Ep. 7: Public Health Deep Dive: Ebola, Burn Pits, and Everything in Between

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Matt Hittle: Welcome back to another episode of Akin Gump's *OnAir: Health Care*, a podcast that delves into the intersection between health care and policy. And Mario, we have got a wonderful episode today, don't we?

Dr. Mario Ramirez: Absolutely, Matt. I'm super excited about our two guests. I think they're going to add a nice perspective that's a little bit different from some of the other guests that we've had that have talked heavily about the pandemic.

Today, we're going to be hosting Kevin Gardner, who is the University of Louisville's Executive Vice President for Research and Innovation. And we're going to be spending some time talking about the university's work in wastewater surveillance and some of their work with veterans and burn pits. And then, in addition to that, our second guest is Gene Migliaccio. He is a professor and the Associate Dean for Applied Public Health at The George Washington University. He's going to spend some time talking to us about his time in the Public Health Service Corps and, really, how we position that Corps to serve America's public health needs going forward. I think it's going to be a great discussion.

Matt Hittle: Definitely. We've heard a lot about public health over the last couple of years, but I think it's only been in the context of the pandemic. And with these conversations, we were able to really jump into some public health issues that haven't gotten a lot of play, but also the public health infrastructure and, namely, the Public Health Service Corps, which is a uniformed service of the United States that not a lot of people have really heard of. So I think our listeners will benefit quite a bit from that. Let's jump right in.

Dr. Mario Ramirez: I am super excited to welcome Kevin Gardner here to join us today. Dr. Gardner is the Executive Vice President for Research and Innovation at the University of Louisville. Kevin, welcome to the show. Why don't we start by asking you to tell us just a little bit about yourself, your professional background, and how you came to the University of Louisville and some of the work that you're doing there?

Dr. Kevin Gardner: Thank you for having me on, Mario and Matt, it's great to be here today. I have an interesting journey. I like to say that I came to Louisville for the pandemic,

which is kind of how the timing played out. So I arrived just about five weeks before the pandemic began. But I came from University of New Hampshire, and my background is actually environmental engineering, so don't take my advice as if I'm a medical doctor as we talk here today. But my work has always been very interdisciplinary in nature, and, so, I've worked with people really across the disciplinary spectrum. And the reason for that is what I am really passionate about is the ways that research, which means new knowledge, solves societal challenges. You just have to have many disciplines come together to do that, and there's a million examples of that. So, that's really my passion.

I was at University of New Hampshire for 20 years, and 10 of those years were in the central research office there. And I have to say that I really landed in the right place when I applied for the position at U of L.

U of L's an institution with a mission that's really centered on being a premier metropolitan research university. And we serve our students well—40 percent of our students are eligible for Pell grants and a similar number is first generation, and we graduate students with the lowest debt load of any of the public universities in the state of Kentucky. On that side of things, it's really impressive, and it's a mission that is really easy to get behind. And then, similarly, our research mission, which is where I spend all of my days and nights worrying about and thinking about, is closely tied to the public that we serve.

We have great strengths in many different areas like environmental health sciences and infectious disease that have played really outsized roles in the last couple of years. But what we really care about as an institution is celebrating, recognizing and supporting application of knowledge in the real world—in the public and in the clinic and through policy changes or other forms of technology transfer, including education of students and spinning out startups and licenses and things like that. So, it is an institution that cares about the impact that we have in the world. That's one of the things that I really value about being here.

Dr. Mario Ramirez: Excellent. Yeah, I've been up to Louisville a number of times when I used to live in Nashville. It's a great place to visit. I'm sure it's a great place to live. In your intro there, you brought up a bit about infectious disease, and for those who don't know, the University of Louisville is part of the Regional Biocontainment Laboratories (RBL) network, which is an issue that you and I have worked together a little bit on before. Can you tell us a little bit about what the RBLs are exactly for our listeners who aren't familiar with it? And particularly as we start to come out of the pandemic, tell us a little bit about what role you think the RBLs are going to play together with some of the other national laboratories.

Dr. Kevin Gardner: Sure. I wish that RBL would be a household name like Pfizer and BioNTech and Moderna, but they haven't quite received that level of recognition. But so there were two National and 12 Regional Biocontainment Laboratories that were built over a decade ago. And the genesis for those was in the very early 2000s, related to anthrax threats and things like that, with the recognition that the United States needs to prepare not just for infectious disease emergencies, but also for bioterrorism events. We didn't really have the infrastructure to conduct the research we needed to respond to those types of threats. And, so, that's why the NIH funded the construction of these laboratories. And they are at the ready, so they're conducting research and development all the time over the last decades and have done a lot of really, really important work that laid the groundwork for

rapid development of vaccines that we saw during the COVID-19 pandemic. So, really, really important work.

People don't know that the vaccines don't get tested in humans first. There's pre-human clinical testing of many sorts that happen and necessarily happen at a place like the RBLs. They have Biosafety Level 3 and 2 capacity and can work with animals. And then the National Biocontainment labs also have Biosafety Level 4 capacity. Both of these National and Regional Biocontainment labs have a national mission, and their mission requires them to drop everything, as it were, and respond to national emergencies. And that's exactly what happened during this pandemic. And these RBLs were a really critical part of Operation Warp Speed for vaccine development. But beyond that, they also served really important roles in helping the United States develop therapies for COVID-19 and other types of prophylactics and so forth.

They got bombarded with requests because they're regional and national in nature. You could think about them as kind of publicly available. They do a lot of contracts for private sector companies like the Pfizers of the world that need to test their formulations or therapies or whatever those might be. So, that's kind of the role that they've played. And I think it's really important to recognize that they're located at universities, at really premier academic health centers, but they're national and regional facilities. So, they are open to scientists from the government, from nongovernmental organizations, from private sector companies. And that's a really important point, I think, that needs to be made about these laboratories. It's not U of L's lab just full of U of L people and U of L projects, but it's full of projects from private sector companies, other universities, and so forth.

Dr. Mario Ramirez: Well, and the labs have a little bit of a different focus, right? Not all of the labs do the same research, and they're not all animal labs. Some of them actually do botany work. And I think some of our listeners may not realize that the biodefense and biocontainment work actually stretches the human, animal and plant interface. Tell us a little bit about that.

Dr. Kevin Gardner: Yeah, that's right. One of the labs is located at one of the national non-human primate facilities. So, if work is needed to be done with non-human primates at a BSL 3 facility, that's the place where you would do that work. So, they do have these unique capabilities; they're not all the same. They all have a lot of similarities and overlaps in the types of viruses that they work with and select agents, but they do have these other capacities. There's some that really focus on the interplay with human virus and animal virus and the passing back and forth of those types of things—so, a lot of really important work because of the capability of viruses to jump species like that. So, that's really critical research to understand at a fundamental level. And then, on the other hand, many times research that needs to be done at a very applied level when you do have an infectious disease outbreak like everybody is now an expert in, in the whole country.

Dr. Mario Ramirez: And, so, maybe on that point, Kevin, one of the things that I think a lot of Americans will look at as we, hopefully, review what went well, what didn't go so well during the pandemic, was how we get these RBLs and the National Biocontainment Laboratories (NBLs) to hopefully work as a more cohesive unit. How do we stay better prepared for the next potential outbreak? And I know that

the RBLs received some money in this year's omnibus. Tell us a little bit about how that money will be spent and how we think that the RBLs and the NBLs can keep working better so that surveillance across the country is really what we need it to be.

Dr. Kevin Gardner: Yeah, it's a really good point. I'll say with the experience in our own RBL here at Louisville, as soon as that pandemic broke out, they were just absolutely swamped with requests for tests, for preclinical testing of different therapies and vaccines and so forth, absolutely swamped. And everybody was. But we didn't have a national infrastructure for those types of requests to be vetted and prioritized. So, if a vaccine from company X gets prioritized, that means another project gets deprioritized. And, so, how do we do that? How do we think about that, and how do we make sure that we're prepared for that type of national response as opposed to an individual lab response? So, I think it's important that we think about doing that and allocate those appropriately and transparently.

There are some cases where a company or another university might approach a lab and say, hey we really want to do this research. And, meanwhile, our labs are totally backed up and overbooked with the amount of work that they can handle right now—so, being able to prioritize appropriately. One of the other reasons, and we gathered all the RBL and NBL directors on a regular basis, the major limitation to the work that could be done was personnel. The labs have not been supported in the past in terms of their operation. And, so, all of the personnel are either university employees or research grants—“soft-money” types of researchers. There's just not enough people to do the work. With a laboratory that has select agents in its arsenal of infectious agents, what the lab directors say is it takes six months for an individual who already knows microbiological techniques to be trained to work in a BSL 3 facility, and to be cleared to work in a secure facility like that.

So, what we would call having a warm, ready workforce that's able to quickly pivot and work on an emerging infectious disease like we saw with the coronavirus is a key thing that we need to do to be sure that we are prepared for future threats. There's a few other priorities that we think are significant for this network. There's a lot of cybersecurity concerns around—security concerns in general; these are highly secure environments, so they all have that type of physical security—but cybersecurity becomes a really important thing as we've heard a lot about that in recent weeks and months, for sure. But it remains an issue to make sure that we've got cybersecurity around these laboratories, which are critical infrastructure for responding to an emergency. And, so, a coordinated attack of bioterrorism and cybersecurity could really be debilitating. So, it's really important that we work together as a network of laboratories to make sure that we're able to respond appropriately from that perspective as well.

Dr. Mario Ramirez: Got it. So, lots going on. Matt, I know you were interested in another project that Kevin and I have worked on about wastewater surveillance. Let me kick it to you.

Matt Hittle: Yeah. As someone who's not a public health expert, toward the beginning of the pandemic, it was a little surprising to hear about a capability that was deployed I was unaware of, and that's wastewater surveillance. Kevin, could you talk a little bit about what wastewater surveillance is, and how you've been involved with it?

Dr. Kevin Gardner: Yeah, absolutely. It's not that new of a technique, and people have been looking at this kind of thing for quite a while. But it certainly has gained a lot of attention and more public recognition. It's, essentially, just collecting wastewater and analyzing that wastewater for the viruses it contains. And there's a lot of other things that people analyze from wastewater, such as pharmaceutical products or personal care products, things like that, that might be going into our waterways. But to think about the wastewater as an indicator of the level of infection in a community is something that's somewhat new. And University of Louisville's been working on monitoring wastewater in the county where you reside in since June of 2020. So, pretty early on in the pandemic, we started doing that work and actually communicating the results of that work to the public health department, who were able to then respond appropriately.

In the case of viruses, you're able to see the emergence of a pandemic much earlier than you see clinically. So, there's a delay in the replication of the virus, and it's being excreted into the wastewater and then people actually getting sick and spreading the virus and then actually having to go to the hospital. And then we see that clinically. So, it can be really valuable to keep an eye on the community, and, in many cases, it provided really good information to say, hey, there's a large increase in the viral activity in this part of the city because we can segregate the city into these sewer sheds and analyze the wastewater from that.

There's a lot of aspects to it that are really important, and one of those is that some people don't like getting tested for COVID-19, and then we just don't have samples. Maybe it's a particular section of the city or certain type of population, or people that just are sick of getting something stuck up their nose. But wastewater doesn't require that. It doesn't require us to test individuals like that. But, rather, we test more as a community. We also have, since sometime in the last year, paired our wastewater collection with NextGen sequencing of the wastewater, and that's really a new thing. We've now expanded this to go across the state of Kentucky, looking at nursing homes, looking at correctional facilities. So, it provides a really good opportunity for early warning systems for those particularly vulnerable populations where people are in a congregate setting, or if it's an assisted living facility or something like that where there's a much more vulnerable population.

Matt Hittle: There's quite a bit of value here, it sounds like. And, so, because of that, it was a little concerning to see some recent reporting that the administration is not utilizing wastewater surveillance as much as the administration first announced it would. Could you talk a little bit about the utilization by the administration of wastewater surveillance? And have you experienced a lag in uptake? And if so, how do we improve coordination?

Dr. Kevin Gardner: I would say a couple different things. One is that, on the one hand, this is a capability that many universities across the country have. They have the capability of analyzing wastewater for particular viruses, but we don't have funding or a very coordinated network across the country. It's pretty much ad hoc now, and some people do it, some people don't do it. So, it's really not a national infrastructure or a national coordinated program as yet.

I will say that as we, hopefully, transition out of the COVID-19 pandemic, U of L has developed a new lab standard for panviral work that includes analysis of over 3,000 viruses from a single sample. This is what this technology promises. If we

have a coordinated network across the country, then we can also analyze a whole suite of viruses: everything from influenza to any kind of MERS or SARS or any of these types of infectious disease we might be concerned about having a new outbreak of.

This is a technology that can do that. And that's a technology we're still working on the development of, but that development is going well. It's pretty exciting to think about a more robust, coordinated network across the country where we can get much more advanced notice about a new virus that might be having an outbreak. Even thinking about influenza and the damage that influenza does every year, the wastewater surveillance in a city could let people know in advance that influenza is here and is increasing in its prevalence, and now would be a great time to break out that N95 mask that you have back from the COVID-19 pandemic and put that thing on if you don't want to contract the flu.

Matt Hittle: That's funny you say that; that's exactly the example that Mario and I were discussing before we had you on, as we talked about these questions in advance. So it's good to know we're on the same wavelength there. Given that, clearly, the academic community is on the cutting edge of the wastewater surveillance technology—it's clearly something you've begun on your own initiative, working with your local public health departments—is this something the academic community just needs to charge ahead on as a solution, not quite private sector, but something that's not fully government-operated here or government-led, given that you're already there and government seems to be catching up?

Dr. Kevin Gardner: I will say our research was supported by an $8 million CDC research contract that was really about connecting what we see in the wastewater with prevalence in the community. There's still method development type of work to be done, both in understanding what does it mean if we've got such and such a viral load in the wastewater, what does it mean in terms of people in the community. So, there's that kind of connection that doesn't quite exist now, except we can just say, "Well, it's going up or it's going down," and that type of thing. And then the second part of research development is this panviral type of work where we can look across all the different viruses that may be there and pick up emergence of a new virus that we weren't really even thinking about when everybody's thinking about coronavirus and now MERS or SARS or something comes along.

That's the kind of work that can proceed with government funding, research contracts from the NIH, and so forth. Those types of activities can continue with the existing grant-funded mechanisms and peer-reviewed research that happens through places like NIH. I would say that we have to think differently about pandemic prevention and what the kind of infrastructure is that we need for that. The municipalities across the United States I don't think have the appetite to fund the kind of work that goes on to collect samples regularly and get those analyzed regularly. The question is: Who's going to pay for that? I think that that is a role that the federal government likely is going to need to play if we want this to be part of the arsenal for pandemic preparedness for future pandemics, to catch them early and so forth. So, I would say that that part, the universities and the municipalities can be part of a network, but there needs to be a network that's more than completely bootstrapped.

Matt Hittle: I have one final question on this before I move to our final topic. When it comes time to go collect the samples, is that something that your undergrad research assistants get to do? A rite of passage?

Dr. Kevin Gardner: That's a good question. Usually we've done this in concert with municipalities and correctional facilities and so forth. In many cases, the workers from those municipalities are accessing those samples. But we didn't build our wastewater systems in order to sample smartly from the grid, right? We built the sewers to convey wastewater to the centralized wastewater treatment plant most efficiently, and didn't necessarily think that we need access points for easy sampling in certain places. So that's a kind of future planning state for how we build infrastructure so that we can understand what's happening in our community from a public health perspective.

Matt Hittle: Finally, I want to talk about veterans issues. From my time on the Hill, some of the most common questions we get are related to veterans' benefits and what the VA offers and what it doesn't offer, what it covers and doesn't cover. One really hot topic, given the wars in Afghanistan and Iraq, has been burn pits. We understand, obviously, watching the State of the Union address, that the president has made this a priority of his, ensuring that veterans who have illnesses arising from their exposure to burn pits can get care for those illnesses. There are a number of bills working their way through Congress right now, including the Health Care for Burn Pit Veterans Act and the Toxic Exposure Training Act. I understand that this is an area of research for you at the university. Could you talk about that research and where you think that research and the legislative effort may go?

Dr. Kevin Gardner: Yeah, I'd be happy to. I'll just start out by mentioning—and I have to represent the university when on a podcast like this—University of Louisville is an institution that is strongly connected to the military, and we've got a lot of ways of showing that. We did just receive a “Gold” ranking as a Military Friendly university, and there's 10 other R1 universities in the country that have that distinction. We do really focus on serving the military well through our academic programs, and we also have really close and supportive relationships with the VA through our research and our clinical work. In the case of burn pits, U of L researchers have been studying the effects of inhaled pollutants for several decades. We have really significant sophisticated infrastructure for studying that in the laboratory and also large networks across the community for studying exposure to inhaled toxins, particulate matter and VOCs [*volatile organic compounds*].

So this is a real strength. At the top of the podcast I mentioned environmental health sciences being a real strength for the university, and this is one of the ways that it has been the case. Unfortunately, toxic gases have a really high local relevance. We’ve had a high concentration of industry for decades and decades and emissions from these industries and other sites have led to high levels of VOCs in the area. So we have studied chronic exposure to emissions like this for a long time. Our faculty at U of L were involved in studying health effects of exposure to burn pits in Iraq and Afghanistan specifically.

There's an Institute of Medicine study that was commissioned by the VA that a couple of researchers had participated in. It was a big study that was done with people from across the country. That study found that there's a high plausibility that exposure to burn pits could lead to many different types of adverse health

effects. And it was recommended at the time, this was 10 years ago or more, that there needs to be longer-term follow-up for exposed people to better quantify exposure and to better quantify health outcomes. There's a large population of veterans who have been exposed in those conditions. So, for sure, it's a study worthy of doing. That's what the Institute of Medicine said 10 years ago when they wrote that report, and that report was never done. It is an epidemiological study that ought to be done because of the large number of veterans there and the likelihood that there are disease outcomes from those exposures, particularly cardiovascular disease is a major one that could result from that kind of exposure.

Matt Hittle: Dr. Gardner, thanks for joining us today. We really appreciate your insight and we'll have you back as these issues percolate through Congress, and please keep us apprised of your research.

Dr. Kevin Gardner: I will. Thank you, Matt and Mario, for having me. It was my pleasure for sure. And I'll be curious what comes through Congress as well. I think you know a lot more about that than I do.

Dr. Mario Ramirez: Great. Well, thanks for coming, Kevin, and we'll look forward to speaking with you soon.

Dr. Kevin Gardner: All right. Thank you guys.

Matt Hittle: Our next guest today is Dr. Gene Migliaccio, professor and Associate Dean for Applied Public Health at George Washington University. Dr. Migliaccio, thank you for coming on today. Give us a little bit of background about yourself, your professional background and how you came to be at GW.

Dr. Gene Migliaccio: Thanks so much, I appreciate it very much. Greetings, everyone. I'm Gene Migliaccio. I have been very fortunate to start a position just a few years ago on a full-time basis at George Washington University, the Milken Institute School of Public Health. I've had a long career in public health, in government 35 years. After leaving government, I worked in the private sector working with private equity on health care turnarounds. I consider myself a public health practitioner, a veteran, and also an educator. So, over my public health career, I've worked with some amazing populations where I've had a chance to effect some positive change. Along the way, it just kept me motivated to continue to focus on the field of public health, which has brought me into academia.

I started working part-time on the adjunct faculty at George Washington University a little over 20 years ago and just kept plugging away teaching. First, it was a course a year, then it became a couple of courses, and, 20 years later, I was teaching up to four courses and that turned into—after retirement from the federal government—a full-time job. But I've had a love of public health, and I've had that through several iterations of phenomenal mentors that have kind of kept me moving, not only from the academic space, my mentors, but also within public health itself.

Matt Hittle: Give us a sense for what you do on a daily basis up there at GW.

Dr. Gene Migliaccio: I serve as the Associate Dean for Applied Public Health. What does that mean? We have a large school of public health in terms of numbers. We have a

phenomenally large Master of Public Health program, over 1,200 students online and about 300 students in residence at our campus in Foggy Bottom in Washington, D.C. The applied work takes me into the field of practicums. I set up large national programs with large associations for our students, especially the students that are outside of the Washington, D.C. area. So I work with practicum. I work on community engagement initiatives within Washington, D.C. with local organizations. And then I also oversee our Doctor of Public Health program. So that's my day job in terms of the administrative side. And then I teach half time. I teach within our Doctor of Public Health program, and a couple of courses I also teach in our Master of Public Health program too.

Matt Hittle: There are few people who are as qualified as you are to apply public health principles given your long and illustrious career with the Public Health Service Corps. And I have to say, as someone who worked at HHS for a couple of years, people who do not know a lot about the Public Health Service Corps walk into the building, and they see all these folks walking around in military uniforms, and they wonder, “I walked into HHS, not the DOD.” But I think, right now during the pandemic, we are seeing a focus on the Public Health Service Corps unlike ever before. So, could you give our listeners a little bit of detail about what the Corps is, what it was like when you joined, and maybe how things have changed over time?

Dr. Gene Migliaccio: Just a little bit on the Public Health Service, I'll back up just a touch. I had an opportunity when I finished my doctoral degree in public health from Tulane University in New Orleans, I was always fascinated with the Public Health Service, but in the ‘80s, the Reagan administration had closed down public health hospitals and clinics throughout the nation, and it was extremely difficult to come into the Corps in the late ‘80s. What I did is I took a pause, and I wanted to start a federal career in uniform, and I went into the United States Air Force within their Medical Service Corps. My goal was to do that for about three years and then see if I could get into the Commissioned Corps. I had such a wonderful time in the Air Force as a hospital administrator and then also working in population health and managed care initiatives that I stayed for a little over eight years before I went into the Public Health Service.

But just to tell everyone a little bit about the U.S. Public Health Service, it's one of the nation's eight uniformed services, and it's the only active duty force that's solely dedicated to protecting, promoting and advancing America's public health. It sits within the Department of Health and Human Services. It's a corps of close to 7,000 officers; there's not an enlisted corps. And we also provide really important services to other federal agencies. When I was in the Corps, I worked within the Department of Justice, providing some support to the Federal Bureau of Prisons. I worked also in the Immigration and Naturalization Service when it was in Justice, before it was transferred over to Homeland Security and became the Immigration and Customs Enforcement. I ran their health care program, taking care of individuals that were coming into the United States. We had clinics set up at a lot of border cities, focused a lot on curtailing tuberculosis, focusing on infectious diseases coming into the United States with the work we were doing with our folks in Immigration and Customs Enforcement.

Besides some of the direct care services for other federal agencies, the Public Health Service is focused on public health emergencies or global emergencies. We also do a tremendous amount of work running health care programs and

policy development. When I joined the Corps, I joined, actually, in the early '90s. Coming from the Air Force, I did an inter-service transfer to the U.S. Public Health Service. And as I mentioned, I was assigned to an agency called the Health Resources and Services Administration within their Bureau of Primary Health Care. Then I was detailed over to support some of the health programs in managed care within the Bureau of Prisons. So, that was my initial foray into it. There's been a lot of changes in the last 30 years from joining the Corps. I stayed within the Corps until 2007, when I retired going into the civil service at Health and Human Services.

But during my Corps days, I had an opportunity to work with some phenomenal champions. I had served as chief of staff for Richard Carmona, who came into the Public Health Service as a political appointee right after 9/11 with a lot of tremendous skills in preparedness. Using those skill sets, I had a chance to work with him on some transformation efforts within the Corps. So, it's a different Corps that we see today than what it was decades ago, but the focus was always on preparedness, which brings us up to today with the work that the Corps has done with global initiatives, such as what we see right now with COVID.

Dr. Mario Ramirez: I think you bring up a good point there that, while the Corps was originally focused on public health preparation, and that is so much of what public health work is all about, during the pandemic most Americans came to know the Corps as more of an emergency response organization. Can you talk a little bit about the Corps' work in that space? And I think a question that has often come up for a lot of people is whether or not the Corps is ideally positioned and structured to serve that role. When I was at HHS in 2014, the Corps deployed to West Africa as part of the Ebola response but also worked closely with the other uniformed services, the Army, the Air Force, that deployed to Africa. So, tell us a little bit of how well set up the Corps actually is to execute on that role.

Dr. Gene Migliaccio: Yeah, that's an excellent question. I'm going to give you some honesty on this. The Corps, its heart is in the right place. The people that are part of the Corps itself, the uniformed service members, Commissioned Corps, have phenomenal skills. But they're constrained at times. They're constrained because of a lack of line item budgets. They are constrained because, typically, what we see in a more of a military operation is teams train together and then they deploy together. When the Corps deploys, they're pulling individuals from the multiple federal agencies that they support, such as agencies within Homeland Security or Justice, Health and Human Services, for example. There are Corps officers that are assigned to those agencies and others. They're pulled together, they train together, but not as you would see with military units. So, there's a force management issue. There are issues in terms of deploying for long periods of time that would take them away from their current day to day activities.

So, there's a little bit of a structural issue that the military forces don't really have because of the nature of the work. Military units deploy. Many times they're backfilled with individuals from the reserves—Army, Navy, Air Force Reserves would actually come back in. Take medical, for example. You'd find more reservists being deployed to support the peacetime efforts here in the states while active duty members could be deployed also with reserve members overseas.

So, let me start a little bit in terms of some of the early work of the Corps just over the past eight years and tie in some of the military commentary also. You had mentioned that the Corps deployed to West Africa in 2014. The Ebola epidemic in West Africa and the resulting humanitarian crisis remained as really a top national security priority for the United States. And we took a look at this. This was, I think, our first contemporary look at an infectious disease that was almost 100% mortality in terms of what we started to see. It really started to hit some fear in terms of what was taking place in Liberia, and then also what was starting to take place here within the United States.

The U.S. Public Health Service Commissioned Corps responded to this need, and Health and Human Services deployed the Corps to manage a staff, the Monrovia Medical Unit, which was a 25-bed hospital, which served as a first of its kind in Liberia dedicated to providing care to health care workers who became infected with Ebola. Now, the Corps was supported with that, had no assets to build a 25-bed hospital. That was all set up by the U.S. military forces. The Army set the hospital up, and the Commissioned Corps provided the staff to run the hospital, but they were the only force, the only U.S. government force and asset that provided direct patient care in Liberia. The military did not do that.

I know this very well. My daughter, who's a U.S. Commissioned Corps officer, was deployed to Liberia on the advance team to oversee the construction of that medical operation and work with interagency and NGO partners to establish the basic operating procedures and support for how the U.S. government would provide direct patient care at the hospital. In terms of the question, when we deploy, especially where we have to bring in the resources, there's a dependency on either our military forces, if it's global work, or many times, if we deploy, it's utilizing some of the assets that we find within local communities. So, the Corps comes in with expertise. They come in with a skilled workforce. But for the most part, the resources that they bring are limited.

Dr. Mario Ramirez: Are there particular benefits that that also brings to the battle? When I think about my own time in the Air Force, I think the traditional uniformed services that we think about—the Army, Air Force, Marine Corps, etc.—they can be very structured and very regimented. Are there cultural differences between that set of uniformed services and the Public Health Service that create other benefits, for example?

Dr. Gene Migliaccio: Yeah. So, from my standpoint, having served in both the Air Force myself as a hospital administrator, and then serving in the uniformed side of the Public Health Service, there are differences in culture. Working within two entities that provided health services—the Medical Service in the Air Force and then the Public Health Service—I was involved in a lot of organizations that provided direct patient care, as well as policy and program and funding support to state and local governments. The training is different in terms of military and U.S. Public Health Service, but in terms of culture, that medical can-do attitude to take care of patients and your populations is extremely similar. The relationship between military and Public Health Service is strong. It's extremely beneficial. And the U.S. Public Health Service works extremely well with the armed services.

Dr. Mario Ramirez: Great. That's super interesting, Gene. It strikes me right now in your role at George Washington, you are charged with creating the next generation of public health leaders. We're at something of a consequential time in public health right

now, either because of the pandemic or because of politics. I think some of the American public's trust in our public health institutions has been injured and degraded in a way. How do you address that with your students? Is that something that you have also found that you worry about, and how do we address that moving out of the pandemic?

Dr. Gene Migliaccio: Yeah, great question. I want to answer it first by mentioning too just some of the thoughts that myself and some of my colleagues share. Back in the day, which was maybe about just a few years ago, when you mentioned that you work in the field of public health, people would ask, "Well, what is public health?" Well, the nation's had an experience over the last two years with COVID, of “public health 101” education. We don't get asked the question anymore in terms of “what is public health,” but we've gone from being the unknown to the known. And as we have moved forward with some of the public health measures that have been put in place, we have become a little bit vilified. When I hear the word “trust,” the public trust—and we can talk about this later—but with some of the misinformation that has gone around with some of the non-pharmaceutical interventions, which are social distancing, masking, etc., there's been a lot of concern.

And, so, trust has been eroded with some of the misinformation. But I believe when I hear the question in terms of public trust and what we see, our nation is woefully underfunded in terms of supporting state and local health departments. We are just woefully underfunded and underresourced.

So, I'll start with the classroom first. And then I'll just talk a little bit about what's taking place in the nation right now. But my focus is building public health leaders. Undergraduate programs, our masters and our doctoral programs in public health all focus on public health leadership. Personally, my interest in going full time in academia was to build the next generation of public health leaders. With some of my coursework, I help our students design health care programs to reduce morbidity and mortality.

I focus on not only the social determinants of health, but also thinking about some of the commercial and political determinants of health in terms of what really affects communities’ health. And I also focus on project management in public health. So, I have a focus area that I like to bring to students. I talk a lot about teamwork, our ability to express different points of view so we can focus on our populations that we serve. I focus on ethics. And I think it's important when you focus on the public's health is to focus on activism and advocacy so we can drive policy, so we can invest in our communities. So, having an engaged population that we work with, and to take care of our population, I believe advocacy is critically important.

A couple of things that I wanted to share with everyone when I talk about the underfunding of our public health system: There have been a couple of studies recently that focus on workforce. I think workforce is essential. I think what we've seen from the pandemic is that, in the United States today, we're 80,000 full-time equivalents understaffed in our state and local health departments. Two major principles—one's coming from the World Health Organization, and the other is coming from CDC. But both organizations focus on building a competent public health workforce. In CDC's statement they focus on building and supporting a diverse and skilled public health workforce. With that said, in government, the

government public health workforce provides unique, essential services that are not provided elsewhere, not provided by the private sector. So, our focus on public health education, I focus a lot on working on some of the core principles on foundational public health services and skills that are critically necessary in local communities. And we're underfunded and underresourced from our workforce side.

Not only from our workforce, but also in terms of the finances that are necessary. We're about $4.5 billion underfunded for our state and local health departments in terms of what it really takes to build strong public health infrastructure throughout the nation. So, I think what we've seen from the academic side of the house in terms of how we're training our students is to really focus in on being part of the change and part of the transformation that we're going to see in the out years to really contribute to rebuilding the infrastructure.

Dr. Mario Ramirez: And what about on a more global stage, Gene? When we think about the prior presidential administration and a potential sense that the U.S. was going to withdraw from the World Health Organization to the Biden administration re-engaging, I think a lot of people who watch public health are curious to see how we think some of the efforts of WHO reform are going and whether the U.S. will stay engaged, and potentially if we have a change in presidential administration in 2024, would the U.S. again consider withdrawing from the WHO? What would that mean for global health and global health diplomacy? What are your thoughts there?

Dr. Gene Migliaccio: Again, phenomenal question. I'd like to answer it by just talking about the world at hand and in terms of what we're seeing from some of the critical, complex public health problems that we face as a global partner in health, and what the World Health Organization really stands for is really to focus on the world's health. So, we've got major issues in the world from violence as a public health issue, racism as a public health issue; now we are looking at the effects of war and humanitarian crises as a public health issue. So, should we remain as a partner within the World Health Organization if the administration does change and Congress does change? I would say that, as a global member in health and a leader in health, the answer is yes, you've got to stay committed to the World Health Organization.

There are 194 member nations that are part of the World Health Organization, and we're one of the 194 members. We provide a tremendous amount of funds to support WHO, as other developed nations do too. But the concern from the Trump administration was that there were concerns, and others raised concerns too, in terms of response to the COVID pandemic that we're in. But to walk away is not the answer. The answer is to engage and look at some of the structural changes and transformations that we, as one of the 194 member nations, can look to, to enhance and revitalize WHO wherever it needs the support. We have WHO set up with a director-general. They also have a leadership team, and we do have a couple of U.S. members that are on that leadership team. So, we're well staffed at the highest levels. And our initiative is to stay, to continue to build changes and transformations within the World Health Organization, and to really be a key member in global health and global health diplomacy.

Matt Hittle: Great. This has been a really enlightening and interesting conversation, Gene. As we see all those uniformed folks walk around HHS, I think people now after

hearing this will have a much better idea of what those folks do on a daily basis and how important they are to not only the work that the government does inside of our own borders, but outside as well. Dr. Gene Migliaccio, who is Associate Dean of Applied Public Health at the Milken Institute School of Public Health at the George Washington University, thanks for joining us today.

Dr. Gene Migliaccio: Thank you so much. Have a wonderful day. And I really appreciate talking to all your listeners today.

Matt Hittle: Thank you. Great episode today, Mario. I think we heard some perspectives that were really unique and that we hadn't heard before, and I think our listeners got a lot out of it. I hope you did. Signing off from Akin Gump's *OnAir: Health Care*, this is Matt Hittle.

Dr. Mario Ramirez: And I'm Dr. Mario Ramirez. Thanks for joining us today.