

Center for Strategic and International Studies

**“Global Security Forum 2016: The Global Health Security Agenda: Its
First Years and the Way Forward”**

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Moderated by:
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STEPHEN MORRISON: Good morning. I'm Steve Morrison, senior vice president here at CSIS and head of our global health policy center. We're thrilled that on this panel that we can host here today Dr. Thomas Frieden, director of the Center for Disease Control and Prevention, CDC, in Atlanta.

I'm going to say a few words about the topic on the table today, which is health security, a few opening remarks on that and a few remarks about Dr. Frieden's leadership and tenure. And then we will hear a presentation from him followed by a discussion. And we'll offer the opportunity in the course of that discussion to bring you all from the audience in with your comments and remarks.

And a welcome also to those joining us online.

A special thanks to Thomas Mampilly from the CDC office here in Washington, D.C. for all of his assistance and supporting in pulling this together. Thank you, Thomas.

And special thanks to our staff, Chris Millard, Joe Jordan and the support staff here, Chris and others, who are pulling things together today.

Health security as an issue is an inherently complicated and difficult one. And we'll hear more about that. It's a subject that draws a mixed and sometimes neuralgic reaction from public health folks who are a little resistant to the notion of using those two terms in combination. It's something that Congress itself sometimes gets a big neuralgic about investing ahead of time for contingencies that we haven't seen yet.

We tend to think of it – we have over history tended to think of it as an episodic phenomenon that we would deal with case by case versus dealing with it more systemically, on a more sustained and comprehensive or strategic basis. It's something that's not necessarily all that well understood as a challenge and as to what the requisites are. And as we've seen with Ebola and we've seen with Zika, it's something that's politically very porous. In the 2014 political cycle, as the Ebola outbreak in the United States, the few cases in the United States were unfolding, and as the efforts were intensifying in West Africa to bring it under control, our own political cycle dominated and made it very difficult, and it became very polarized and very difficult to have that kind of rational and serious conversation in that period.

We've had a similar phenomenon with Zika in this last cycle, dating back to the February declaration of a global emergency and the president's request to Congress shortly thereafter for a \$1.9 billion supplemental, emergency supplemental, which only eight or nine months later became possible with 1.1 billion (dollars).

There's been – it's made even more – it's made more difficult by the nature of our media, and we'll hear a bit more about that, but the cable news 24/7 cycle doesn't make things very easy in messaging. It's a challenge to Tom Frieden and others in communicating to a nervous public about how to be vigilant, not overreact and be informed. Fake news and many other alternative channels complicate that further.

Another thing we've seen with Zika and we've seen with Ebola here at home is the shaky confidence that many in our public have towards the establishment, and public health officials are no exception to that. So there's been a challenge of building that trust and confidence, penetrating a media

environment that is oftentimes terribly noisy, confused and full of disinformation and overcoming people's tendencies to see this as something that doesn't require a strategic approach.

We're going to hear more today about the Global Health Security Agenda. I want to mention a few things. One is, back in 2011 and '12 we worked with Dr. Frieden and others in the U.S. – in the Obama administration to organize a series of conversations, private conversations here at CSIS. We had a series of them over a year-and-a-half involving congressional staff, staff from the key authorizing and appropriating committees and from the leadership ranks, both parties, both chambers. I'd say we had five or six of these. And Dr. Frieden was very forthcoming and generous in participating in those along with a number of other senior officials. And there were a couple of things that came across from that. This pre-dated the launch in February of '14 of the Global Health Security Agenda.

One of the things that came forward was, yes, we understand, consciousness was rising. We understand this problem, it's not something that should divide us. It was something that was there was a shared understanding. But at the same time, there was an appeal to the executive to lead. It was something that the executive needed to get out in front of and move things forward. And out of those messages, I think, and the deliberations and the leadership that Dr. Frieden and others showed, from the White House, from CDC and from elsewhere, came this initiative, the Global Health Security Agenda, which was launched on a snowy day in February of '14. It was launched publicly here a few days later.

Now looking back almost three years later, it's gone farther and faster than anyone had expected. It's put in force assessment tools that we'll hear more about. It's moved forward a number of external – joint external assessments I think 18 or 20 countries completed; another 20 or 30 expected by May of next year. There are issues obviously about sustainment of this. Ebola played a very dramatic role in raising consciousness and creating new opportunities and new resources.

Dr. Frieden played the central and integral role here along with, of course, President Obama himself, in his role as having served as the head of CDC for almost the entire duration of the Obama administration, his leadership and exceptional longevity and continuity. He's brought remarkable energy and drive and a relentless focus on these matters of health security, among other things, and has made a dramatic impact, I believe, in connecting the domestic and the international, lifting and strengthening CDC as an institution, creating a new buzz and a new moral and pride and stature of CDC's role. I think we'll hear from Tom that over 1,400 CDC personnel served in West Africa on extended duty, which is a remarkable commitment and a remarkable thing and a remarkable legacy of what has happened.

So please join me in welcoming Dr. Frieden.

Tom, thank you so much. (Applause.)

THOMAS FRIEDEN, M.D., MPH: Thanks very much, Steve.

And thanks to CSIS for being such a wonderful, not just convener, but thought leader and partner in these critically important times.

So I want to start with two basic thoughts. The first is that from a microbial perspective it's a dangerous world out there. There are a lot of threats, some of them are known, pandemic influenza, emerging infections, resistant infections, intentionally created infections. Some of them are not known. We don't know what or where the next threat will come from. In fact, if there's one of the key lessons

from the past decade, it's that efforts to predict where the next threat will come from are fraught and unlikely to succeed.

No one predicted that the first pandemic of this century would come from Mexico, but it did. No one would have predicted MERS in the Middle East, or that West Africa would have the world's first Ebola epidemic, or that we would have had SARS in the way we did. And we don't know where the next SARS or MERS or HIV will come from, so it is a dangerous world.

I think we can look back in the last eight years and say that the United States, that Americans are safer and healthier than they were eight years ago. And that's the case because we have stronger systems in this country and around the world, laboratory systems, epidemiologists, response systems, collaboration and coordination, trained staff who are actually there to make a difference. That's the case because we've responded rapidly to emergencies.

And one of the key defining characteristics of response to health emergencies as opposed to natural disasters is that they have to be adaptive. What is the right mode of action, what is the right action at one stage of an epidemic is very different from another stage of an epidemic. And the only way to get that right is to have rapid collection, analysis and dissemination of data as you're responding to an emergency.

So in the course of the Ebola response, we were continuously looking at, how could we diagnose better? How could we isolate more safely? How could we help health care workers be safer in their care? That's not an occasional aspect of emergency response. That is an inherent aspect of emergency response in the case of health emergencies. So we're safer and healthier because we've built systems, because we've responded effectively and learned from that response and because we've done what works to save lives. We've focused on what we know can make a difference and scaled up those things that are going to protect Americans.

Now, despite that progress, we are, as I've said, not only in the U.S., but globally safer than ever from threats. And that's because we have better systems, better laboratory tools, better communications, but also we are at higher risk than ever before. And that's for many of those same reasons. We're more interconnected.

The risk of bioterrorism is real. The same tools that allow us to rapidly diagnose, come up with new treatment modalities, explore new vaccines in timeframes that are dramatically faster than ever thought possible before, those same tools can be used, quite frankly, for evil, to create more resistant, more virulent, more easily spreading bacteria and viruses. And because of that, we really are at greater risk than before, and a health threat anywhere is a health threat everywhere.

Bill Gates has made the very accurate observation that only nuclear war and a biological disaster are likely to be able to kill more than 10 million people around the world and, I'd add, more than a million Americans. I thought of that on the flight up here this morning and I remembered one of my first days as CDC director back in 2009. I met with President Obama in the Roosevelt Room as the H1N1 pandemic was scaling up. And the president looked me in the eye and he said, this isn't going to kill a million Americans, will it? And I had to hesitate for a millisecond and I said, no, Mr. President, it won't unless it evolves and changes to be more virulent than we've seen so far. I wasn't actually sure of the answer, so I went back and I asked the experts at CDC, the top of our flu program. We have fantastic flu experts. What would you have answered to that question? And they had to pause also and then come up with the same answer.

There is incidentally a misperception that the H1N1 pandemic of 2009, 2010 was mild. It was mild for older people because it turned out that some of our prior exposures provided some resistance to that infection. It was not mild for younger people. And I knew that from my time as New York City health commissioner when in the first big outbreak in a parochial school in Queens, one kid came back and soon more than a thousand kids were sick in a school of 3,000 people. So it was spread very rapidly, and our estimates are that ultimately it killed more than 1,500 American kids. So this was a serious pandemic that we responded to rapidly.

But the health threats are substantial and we are interconnected. Those include, as I mentioned, not just emerging, but also natural infections, drug resistance, the risk of intentionally created and either intentionally or unintentionally released new organisms. And of course, we don't know what the next organism will be. And the ambit of infectious diseases is constantly expanding. We're recognizing that conditions that we didn't think were infectious are, or that conditions that are infectious may contribute to noncommunicable diseases. So there's a very important interplay here and there's an enormous amount that we don't know, whether it's about the microbiome with the extent of drug resistance around the world or the most effective ways to curtail some of the greatest threats that we have. So there's a lot that we need to do, know what we need to do and haven't done, but there's a lot that we don't know yet that we need to discover.

I'm often asked what keeps me up awake at night as CDC director, and the accurate answer is nothing, I have great staff, we're on top of it, we're trying to have your back. But truly, the thing that is of most concern is the possibility of another influenza pandemic. And it's worth going back and remembering what happened during 1918 and 1919 where 50 (million) to 100 million people died around the world. There was massive global disruption. It killed more people in six months than have been killed in 24 years of the AIDS pandemic. And today is World AIDS Day with some really exciting new information just released that maybe we can go into later. And most of those killed were healthy young adults. Health care systems were overwhelmed around the world. And it was dramatic enough to substantially reduce life expectancy in the U.S. for that year.

Early on in my career as an epidemic intelligence service officer assigned to New York City, I stumbled into a supply closet where the copy machine was kept and found literally the registers on the floor from 1918 where influenza and pneumonia had not been printed as causes of death, had been written in as causes of death and added huge weekly totals. You get a sense of how a new and unexpected phenomenon can cause massive problems.

Now, the world has taken note of this and after the SARS outbreak passed the International Health Regulations. This is an important framework. It says that the world is committed to being ready to find, stop and prevent health threats. However, it was, to a great degree, a dead letter. Most of the world is still unprepared. Fewer than one in three countries even self-reported being fully prepared for outbreaks as of 2014. And the initial work of the International Health Regulations basically said that it was going to be self-assessment by the country. It was with a tool that the person who designed it told me was completely unintelligible. And there would be no public information about which countries were ready, which were not and what were the gaps. That was the plan.

And that was one of the reasons that in 2012 CDC proposed the Global Health Security Agenda. We were unable to get additional dollars for it, so we began piloting it in Uganda and in Vietnam. And we've shown that we can make rapid progress.

We launched it, as Steve mentioned, on a snowy day in February of 2014 a couple of years later. Ebola was already spreading by that time, but the world didn't know it. And the Ebola epidemic taught the world some very important lessons. The first is that speed is of the essence, that every minute counts. And this is an enormous challenge in public health because we work in public health systems, we work with international collaboration, and the speed of an epidemic is a different pace than the speed of, for example, Congress in passing an emergency supplemental request or even health systems around the world in being able to adapt.

At CDC we're fortunate to have a longstanding culture of immediate response. And when I joined CDC in 1990 I was told there were going to be opportunities to respond to emergencies, yes, for those of us in public health those are opportunities, not risks or responsibilities, but great privileges, and if you're not on the plane by the time the sun sets someone else will be. So this concept of an immediate response is really part of our DNA at CDC. But the immediacy of response is critically important.

And the second is that every country has to be ready to find threats, respond or stop them promptly and prevent them wherever possible. If there's a weak link anywhere, the chain can break and that's what happened in West Africa. Guinea had an outbreak. So did D.R. Congo a few months later. D.R. Congo stopped it, so did Uganda many times over the past decade, they stopped it. So the fact that there was a weak link in Guinea had implications for Guinea, for the region and potentially for the world.

One of the things that's least-well-recognized about Ebola is that not only was it an epidemic that shouldn't have happened if there had been core capacity in these countries, but it could have been far, far worse. In late July of 2014, the world really was on the brink of an abyss. There was the possibility that Ebola would get out of control in Lagos, Nigeria. It had already been spreading for more than a week. The initial response of the Nigerian authorities was not effective. And then Nigeria had the wisdom to put the polio eradication infrastructure in place to manage the response. And they very rapidly controlled it.

But I will tell you that my staff called absolutely frantic. Before the polio staff was put in charge, the individual in charge spent more than three hours of their scarce time of the incident management system debating what to do with an embalmed corpse that had transited through Liberia and presented no risk to anyone. And while those debates were going on, health workers who cared for the first patient were dying in the back of an ambulance with nowhere to be cared for. No contact was being traced. No place was being identified to care for patients with suspected Ebola. Diagnostic criteria and testing was not being ramped up. Nothing that was necessary to stop that outbreak from spreading was happening.

If it hadn't been stopped, there's little doubt in my mind it would have spread throughout Lagos, which had the same population as Guinea, Sierra Leone and Liberia combined, that it would have spread through much of Nigeria, Lagos has literally 10 times the transit in and out as the three West African countries, and that it could have spread for months and years, not just in Nigeria, but throughout Africa, not just killing people from Ebola, but shutting health care systems because that's what Ebola does. It scares patients and health care workers.

So that weak link is a risk to all of us. And that's fundamentally what global health security is about, strengthening systems around the world so we don't have blind spots, so things aren't happening that we don't learn about until it's too late.

The world also has to be ready to surge in when a country's capacities are overwhelmed. That can happen. It happened a few months ago in Angola when the initial response to the yellow fever outbreak there was not effective. The World Health Organization moved in, they needed an incident manager. We've created a Global Rapid Response Team I'll talk about more later, we provided that incident manager. Within weeks the outbreak was stopped. So the world has to be able to move in rapidly.

And fundamentally, we have to move from a world of non-accountability and non-assistance to a world of mutual accountability and partnership. And that's what the Global Health Security Agenda is all about. When launched, we had the participation of the World Health Organization and we've worked very closely with the World Health Organization.

The approach of the Global Health Security Agenda is very specific. It's not about vague goals. It's about measurable indicators. Have you done what you should do to keep your own people safe, your neighboring countries safe and the world safe? Have you done everything possible to prevent avoidable outbreaks, to find threats early and to respond rapidly and effectively?

There are 11 action packages that all have specific indicators associated with them. We think at CDC of four of these as the core four. Every country needs to be able to have a detection network, needs to find things when they first emerge, one. Two, every country needs to have the people who can respond effectively. And we've been able, with the funding that Congress provided for the global health security work, to dramatically increase the number of trained epidemiologists in other countries who can find and stop things there so that we don't have to be involved. Third, we need information systems so that you can see when there are signals. If you don't know every day how many cases are expected and happening, you won't be able to find a discrepancy when it occurs. And fourth, you need rapid response teams that operate out of an emergency operations center using incident management systems.

Global health security is smart spending. The cost of a pandemic is estimated to be \$6 trillion. The annual cost per person of protection against global threats is estimated to be about 65 cents. Public health is a best buy. In public health we save lives and we save money. The reason it is not invested in is that the threats are sometimes theoretical or not too visible.

I sometimes think that in public health we risk having what I would call the Cassandra curse. In public health, we see the lives and the faces behind the numbers. When we talk about 400,000 children dying from malaria per year in Africa, I think of the kids I've carried in Africa or I've seen or I've seen dying in hospitals. They're real lives to us, not statistics. But what we want to do in public health is not just see those numbers and be able to decry the terrible things happening, as Cassandra did, or that would happen, as Cassandra did, but to change that future. And we can do that by intervening rapidly and effectively.

Global health security will also support productivity and economic benefit. If we just look at the countries that we're partnering with, we're talking about hundreds of thousands of jobs in the U.S. and tens of billions of dollars. These are countries that are important to us economically.

In Guinea, I met with the ambassador, who informed me that since the beginning of the outbreak all mining activity had stopped because there was Ebola in those areas, that had previously

accounted for more than a million-and-a-half dollars per day of activity. So it was devastating for the economy of Guinea, but also for many other parts of the world economy.

And, of course, health security protects much more than just health. It is a national security issue. There are few things that can threaten us as existentially as a massive epidemic could. Protection from diseases before they reach our borders is not only an ethical thing to do, it's also an efficient thing to do. It's cheaper, it's more effective, it's quicker to stop them there so we don't have to fight them here. It promotes both economic and political stability. There are not many things that can destabilize a government as much as a widespread epidemic. It promotes U.S. economic interests. It's soft power. It's really the best diplomacy tool.

And I remember in 2010 traveling to rural Nigeria to work on the polio eradication program there. And I met with an HIV treatment program and met a woman who was holding twins. And she said to me, she said, I am HIV positive, but my babies are HIV negative. Please go back and thank the American people for me because of PEPFAR. And that's the kind of influence that the U.S. can have through effectively run programs around the world. And ultimately, it's the right thing to do. It is one of the reasons that we as a country are great.

Now, one of the challenges that I mentioned with global health security is that previously there wasn't any form of accountability. And we've changed that. We've established a system of joint external evaluation. It's transparent, it's independent, it's objective. Every country is accountable to itself and the global community, and the world is accountable to each country to try to assist them if they're a country that just doesn't have the resources to do that.

Independent assessments are key to knowing status and to filling gaps. And this map of the world shows two dozen countries that have already done assessments, another two-dozen-plus that have them scheduled, another two-dozen-or-so that have expressed interest. And we expect that by this time next year or a year or two, most countries in the world will have gone through these. And they're very rigorous. They work. They tell you, for each of the domains of health security, are you ready? And if you're not, why not? Where are the gaps that you have? And this shows you some of those ratings for the country, for the world. You can see that they vary. There's a lot of yellow here. There are reds here that aren't yet posted, but they're being finalized in Africa and elsewhere.

And soon enough, not soon enough, but relatively soon, within a year or so, you should be able to go online, click on a map like this and drill down to find out where are the strengths, where are the weaknesses in every country that's gone through this process. That will tell you where are the lab networks weak? Where is there not enough staff? Where is not a good surveillance system? Where can't they respond rapidly to an emergency? And that has a lot of implications.

If you're a donor, that gives you a road map for gaps to fill. If you're a company working there and you want to do something to keep yourself safer, you may want to address that gap. If you're a company thinking of moving to one country or another, you may want to take that into consideration. If you're a country and you're worried about whether businesses will come there and you will be able to protect your people adequately, you'll work to close those gaps. I think this is a crucially important tool going forward that holds the world accountable for the first time, that gives for the first time accurate, objective information on preparedness.

Now, Zika is the latest health threat and it really illustrates the importance of each of the global health security goals. If you look at that basic rubric of prevention, detection and response, in

prevention we need to do much better with mosquito control. We have very limited effective means to stop aedes aegypti now. We also need to expand access to voluntary, effective contraception. And we need a vaccine. It's going to take a couple of years at best, but it should be possible and we hope it will be available. But even so, we're going to need better ways to control mosquitoes because Zika won't be the last. There are literally hundreds of viruses that none of us have heard of that spread by mosquitoes.

Second, we need to detect early. And the CDC lab has done fantastic work here. They have distributed more than a million tests to more than a hundred labs around the U.S., more than a hundred countries around the world. They did this in a matter of weeks. They used modern genomics to create new tests. They're not perfect. There are better tests needed. There are quicker tests needed.

Sometimes I think in public health that we're victims of our own success. People say, well, you got rid of smallpox, polio is almost gone, all the major killers are down 99 percent in the U.S. from vaccinations, you'd expect that you'd be able to just do things immediately, like come up with a vaccine or treatment or perfect diagnosis of Zika. I feel like saying, well, if you're an engineer, why aren't we all flying around in jet packs yet, right? We're not quite there yet. We need better tools. But we've done a lot, we've made a lot of progress. However, in diagnostics, we're not yet able to distinguish the antibody reaction of Zika from the antibody reaction to dengue and other related infections. They're too similar. And we're not able to identify a Zika infection that happened many years previously. We've put out a couple of bid documents now. We have some very exciting proposals to learn to do that, but they're going to take time.

We also don't have adequate surveillance for mosquitoes and mosquito resistance to insecticides. We need to do better with that and we need better insecticides. And in terms of response, we need to advise pregnant women not to travel to places where Zika is spreading. The world is a different place now that there's Zika than it was before. It's going to change travel patterns.

We already recommend at CDC that if you have – if you have – if you're pregnant, don't go somewhere where malaria is spreading. If you're pregnant and you haven't gotten a rubella vaccine, don't go where there may be rubella. That same criteria is going to become the new normal for Zika until we have a vaccine, that if you're pregnant you shouldn't go there.

In fact, on January 15th, within just days of first identifying, seeing in the pathology lab with sophisticated PCR-based stains developed at CDC, that the Zika virus actually invades the neural tissue of the fetus, we issued the travel advisory. It was almost three months later before we could say definitively that Zika cause microcephaly. But when there's information that's good enough to advise the public, we have a responsibility and a duty to warn.

Now, the Global Health Security Agenda isn't just an idea. Because of the funding that Congress made available a couple of years ago and because of the hard work of people throughout the U.S. government and at CDC, we've made a lot of progress. And I want to take you through a whirlwind tour of some of that progress.

One is training of frontline epidemiologists in Liberia. One of the most moving experiences I had during one of my many trips to West Africa during the Ebola epidemic was traveling in Lofa County with an epidemiologist from Uganda who had been trained by CDC through the Field Epidemiology Training Program. This is a great program. It trains people in their host home countries.

Eighty percent of them stay in public health usually for an entire career, usually in positions of leadership.

And this physician from Uganda had come to Liberia and was training people in Liberia how to do infection control, how to do disease investigations. And then he wasn't just training them and leaving, he was sitting in the back of the room while they trained others within Liberia, so he was making sure that that circle of training was continuing.

But what we've done is to train epidemiologists in every county in Liberia, who are now reporting regularly. And we've done that throughout the world. So now we've greatly increased the number of trained epidemiologists. And this is crucially important because they're the folks who will run those surveillance systems, who will respond to emergencies and keep their countries and America safe.

Second, fighting cholera in Tanzania. Tanzania was one of the initial countries that happened to have a cholera outbreak around them. We were able to rapidly help them to improve treatment, identify sources, identify huge problems with the quality of the water. Here we're measuring chlorine in the tanked water system, and it was exactly zero despite the fact that it was supposed to be chlorinated.

Investigating polio – in Mali there was a vaccine-derived polio. And an FEPT graduate investigated the case; we were able to rapidly stop the spread.

Looking at infectious diseases in Pakistan, we've had a very strong partnership with Pakistan for 10 years running a Field Epidemiology and Laboratory Training Program. Those FELTP residents have been deployed as part of a national Stop Transmission of Polio Team. They've gone to every part of Pakistan, including insecure areas. They're Pakistani, they're physicians. They do so at great risk. One was shot during a violent episode and went back to work, despite significant health problems. But they've been able not just to address polio, but a variety of health outbreaks. They're strengthening the ability of Pakistan to find, stop and prevent health threats.

We've also in Tanzania developed a system for the community identification of anthrax. Anthrax is an endemic disease in much of Africa. We worry about anthrax attacks with reason. It's one of the bioterror attacks that has the greatest potential to cause harm. And it's been used, so we know it's not just theoretical, it's possible and it's there in nature. And what this was able to do is actually use and partner with the community to get a rapid data feed. We've also used health data.

And we've also had laboratories rise to the challenge in India where we've been able to greatly strengthen systems. It's quite striking. We've put into place in India surveillance systems that are finding out why are people sick, and we're finding things we did not expect. A large number of cases of leptospirosis, that's a relatively rare disease, but it's not rare in districts of India. Way more dengue than people thought was there in many parts of India. A whole lot more influenza than people thought was there. Kyasanur Forest disease, that is a hemorrhagic fever spread by ticks. And we now know that it occurs in a much wider swath of India than was known before. It is one of several hemorrhagic fevers spread by ticks, another is CCHF, Congo-Crimean hemorrhagic fever. That is also in a wider range of India than was known before. Just imagine, if instead of being worried about Lyme disease, you were worried about getting something that looked like Ebola from a tick bite, but that's not impossible.

As I said, it's a dangerous world out there from a microbial standpoint. And this is an example of using data systems, including electronic data systems, to both track a measles outbreak and then rapidly respond by vaccinating children.

In Thailand, where we've been working for more than 35 years, in fact it was the first country to have a Field Epidemiology Training Program, we've strengthened their ability to detect problems. And that's why they were able to find Zika infections there. We're still unraveling the epidemiology of Zika in Asia and Africa, but we're able to do that because there are strong systems there.

We've improved biosafety and biosecurity. This is a facility in a polio lab. I will say there was an attempted theft in Kenya last year of agents that could have been used as bioweapons. We had worked for many years in Uganda with the government and with the Department of Defense to harden the laboratories in Uganda so they're not only expert, but they're also safe and secure.

There was a meningitis outbreak in Ghana. We were able to rapidly respond and stop it. And in Sierra Leone, we've been able to dramatically improve public health management, so we're getting regular reports in and regular responses to outbreaks and health threats.

We've address MERS in Saudi Arabia with a series of investigations and partnerships there. And we've had a longstanding partnership, again, on epidemiology and labs there. And I mentioned yellow fever, in Angola, but also Uganda was able to rapidly stop it and remarkably was able to use whole genome sequencing from a handheld device and determine within days that the yellow fever strain that was causing their cluster was not the one from Angola, but actually had been in what's called the sylvatic cycle in Uganda for a few years.

Now, I talked about the need for global health security by strengthening individual countries, but there's also the need to strengthen the World Health Organization. This is really key globally. It's an organization that is challenged by over-politicization, by sometimes a lack of implementation capacity. But the bottom line is we are all stronger when the World Health Organization is stronger. It does important work. It needs to be stronger. The new director-general has a major task ahead of him or her in the future. And we need to both hold them accountable, but also support them.

Some people sometimes ask me, well, if WHO did its job, would CDC's global work be necessary? And the answer is absolutely. We have very different roles. There's no reason to think that we can assume that the World Health Organization would prioritize the health of Americans as the CDC prioritizes the health of Americans. There's no reason to assume that the World Health Organization has the laboratory or epidemiologic capacity that it needs to respond to an emergency that could threaten American lives. In fact, it has no laboratories. It relies on partner governments and partner agencies to run centers of excellence and laboratories. We have more than two dozen of them at CDC, two dozen centers of excellence or WHO-collaborating centers. No agency alone can do this. WHO is very important for its coordinating role, but it does not in any way, even if it gets this job right, detract from the critical role CDC has to play.

One of the things that we've done since Ebola is create what I like to call the GRRT, the Global Rapid Response Team. This allows us to put staff anywhere in the world within 24 to 48 hours. It also does so in a way that pre-trains, pre-qualifies and reduces some of the disruption to the agency, because it isn't easy to deploy, as Steve mentioned, 1,400 people to West Africa. We had 4,000 people who responded to the Ebola epidemic at CDC. We've had over 2,000 respond to the Zika epidemic. And Zika is, in many ways, the most complex response we've ever had because it involves not just

mosquito control and virology, but sexual health, reproductive health, birth defects, surveillance, communication issues, quite, quite, complex.

What the GRRT does is provide the ability to have a rapid response from the CDC. It's part of that rapid surge in. So remember, I said at the beginning, there are two things we need to do: strengthen governments and strengthen the world capacity move in. Strengthen governments, that's what global health security. Strengthen the global capacity to surge in, that's what World Health Organization reform is about, that's what the GRRT at CDC is about, that's what other efforts to create an emergency response fund so we can respond rapidly are about. Those are very important.

We also have to think about sustainability. And part of that sustainability will be by ensuring that countries have robust public health systems. Part of that is strengthening national public health institutes. I don't think I've been in a single country, and I've been in at least two or three dozen over the last eight years, where I haven't been asked, how can we have our own CDC? And we want countries to have their own CDC, we want them to be stronger. And we'll do everything we can to strengthen them with partnerships, with technical assistance, with some resources that we have available through the global health security funding. If they're stronger there, we're safer here.

But how secure is our future really? I think at this point going forward, the key priorities are sustainability and accountability. We need to expand the Global Health Security Agenda and establish stable funding. We are doing this on one-time supplemental funding which will run out next year. This is better than nothing, but it's not any way to keep Americans safe. We need a stable source of supporting systems in this country and around the world that keep Americans safe.

Second, we need to complete the joint external evaluations for most countries to follow through on action plans. This is a quid pro quo. A country is opening itself up, it's showing what its vulnerabilities are. Once it has demonstrated those vulnerabilities, the world has an obligation to help them close it. If it's an OECD country, it should do it on its own. Technical partnership? Great. If it's a middle-income country, technical partnership, some advice, some input, some sharing of lessons and they should be able to do it. If it's a low-income country, they should do what they can, but we're going to have to do what we need to do to keep them and us safe as well.

Fundamentally, we need to maintain accountability of low and middle-income countries to improve capacities, of OECD countries and global institutions to support countries to close gap. Fundamentally, strong country capacity reduces disease spread, increases political and economic stability, leads to a safer and more secure U.S. and the world.

At CDC, we work 24/7 to protect Americans. And going back to what I said at the beginning, it is a dangerous world out there. It's a dangerous world. And if we don't continue to invest, if we don't continue to build systems, we will be at greater risk. Because the question is not whether there will be another global health threat. We don't know where it will come from, we don't know when it will come, we don't know what microbe it will be, but we know with 100 percent certainty that there will be another global health threat and that it can threaten the health, safety and economy of America and Americans. And if we're not maximally prepared, shame on us.

Thank you very much. (Applause.)

MR. MORRISON: Thanks very much, Tom. That was so impressive, so many achievements, there's so much to talk about. I wanted to start by asking you more of a personal question. And you've

been doing this for almost eight years come this spring. And you've taken some hits, you've gone through some really difficult periods in terms of the crises that have emerged. But you've never flagged in your energy and your enthusiasm for this job. And that's really quite remarkable.

So tell us a little bit about, like, when you look back, what do you think are the most – are going to be the most vivid points in all of this for you personally? We know – we're hoping, of course, that you put pen to paper soon thereafter. But what are the most vivid personal experiences for you in the course of this remarkable period?

DR. FRIEDEN: I think the times that make the most impact are the times when we're closest to a devastating situation. Early on with H1N1, we didn't know just how bad it was going to be. And the contract through HHS for vaccines was seriously delayed. And it was only over the course of weeks, understanding that it would be a major risk for young people, not such a major risk for older people, that we could say with certainty that it wasn't going to kill a million people.

Similarly with Ebola. I talked some about the time with Lagos, but I have to say that stands out because the frustration of our team in dealing with Dr. Nasidi, who was the individual initially put in charge, who was just not effective at all. And the knowledge that urban Ebola was different, fundamentally different from every Ebola we had seen before. Once Ebola gets into an urban area, contact tracing is extraordinarily difficult.

MR. MORRISON: Yeah.

DR. FRIEDEN: We, you know, we had people in West Africa who took 11 taxis or 11 motorcycles to get from one place to the hospital. You try finding 11 motorcycle riders in West Africa. You know, it's impossible. So the risk that Ebola could have truly caused a catastrophe was just very, very real. And I don't think the world was more than a few days away from it in Lagos. Now, it could have happened also in West Africa. It was quite fortunate that it didn't get into Cote d'Ivoire or bad things could have happened there. But that moment in Lagos was, for me, the moment of maximum terror at CDC.

And with Zika, I'll never forget. Our chief pathologist, wonderful scientist, Sherif Zaki, called me over to his laboratory in mid January. We had received samples from Brazil of infants who had died in the first 24 hours with very severe microcephaly. And he had discovered, developed a PCR-based stain to show the Zika virus in their neural tissue. And it was horrifying because this is what we call a neurotropic virus. It attacks the brain and grows in the brain. And what we could see under the microscope was a huge number of Zika virus particles attacking the infant brain. And it was because of that that we moved very quickly to issue the travel warning.

So I think probably the most vivid times are those times when there's a huge threat and you know that you've got to move in minutes or hours to respond to it and that that can make a huge difference, that can change the course of an epidemic.

MR. MORRISON: And looking back, how do you think this has changed you personally? How do you think you're different from where you were when you entered?

DR. FRIEDEN: You know, it's hard to give that answer. I was – by change, I was with a reporter who was doing an article about me actually when – and it had been planned for weeks in advance, during the absolute height of the Ebola crisis. And she was in my office and I was on the

phone with a senator. And I was on hold for a minute, and she said, you know, isn't this stressful for you? And I said, no, actually.

India was stressful. I worked in India for five years. And for five years in India, the program was on the brink of failure and on the brink of success. And when I got to India in 1996, more than half-a-million people in India were dying every year, more than a thousand every day, from tuberculosis which is a completely curable condition. And every day for five years, I had to face the knowledge that a thousand people had died that day and we hadn't yet implemented a program as effectively as possible. And the challenges were enormous.

We were able to get a good program up to cover the country. Not perfect, lot of problems still, has saved 3 million lives, but a lot of problems still. But that was much more stressful for me than the CDC situation. And part of that is because we have great staff. One of the things to understand about the CDC beyond the fact that we work 24/7 to protect Americans is that we're effective at doing that because we're both broad and deep.

If you look at any problem in health, you've got some of the world's experts at CDC. And that is so crucially important because when it came time, for example, to look at Zika, we had the world's experts in birth defects and congenital malformations. So I think CDC has the ability to really rise to the occasion because it has such a strong foundation.

For myself, I would say there's a bigger difference than I would have appreciated before between working at the federal level and working at the city level. In New York City as health commissioner for eight years, it was much easier, in some ways, to have an idea that would save lives, propose it, get it funded, implement it, evaluate it. At the federal level, that moves rather more slowly.

MR. MORRISON: So you have had to adopt a different kind of political persona, really a strategy of moving your agenda. I mean, I remember, during the Ebola crisis, you know, in the summer of '14 as things were getting very difficult in July and August and becoming more visible, but there was a great deal of confusion in our government about what we were going to do. And you took a trip to West Africa in August and came back and there was this moment, end of August, Labor Day, that was really the turning point. And it really came – it was that things were mushrooming, but it was more than that, I think, that you came back and confronted our decision-makers with the realities that you had observed. And that was not particularly welcome news.

And then by September into October and November as things – as we confronted all of the calls for closing our borders, not allowing circulation of health workers, it got into the Twittersphere. You know, all of those intensified things. That was when you came under death threats. I mean, that was something that you told us about. And it was – your leadership became a magnet, in a way, for a lot of anxiety that welled up in that period.

DR. FRIEDEN: What I stuck to in that time was the simple thought, do the right thing, tell the truth, and it will work out. And I think that's what we did. I came back end of August, early September, and I was – I had known things were getting out of control and I had known that things were on an exponential increase. In fact, I had name-requested Martin Meltzer, one of our great modelers at CDC, to come up with a model of what might happen and what might we do to change the trajectory of the epidemic.

And one of our most experienced Africa experts, who has worked for decades there, sent in to one of the countries and it was clear talking to him that he was emotionally destabilized by this. And I thought this is as experienced a person as we have in global health. And if he can be destabilized by this, it must be terrible. And it was that experience that led me to say I've got to go.

I went and it was astonishing. It was like scenes out of "Dante's Inferno," scenes I will never forget. And I've been in famine and war and earthquake and hurricane and epidemics, seen a lot of death in the work I do, not easy, but this was different. The idea that you had so many people dying that you couldn't even remove the corpses. That you had the one few facilities that were caring for patients and they were so overwhelmed they couldn't provide even minimal basic care. That you had health systems that were shut. So you knew what was happening was that people weren't getting emergency Caesarian sections when they needed them, they weren't getting vaccines, they weren't getting treatment for TB and HIV and malaria. And we showed that more people died actually because of Ebola than from Ebola because there were so many deaths.

So I think it was important to make clear the reality and tell it like it is. I met with each of the heads of state in each of the three countries and I told them international assistance will not come fast enough. The epidemic will get out of control before the world can react. You have to marshal whatever strengths you have in the community to respond. In fact, that's what turned the tide in Liberia early on.

I came back and told people here. The president described me – I talked to the president on September 1st. Two weeks later he came to CDC and announced the whole-of-government response, the request to Congress, defining it as a national security threat, involving the military in a very important role. Ambassador Malac, the ambassador to Liberia, has pointed to that day as the turning point, from her perspective, when Liberia realized the world wasn't going to abandon them.

President Obama met with our staff to thank us, talk to us, and he described that phone call I had had with him two weeks earlier as my having been, quote, "a little agitated" – (laughter) – which I was. I met with the World Bank and I told them, quite frankly, it's like trying – what we're doing now is the equivalent to trying to stop a raging elephant with a peashooter. We're just massively over-matched by how the epidemic was raging.

I met with the United Nations and I showed them what might happen and urged them to be involved and to try to not do the irrational things that countries in Africa did that were counterproductive in terms of restricting transport and to get their own systems ready. So I think you start with do the right thing and tell the truth and it will come out all right.

MR. MORRISON: Thank you. We're getting short on time. On the Global Health Security Agenda that you've detailed where we are and the achievements up to now and you've flagged that money – the billion-dollar appropriation will – emergency appropriation will be expended by the end of next year.

I'm worried about the ability to sustain these gains, I'm worried both with respect to Congress and the next administration embracing this and moving it forward. And I think what you did today is terribly important in getting that record out there so that people have those reference points, they get it, it's comprehensible, it's intelligible, it's powerful. But I'm also worried about the broader environment in terms of who's going to pick this up, because this agenda requires high-level political leadership to embrace this.

I mean, it was President Obama agreeing to the basic proposition that we could form this alliance, we could move this agenda forward, that others would come in. And say a bit more about that. I mean, are we going to – we know we're going to have lots of turnover at WHO, UNDP, UNICEF. We have António Guterres now as the new secretary-general, a very promising, I think, very promising appointment. What's your thinking about how do we put together a political strategy for this next period, not just focused on Washington, but more broadly?

I realize this isn't necessarily your job description, but to sustain these gains requires, you know – we can't assume that we're going to have another Ebola that suddenly puts people all back in focus, right? It could be something much more low grade and that continued sort of austerity, populous pressures, inwardness, skepticism that's accumulating around this, the memories of Ebola fading. What's your thinking?

DR. FRIEDEN: I think of it as a relay race with a baton. And if you look back, you can go back decades to the creation of the first biosecurity, high-security labs at CDC, work that's been done for many years on a broad range of issues. Look at smallpox eradication where the United States and the then Soviet Union worked together because health can be a bridge, even when there's conflict.

The George W. Bush administration did very important work on influenza, so they greatly increased our ability to find it and improved our tools to respond to it. Created the strategic national stockpile which currently has \$7 billion of product in it to protect Americans.

I think this is a bipartisan issue. I think it's an issue that everyone can understand. It's about keeping Americans safe. And that's what CDC does 24/7. That's what global health security, whatever you want to call it, does. It's about strengthening systems around the world so we can stop epidemics there and don't have to fight them here. It's analogous to terrorism. Its analogous to other threats to America. But it's a threat that could kill a lot of people if we don't pay attention to it.

What's why it's important to do a few things. One is to continue to provide the information on what the threats are. Two, to continue to provide the information on or provide the information on what's happening because there's a lot – there are a lot of good developments.

I mentioned in this talk some examples in the last just year or two of dramatically stronger health systems that, well, to give you a very specific example. Since the Ebola epidemic ended in West Africa, there have been seven clusters of Ebola. All of the probably emerged from sexual transmission of Ebola, something we didn't know about before this outbreak. All of them were rapidly identified and rapidly stopped, usually with local leadership. So any of those seven could have become another epidemic, but didn't, and that's with the investment that we've had. We have to keep up that investment. We have to show that there's progress, show that there's a threat, also show that there are other countries contributing.

If you look globally, many countries are doing a lot in this area within their own borders. We're seeing G-8 and G-20 commitments. We're seeing commitments from the World Bank, very important surveillance initiative that's going to spend \$300 million in West Africa on this. So the U.S. doesn't have to go it alone. If we pull back, others will pull back. If we continue to invest, others will continue to invest, and we'll have a safer world.

It's really part of the global commons. There are free riders here, but the U.S. can never be a free rider because if we pull back, the world will get to be a much more dangerous place.

MR. MORRISON: Thank you.

I apologize to our audience, we've run out of time. Please join me in thanking Dr. Frieden.
(Applause.)

Thank you so much. Thank you so much for being with us.

DR. FRIEDEN: Thank you.

MR. MORRISON: And thanks so much for your leadership.

(END)