CDC Ebola Response Oral History Project

The Reminiscences of

Inger K. Damon

David J. Sencer CDC Museum

Centers for Disease Control and Prevention

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Inger K. Damon

Interviewed by Samuel Robson
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Interview 1 of 1

CDC Ebola Response Oral History Project

Q: This is Sam Robson here with Dr. Inger Damon. Today's date is May 17th, 2016, and we're here in CDC's [United States Centers for Disease Control and Prevention] audio recording studio at the Roybal Campus in Atlanta, Georgia. I'm interviewing Dr. Damon today about her experiences of the Ebola epidemic response that CDC has taken part in since 2014. Dr. Damon, thank you so much for being here with me today. Would you mind pronouncing your full name for me and tell me when and where you were born?

Damon: Inger Damon. I was born in 1962 in Pittsburgh, Pennsylvania.

Q: Did you grow up in Pittsburgh?

Damon: I lived there for eight years, and my dad used to work at Westinghouse [Electric Corporation]. He was in the research and development group, did solid state physics. They were closing up their research group there, and so he followed his supervisor to the University of Connecticut, sort of a second career in midlife, and he went into academics. Taught physics. I actually grew up most of my life in northeastern Connecticut, in Storrs.

Q: Do you have a lot of memories of Pittsburgh?

Damon: I remember walking to school. I remember going camping in the Shenandoah Mountains. But minimal memories of Pittsburgh. I remember my elementary school.

Q: What was Connecticut like?

Damon: Well, we thought it was pretty boring, [laughter] because there wasn't a whole lot to do. There was one large movie theater. There were a lot of dairy farms around. At that point in time, it was a university town where the buses would line up on Friday, and all the kids would go home on the weekend and then come back. It was a sleepy, academic little community, town.

Q: That's great. Who else was in your household? It was you, your dad—

Damon: My mother and father, and I have one sister.

Q: What did your mother—how did she spend her time?

Damon: Mom, when we were in Pittsburgh, was basically taking care of us at home. She started to lecture again at Carnegie Mellon University. She's a [PhD] chemist by background. She started to teach high school when we moved to Connecticut.

Q: What kinds of things did you start getting interested in up through high school?

Damon: I played violin, and I played field hockey. I liked the sciences, and I guess somewhere in high school I decided that I wanted to be a physician.

Q: Was that encouraged by your parents in any way, science kind of—

Damon: My parents sort of thought that they wanted me to be an academic, so they didn't really think that being a physician was [as valuable or as important]. [laughter] I ultimately went on, I got an MD/PhD.

Q: Tell me about what happens after high school.

Damon: I went to college in Amherst, Amherst College, and then went to medical school and did my MD/PhD at the University of Connecticut Health Center in Farmington. Met my husband there, and then we went through the medical training system. We both did our internships and residencies in Philadelphia at the hospital of University of Pennsylvania, then went to the Maryland/DC area. I did my infectious disease training at the National Institutes of Health in Bethesda.

Q: How did you start to get interested specifically in infectious disease?

Damon: I liked problem solving. I liked puzzles. I think that's what attracted me to infectious disease. The other field I really enjoyed was actually OB/GYN [obstetrics and

gynecology], and actually in my clerkships, in the end of medical school, trying to decide what to do, I actually did a clerkship in maternal/fetal medicine down in Philadelphia. My husband was there at that point in time, ahead of me. I actually ranked both and interviewed both for internal medicine and OB/GYN programs.

Q: Was there anyone up through that point, up through internship and residency, who you think had a special influence on how you thought or your career path?

Damon: Yeah, I guess my graduate school advisor, Mary Jane Osborn, at the University of Connecticut. Wanted to see a woman in science who was successful, and to be mentored by that type of person was important for deciding a career path and what I could do.

Q: And, I'm sorry, I probably missed it: what was your PhD in?

Damon: My PhD was in what we—we called it biomedical sciences, was the PhD degree that you got as an MD/PhD, but the focus was really in microbiology. I worked on *Salmonella* Typhimurium.

Q: Is that what you ultimately wrote a thesis about?

Damon: Yeah, so I worked on O-antigen synthesis. The initial project I was assigned was one to sort of look at how this hydrophilic substance gets assembled onto the membrane

of the bacteria, and ultimately it turned into a thesis more about the regulation of one of the genes that's responsible for O-antigen biosynthesis.

Q: What happens after all the education, all the years of preparing?

Damon: So, I guess—what happened? [laughter] I really always enjoyed clinical medicine. I enjoy working with patients, but I also really enjoy thinking through scientific problems and asking questions. In thinking about careers, after I finished up my infectious disease fellowship and postdoctoral work at NIH [National Institutes of Health], my husband had taken a position here at CDC, and so I looked both at CDC for positions and then also interviewed for some second postdoctoral fellowship or early career track positions with Emory University. And I chose a job at the CDC.

Q: Doing what? What was the job?

Damon: I joined what was then the Viral Exanthema and Herpes Virus Branch as a new member of the poxvirus team that was within that branch. My boss was Joe [Joseph] Esposito, and the group really had gone down in size, and with the biodefense moneys, there were new positions or FTE [full-time equivalent] positions, and so I filled one of those. I was essentially Staff Number Two in the new, re-growing poxvirus team.

Q: I'm sorry, I confess ignorance here: I'm not sure what the funding—what was that?

Damon: It was 1999, and this is when the bioterrorism preparedness moneys were being appropriated from Congress for CDC to get involved more in both research and planning efforts for bioterrorism preparedness.

[break]

Q: Okay, we're back after I had to fix the little monitor. Sorry about that. So, Dr. Damon, just tell me about some experiences in your first few years at CDC.

Damon: So, I guess a sense of being incredibly busy. I actually came to CDC initially to work on monkeypox. Monkeypox was a disease that was reemerging at that point in time in the former Zaire, now the Democratic Republic of Congo, and there had been three outbreaks that CDC had been involved in responding to in the late nineties, and this is the first time the disease had been recognized since it had been studied there in the mid-to-late eighties by the World Health Organization. Monkeypox caused a disease that looked quite a bit like smallpox, but it was zoonotic, so it's a disease that occurs in animals. We don't really know the reservoir. Human disease usually came from interaction with animals, but there was also human-to-human transmission that was seen with this poxvirus infection. So, somewhat similar to smallpox, but dissimilar in having an animal reservoir. My job was going to be to come to CDC and to help develop some research projects, and also help look at some of the surveillance work, and work in Africa. At that point in time, the decision was that CDC was going to really focus intensively on the smallpox research agenda, so using live *Variola* virus. This was a follow-up from the

Institute of Medicine report that came out in 1999 about the future needs for live *Variola* virus, and it outlined a number of applied research activities which were considered to be of benefit for preparedness in the United States and internationally. So, worked to build a team that then worked and trained to work in the biosafety level four laboratory, the high-containment lab at CDC. And worked to grow a number of strains of *Variola* virus from the collection to do characterizations, to then do sequencing work on that. We later really helped to get the core facility here at CDC sequencing efforts together and helped to build that capacity at CDC, and also helped to bring next-generation sequencing technologies to the agency a little bit later. We worked then with counterpart colleagues at the United States Army infectious disease—USAMRIID [United States Army Medical Research Institute of Infectious Diseases]. Worked on both antiviral screening, some work to look at vaccine development, and less reactogenic vaccines, diagnostic development, and animal model development, whereby to look at antiviral and vaccine efficacy.

Q: By the sound of it, it sounds like—when you came in, were you already kind of the head of a team?

Damon: No. That's why it was sort of busy. [laughter] It was sort of whatever had to be done, I did. Gradually, more people came on to work with the group. Richard [J.] Klein, Yu Li, Joanne Patton. And then expanded from there. So really grew the group from a very small group into more than, I guess, twenty people within the poxvirus team, and

then became a program at some point in time. It sort of separated from the branch, and then worked more directly with the division.

Q: Did that mean that your day-to-day kind of changed? Like focusing on the lab to—

Damon: Yeah. I was really intensively in the lab, so I was doing a series of experiments looking at how poxviruses utilize chemokine receptors. September 11th, 2001, is a big date for a lot of people in terms of changing—that really amped up the research program and the need to move it forward quickly. Really about that time is where I spent less time in the lab myself and more time coordinating and managing the work of others.

Q: How did you feel about that?

Damon: I like lab work. I think it's incredibly rewarding. It can also be incredibly frustrating at points in time. But I think it's also—I think when move more into sort of the PI [principal investigator] and less hands-on at the bench, I think it's also rewarding because of mentoring, and you're thinking of projects, and you're working across a broad spectrum of activities, rather than simply on your own experiments.

Q: It's like broadening in a way. Gotcha. Was there anything you, within those few years, really got excited about? Any projects that either you or somebody else was working on, you were able to mentor?

Damon: Watching the program evolve, and the successes that came from it, was really rewarding. In developing new diagnostic tools, when the monkeypox outbreak occurred in the United States in 2003, we were ready because we had been through the process of developing real-time PCR [polymerase chain reaction] assays for both orthopoxviruses and smallpox, and also monkeypox. We could take tools, which we had then used and developed in what we called the Laboratory Response Network—so this is a coordinated set of state and local public health labs—to implement testing for monkeypox, to help support the outbreak response. I think also, then, from the monkeypox work was the animal model development that the group has done, in terms of looking at the North American prairie dog as a model of systemic poxvirus disease, and looking at some of the antivirals which have been developed for smallpox purposes, and showing in the animal model, which is fairly faithful to the timeline of how orthopoxvirus diseases like smallpox or monkeypox present in humans, showing that antivirals that were being evaluated were protected in this animal model. One of those drugs is now in the strategic national stockpile. So I think feeling like we were contributing and making progress in tracking the research agenda.

Q: Okay. Yeah, nice to work in an area that people are paying attention to and are funding. So did you stay in poxviruses for a while, or—

Damon: Yeah, I was in various leadership positions in the poxvirus group, and then we merged with the rabies group in 2006. So until really 2014, when I took the division director position.

Q: Any notable memories that stick out, or anybody who you worked with who sticks out between, you know, 2006 and 2014?

Damon: A couple people were—Russ [Russell] Regnery, who joined the poxvirus group from the rickettsial group, just as somebody with a wealth of experience in working with lots of different pathogens, was involved in setting up the first BSL-4 [biosafety level 4] lab here at CDC. Someone who's just a curious man, a very thoughtful and deliberative and good scientist. Joanne Patton, who worked with me for many years, both on the bench in the lab, and later in administrative positions. Elsie [M.] Simmons, who came on. There's lots of people who've really been critical to helping move the scientific work forward. Vicky [Victoria] Olson now is the acting Poxvirus and Rabies Branch chief, so she came really as the first postdoctoral fellow that we supported in the poxvirus group.

Q: What leads to you becoming director in 2014, and what's that like, making that transition?

Damon: I think being division director is—our division is—we used to be the Division of Viral and Rickettsial Diseases, and so the rickettsial group left, and the Bacterial Special Pathogens Branch became part of the division. We're now the Division of High-Consequence Pathogens and Pathology [DHCPP]. It's an incredibly diverse group of pathogens that we work on in the division. Many of them are select agents, so these are additionally regulated by the US government [Select Agent Program]. We work on

anthrax and brucellosis, leptospirosis, *Burkholderia*, the viral hemorrhagic fevers, poxviruses, rabies, prion disease. The Infectious Disease Pathology Branch is also in the division, which really supports a lot of groups across the agency, and the work to support the human papillomavirus laboratory work is in our branch, as is the work on chronic fatigue syndrome. So an incredible breadth and depth of science in the division. It's a fun place to work. There are always new things to learn. There's a really high quality of epidemiologic and laboratory work that goes on in the division.

Q: Can you talk a little more about working with other agencies within CDC as part of NCEZID [National Center for Emerging and Zoonotic Infectious Diseases], and how that was before the Ebola epidemic?

Damon: Yeah. I guess because of bioterrorism preparedness work, which is a large focus of a number of groups in the division, we've really worked extensively across the agency. So with the bioterrorism preparedness response and preparedness branch, which is now the Division of Preparedness and Emerging Infections; with OPHPR, the public health preparedness and response office; with the Division of Healthcare Quality Promotion, in terms of infection control, just for a number of the pathogens in the division. So that's also in NCEZID, as is the Division of Preparedness and Emerging Infections. We work on surveillance issues. We've also worked with Bob [Robert W.] Pinner's group in the Center [for Emerging and Zoonotic Infectious Diseases]. And then I think across the HHS [U.S. Department of Health and Human Services] enterprise, work with FDA [Food and Drug Administration] in terms of regulatory review of a number of the products that

are moving forward from the work in the Division [of High-Consequence Pathogens and Pathology]. Work with NIH on coordinating research agendas, work with the BARDA [Biomedical Advanced Research and Development Authority] group and HHS ASPR, so the Associate Secretary for Preparedness and Response. And really, those activities have been ongoing for—the poxvirus group initiated some of those discussions, for instance on diagnostics with FDA, back in 2002. We were one of the first groups to move forward on getting regulatory approval in terms of a 510(k) approach on some of the diagnostics that we were developing within the poxvirus group.

Q: Okay, thank you. So 2014, you become the division director, and then I think it's July, right, when you shift into the incident manager position in the EOC [Emergency Operations Center]. Lot of change in a short time.

Damon: Yes, I became division director against—my objections were that I did not want to become the division director on April 1st, but that's when my Commissioned Corps orders were. On April Fools' Day I became the division director. [laughter] I said, "March 30th would be just fine." So, this was really, the Ebola response in West Africa was gearing up. People from the Viral Special Pathogens Branch had been already deployed to Guinea to help support that work in late March, when the disease was confirmed. I was involved as the division director, involved in writing the first CDC Foundation proposal to get funds that could be more easily used in the West Africa context to support the response activities in Guinea. And watched the optimism in late spring that hopefully disease was on the wane, was being contained. Although disease

had been identified in Guinea and then Liberia, it looked like the Liberia response was robust enough to have contained disease spread, and that there was a good response, and in Guinea it also looked like cases were on the wane. Cases had not been confirmed in Sierra Leone. I think then, as the spring moved into the summer, sort of began to get the sense, as both WHO [World Health Organization] and CDC brought their people helping in the response efforts in those countries back home, it became clear that the spread of disease was far worse than had been suspected. I was actually on vacation in July, and not doing a lot of vacating. [laughter] A number of issues came up at that point in time, both the discovery of the vials of smallpox virus, or *Variola* virus, on the NIH campus, and talking about whether the Emergency Operations Center should be set up to help with the Ebola response, really, to try to get additional people in-country. One of the challenges that was identified even in spring of 2014 [by] Pierre Rollin: we need more people to come and help because there just isn't the type of workforce present in these countries that has a good public health background to be effective independently. That they really did need a lot of support from both nongovernmental organizations and governmental org—and other international community to help with the response effort. This is something that Médecins Sans Frontières had also said, that there really was the need for more people to come and assist, and that this—making it clear that this is really of international importance, and it's only through curtailing the spread of disease in the [West African] countries that the global community [would] be protected against the potential importation of disease beyond the West African countries, which we, in fact, saw.

Q: What kinds of things did you do to try and advocate for that, for more people?

Damon: I think by the virtue of activating the Emergency Operations Center—Stuart [T.] Nichol was the first incident manager in July, so I think it was activated on July 6th. It was really to, you know, develop a structure that could be more responsive and get people to the field quickly. By activating the Emergency Operations Center, it avails you of a number of opportunities to speed the logistics for getting people in-country, to support them, to get the type of equipment that they need out to the field, and then it also—there's a tremendous amount of work that happens in bringing people here into the Atlanta area, into the [Emergency Operations] Center itself, just to support the people that are in the field.

I became the incident manager in the end of July. July 26th.

Q: Why?

Damon: At that point in time we were still in a phase three activation, but it was just getting more and more demanding, and I think Stuart really needed to be able to focus on a lot of the scientific work as opposed to some of the management work. So I came in to be the incident manager, to free Stuart up to really help coordinate the science. So Stuart was the chief scientific officer for the response for many, many, many months.

Q: Also, I should have asked: were you just in town on vacation in July, or—

Damon: I was in Colorado.

Q: Oh, you were in Colorado.

Damon: Yes, my husband and I had been convinced by our brother-in-law and my sister-in-law that we should try to run the Imogene Pass Run. So we were training for the Imogene Pass Run. [laughter]

Q: Have you been a longtime runner?

Damon: I've done a couple marathons.

Q: Oh, wow.

Damon: Two and two-thirds.

Q: And then it was a different kind of running that you were in store for over the next few months.

Damon: Yes.

Q: Okay. And so I think level one activation is August 5th.

Damon: Yeah.

Q: Around there.

Damon: Yeah, so we rapidly ratcheted up, both when it became clear that disease had been exported to Nigeria, and really, then, the mounting need to make sure that we had a robust and effective domestic response plan in place, ratcheted up to a level one.

Q: That's right, okay. Yes, happening at the same time as that individual flew from, was it, Liberia to—

Damon: Liberia to—yeah—

Q: —to Lagos.

Damon: —to Lagos.

Q: Huge international city. Now, when you learned of that, were you currently incident manager?

Damon: Yes. That was, I think, day two or day three of being incident manager. [laughter] We were waiting for confirmation from the lab in Germany, and when it was

confirmed, we already had people in-country in Nigeria. The polio team was there, and Frank [J.] Mahoney. My husband was actually the incident manager for the polio response. So I asked Greg [Gregory L. Armstrong] to call Frank. [laughter] So sort of over that weekend, we pulled together a minimal crew of people to go to Nigeria to help the polio group, in terms of coordinating the response in Nigeria with their incident management system, which had been set up for the polio response.

Q: Did it take a while to get to that point where it was like, okay, let's use this polio team to come into Ebola? Or was it pretty quick?

Damon: It was pretty quick, just because they—there was a good—well, the Field Epidemiology Training Program, FETP, was really strong in Nigeria, a really good leader there. So with the polio crew there, we were able to rapidly use them. Frank is a force, and a terrific leader. John [F.] Vertefeuille also, who later then took over the work in Nigeria.

Q: Okay. And I should've asked before: your husband, Greg, focuses on polio?

Damon: For a couple of years, yes, he was running the polio response as the incident manager, and now is actually in our center [NCEZID], running the AMD [advanced molecular detection] program.

Q: And yeah, that sounds like such a serendipitous connection, that you told Greg to call Frank. [laughter]

Damon: Well, I don't remember all that was going on, but it was just an incredibly chaotic time. There was a large number of issues going on, and it was clear that we needed something rapid in-country. We needed to make sure that Nigeria was as well-staffed as could be, that rapidly got information to them about disease and what could be done. I think there was a lab in-country, which had been doing Lassa fever diagnostics, that was supported by Stephan Günther's group in Germany. They really took on the diagnostic support in Nigeria, and really just trying to figure out what it was that CDC could do to help contribute to response efforts. Really it was communication needs to get education messages out to the community, to engender support for activities that would be going on, to help manage infection control issues, both in the hospital where the individual had been cared for and was taken to from the airport, and then trying to identify places which could be used for Ebola treatment. CDC assisted in all of those areas, and then also in just the response that needed to be coordinated in terms of identification of contacts and following and monitoring them.

Q: Right. Were you in pretty close contact with Dr. [Thomas R.] Frieden throughout?

Damon: Yes.

Q: Yeah.

Damon: That would be an understatement. [laughter]

Q: That would be an understatement, okay.

Damon: Yeah, Dr. Frieden was incredibly hands-on, whatever could be done, wanting to make sure that the best individuals in-country were engaged and were aware of whatever it was that CDC or the US government could bring to support. He was a strong advocate for rapidly ramping up whatever could be done in terms of some of the investigational antivirals or biologics, so the ZMapp compounds, vaccine work, and was a strong motivator in terms of helping the US government ramp up activities on many of those fronts.

Q: Any other developments in the Nigeria response that come to mind?

Damon: Frank is probably the best person to talk about that, in terms of what it was like in those first days. I remember calls where he was trying to get individuals who were contacts and had signs and symptoms of Ebola into places where they could be safely treated and isolated. You know, he'd be standing outside an ambulance trying to get somebody inside to a healthcare facility and calling us in terms of what was going on, and what we could do to try to help move things forward in terms of making strategic calls to the Ministry [of Health], or helping to identify people who in-country would be most efficient to help manage the response in Nigeria.

Q: Right. I don't want to lose track of that fact that you're the head and you're in Atlanta, and there's this communication that has to take place between the field and Atlanta, and having to bridge that gap.

Damon: Yeah. Yeah, so it's really—you want to make sure that the people in the field are empowered to make decisions, and that we, in Atlanta, are doing our utmost to support those efforts in-country, and making sure that we're communicating to them what we know from our vantage point, and then understanding from their vantage point what they're seeing on the ground and where it is that they need additional support.

Q: Was there—I remember EVD [Ebola virus disease] made a jump to Port Harcourt at some point.

Damon: Right.

Q: Was that kind of a pivotal thing, or was that a crazy time?

Damon: It was a point in time—so we knew at that point that there were a couple of contacts who were high risk who had not been monitored for a few days. There was some concern that, where had these individuals gone? Where had they eloped to? And so the recognition that they had—and getting the information that they'd gone to Port Harcourt, essentially, and then moving another emergency response or operations center to Port

Harcourt to help manage that. So yeah, there was—I mean, it was a collective sigh of relief when the last contacts made it through their twenty-one days of monitoring, and that we'd gotten through this.

Q: And then the other thing, I suppose, that's happening in the same time period, is the two Americans from Liberia being evacuated, coming back to Emory [University Hospitals]. What was your involvement like in all of that?

Damon: We were involved in making sure Emory was comfortable and felt prepared to bring them in, so a number of folks from DHQP [Division of Healthcare Quality Promotion] went over and helped with mock training and reviewing their protocols which were in place, reviewing the facility. We were involved in helping to set up medevac [medical evacuation] to get them back to the US, the two individuals, and then trying to assess anybody else who was considered to have an at-risk exposure, trying to get people to a point where they could be monitored safely for the twenty-one days.

Q: Just a huge number of different relationships that you're having to maintain. Can you talk about that aspect of it?

Damon: It's a huge number of relationships, both within the incident management structure, within the agency—so running IM [incident management] meetings, making sure each of the task forces are staffed, understanding what the scientific needs are, thinking about what new programs had started off every day with a call with HHS, in

terms of status updates, what's going on domestically, what's going on internationally. There were briefings with the National Security Council usually at one o'clock every day, sort of an end-of-day brief with Dr. Frieden at five thirty or so every day. And meetings throughout that period of time. Really, as the incident manager, you delegated as much as you could. So one of the deputy IMs [incident managers] handled the calls which were later instituted with the ambassadors of the affected countries and the at-risk countries to get them up to speed on what was going on. Clearly their role in-country was critical for helping support CDC activities on the ground, since they're responsible for the safety of everybody who comes into the country who's an American citizen. [Alexander M.] Laskaris in Guinea was an incredibly hands-on ambassador who was incredibly effective in supporting activities in-country, and actually strengthening activities in-country, an incredibly effective communicator with the local people of Guinea in terms of knowing languages and learning native tongues of the country. Was really a unique individual.

Q: I love hearing about that, thank you. Any other individuals, especially from—during this early point, you know, like July, August, who stick out?

Damon: That's also when—so when the disaster declarations came into place in the countries, that's when our response became coordinated underneath the USAID [United States Agency for International Development] OFDA approach, the Office of Foreign Disaster Assistance. That was also an incredible work in progress, in terms of putting together the foundational document of what would the coordinated activities look like, so we would be responsible for essentially the public health response. OFDA already

supported a limited number of activities, mostly in Liberia, and then also established more of a footprint in Sierra Leone and Guinea. And so leveraging whatever was already in place. This was also part of that going up to level one activation, and what it was that CDC would add additional technical expertise to, and working through what that relationship would look like in the briefings with the National Security Council. Before the USAID, the EPT [Emerging Pandemic Threats] program had been involved to some extent in helping with PPE [personal protective equipment] distribution in some of the countries, and now this was all sort of being marshaled under the OFDA. That was a new relationship for CDC to work with in terms of how we interacted in-country. That was really in Liberia, Sierra Leone, and Guinea.

Q: Right, a new relationship in what you described as a really chaotic environment.

Damon: Right. It's a chaotic environment. It's trying to get health messages out to a population that, in many cases, does not have a good understanding of germ theory, a lot of mysticism, belief in, "is this witchcraft?" Trying to get healthcare messages out that could be understood by a population which really is one that lived by oral history as opposed to written messages. Trying to figure out how to target that, and then trying to build effective structures in-country to help manage the responses, so working to develop emergency operations centers and streamlined modes of communication so that people in-country could work effectively with each other. Initially, there were far too few implementing partners. Then there were many people who came to the table who wanted to participate, and trying to manage all of that. I'm now rambling, but—[laughter]

Q: No, you're good. This is good. This is all good.

Damon: I think one of the most exciting things we did was really try to build additional capacity in-country, in terms of trained responders who could help support work in Ebola treatment units. In August, as the numbers were climbing exponentially, MSF [Médecins Sans Frontières] was clearly strained, wanted assistance, but just had already expanded so much that they really didn't have even the additional flexibility to help support training of new people. So we worked with MSF and with WHO to put a training program together that launched in September, and really was an intensive effort of a large number of people in the agency to put an Ebola training or Ebola treatment unit training together. So, what are the principles of how you take care of Ebola patients? What are the principles of infection control? What are the operational standards? Some experiential training in terms of dealing with cleaning up spills and the basics of Ebola. This was a one-week course that was put together, and I guess by the end of 2014, over six hundred individuals had gone through it and many of them, if not all of them, participated in the response in West Africa. So really, we were able to do something innovative to help support the treatment capability in-country.

Q: And we're talking—we're referring to the trainings in Anniston.

Damon: Yeah.

Q: Yeah. Oh, that's neat. I want to go back to something you mentioned about—it sounds like early in the response there was a problem with crowding in some instances? That there were a lot of organizations that wanted to help, and having to manage that?

Damon: Well, in early—there was a distinct paucity of responders.

Q: Oh, okay.

Damon: And so that was when Jordan [W.] Tappero went to Liberia. I mean, part of that first month—so he went as the first sort of lead under this OFDA umbrella—went to sort of identify what were the NGOs [nongovernmental organizations] in-country. There was also somebody who was very experienced from OFDA in-country, who was really a fabulous counterpart. Many of these NGOs were just unwilling to take that additional risk, or just didn't feel like they had the capacity to take on some of the Ebola treatment issues, and so really trying to encourage and look for ways that could be supported. Around that time also was when the decision was to move under the UNMEER [United Nations Mission for Ebola Emergency Response] structure, so the UN response, which was hopefully going to bring in much of that humanitarian assistance. Bring in World Food Programme, help with operations and logistics in terms of building Ebola treatment units, and support for health communications. The playing field became filled with many people who—and trying to make sure there was a comprehensive and a cohesive plan for moving response efforts forward I think became an ever-evolving situation as more players came to the table.

Q: I appreciate that description, how at first there's this, as you said, paucity of people, for a variety of reasons, I'm sure, and then it's the—UNMEER—

Damon: Yeah.

Q: —that precipitates a lot of players and initial, probably, disorganization with that.

Damon: WHO [efforts] initially were run by the regional office. Then Geneva was more involved, and UNMEER became—so within the US it was initially CDC, USAID EPT helping, DTRA [Defense Threat Reduction Agency], the DoD [Department of Defense] also assisting in some of the lab-based issues, then moving under an OFDA structure. So really, always trying to understand, what are the specific roles and responsibilities? One of the things that we pushed for within each of the three countries was really to have an incident management system set up so that the roles and responsibilities of all these different players could be clearly defined and understood, and so there would be unified effort. But it's just—the number of calls you would have where there's PPE needs, and people say there's PPE in-country, but there's not personal protective equipment, or PPE, where it needs to be, and so what's the distribution system? Just, it was never-ending.

Q: Can we stick on this for a second? Could you describe just the development of how this went, managing so many different partners?

Damon: HHS had some role. The National Security Council had some role. This is from the US perspective. I think within each of the three countries, it was, who is the incident manager within the country? In Guinea, Sakoba [Keita] was identified as that person. And then supporting that person so that there is a structure of who's responsible for case management, who's responsible for contact tracing, who's responsible for health communications, who's responsible for infection control. Trying to make sure that meetings ran smoothly and it wasn't just three hours of people talking, but identifying what needed to be done, what was a status update, and how tasks were going to be assigned. I think this is something that in Liberia—so with Tolbert [G. Nyenswah] as the incident manager, there was—this process evolved, I think, fairly efficiently over time, and decision making and information sharing was fairly good. Sierra Leone, the UK, really supported a lot of these efforts.

Q: Of course. In Sierra Leone it's much different, because the UK is there. NERC [National Ebola Response Centre] comes into—

Damon: Right.

Q: —play at some point. But was the—because of that different organization, did you find that organization of so many different partners fared differently than in Liberia?

Damon: I don't know that I had the greatest visibility on the organizational structure in Sierra Leone. I think CDC initially was really there as a technical advisor, and not as

much in terms of providing hands-on for the overall management, and I think, in many ways, that was probably a strength. CDC really focused there in Sierra Leone on a lot of the communications needs, so that's where the Big Idea of the Week evolved, trying to look at the many health communication messages which were way out there, and then trying to streamline it into focused messages which would change on a weekly basis. Something that was fresh, keep people up-to-date and involved in terms of understanding Ebola and the response efforts. I think it allowed CDC to be more actively engaged in helping with contact tracing and moving those efforts along, which was one of the key components of the effectiveness of the response, was to be able to identify those people who are at risk of getting disease and rapidly getting them into isolation or treatment. Then I think in some of the initiatives of the Western Surge, CDC had key roles in helping to move some of those activities forward.

Q: When I spoke with Dr. Frieden, he talked about how the difficulty with Guinea was that—well, he said that, "Frankly, the reason the epidemic lasted longer there was because CDC wasn't able to put as many personnel there because there was a paucity of Spanish speakers," or—

Damon: French.

Q: —excuse me, French speakers. [laughs] What were some differences in dealing with—

Damon: Right. I mean, it's actually—I think Guinea was really unique. It was a very different trajectory of the outbreak than what was seen in Sierra Leone or Liberia, where you really saw this sort of exponential growth and this then rapid tail-down. So yeah, I think we were limited in the number of people that we could get into the field in Guinea because we don't have that many French speakers at the agency. But you tended to see more the typical flare-up of cases, and then it would go down, which is typically what had been seen in previous Ebola outbreaks in Congo, or in Sudan, or in Uganda. Guinea is also quite a bit larger than Sierra Leone and Liberia. There are multiple different sort of sub-ethnic communities, as well, within Guinea.

I think getting the messages out, and getting it integrated in each of those societies, is really important for disease control. This was, I think, well exemplified in Lofa County in Liberia. In September, it really looked like disease was going down in Lofa, and [we] really weren't sure, was this a reporting issue or was disease really going down? Trying to look at multiple sources of information, both on case reporting, number of deaths in the community, number of individuals in Ebola treatment units, and all of the data seemed to align to say that there really was a decrease in cases, but really trying to understand, why was that? One of the reasons really was that the community was beginning to address it on their own. That the repeat efforts—and really, this is of one primary—one individual from WHO, who went into that community and did the sit-downs with the tribal leaders and community leaders to talk about disease, and as the community took ownership of it, I think we began to see that's really what led to the decrease in the number of transmission events and the number of cases.

Q: Who was that person from WHO?

Damon: Peter Clement.

Q: Peter Clement. Gotcha. Okay. Well, I think I'm getting a good picture of the differences in managing CDC's response in the three countries, and that's helpful, thanks. I suppose on the chronology, the next thing that would happen would be a huge focus on the domestic response in the wake of Dallas, right?

Damon: Right.

Q: Can you take me through that?

Damon: Yeah, and I guess the other thing I would say about Guinea is—

Q: Sure, sorry.

Damon: —really, is a lack of communication infrastructure in Guinea really hampered the response, as well. The limited ability to communicate easily with all of the communities—radio towers need to be built, internet connectivity was very poor. As that infrastructure developed and evolved, I think that also helped with the response. It's interesting because I think also that in some ways, because the disease never achieved

those epidemic proportions that were seen in Sierra Leone and Liberia, there was more of a capability to actually do contact tracing during the course of the response. I think that also, even though it extended longer, the trajectory was very different.

Q: Right. No, absolutely. And actually, I'm remembering another thing that you said, which was that it's similar to some of the outbreaks that you saw before in Congo and Uganda. Did that lead to some greater sense of comfort in dealing with something?

Damon: When it was introduced into a new community, there was lots of fear and panic, hiding cases. As the community got more accustomed to it, then—and began to understand the disease, and not it's witchcraft or, you know—I think there were, additionally, issues of distrust of government were also present in Guinea. I can't remember the original question now. [laughter]

Q: Oh, I was just, I was asking whether the similarity in cases in Guinea led to greater—

Damon: Yeah, so I don't think—

Q: Hold on a second, I'm sorry.

[break]

Q: So October comes around. I suppose earlier than that, late September, you're hearing about a case in the United States.

Damon: Right. Yes, I was in Liberia, visiting, just to see how things were going in Liberia, when the first reports of a potential case in the US [came in], so—

Q: Right. Let's actually—okay. Now that you mention being in West Africa, was the trip to Liberia the first time that you had been there during the epidemic?

Damon: Yeah.

Q: What did you see?

Damon: I saw the emergency operations center at work. I saw ELWA [Eternal Love Winning Africa] Ebola treatment center. I saw some of the Ebola treatment centers that the US military was beginning to put together at that point in time. I saw the US military set-up, and talked with them in terms of the coordination of the US military's efforts with Ebola treatment unit building in Liberia, with CDC, and in-country and OFDA partnerships.

Q: Wow. But it's not until October with the US military really comes in force, correct?

Damon: Right. This was sort of developing the planning, but they were—I guess the old Ministry of Defense site was the site right outside of Monrovia, where one of the big ETU [Ebola treatment unit] builds was going on. They'd already poured the slabs, so I went and saw that.

Q: I knew that—who was I speaking with? I was speaking with someone recently about how long before October there were efforts from people in CDC to try and get that military presence going, to make it happen.

Damon: Yes.

Q: Can you talk about that a little bit more?

Damon: It was really, I think, the modeling efforts that Martin [I.] Meltzer and others were putting together, looking at what would happen if the case counts continued to increase with the same trajectory as what we were seeing. As far back as June, July, when MSF was raising the call that there needed to be additional support, there had been inquiries to the DoD through the DoD representative that we have at CDC to see whether they would engage. I think it was really only Frieden briefing at the White House level what the potential extrapolation of case counts would be that really garnered the support that the DoD should reprogram some of its funds to support the work for ETU builds. They still were one of the things we'd hoped for, as well, because the DoD really has a very good and very strong infectious disease capability in terms of their medical

capabilities. We hoped that they would also staff the Ebola treatment units, and that was something that they weren't willing to do. We did, ultimately, encourage the United States Public Health Service to take that on.

Q: What was lost because the United States military wouldn't staff those things?

Damon: I think a lot of American physicians, through NGO opportunities, staffed Ebola—the more classic Ebola treatment units, and then the staffing of the healthcare worker facility that was built in Monrovia called the Monrovia Medical Unit was staffed, ultimately, by United States Public Health Service personnel. This gave a better healthcare-worker-to-patient ratio, and had a few more technical capabilities than the classic Ebola treatment unit had. So what was lost? I would say that there were—and the numbers, perhaps, we knew best in Sierra Leone, and in Liberia, perhaps, more than in Guinea. But early on, especially, there were a large number of healthcare workers in-country who succumbed to disease, more often than not, we believed, because of treating individuals in facilities without appropriate personal protective equipment, or knowledge of the infectiousness of what they were dealing with. Again, what we saw is when you responded rapidly and could go in quickly with everything you needed, that you could rapidly curtail the size of the outbreak and the number of cases. That was also the strategy developed in Liberia, which was known as the RITE strategy, so—respond—

Q: I think it's Rapid Isolation and—

Damon: —Treatment of Ebola, yeah.

Q: Yeah, right. Okay. Sorry, I only ask because Dr. Tappero mentioned that it would've been good to get some—maybe, potentially, some training for military medical staff, having that experience in the ETUs. Sorry I keep on circling around it, but tell me about your vantage point, especially, as incident manager through what was going on in the domestic sphere.

Damon: When I came on in July, I think one of the things I recognized is that we needed to—there was a State Coordination Task Force, but we needed to make sure that they were more engaged across the domestic community. What do we need to do in terms of more frequent briefings for both the organizations that we work with—so NACCHO [National Association of County and City Health Officials], ASTHO [Association of State and Territorial Health Officials], CSTE [Council of State and Territorial Epidemiologists], APHL [Association of Public Health Laboratories], you know, state and local health departments—what did we need to do in terms of domestic preparedness? This was also the Medical Care Task Force in terms of infection control guidance, getting information and health communications out there, and letting people know where to find the information. We increased the frequency of the multistate calls and partner calls, ultimately brought individuals from NACCHO, CSTE, ASTHO, to be embedded with us, so that they could also then get communications out to their membership more frequently. That was done in Chris [Christine] Kosmos and Harold

Peets's and Steve [Steven F.] Boedigheimer, in terms of the State Coordination Task Force.

Q: Do you remember any moments specifically in coordinating?

Damon: Perhaps the most intense period was having to go back and revise all of the infection control guidance after—in light of Dallas, with really imperfect knowledge about what happened there in terms of why the two healthcare workers were, in fact, infected. I think we learned an incredible amount there, and also at Emory, in terms of medical waste. What the barriers were to moving material, to having it taken care of, since this was considered a Category A waste. I learned more about waste management than I ever knew before. [laughter] The intensity of trying to explain, again, with limited accurate knowledge about [why] the healthcare worker infections in Dallas occurred, and try to communicate that, and then revise guidance. Essentially, we made a decision, recrafted guidance, cross-cleared it with MSF, with WHO, and really the focus became cover all skin, make sure people are trained and exercised in donning and doffing and all protocols. That's really a period of a week or two where we intensively looked at what could we do to have prevented the delayed recognition of this individual as having Ebola. That's really what led to the guidance in terms of the movement and monitoring guidance. Not just doing exit screening in-country, which is what had been instituted to try to prevent the export to Nigeria, but additionally, to do this risk assessment of individuals when they came into the United States. To then triage them into some level of risk for Ebola, and then make recommendations in terms of their movement, whether

they could use public conveyances or whether they needed to use private conveyances, and then that ultimately then turned into the post-arrival monitoring system within the US. Being able to take that risk assessment and then provide that to the state and local health department where that individual would ultimately go, and have that person monitored for the remainder of their twenty-one days of potential at risk for infection. Developing those systems and putting those recommendations in place was an incredible amount of time, 24/7 [twenty-four hours a day, seven days a week] in terms of really working through multiple iterations of a document, moving it through HHS for review, moving it through other agencies across the US government, working with [the US Department of] Homeland Security and Customs and Border Protection to get people trained. Again, the issue of waste management of the PPE that people had to use—just an incredible number of details that you don't think of when you go into this.

Q: No doubt. [laughter] Any, like—sorry, I hate this term, but any decision points specifically that you remember, either in the infection prevention guidelines or in the monitoring and maintenance, or monitoring and—

Damon: Movement.

Q: —movement guidance—excuse me—as incident manager?

Damon: I think, really, the changes to the movement and monitoring guidance, and really developing the post-arrival monitoring system, and then marrying that to what ultimately

we turned into how we looked at domestic preparedness in terms of hospitals. We would have the Ebola treatment center, ultimately there were fifty-five of those identified and certified across the United States, and the strategy of this—within two hundred miles of where somebody resided, you would want to have one of these places. And then coordination with assessment hospitals, which would be able to, with appropriate PPE, assess patients for the possibility of Ebola; refer them, if needed, to an Ebola treatment center; but be able to take them for a short period of time. And then the frontline hospitals. That was, I think, a huge lift in terms of policy development and changes to that policy over time.

Q: So you're incident manager through March of 2015.

Damon: Yeah, so I was the incident manager from the exponential shift up to the downward slope. [laughter]

Q: Right. It's an amazing perspective.

Damon: Yes. The fact that we essentially, in August, we're just so defeated by the numbers of what we were seeing internationally that when we put together sort of the dashboard which we presented to the president on a weekly basis in terms of what was going on, we didn't even include contact tracing in the beginning of that because there were just so many cases. There was not the bandwidth in Liberia or Sierra Leone to do that. There still was some capacity in Guinea, and it was only when we got past the—or

"bending the curve," as the phrase was, that there really was the ability to allow people—there was time to build the capacity and train people to get that capacity in place in-country. That was really a key need in each of the—it's a key factor that's required for Ebola outbreak control, just because there currently are no licensed antivirals, nor is there a licensed vaccine to use, and so you really are trying to do supportive care, rapid identification, and isolation and treatment of cases. You prevent future transmission, and then identification of contacts—who's at higher risk, who's at lower risk—and then monitoring those individuals for the incubation period. I think NIH really—and CDC also—contributed, really, to an extraordinary effort, as did WHO in terms of trying to move to the field protocols which would allow the evaluation of both antivirals and vaccines.

Q: What role did you have, if any, in STRIVE [Sierra Leone Trial to Introduce a Vaccine against Ebola]?

Damon: I had no personal role in STRIVE, other than really just supporting the development of the—initially it was a vaccine team in the Medical Care Task Force, and then it became a Vaccine Task Force in and of itself. It's really the work of Anne Schuchat, and Tom Clark, initially, Susan [T.] Goldstein, Jane Seward, many others, move that forward.

Q: Okay. Yeah, I've had the opportunity to speak with Dr. Schuchat and Jane Seward, and amazing individuals, both of them, just what they did. Okay, when I imagine my

timeline of the Ebola epidemic, I start to have fewer events, I think, after October, November. I'm wondering if you can fill me in a little bit about what it was like, what was taking place for you, what happened, basically, from December through March.

Damon: Some of the other pivotal moments, I think, were really Ron Klain as being the Ebola—

Q: Czar.

Damon: Czar, yeah. He was really, I think, incredibly effective in terms of synthesizing and coordinating the flow of information so that it channeled to the National Security Council and the president. I don't know that there is a response which has engaged the president of the United States as closely as this one did. I don't remember when he stepped down.

Q: Ron? We'll look it up. We'll put it in the transcript. [note: around February of 2015] Did you work closely with Ron Klain?

Damon: Yeah.

Q: Did you have a lot of contact with President Obama?

Damon: That translated up.

Q: Okay. [laughter]

Damon: But I did get to stand behind him at some—at an event at the White House.

Q: Actually, that's—okay, I think I've seen maybe a little video where—

Damon: So, yes.

Q: —our curator, Louise Shaw, said, "That's Inger! You can see her shoulder!"

Damon: Yes. [laughter]

Q: Okay.

Damon: But again, we did this reporting, the Presidential Dashboard, as we called it, in terms of showing indicators of EOC development in countries; later on, of contact tracing, and how that was working; infection control capacity in-country; ETU development and number of individuals within ETUs, to look at capacity. Then in terms of—the movement and monitoring guidance, again, I think included Mali for a period of time. Another pivotal decision was when to get countries off of that list. I think we were very effective in terms of the Mali response, in terms of getting Mali off of the medical movement and monitoring risk assessment, and put that policy together and got that

approved. I think Ron Klain was pretty instrumental in being the person who listened to what we advised, and then was able to synthesize that information and get it approved. Whereas I think subsequently it was more difficult in other cases to bring countries off. I think because there had been cross-border transmission between the three—Guinea, Liberia, and Sierra Leone—there was greater reluctance. But, again, the disease was also a cross-border movement into Mali.

Q: How, if at all, did your position as incident manager change in the last few months when you were working?

Damon: That was really at a period when there were likely far more partners in each of the countries. I think managing the level of support in terms of the number of deployments in each of the countries was becoming a little bit more difficult, and especially for getting senior people into country. That would be something to talk about with Barb [Barbara J.] Marston specifically, in terms of the International Task Force. I think having Ray [R.] Arthur go to Guinea was really helpful in terms of helping them move forward, especially with some of the laboratory capacity issues, which had always been a concern. Moving that forward. Ray has extensive experience with WHO. He's known by many of the partners, so it was very effective in terms of a good presence. Pierre Rollin had sort of been that in the earlier days, as well, in terms of being very effective in Guinea. And obviously Ben [Benjamin A.] Dahl and Mike [Michael H.] Kinzer were also fabulous.

Q: One thing that I hoped to get to, and we have limited time left—thank you, by the way, for talking at length about this, [laughs] it's no mean feat, I appreciate it—is the closeness with which NCEZID and CGH [Center for Global Health] came to work, and how that relationship developed.

Damon: The technical subject matter expertise for Ebola existed in our center, in my division in the Viral Special Pathogens Branch. I think one of the issues that I saw early on, and was sort of why I structured the EOC as I did here, was to try to spread the subject matter expertise as best as we could. I think we recognized that in order—that typically when we work internationally, work is facilitated by having country offices. CGH was really instrumental in setting up the country office system for Guinea, Sierra Leone, and Liberia, and getting people hired there. Everything takes longer than you want it to, and everything did take longer than we wanted it to. Even though we recognized the importance of getting in and responding quickly, it was difficult, and it was not because people didn't try, and not that people didn't work hard to do it. CGH really took on that role of building that level of capacity in-country, and I think Tom [Thomas] Kenyon was also really instrumental in getting the African Union involved in terms of helping to provide both infection control expertise and hands on the ground in Sierra Leone, Liberia, and Guinea. Again, that took longer than people wanted it to, as well. Engaged with partners, so Public Health Agency of Canada ended up being a very rich source of French-speakers to help in Guinea, and were very instrumental in EOC development in Guinea. I think it was really that, trying to coordinate what the capacities and platforms that CGH can bring to bear, and then building the additional subject matter expertise over

time in terms of having people in-country who were known, gained experience, and worked with our subject matter experts. Then really the center [NCEZID] in terms of both healthcare quality and promotion [DHQP] really did the infection control, technical guidance and expertise, and then the Global Migration and Quarantine Division is also in the center, so that provided a lot of the support for exit screening at airports, and working with WHO and IOM [International Organization for Migration] and other partners, helping to establish better communication across the three countries to do cross-border surveillance. That became more effective as the response aged, so it wasn't just Ben Dahl calling and saying, "I've heard this rumor of a person who went into Mali, and we're following up, and we're contacting our counterparts," but a focused team of people that would help coordinate that in that capacity was developed in countries.

Q: Thank you.

Damon: That's how it coordinated.

Q: Would you mind giving me your perspective on what's going on currently with CDC's work in West Africa with the Ebola-Affected Countries Office?

Damon: Knock on wood, there have been no new cases at this point in time, and I think it's really—it's trying to understand what the core capacities are going to be in-country. Have we really established a quality of laboratory-based surveillance in-country, and a sensibility about that? Training people in terms of—really to have good public health

infrastructure, working with other partners in-country in terms of USAID, in terms of the health promotions activity and infrastructure development. In many ways, really, following up on the tenets of the Global Health Security Agenda.

Q: Can you just tell me a little bit about wrapping up as incident manager, and transitioning back to life post-incident-management-position, and—

Damon: Yeah. Yes, maybe the theme is April Fools' Day. [laughter] Effectively as of April 1, 2015, I was back in the Division [of High-Consequence Pathogens and Pathology]. Dan [Daniel B.] Jernigan formally took over March 26th, or the 27th, so we actually worked pretty closely the last three weeks during the month of March, worked closely together. We both were in Guinea with Dr. Frieden before my transition out. And then picking up where I left off with the division, and trying to move the work of the division forward.

Q: As you look back over your experience with the epidemic, and your leadership of CDC there, do you have any final thoughts or reflections that you'd like to share for the historical record, or anything we haven't gotten to that you think we should explain more?

Damon: It's been over a year now since I left, and some of my memories have dimmed, but it's really just an incredibly complex response with many partners, many other agencies involved, many other nongovernmental and international organizations

involved. Information and data was often limited. The quality of it was poor. Having to make decisions with limited data is not something as a scientist you want to do, but you had to, in this case, assemble the best sources of information you could find and make decisions often with what you knew was poor data. All in all, I think it was an incredible effort. Knock on wood, it's great to see that it really looks like the epidemic is over. We have learned some extraordinary things about persistence of virus in terms of clinical [disease pathogenesis] and sequelae of disease. It's a sobering experience, and I think it's one where really the efforts of multiple people and multiple agencies and the coordination of efforts ultimately resulted in control of the epidemic.

Q: Thank you so much for sitting here with me. It's been a pleasure, and I've learned quite a bit, so thank you.

Damon: Get over my PTSD [post-traumatic stress disorder] now. [laughs]

Q: Yeah, I'm sorry about that. [laughter] I get the impression that you've just been through this looking back a lot at this point.

Damon: Honestly, it was an incredibly intense experience. There's things that I wish I remembered more clearly, but there was just so much going on. I'm actually getting an honorary degree at Amherst [College] this weekend, so I actually have to pull my thoughts together to give a talk. So this was sort of useful to go back and think about what is it that I should focus on.

END