It was really amusing. The healthcare workers put on a play that was just extraordinary. It was almost a half-hour play, and they did all these dynamics about the doctors being arrogant and not listening to the nurses, and the patient gets infected, and then the healthcare worker gets infected. It was so amusing and they were so rowdy. It was such a great party.

It was a good example of how that partnership—I think a unique aspect of the CDC response there. A friend of mine from WHO was there, and he was so astounded. He said, "WHO could never do something, organize something like this." [laughs] He was just

amazed that this celebration and relationship with the community was so tight by that time. Scott was playing his ukulele and all these nurses were singing with him. It was really cute.

Q: When was this?

Mahoney: That was in late March, at the end of the outbreak.

Q: Okay, gotcha.

Mahoney: In early December, I was talking with Carmen DePesova regarding the outbreak response in Montserrado County. Her comment was, “We just have to divide that elephant up into manageable pieces.” That’s what we did. Between December and January, the EOC created four sectors and put multidisciplinary teams in each sector. The EOC found places for the teams to co-locate and it was the first time that all the different technical teams worked together. It was an effective strategy to stop transmission in Montserrado. Different partners, MSF, others were all part of that sector approach, some being the teams leads.

At times, there was a lot of tension between partners. In a response like this, there’s a lot of issues to sort out including roles and responsibilities of each partner. Generally, it was extraordinarily good cooperation and a seamless response. I think that was a result of the

leadership of the incident command structure. We had a good incident manager in the response, Minister Tolbert [G. Nyenswah].

Q: I'm sure that there were disagreements between partners sometimes.

Mahoney: Absolutely, yeah.

Q: Around things like home-based care and quarantine.

Mahoney: Right, right. Absolutely. We would have a lot of debates about that even up to the end, but nothing that got in the way. One of the issues was triaging patients and admission to ETUs. At one point in the response it became known that high-risk contacts would come into a treatment center with fever and get sent home. That just made Mosoka very upset. He said, "They don't have the option of going home. We have laws. They have to come for treatment." Then the partners would say, "They have human rights. we can't force them to be admitted. This is a human rights issue. We can't force them to do something against their will." Then the government brought out their public health laws and said, yes, indeed, we can, and they passed out their public health laws that said we have the right to involuntarily quarantine a sick patient that's a threat to the health of others. Those kind of issues generated animated discussion in the EOC, but it didn't prevent partners from working together.

Q: Was MSF one of those that was talking about that?

Mahoney: Yes.

Q: Desmond [E.] Williams mentioned that when he visited.

Mahoney: Did Desmond—when he visited what, me?

Q: No. When he visited us at the museum, in a conversation.

Mahoney: Yeah, yeah. I actually—I wasn't aware, but there's a website that somebody created this debate between Frank Mahoney and MSF about isolation of patients. [laughs] It's on the web now. It was being done in November, and I was totally unaware of it, but there's this debate on the internet about the rights of the patient versus the rights of the community, and isolation in an ETU versus other settings. Somebody created this whole debate online about second-guessing decision-making, or what are the issues and the ethics of this stuff.

Q: I think you might have actually, even accidentally in this interview, used the phrase "involuntary" when you did mean voluntary. Like, voluntary quarantine facilities? Is that what you were referring to?

Mahoney: Yeah, yeah. We were using voluntary quarantine.

Q: That was the main focus.

Mahoney: It was at the end for those last clusters. We called it "voluntary precautionary observation," in the EOC. [laughs] Because they were so sensitive about the negative experience they had with the quarantine in West Point.

Q: Right, but in some cases it would not be. It would be involuntary when someone wants to—he's very sick and wants to leave.

Mahoney: I can't think of an experience where they kept anyone against their will.

Q: So, in practical matters—

Mahoney: No one was put in prison or anything like that.

Q: Sure. That's an important thing to note. Let's take a quick break, if that's okay.

Mahoney: Yeah, sure.

[break]

Q: We're back from a short break, and Dr. Frank Mahoney, I was going to ask you—it sounds like in Nigeria and in Liberia, Dr. Frieden was in very close contact with you. Can you talk about your working relationship on the Ebola response?

Mahoney: Yeah. We had a really good relationship. Dr. Frieden and Inger Damon, the CDC EOC IM. We had very good relationships and I really appreciated their help and input. Particularly at the intense times in Nigeria, he and I would talk, or I would have email exchanges with Dr. Freiden throughout the course of the day, because it was teetering on catastrophe. I think similarly with Dinger [note: a nickname], I would send her unvarnished sitreps—I'm sure she sent them to Dr. Frieden—telling her the backstory and what was really going on. Sometimes in not the best language, I'm sure. [laughs]

We would have regular calls. Often, I remember that they weren't in the easiest place to talk—I can remember once we were at JFK [John F. Kennedy Medical Center] and he called and we were out with a number of the team there, and we talked for a lengthy time on a loading dock at JFK. On multiple occasions, actually, this occurred.

We also had a really good partnership, relationship, with the DoD, and with the ambassadors, and the visiting delegates. I think that Samantha [J.] Power came out. She was great. She really understood the response. The support from the bigger USG [United States government] response was really good.

Also, I had known [H. Clifford] Cliff Lane from NIH [National Institutes of Health] prior to this. I'd worked with Cliff and the team setting up their vaccination trial. CDC helped foster their set-up with the embassy and helped in dialogue with the government. They did a great job. Mosoka was one of their team members.

Getting back to Dr. Frieden. I think the thing we would talk mostly about was strategy. I guess he had a lot of need to feed the beast in Washington, so he would want to get good ideas of where the outbreak was going, and what could we do more, and how could we get more beds, and things like that. He would push us to think of new ways to do stuff.

Q: Do you remember any conversation in particular?

Mahoney: I think the intensity of the Nigerian response—we talked several times during the day about getting people into a treatment center. We talked about that and the need to put in a proper management team. I think those were probably the key ones to figuring out how to deal with the change in management of the Nigerian response. It was a big challenge. It was certainly beyond my capacity to make that change, so I think it was really helpful having his engagement on that.

Q: Your tenure spanned from August to March?

Mahoney: I was there from August until just before Christmas, then I came back in January to March. It was about four and a half months. I worked with Kevin [M.] De

Cock. Kevin was, of course, the team lead prior to my arrival and when I was gone. I think it really was helpful to have a tag team of leadership. We had a lot of people coming and going all the time, but when the government could see consistency in the leadership, that was a really helpful part of the response at CDC. Yeah.

Q: I hear that with the turnover.

Mahoney: Yeah, yeah.

Q: At some point I have down here in one of my notes that you were in Guinea with the Red Cross?

Mahoney: No, that wasn’t me.

Q: That wasn’t you?

Mahoney: No.

Q: Okay. I guess you’ve just done recent work with the—have you ever been to Guinea?

Mahoney: No, I’ve never been in Guinea, never worked in Guinea or Sierra Leone. [laughter]

Q: Okay. Gotcha. What have you been doing since the response?

Mahoney: I'm attached to the IFRC [International Federation of Red Cross and Red Crescent Societies]. It's a new assignment. It's an idea that CDC tried in the late eighties, and then we haven't had anybody there for some time. I'm a focal point on immunization in IFRC. When I arrived, the health department was in a bit of a change mode and some reorganizing. It took some time to clarify the roles and responsibilities. They have a new secretary-general and a new head of the health department. The secretary-general is pushing the organization to be much more operational and to get out and do more to have impact. Of course, the Red Cross movement is really about reaching underserved communities, people that are left behind.

The health department created a unit for complex environments. A team that's going to really focus on working in complex operating environments and trying to push provision of health services, lifesaving interventions to children and adults living in those kind of settings. The CDC assignment was supposed to be working on measles. It's a little bit shifted now towards this working in complex operating environments. I think if you were going to work in those complex, the most important thing for children to save lives would be measles vaccination. I'm working in all the garden spots—Afghanistan, Central African Republic, the Congo, Burundi—pushing immunization work. Collaborating with partners in WHO and UNICEF in those settings.

It's a new activity starting to develop capacity of the organization to do that. It's a bit of a mindset for the organization to change their way of thinking and how they work in those settings. It's moving forward. We have projects in Afghanistan to work on polio in the anti-government-element areas, pushing polio vaccination where government teams can't go. We're going to also work on strengthening routine immunization on Afghanistan. Working on some measles campaigns in CAR [Central African Republic] and DRC [Democratic Republic of the Congo] and Burundi.

Q: We're at about the end, I think, of our time. But we still have some time left. When you look back at your experiences in Nigeria and then Liberia, are there any other memories that stand out in particular to you?

Mahoney: I think what was amusing, we got an apartment. I got an apartment, and it was a way of team building. I called it "feeding the engines." We did a lot of cooking together with the teams. Late in the day, we would all come back to the apartment and we'd cook up these amazing meals. We found a place to buy lobster. They're very cheap, so we would have all these lobster dishes. Sometimes it would be the infection control team, and Minister Tolbert, and Hans Rosling came one time. We had all these great evenings of people talking strategy over a meal in an informal setting and really accomplishing a lot. It was an amusing part. I think a lot of people really enjoyed it. In fact, the night Obama called, we had a huge team in the apartment, and we had had a Mexican night, and we were eating enchiladas. Everybody was sitting around talking about how to work together.

I think the team, to me, that's the memorable thing is how we fostered a good team spirit among the CDC staff working in the field. I think they probably would acknowledge, say that. We had a good rhythm. We met three times a week and people would do stuff. Those evenings with having dinner and talking strategies were kind of memorable to me and a bit amusing.

Q: That was an apartment in Monrovia?

Mahoney: Yeah. Close to the main hotel where people were staying.

Q: Gotcha.

Mahoney: Did you interview Athalia [Christie]?

Q: I haven't yet. She's done a StoryCorps interview with us together with Jordan [W.] Tappero, actually. She's someone I should talk to?

Mahoney: Yeah, you should talk with Athalia. It would be good.

Q: Yeah, I'd like to. Anything else looking back that you'd like to share for the record or that stands out vividly to you?

Mahoney: I think the unsung heroes in Nigeria were the FELTP residents. They did a great job, and I don't think they got much credit for that. I don't think there's an appreciation of what got prevented there, what would have happened. I think Nigeria would have been much worse than Liberia because of the dynamics, the population movement, the density of Lagos's population. It would have been a big disaster.

I think what's striking to me was the epidemiology of Ebola in those kind of settings. I don't think it's ever been written up. I don't even know if we have the data to look at. You would think that in a densely populated slum, that Ebola would just whip through and they'd have big outbreaks, but it wasn't actually that way. It was very focal, even in West Point. When you found cases, they were tightly clustered geographically—neighbors and family members in just one or two small areas. It never spread rapidly through the slums, which was what our biggest worry was. If it showed up in another area, slum, again, it would be tightly clustered geographically. Those are interesting things.

The other thing I remember learning and being amazed at was how the communities had organized themselves. They would do their own—without any government training or prodding, communities were doing surveillance. They were going around looking for sick people. I was in one community and they had had a death two or three days earlier. I was told that four different people called the burial team to pick up a body. Different people from that one community. So there was a great deal of community vigilance and community response.

There's one thing I think we were talking about that was really, for me, was really problematic, was the press coverage. The international press came in, and so often they would do stories that were totally unhelpful to the response. They would put on CNN pictures of the ETUs with people dying. Here we were, trying to get people to come into ETUs, and they would put these lurid stories of people dying in the streets, in the ETUs, and just scaring the public to no end. At one point they were even going into ETUs and filming patients. Again, it's just not helpful. It may get them coverage, but it was the worst thing that we needed for the response. Then the government put a stop to them going into ETUs, and they had the audacity to put a cam [camera] on one of the clinicians, and then they had a clinician go into—you would never get away with that kind of stuff in the US, filming patients without their permission. Unbelievable. Again, one time they did a story on CNN about how people were treating patients at home, and they were using bags and things on their hands, as if this is a good idea. It's the absolute opposite of what we want families to hear. Even embedded in the story, they said, "She's been treating her family members and wearing gloves and bags on her hands, and six of eight of them have died." Do you get it? That's not working. Wearing bags on your hands is not working, but the way it was visualized on TV it was acting like, oh, this is such a unique idea, a good idea. Anyway, I was quite angry with the international press at times.

Q: Did you ever have any personal interactions with them?

Mahoney: No. I would see them in the hotel and I should have talked to them about it, but I didn't. It was just, to me—I had a lot of interaction with the Liberian press. I was on the Liberian press a lot and supported the government in press conferences and things. We did a lot of work with them.

Q: Anything else looking back?

Mahoney: I can't think of anything. Thank you so much.

Q: Thank you so much, Frank. This has been a total privilege and I appreciate it.

END