

THE STATE OF U.S. PUBLIC HEALTH BIO-
PREPAREDNESS: RESPONDING TO BIOLOGICAL
ATTACKS, PANDEMICS, AND EMERGING INFEC-
TIOUS DISEASE OUTBREAKS

HEARING
BEFORE THE
SUBCOMMITTEE ON OVERSIGHT AND
INVESTIGATIONS
OF THE
COMMITTEE ON ENERGY AND
COMMERCE
HOUSE OF REPRESENTATIVES
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¹ The committee did not receive a response to Ms. Schuchat's submitted questions for the record by the time of printing.

² The committee did not receive a response to Ms. Hinton's submitted questions for the record by the time of printing.

³ The information can be found at: <https://docs.house.gov/meetings/IF/IF02/20180615/108422/HHRG-115-IF02-20180615-SD003.pdf>.

THE STATE OF U.S. PUBLIC HEALTH BIO- PREPAREDNESS: RESPONDING TO BIOLOGI- CAL ATTACKS, PANDEMICS, AND EMERGING INFECTIOUS DISEASE OUTBREAKS

FRIDAY, JUNE 15, 2018

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The subcommittee met, pursuant to call, at 9:01 a.m., in room 2123, Rayburn House Office Building, Hon. Gregg Harper (chairman of the subcommittee) presiding.

Present: Representatives Harper, Griffith, Burgess, Brooks, Collins, Walberg, Walters, Costello, Carter, Walden (ex officio), Degette, Schakowsky, Castor, Ruiz, and Pallone (ex officio).

Also Present: Representative Eshoo.

Staff Present: Jennifer Barblan, Chief Counsel, Oversight and Investigations; Adam Fromm, Director of Outreach and Coalitions; Ali Fulling, Legislative Clerk, Oversight and Investigations, Digital Commerce and Consumer Protection; Christopher Santini, Counsel, Oversight and Investigations; Jennifer Sherman, Press Secretary; Alan Slobodin, Chief Investigative Counsel, Oversight and Investigations; Austin Stonebraker, Press Assistant; Christina Calce, Minority Counsel; Jeff Carroll, Minority Staff Director; Chris Knauer, Minority Oversight Staff Director; Miles Lichtman, Minority Policy Analyst; C.J. Young, Minority Press Secretary; and Perry Lusk, Minority GAO Detailee.

OPENING STATEMENT OF HON. GREGG HARPER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MISSISSIPPI

Mr. HARPER. Good morning. Today, the subcommittee continues its longstanding oversight of the U.S. public health system's preparedness to respond to biological threats and emerging infectious diseases that endanger the public health. The purpose of today's hearing is to hear from top public health experts on the good work being done at their agencies to protect the public and to explore where improvements need to be made.

The biological threats facing the United States in today's global society are varied, ever-evolving and, in some cases, intensifying. The CDC just reported that the seasonal influenza claimed the lives of 172 children during the most recent flu season, making it the deadliest seasonal flu season for children on record.

In recent years, the U.S. has also seen an increase in the number of antibiotic-resistant bacteria. Around the world, viruses are emerging, adapting and, in some cases, reemerging. Currently, there is an Ebola outbreak in West Africa and a Nipah virus outbreak in India that has killed at least 17.

In recent years, we have also seen humans in China contract the H7N9 strain of influenza which has been confined to birds. The H7N9 influenza strain is rated by the CDC's influenza risk assessment tool as posing the greatest risk to cause a public pandemic.

The 2013 ricin mailings addressed to President Obama and Senator Roger Wicker that originated in my home State of Mississippi, as well as the 2001 anthrax mailings and foreign terrorist threats, is a reminder of the risk of intentional biological attacks.

Today's hearing is especially timely, given that the committee is considering bipartisan legislation sponsored by Mrs. Brooks and Ms. Eshoo to reauthorize the Pandemic and All Hazards Preparedness Act, PAHPA, which is set to expire at the end of September. Passage of PAHPA's reauthorization would not only provide critical certainty for public health agencies and industry partners, it would also bring about some much needed reforms. One such reform proposed in the legislation is transferring control of the Strategic National Stockpile from the CDC to HHS' Office of the Assistant Secretary for Preparedness and Response, to improve management of the stockpile.

A year ago, HHS' Office of Inspector General reported systemic issues with security and inventory management of the stockpile, risking CDC's ability to deploy the stockpile during a public health emergency. These issues need to be addressed, as does improving the training of State and local stakeholders on deployment of medical countermeasures.

Administrative reforms are also of interest. For example, are there ways to improve the timeliness of the decisionmaking process on threat assessments and appropriate countermeasures? Effective threat detection has been a subject of committee oversight. In 2016, the committee questioned the CDC about the effectiveness of its Laboratory Response Network, or LRN, which is responsible for developing assays for public health labs to test for the presence of Federal select agents.

In a May 2017 letter to the committee, the CDC reported that the LRN had only developed three assays approved by the FDA to detect specific Federal select agents. While the LRN has also had those cleared by the FDA under emergency use authorization, after nearly 20 years of this program, with about \$135 million in funding over the last decade, could the LRN have cleared a significantly higher number of assays through the most rigorous FDA 510(k) process?

Finally, maintaining public confidence in critical Federal bio-preparedness research is essential. In response to safety lapses in 2014 and to an expert panel's recommendations, the CDC and FDA each formed new offices in 2015 to centralize and elevate oversight of laboratory safety, with the directors of those offices reporting directly to the agency head.

These changes sent a strong message that lab safety was a top priority, backed by the clout of direct backing from the agency

head. Unfortunately, both agencies seem to be backtracking from this good direction.

In the FDA's case, less than a year after this administration approved the direct report organization—or reorganization, the sudden change is curious and would seem to be a step in the wrong direction. So we need to hear more details about the basis for this new direction.

I would like to thank the distinguished members of our panel for being here today and for your service to our country.

I now recognize the ranking member of the subcommittee from Colorado, Ms. DeGette, for 5 minutes.

[The prepared statement of Mr. Harper follows:]

PREPARED STATEMENT OF HON. GREGG HARPER

Good morning, today the Subcommittee continues its long-standing oversight of the U.S. public health system's preparedness to respond to biological threats and emerging infectious diseases that endanger the public health. The purpose of today's hearing is to hear from top public health experts on the good work being done at their agencies to protect the public, and to explore where improvements in bio-preparedness may still be needed.

The biological threats facing the United States in today's global society are varied, ever-evolving, and in some cases, intensifying. The CDC just reported that the seasonal influenza claimed the lives of 172 children during the most recent flu season, making it the deadliest seasonal flu season for children on record. In recent years the U.S. has also seen an increase in the number of antibiotic resistant bacteria.

Around the world, viruses are emerging, adapting, and in some cases, re-emerging. Currently, there is an Ebola outbreak in West Africa and a Nipah virus outbreak in India, that has killed at least 17 people.

In recent years, we have also seen humans in China contract the H7N9 strain of influenza, which had been confined to birds. The H7N9 influenza strain is rated by the CDC's Influenza Risk Assessment Tool as posing the greatest risk to cause a possible pandemic.

The 2013 ricin mailings addressed to President Obama and Senator Roger Wicker that originated in my home state of Mississippi, as well as the 2001 anthrax mailings and foreign terrorist threats, is a reminder of the risk of intentional biological attacks.

Today's hearing is especially timely given that the Committee is considering bipartisan legislation, sponsored by Ms. Brooks and Ms. Eshoo, to reauthorize the Pandemic and All-Hazards Preparedness Act (PAHPA), which is set to expire at the end of September. Passage of PAHPA's reauthorization would not only provide critical certainty for public health agencies and industry partners, it would also bring about some much-needed reforms.

One such reform, proposed in the legislation, is transferring control of the Strategic National Stockpile from the CDC to HHS' Office of the Assistant Secretary for Preparedness and Response to improve management of the Stockpile. A year ago, HHS's Office of Inspector General reported systemic issues with security and inventory management of the Stockpile, risking CDC's ability to deploy the stockpile during a public health emergency. These issues need to be addressed, as does improving the training of state and local stakeholders on deployment of medical countermeasures.

Administrative reforms are also of interest. For example, are there ways to improve the timeliness of the decision-making process on threat assessments and appropriate countermeasures?

Effective threat detection has been a subject of Committee oversight. In 2016, the Committee questioned the CDC about the effectiveness of its Laboratory Response Network (LRN), or LRN, which is responsible for developing assays for public health labs to test for the presence of federal select agents. In a May 2017 letter to the Committee, the CDC reported that the LRN had only developed three assays approved by FDA to detect specific federal select agents. While the LRN has also had assays cleared by the FDA under Emergency Use Authorization, after nearly 20 years of this program with about \$135 million in funding over the last decade, could the LRN have cleared a significantly higher number of assays through the more rigorous FDA 510(k) process?

Finally, maintaining public confidence in critical federal biopreparedness research is essential. In response to safety lapses in 2014 and to an expert panel's recommendations, the CDC and FDA each formed new offices in 2015 to centralize and elevate oversight of laboratory safety, with the directors of those offices reporting directly to the agency head. These changes sent a strong message that lab safety was a top priority backed by the clout of direct backing from the agency head. Unfortunately, both agencies seem to be backtracking from this good direction, in the FDA's case less than a year after this Administration approved the direct-report reorganization. The sudden change is curious, and would seem to be a step in the wrong direction. We need to hear more details about the basis for this new direction.

I would like to thank the distinguished members of our panel for being here today and for your service to our country. I now recognize the Ranking Member of the Subcommittee from Colorado, Ms. DeGette, for 5 minutes.

OPENING STATEMENT OF HON. DIANA DEGETTE, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF COLORADO

Ms. DEGETTE. Thank you, Mr. Chairman.

I know we agree that preparing this country for a bioincident is of critical importance. The threat, as you said, is real and it's growing.

In April, the CDC reported that in 2017, Colorado saw 25 cases of an antibiotic-resistant bacteria known descriptively as the nightmare bacteria, because 50 percent of those infected by it die. Thankfully, those cases were isolated, but the same CDC study noted that it's possible for these germs to "spread like wildfire." If that happens, we need to know that we're able to respond.

We've looked at this issue in this subcommittee many times over the years, as our panel well knows. It's a regular appearance, and I want to thank you for coming again. And again and again, we've found that the Federal Government has to scramble to address biosafety incidents.

Those of us who were here during the fall of 2001 vividly recall the chaos that a few small envelopes of anthrax caused on Capitol Hill. Offices were closed. Buildings were fumigated. Some congressional business was suspended, and thousands of staffers and other personnel lined up for days to get tested for exposure. Far worse, some of the workers in our Postal Service were infected and died.

In 2009, we again had to scramble to produce sufficient doses of the H1N1 swine flu vaccine to protect against this new strain of the disease.

In 2014, hospitals and healthcare providers were not adequately prepared to deal with the arrival of Ebola patients in America. In one case, a hospital in Dallas failed to diagnose Ebola in a patient who had traveled to West Africa and discharged him. The virus was later transmitted from that patient to two healthcare workers. In the days and weeks that followed, important questions were raised about how this event was handled and were we adequately prepared for the larger event.

And then, of course, in 2015, the Zika outbreak underscored the need for the U.S. Government to focus on disease preparedness every day. And I know our panel here today does just that.

I'd like to know today, though, what lessons we've learned from these incidents, and I want to know how the agencies are using what we've learned to better prepare for the next crisis, because there will be one.

For example, do we have adequate medical countermeasures in place to respond quickly when an outbreak occurs or a toxin is released? Do we have the capacity to quickly deliver these countermeasures to the doctors and nurses who will actually use them? And do the healthcare workers understand how to deploy the countermeasures?

Similarly, research into emerging pathogens and existing pathogens that have mutated is key to helping us quickly respond to new and expanding outbreaks. How is this research informing our surveillance and detection methodologies? Are we prioritizing research into threats of greatest concern? And are we dedicating adequate resources to the threats?

I also want to hear more about how all of our agencies—CDC, ASPR, NIAID and FDA—coordinate their research, surveillance, and response efforts. Because while each one of these agencies today has a specific valuable role to play in ensuring preparedness, nobody can operate effectively alone.

In fact, one major finding of the Blue Ribbon Panel's 2015 report on biodefense preparedness was these agencies must ensure they're equipped to work together to respond to pandemics. The Blue Ribbon report also found that the Federal Government must dramatically increase the support provided to local jurisdictions to help them build and sustain their biodefense capabilities.

Local providers like hospitals and healthcare workers will be on the front lines in a public health emergency. I want to ensure that we're adequately supporting these providers, as well as State and local Health Departments, so they are equipped to detect incidents when they happen and respond appropriately.

Mr. Chairman, I'm really hoping we'll hear today that we've made tangible, measurable progress in this area, but, again, I urge us to revisit the work of the Blue Ribbon Panel and some of its findings to determine what more we need to do to better prepare the Nation for the threats that we will be discussing today.

I just can't thank our panel today enough for the tireless work that they put in to keeping America safe. We always have a great opportunity to hear from you, and we know that you're working hard. We think by having you come up here and take the time, it really helps us represent our constituents, and it helps all of us be better prepared for the next emergency that faces us.

Thank you, and I yield back.

Mr. HARPER. The gentlewoman yields back.

The chair now recognizes the chairman of the full committee, the gentleman from Oregon, Mr. Walden, for 5 minutes.

OPENING STATEMENT OF HON. GREG WALDEN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF OREGON

Mr. WALDEN. Thank you very much, Mr. Chairman. To all our committee members, thanks for your work on this. And to our panelists, thank you, not only for your guidance on this issue, but also what we tap into you for along the way. And so we appreciate your professionalism and your assistance in our policy debates.

The topic of biopreparedness really hits home for me. I think I was the first Member of Congress to be diagnosed with H1N1 years ago. Not a distinction I was glad to get, but one apparently I had.

But more than that, 30 years ago, a religious group called the Rajneeshees moved to Oregon. You may have seen the documentary on Netflix called *Wild Country*. And if you read Judith Miller's book *Germs*, you'll find it was the largest bioterror attack in the Nation's history, but it took the Federal Government a year, I think she wrote, to admit that that's really what it was. They grew their own salmonella and then sprinkled it over salad bars in Dalles, Oregon, and sickened 751 people, many of whom I know.

Deliberate biological attacks are just one risk. With more global travel, there's, of course, increased risk of spread of infectious diseases. As we've seen with influenza, our vaccines must be constantly updated to keep up with the latest strains. Meanwhile, other pathogens can develop antibiotic resistance, and our ability to quickly recognize evolving diseases and respond to new outbreaks is reliant on the testing and treatment and capabilities in the men and women who do the work that you all oversee.

Lack of preparation is not an option. A mock pandemic exercise hosted last month by Johns Hopkins Center for Health Security with a group of current and former government officials, including our own colleague Susan Brooks, I'm told was quite eye-opening. The exercise resulted in a failure to develop a vaccine within 20 months, and that led in this exercise to 150 million deaths globally. So obviously, we've got to do more to be prepared for these types of outbreaks.

So that's where the reauthorization of the Pandemic and All Hazards Preparedness Act comes in. PAHPA originally was adopted in 2006. It's set to expire at the end of September. We intend to move forward with legislation prior to that.

Our Health Subcommittee met just last week to consider a bipartisan discussion draft to reauthorize this law and continues to fine-tune it. It's critically important Congress reauthorizes this law in time and to make sure that all levels of government are well-equipped to handle, not just current and emerging biothreats, but also chemical attacks, radiological emergencies, cybersecurity incidents, and mass casualty events.

Through letters, hearings, and investigations, the Committee has raised numerous issues regarding biological threats to the U.S. and our nation's ability to respond to infectious disease outbreaks. For example, the Committee has examined concerns about the CDC's management and the security of the Strategic National Stockpile and the capabilities of CDC Laboratory Response Network. The Trump administration is set to transfer management of the stockpile from the CDC to the Assistant Secretary for Preparedness and Response, known as ASPR. And we look forward to hearing more details about how this transfer will work.

Another area of interest to the Committee is the improvement of our biosurveillance capabilities. Innovation in this field could bolster our public health response in the event of an attack or epidemic. So I'll be interested in learning more about that as well.

One thing we do know, the Federal Government needs to act faster to identify and determine material threats. The Department of Homeland Security in March 2018 made a material threat determination for pharmaceutical-based agents such as Fentanyl. It took 2 years for the DHS to make this designation, yet carfentanil, a

highly potent form of Fentanyl, was used in a terrorist attack more than 15 years ago. So it's only after that designation is made that the Public Health Emergency Medical Countermeasures Enterprise can approve countermeasure development and acquisition. If we knew about it 15 years ago and it took 2 years to get that designation, we can do better.

Maintaining public support for critical biopreparedness research relies on Federal scientists and researchers working with these diseases and dangerous pathogens in a safe and secure manner. Following several safety lapses at CDC and FDA labs in 2014, both FDA and CDC created new offices to oversee and prioritize lab safety. These are positive steps. The recent proposals at these agencies to lower the status of their lab safety offices raises concerns with this committee.

So I thank you for being here today.

And I'd like to yield the balance of my time to Dr. Burgess and hopefully to Mrs. Brooks.

[The prepared statement of Chairman Walden follows:]

PREPARED STATEMENT OF HON. GREG WALDEN

Mr. Chairman, thank you for holding this hearing. The topic of biopreparedness hits home for me. Some of you may recall that in 2009 I was diagnosed with H1N1—the swine flu. It was reported at the time that I was the first Member of Congress to contract swine flu—a distinction I'm not particularly proud of. But that's not all. The first and single largest bioterrorism attack in the U.S. occurred in my district. More than 30 years ago, a group of Rajneeshee cult members used salmonella to contaminate at least 10 restaurant salad bars in The Dalles, Oregon, causing at least 751 people to get ill.

Deliberate biological attacks are just one risk. With more global travel, there is increased risk of the spread of infectious diseases.

As we've seen with influenza, our vaccines must be constantly updated to keep up with the latest strain mutations. Meanwhile other pathogens can develop antibiotic resistance. Our ability to quickly recognize evolving diseases and respond to new outbreaks is reliant on our testing and treatment capabilities.

Lack of preparation is not an option. A mock pandemic exercise hosted last month by Johns Hopkins Center for Health Security with a group of current and former government officials, including our colleague Susan Brooks, was eye opening. This exercise resulted in a failure to develop a vaccine within 20 months and led to 150 million deaths globally. We must do more. We must be prepared for potential outbreaks.

That's where the reauthorization of the Pandemic and All-Hazards Preparedness Act (PAHPA) comes in. PAHPA, originally adopted in 2006, is set to expire at the end of September. Our Health Subcommittee met just last week to consider a bipartisan discussion draft to reauthorize this law and continues to fine tune it. It is critically important Congress reauthorizes this law to ensure that all levels of government are well-equipped to handle not just current and emerging biothreats, but also chemical attacks, radiological emergencies, cybersecurity incidents, and mass casualty events.

Through letters, hearings and investigations, the committee has raised numerous issues regarding biological threats to the U.S. and our nation's ability to respond to infectious disease outbreaks. For example, the committee has examined concerns about the CDC's management and security of the Strategic National Stockpile, and the capabilities of the CDC Laboratory Response Network. The Trump Administration is set to transfer management of the stockpile from the CDC to the Assistant Secretary for Preparedness and Response (ASPR), and we look forward to hearing more details about how this transfer will work.

Another area of interest to the committee is the improvement of our biosurveillance capabilities. Innovation in this field could bolster our public health response in the event of an attack or epidemic. I will be interested to learn whether more intensive research could help expedite addressing the technical challenges.

One thing we do know: The Federal Government needs to act faster to identify and determine material threats. The Department of Homeland Security (DHS) in

March 2018 made a material threat determination for pharmaceutical-based agents such as fentanyl. It took 2 years for DHS to make this designation. Yet carfentanil, a highly potent form of fentanyl, was used in a terrorist attack more than 15 years ago. It's only after that designation is made that the Public Health Emergency Medical Countermeasures Enterprise can approve countermeasure development and acquisition. We must move faster.

Maintaining public support for critical biopreparedness research relies on federal scientists and researchers working with these diseases and dangerous pathogens in a safe and secure manner. Following several safety lapses at CDC and FDA labs in 2014, both CDC and FDA created new offices to oversee and prioritize lab safety. These were positive steps, but recent proposals at these agencies to lower the status of their lab safety offices raise concerns.

I'd like to thank our witnesses for being here with us today. We value the feedback and insight you provide and look forward to today's discussion.

Mr. BURGESS. Thank you, Mr. Chairman.

And this issue is one that is important and timely for this subcommittee. And last week, the Health Subcommittee had a hearing on the discussion draft of the Pandemic and All Hazards Preparedness Act authored by Representatives Brooks and Eshoo. At that hearing, we heard from witnesses with firsthand experience in combating these biological threats to our nation and received input on the draft legislation.

Certainly, our witness panel today is well-known to us and they are all experts. I look forward to hearing from our witnesses.

And I thank you, Mr. Chairman, and I will yield to Mrs. Brooks.

Mr. HARPER. Maybe with unanimous consent, due to your leadership role in this, 30 seconds.

Mrs. BROOKS. Thank you, Mr. Chairman.

And thank you to our witnesses for your work on this public health and national security issue.

Last February, our subcommittee here held a hearing examining how we best combat biological threats. And I'm pleased we're once again examining the state of our preparedness as we prepare to reauthorize PAHPA.

As everyone here knows, it is not a question of if we face a threat; it's a question of again, once again, when we face a threat. And we've been reminded by the stories that we've heard here today that these types of incidents have already happened in our country over the last decade and a half.

Created in 1999, the National Stockpile is the repository of vaccines, antibiotics, and supplies used in the event of an attack or an outbreak. But HHS OIG, in June of 2017, issued a report identifying serious systemic issues within the CDC's management of the stockpile.

I look forward to hearing from our witnesses today how we are going to ensure that our stockpile is properly managed and that we can be prepared as a country for whatever threat we are and may face.

I yield back.

Mr. HARPER. The chair now recognizes the ranking member of the full committee, the gentleman from New Jersey, Mr. Pallone, for 5 minutes.

OPENING STATEMENT OF HON. FRANK PALLONE, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Mr. PALLONE. Thank you, Mr. Chairman.

Ensuring that our nation is equipped to respond to pandemics, natural disasters, and the accidental or intentional release of toxins is a key part of protecting public health. Past work by this committee has suggested that our nation has not always been as prepared as we need to be, so I'm glad that we're having this hearing today, and I hope to hear that we have made tangible progress towards increasing our Nation's preparedness.

In 2015, the Blue Ribbon Panel on Biodefense conducted a comprehensive review of the Federal Government's biopreparedness efforts. The panel found that, "The Nation is dangerously vulnerable to a biological event." It produced an extensive report recommending 30 action items for our public health infrastructure to address.

While the Blue Ribbon Panel was the most recent high-level commission to examine our nation's biopreparedness, it was not the first. In fact, for many years, experts have warned that our ability to respond to biologic and other emerging threats must be improved.

These recommendations remain important today, because the emerging health threats this country faces continue to grow. Just this week, officials announced that a child in Idaho had contracted bubonic plague. Last year, an outbreak of this plague killed 200 people in Madagascar.

In March, we heard at a hearing that the threat of pandemic flu is among the greatest concerns in the public health world. And antibiotic resistance also poses a major threat to public health, killing 23,000 Americans every year and making everyday procedures like surgery and chemotherapy increasingly risky. In May, a study showed that warming temperatures were associated with higher levels of antibiotic resistance in common strains of bacteria.

Extreme weather events can also lead to serious public health emergencies. The hurricanes in Puerto Rico, the Virgin Islands, Texas, and Florida last year were a stark reminder of this fact. We must be prepared to address threats from all these sources.

The Blue Ribbon Panel produced many recommendations for improving our biopreparedness, and I hope our witnesses will show that we have made real progress. For example, I hope to hear that the agencies have established a plan for who will take the lead in response to a public health threat and how the efforts will be coordinated.

Along these same lines, I hope we will learn how CDC, NIH, ASPR, and FDA are working together to identify the greatest threats and to prioritize the research, surveillance, and response capabilities needed to target these threats.

We must also focus on how these agencies collaborate with State and local health departments as well as healthcare providers, such as hospitals. These entities are likely to be the first to see patients impacted by an infectious disease outbreak or other incident. In most cases, they'll be the ones to dispense countermeasures and to treat those impacted.

In 2014, for example, we witnessed the negative consequences that ensued when our healthcare infrastructure was unprepared to diagnose and treat patients with Ebola. A hospital failed to detect the disease in the patient in Dallas, and that patient later transmitted Ebola to two healthcare workers. This incident led to a serious question about whether we would be able to handle a larger scale event or incident. And we must make sure everyone on the ground has all the resources they need to respond effectively in such a crisis.

We also want to hear more about how we are conducting surveillance so that when an outbreak happens or a toxin is released, we know as soon as possible. While we cannot anticipate every possible new or mutated pathogen, if we can quickly detect when such a pathogen has emerged, we can respond much more effectively.

And along these same lines, I understand the CDC is gathering a substantial amount of data from laboratories, public health departments, and clinicians across the country every day. So we must ensure that this agency has the resources it needs to effectively use and analyze this data as it comes in.

And finally, I want to hear more about what we're doing to prioritize development of medical countermeasures to help us respond to a biosafety incident. Countermeasures include preventative measures like vaccines as well as therapeutics like antibiotics and antivirals.

BARDA, I understand that you work closely with the private sector to develop many of these products, and I hope that we will hear today about how these partnerships have produced useful, safe, and effective products that truly address the challenges we face.

So, Mr. Chairman, I'd like to thank our panel once again for being here. Preparing for these threats is certainly not easy, but I'm confident that you're up for the task as long as we do our part and provide you with all the resources that you need.

I yield back, Mr. Chairman.

Mr. HARPER. The gentleman yields back.

I ask unanimous consent that the members' written opening statements be made part of the record. Without objection, they will be so entered into the record.

And additionally, I ask unanimous consent that Energy and Commerce members not on the Subcommittee on Oversight and Investigations be permitted to participate in today's hearing. Without objection, so ordered.

I would now like to introduce our witnesses for today's hearing. First, we have Dr. Rick Bright, Director of Biomedical Advanced Research and Development Authority and Deputy Assistant Secretary at the Office of the Assistant Secretary for Preparedness and Response. Next is Dr. Anne Schuchat, Principal Deputy Director at the Centers for Disease Control and Prevention. Then we have Dr. Anthony Fauci, Director of the National Institute of Allergy and Infectious Diseases at the National Institutes of Health. Finally, we have Rear Admiral Denise Hinton, Chief Scientist at the U.S. Food and Drug Administration.

We welcome all of you.

And you are each aware that the Committee is holding an investigative hearing and when doing so has had the practice of taking

testimony under oath. Do you have any objection to testifying under oath?

Let the record reflect that all of the witnesses have reflected that they do not.

The chair then advises you that under the rules of the House and the rules of the committee, you're entitled to be accompanied by counsel. Do you desire to be accompanied by counsel during your testimony today?

Let the record reflect that each of the witnesses reflected that they do not.

In that case, if you would please rise and raise your right hand, I will swear you in.

[Witnesses sworn.]

Mr. HARPER. You are now under oath and subject to the penalties set forth in title 18, section 1001 of the United States Code. You may now give a 5-minute summary of your written statement.

And I will begin with you, Dr. Bright. Welcome back.

TESTIMONY OF RICK A. BRIGHT, PH.D., DIRECTOR, BIO-MEDICAL ADVANCED RESEARCH AND DEVELOPMENT AUTHORITY, DEPUTY ASSISTANT SECRETARY, OFFICE OF THE ASSISTANT SECRETARY FOR PREPAREDNESS AND RESPONSE, U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES; ANNE SCHUCHAT, M.D. (RADM, USPHS), PRINCIPAL DEPUTY DIRECTOR, CENTERS FOR DISEASE CONTROL AND PREVENTION, U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES; ANTHONY FAUCI, M.D., DIRECTOR, NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES, NATIONAL INSTITUTES OF HEALTH; AND DENISE HINTON (RADM, USPHS), CHIEF SCIENTIST, U.S. FOOD AND DRUG ADMINISTRATION

TESTIMONY OF RICK A BRIGHT, PH.D.

Mr. BRIGHT. Thank you.

Chairman Harper, Ranking Member DeGette, and distinguished members of the subcommittee, it's a pleasure to speak today on behalf of our Assistant Secretary for Preparedness Response to discuss the state of the Nation's health security preparedness.

I'm Dr. Rick Bright, the Director of the Biomedical Advanced Research and Development Authority, BARDA, and the Deputy Assistant Secretary for Preparedness and Response.

ASPR's mission is to save lives and protect Americans from 21st century health security threats. BARDA is a component of ASPR created to ensure that we have products to protect people from numerous dire threats that we face as a nation. ASPR's staff is dedicated to preparing for and responding to these threats.

We are currently coordinating HHS' response to the Ebola outbreak in the DRC and monitoring H7N9 influenza in China. In communities affected by last year's hurricanes, we're there for the long haul, helping local health officials manage recovery and build resilience.

ASPR coordinates across the Federal Government to support State and local partners in emergencies. We enhance medical search capacity through our National Disaster Medical System and

Hospital Preparedness Program, and we oversee the development and procurement of medical countermeasures. We've made great progress in public health preparedness response since Congress established ASPR and BARDA in 2006.

BARDA was created to bridge government and industry to accelerate the development of life-saving medical countermeasures that would not otherwise be available. We use flexible authorities, multiyear advanced funding, public-private partnerships, and deep technical expertise to push vaccines, drugs, and diagnostics towards FDA approval. In our 12 years, BARDA has formed over 200 public-private partnerships with industry to accomplish our mission.

I want to pause for one second to acknowledge the hard work of our partners who, together with the U.S. Government, work very hard to create a more secure nation with not only products but capabilities to respond when needed. These partnerships have led to 35 FDA approvals of products that form a protective shield for our nation against a range of the most serious CBRN and pandemic and emerging infectious disease threats.

Through Project BioShield, BARDA has supported 27 vaccines, drugs, and devices to address national security threats, including smallpox, anthrax, botulinum, rad/nuc and chemical exposure. Fourteen of these are now in the Strategic National Stockpile for use in an emergency, and seven have now achieved FDA approval. These outcomes are the spirit of PAHPA: leadership, coordination, partnerships, and capabilities, working together to protect our nation.

While this effort has created life-saving products to be procured by the SNS, it has also created challenges to acquire and sustain sufficient quantities to address the requirements needed for each threat. Critically, each product also represents a company with a response capability that must be sustained to ensure we have these products available when they're needed. Project BioShield and the SNS together represent a marketplace for these products that would otherwise never exist and the products would quickly vanish without it.

PAHPA, ASPR, BARDA, and BioShield have all played valuable roles in enhancing our preparedness. However, the threats continue to evolve, and technology to modify and create new deadly threats have become simpler. We must modernize our capabilities, emphasizing an end-to-end approach, ranging from early detection through the last mile of administering vaccines and treatments to patients.

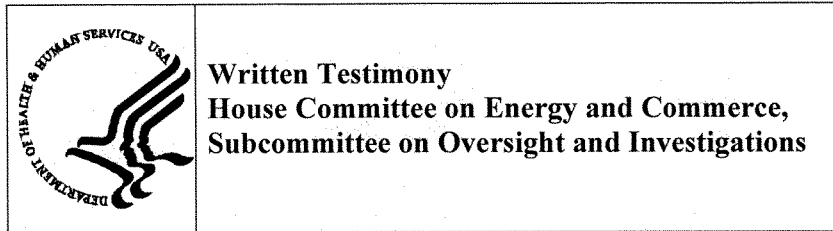
With new technologies and innovation, the time is here to apply transformative approaches to these daunting health security problems. Last week, we announced a new initiative called DRIVE, a nationwide business-friendly approach to identify, capture, and accelerate life-saving innovation. Using authorities you enacted in the 21st Century Cures Act, DRIVE brings together innovators, government, and now the investment community to create solutions for today's threats.

As you consider reauthorization of PAHPA, important changes to BARDA's authorities would sustain and enhance our capabilities. First, advanced appropriations for Project BioShield will attract

more partners to support our mission. Without this consistent and guaranteed market, the companies are reluctant to work with us. Second, an authorization of appropriation for BARDA's pandemic influenza program will sustain our domestic flu vaccine production capabilities, modernize our vaccine technologies, and bring new treatments and faster diagnostics into the homes across America.

I look forward to working with members of this panel, this subcommittee, your congressional colleagues, and I'm grateful for the opportunity to present to you today and look forward to your questions.

[The prepared statement of Mr. Bright follows:]



**The State of U.S. Public Biopreparedness:
Responding to Biological Attacks, Pandemics, and
Emerging Infectious Disease Outbreaks**

Statement of

Rick Bright, Ph.D

Director, Biomedical Advanced Research and Development Authority
Deputy Assistant Secretary For Preparedness and Response



For Release on Delivery
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9:00 am
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Good morning Chairman Harper, Ranking Member DeGette, and other distinguished Members of the Subcommittee. I am Dr. Rick Bright, the Director of the Biomedical Advanced Research and Development Authority (BARDA) and the Deputy Assistant Secretary for Preparedness and Response (ASPR) at the Department of Health and Human Services (HHS). Thank you for the opportunity to testify before you today on behalf of ASPR to discuss the state of our nation's preparedness for 21st century health security threats, including biological incidents, as the Energy and Commerce Committee prepares to consider the second reauthorization of the Pandemic and All-Hazards Preparedness Act (PAHPA).

My expertise is in developing drugs, vaccines, diagnostics and other medical countermeasures (MCMs) for health security threats. In this testimony, I will cover a broader range of ASPR programs and activities, including some background on the nature of the health security threats facing the United States, the mission and duties of ASPR and BARDA, and our vision for where these areas can be strengthened.

Readiness for 21st Century Health Security Threats: A National Security Imperative

One of the federal government's fundamental responsibilities is to provide for the common defense – to protect the American people, our homeland, and our way of life. The strength of our nation's public health and medical infrastructure, and the capabilities necessary to quickly mobilize a coordinated national response to emergencies and disasters, are foundational for the quality of life of our citizens and vital to our national security. The health security threats facing the United States during the 21st century are increasingly complex and dangerous. Therefore, improving national readiness and response capabilities for 21st century health security threats is a national security imperative.

Additionally, we have witnessed the impacts of naturally occurring outbreaks such as pandemic influenza, outbreaks of Ebola and SARS, and the emergence of antibiotic resistant bacteria. ASPR is currently engaged in coordinating HHS's response to the Ebola outbreak in the Democratic Republic of Congo and monitoring other potential emerging infectious diseases that could cause a pandemic, such as the H7N9 influenza strain circulating in China. This year marks the 100-year anniversary of the 1918 influenza pandemic, which killed more people than World War I. During that pandemic, more than 25 percent of the U.S. population became sick and 675,000 Americans, many of them young, healthy adults, died from the highly virulent influenza virus. As our healthcare delivery systems become more networked, cyber-attacks like the 2017 WannaCry incident that affected approximately 150 countries remind us that technological advancements have trade-offs in the form of new vulnerabilities and risks. Finally, we face extreme weather events, such as the recent 2017 hurricane season in which Hurricanes Harvey, Irma, and Maria caused an unprecedented amount of damage and destruction, reminding us of the awesome destructive power of nature and our vulnerability.

These are threats that most people would rather not think about. However, when natural disasters, disease outbreaks, or attacks occur, the people expect our federal government to be ready to quickly respond to save lives and decrease morbidity. Since September 11, 2001, the nation has made great progress in building our response capabilities to protect America from health security threats; however, we still have much to do.

Assistant Secretary for Preparedness and Response: Mission & Duties

ASPR's mission is to save lives and protect Americans from 21st century health security threats. On behalf of the Secretary of HHS, ASPR leads public health and medical preparedness for, response to, and recovery from, disasters and public health emergencies, in accordance with the National Response Framework (NRF) (Emergency Support Function (ESF) No. 8, Public Health and Medical Services), as well as the National Disaster Recovery Framework (Health and Social Services Recovery Support Function). ASPR also supports HHS's role in the delivery of mass care and human services in emergencies (NRF ESF No. 6, Mass Care, Emergency Assistance, Temporary Housing, and Human Services).

When ASPR was established by Congress a decade ago in PAHPA, the law's objective was to create "unity of command" by consolidating Federal nonmilitary public health and medical preparedness and response functions under the ASPR. This approach was modeled on the Goldwater-Nichols Act that created the Department of Defense (DoD) combatant commands; the impetus was the disorganized and fragmented response to Hurricane Katrina in 2005.

ASPR coordinates across HHS and the Federal interagency to support state, local, territorial, and tribal health partners in preparing for, responding to, and recovering from, emergencies and disasters. In partnership with HHS agencies, ASPR works to enhance U.S. medical surge capacity by organizing, training, equipping, and deploying HHS public health and medical personnel, such as National Disaster Medical System (NDMS) teams, and providing logistical support for HHS personnel responding to public health emergencies. ASPR supports readiness at the state and local level by coordinating federal grants and cooperative agreements, such as the Hospital Preparedness Program (HPP), by programs like the Medical Reserve Corps (MRC), and carrying out drills and

operational exercises. ASPR also oversees advanced research, development, and procurement of medical countermeasures (e.g., vaccines, medicines, diagnostics, and other necessary medical supplies), and coordinates the stockpiling of such countermeasures. As such, ASPR manages BARDA, Project BioShield, and the Public Health Emergency Medical Countermeasures Enterprise.

ASPR Priorities for Improving Preparedness, Response, and Recovery

HHS and ASPR have made significant progress since PAHPA was enacted in 2006 and was reauthorized in 2013. However, we still have work to do to ensure we are ready to save lives and protect Americans. ASPR has four key priorities for building the necessary readiness and response capabilities for 21st century health security threats:

- First, provide strong leadership, including clear policy direction, improved health security threat awareness, and secure adequate resources.
- Second, seek the creation of a “regional disaster health response system” by better leveraging and enhancing existing programs – such as HPP and NDMS – to create a more coherent, comprehensive, and capable regional medical emergency response system integrated into daily care delivery.
- Third, advocate for the sustainment of robust and reliable public health security capabilities. For ASPR to accomplish its mission, the Centers for Disease Control and Prevention (CDC) and other partners need support to quickly detect and diagnose infectious diseases and other health security threats. This is critical to rapidly and effectively dispensing medical countermeasures in an emergency.
- Fourth, advance an innovative medical countermeasures enterprise by capitalizing on new

authorities provided in the 21st Century Cures Act and advances in biotechnology and science. We must develop and maintain a robust supply of safe and efficacious vaccines, medicines, equipment, and other materiel to respond to 21st century health security threats, as well as the flexible response capabilities needed to handle the unexpected.

Strong Leadership

In the area of strong leadership, ASPR should continually evaluate and incorporate national health security threats by regularly coordinating with the Director of National Intelligence, the Department of Justice, and the Department of Homeland Security to assess current and future national health security threats.

Medical Countermeasures Enterprise

Congress established BARDA to speed up the availability and use of medical countermeasures (MCMs) by bridging the so-called “valley of death” in late stage development where many countermeasures for health security threats historically languished or failed. By using flexible, nimble authorities, multiyear advanced funding, strong public-private partnerships, and cutting edge expertise, BARDA has successfully pushed innovative MCMs, such as vaccines, drugs, and diagnostics, through advanced development to stockpiling and commercial availability with FDA approval or licensure.

In the last decade, BARDA’s strong partnerships with biotechnology and pharmaceutical companies, the National Institutes of Health, and other HHS components have led to 35 FDA approvals for 31 unique MCMs addressing chemical, biological, radiological, and nuclear (CBRN) threats, pandemic influenza, and emerging and re-emerging infectious diseases. This is a

staggering accomplishment in just 12 years.

BARDA has supported the development of 27 medical countermeasures against Department of Homeland Security (DHS)-identified national security threats through Project BioShield, including products for smallpox, anthrax, botulinum, radiologic/nuclear emergencies, and chemical events. Fourteen of these products have been placed in the Strategic National Stockpile and are ready to be used in an emergency and seven have achieved FDA approval. BARDA also has supported the development of 23 influenza vaccines, antiviral drugs, devices, and diagnostics to address the risk of pandemic influenza.

Because of these successes and progress, more medical countermeasures than ever before are eligible to be procured for the Strategic National Stockpile, thereby creating new challenges in terms of acquiring and maintaining sufficient quantities of medical countermeasures to address the requirements for identified health security threats.

Just last week, we announced an exciting new public-private engagement model – called DRIVE – which is designed to accelerate innovation, address some of the nation’s most pressing health security challenges, and potentially affect major healthcare markets.

At a time when synthetic biology and personalized medicine are not just conceivable but attainable, the time is right to apply an innovative approach to some of the most daunting, far-reaching health security problems, such as sepsis and early diagnosis of infectious diseases.

By implementing the authorities you provided to us in the 21st Century Cures Act, we are opening our doors to more innovators, and most importantly investors, to catalyze advances in science and technology.

ASPR has recommended important changes to BARDA's authorization of appropriations to meet these challenges, including, most notably, additional advanced appropriations for Project BioShield, which would help incentivize private industry to dedicate resources to developing medical countermeasures to meet the government's national security requirements. Without this "guaranteed market," companies are reluctant to incur the costs required to focus development on MCMs for CBRN agents that would rely upon a limited government market that may not materialize when product development is complete. ASPR has also recommended adding a direct funding line for BARDA's pandemic influenza preparedness activities. This authorization of appropriations will help sustain domestic influenza vaccine manufacturing capacity, as well as support better, faster influenza vaccine technologies and antivirals and rapid response platform technologies.

Regional Disaster Health Response System

The 2017 hurricane season highlighted the importance of regional healthcare readiness and medical surge capacity. ASPR led the public health and medical responses to Hurricanes Harvey, Irma, and Maria under the NRF Emergency Support Function No. 8 mission. ASPR worked closely with state and territory health officials in affected areas to augment care with NDMS teams, U.S. Public Health Service Commissioned Corps Officers, Department of Veterans Affairs personnel and facility support, and DoD transportation, facilities, naval vessels with medical and surgical capability, clinicians, and support personnel. Federal personnel under the supervision of

HHS treated over 36,000 patients, and evacuated nearly 800 patients. HHS deployed over 4,500 personnel, awarded over 200 contracts, and provided nearly 950 tons of equipment. Today, HHS continues to support recovery efforts in impacted communities.

Despite our progress, each event teaches us that ASPR needs to improve its internal capabilities as well as enhance our support for the healthcare infrastructure across the country. As with MCM development, the nation's healthcare delivery infrastructure is mostly a private sector enterprise. We must better leverage and enhance existing federal programs – such as HPP and NDMS – to create a more coherent, comprehensive, and capable regional medical emergency response system integrated into daily care delivery. We call this the foundation of a “regional disaster health response system.”

NDMS was created during the Cold War to take care of military casualties from overseas conflicts in U.S. civilian hospitals. To modernize NDMS, strengthen capabilities, and ensure NDMS continues to provide critical support during and immediately after national public health and medical emergencies and national security special events, ASPR is implementing administrative changes and has recommended improvements to the NDMS statute to aid in ASPR's efforts to modernize this critical asset.

The Hospital Preparedness Program (HPP) was established after the September 11, 2001 terrorist attacks, with the goal of improving the capacity of local hospitals across the country to deal with disasters and a large influx of patients in an emergency. Using HPP funding, state grantees initially purchased equipment and supplies needed for emergency medical surge capacity. Over time, the

program successfully evolved to support local coordinated healthcare coalitions, including hospitals, public health facilities, emergency management agencies, and emergency medical services providers. Fifteen years after it was established, HPP can be further strengthened to better utilize existing resources and enhance healthcare preparedness and response capabilities at the local level, and ASPR has recommended modifications to the HPP statute toward this end.

Conclusion

As Congress moves forward on the second reauthorization of PAHPA, we have the opportunity to build on the great progress made and further improve our national readiness and response capabilities for 21st century health security threats. On behalf of the HHS Assistant Secretary for Preparedness and Response, Dr. Bob Kadlec, I want to thank you, again, for your bipartisan commitment to this national security imperative, and we look forward to continuing to work together to enhance our nation's health security. I am happy to answer any questions you may have.

Mr. HARPER. Thank you, Dr. Bright.
The chair will now recognize Dr. Anne Schuchat for 5 minutes.
Welcome.

TESTIMONY OF ANNE SCHUCHAT, M.D.

Dr. SCHUCHAT. Thank you.

Chairman Harper, Ranking Member DeGette, and members of the subcommittee, thank you so much for the opportunity to testify before you today to describe CDC's role in preparing, detecting, and responding to biological attacks, pandemics, and emerging infectious disease outbreaks.

Today I'll highlight CDC's role in protecting the Nation against health threats. I'll describe our role in three areas: preparedness, detection, and response.

The three themes I'd like you to take away are, first, the work CDC does every day in public health lays the foundation for responding to emergencies. Second, the CDC's world-class scientific and medical expertise ensures we're ready to respond to any threat. And third, our longstanding connection to State and local health departments ensures that public health systems function effectively, both day-to-day and during emergency response.

Let me first address how we prepare for emergencies. CDC works every day with State and local health departments. In fact, we have 590 staff assigned to State and local health departments. We fund the Public Health Emergency Preparedness Cooperative Agreement Program and the Cities Readiness Initiative.

Public Health Emergency Preparedness grants go to every State, eight territories, and four cities. These funds support staff, enable exercises to test and validate capabilities, and pay for laboratory and communications equipment.

The Cities Readiness Initiative funds this nation's 72 largest cities, to develop and test plans to receive and dispense medical countermeasures from the Strategic National Stockpile.

CDC expertise helps assure protection of vulnerable populations against diverse threats. For example, CDC worked with the American Academy of Pediatrics, the FDA, and other stakeholders to address gaps in existing countermeasures for anthrax in children, taking advantage of the agency's scientific and clinical expertise and longstanding relationships with AAP.

Turning now to detecting threats. The CDC's lab and surveillance systems are able to detect and identify agents causing illness, ranging from infectious agents to chemical or radiation exposures. Every year, labs from all over the world send specimens to CDC, because they know we'll be able to identify pathogens that other laboratories cannot.

Rapid identification of disease permits intervention before a health threat becomes a crisis. CDC's Laboratory Response Network maintains an integrated, scaleable, and flexible system of 125 Federal, State, and local laboratories. The development of this laboratory network established in 1999 has provided a larger capacity to test and report more quickly than was previously possible. For example, during the Zika virus outbreak response, CDC and our Laboratory Response laboratories processed over 207,000 specimens just for Zika.

Now I'll turn to response. When there's a crisis, CDC responds. We're able to rapidly deploy scientific and medical experts anywhere in the world. By the end of the 21-month Ebola response, 3,700 CDC staff had shifted from their day-to-day duties to assist with the response. 1,500 of our staff deployed to West Africa, making over 2,000 trips. Today, we're responding to a much smaller Ebola outbreak in the Democratic Republic of Congo.

During health emergencies, CDC communicates. For example, during the 2009 H1N1 response, CDC held 39 full press conferences and 21 telebriefings. During the Zika response, CDC published 51 morbidity and mortality weekly report articles to make sure the public health and healthcare professionals had the latest and best information.

Being able to prepare, detect, and respond to public health threats is a top priority for us at CDC. Our preparedness and response capabilities are built on broad and deep scientific, medical, and program expertise. Our longstanding partnerships with State and local public health authorities ensures an integrated approach wherever that approach is needed, resulting in better responses and better public health outcomes, which translate to better protection of the people we serve.

Thank you, and I'll be happy to answer questions.
[The prepared statement of Dr. Schuchat follows:]



Written Testimony
House Energy and Commerce Committee,
Subcommittee on Oversight and
Investigations:
The State of U.S. Public Health
Biopreparedness: Responding to
Biological Attacks, Pandemics, and
Emerging Infectious Disease Outbreaks

Statement of
RADM Anne Schuchat, M.D.
Principal Deputy Director
Centers for Disease Control and Prevention
Department of Health and Human Services

For Release upon Delivery
Expected at 9 a.m.
June 15, 2018

Chairman Harper, Ranking Member DeGette, and other members of the subcommittee. I am Rear Admiral Anne Schuchat, Principal Deputy Director of the Centers for Disease Control and Prevention (CDC). I appreciate the opportunity to be here today to discuss CDC's biopreparedness mission.

CDC is the eyes and ears of the biopreparedness complex, advancing the health security of the nation by helping communities prepare for, detect, and respond to, public health consequences of all hazards. These hazards include chemical, biological, radiological, and nuclear (CBRN) threats, natural disasters, and emerging (and re-emerging) infectious disease. For 72 years, this has been CDC's core mission.

CDC draws on expertise from across the agency, including world-class laboratory testing, public health surveillance (for disease detection), epidemiology, guidance to healthcare providers, incident management, logistics, emergency risk communication, disease control programs, distribution of medical countermeasures, human and animal medicine, and responder health and well-being. Our multidisciplinary workforce and integrated national and international systems broaden our capacity to detect and respond to any developing situation that could affect the health of people in the United States. This ability is enhanced by our long-standing relationships and close collaboration with federal, state, territorial, tribal, local, and global partners.

Prepare

The CDC's Public Health Emergency Preparedness Cooperative Agreement Program (PHEP) (which includes the Cities Readiness Initiative (CRI)) is central to CDC's programs to prepare communities across the nation for the next public health emergency. Additionally, CDC's role in the Public Health Emergency Medical Countermeasures Enterprise (PHEMCE) is critical to national preparedness for chemical, biological, radiological, nuclear threats, and emerging infectious diseases.

Public Health Emergency Preparedness Cooperative Agreement Program

The PHEP cooperative agreement program is the largest CDC state program and provided approximately \$600 million to state, local and territorial public health departments in FY 2017. The program supports these jurisdictions to develop plans for public health preparedness and response, and has been instrumental in integrating state and local health departments into their jurisdictions' emergency response structures. PHEP currently supports 62 awardees – the 50 states, eight territories and freely associated states, and four directly funded cities (New York City; Washington, D.C.; Chicago; and Los Angeles). Funding is awarded according to a base-plus population formula prescribed by statute, which ensures a minimum amount of funding to each awardee. These funds support preparedness and response staff, enable exercises to test and validate capabilities, provide training, and pay for laboratory and communications equipment essential to maintaining preparedness. In addition, CDC personnel support PHEP awardees by helping to identify and address gaps in preparedness capabilities, providing planning resources to ensure the needs of vulnerable populations are incorporated into response strategies, and improving response capabilities from experience gleaned during public health responses.

Cities Readiness Initiative (CRI)

CRI, funded through the PHEP cooperative agreement, enhances preparedness in the nation's 72 largest population centers, where nearly 60% of the U.S. population resides. These cities use CRI funds to develop, test, and maintain, plans to quickly receive medical countermeasures (MCMs) from the Strategic National Stockpile (SNS) and distribute them to local communities. This program, which relies on local boots on the ground, enables effective response to large-scale public health emergencies that require life-saving medications and medical supplies.

Public Health Emergency Medical Countermeasures Enterprise (PHEMCE)

Through participation in the ASPR-led Public Health Emergency Medical Countermeasures Enterprise (PHEMCE), CDC works with other HHS agencies and other federal partners to enhance preparedness for chemical, biological, radiological and nuclear threats, and emerging infectious disease. CDC brings together its scientific expertise and its experience in public health practice to inform the use of preventative measures and treatment during a public health emergency. Specifically, CDC subject matter experts from various CDC centers:

- Develop clinical guidance on the use of PHEMCE medical countermeasures – crucial to ensure health departments and clinicians know the safest, most effective way to use medical countermeasures.
- Inform operational details for SNS deployment – this includes informing which products should be deployed first based on epidemiology and laboratory data and clinical guidance.
- Provide technical expertise to state and local partners for the development and execution of deployment and dispensing plans for PHEMCE medical countermeasures.
- Conduct regular operational readiness reviews and exercises with state and local partners to prepare them and build their capacity to receive and dispense PHEMCE medical countermeasures. (In FY 2017, CDC supported 12 full-scale and tabletop exercises, and trained 3,758 Federal, state, territorial, and local emergency responders representing 13 different jurisdictions, on how to receive and distribute products from the Strategic National Stockpile).
- Provide regulatory science expertise to inform legal mechanisms (Emergency Use Authorizations, Emergency Use Instructions, and Investigational New Drug Protocols) and guidance on the use of MCM that have not received FDA approval or the use of FDA approved MCMs for – indications other than those included in FDA approval.

Protecting Vulnerable Populations during Emergencies

CDC has expertise and programs to promote effective support and care prior to, during, and after a public health emergency, for a wide variety of vulnerable populations. CDC's PHEP program requires states to develop

emergency plans covering children, pregnant women, and other vulnerable populations such, as those isolated due to geography and individuals with disabilities. Subject matter experts within CDC's Children's Preparedness Unit champion the needs of children in public health emergencies and have supported 10 responses over the past 10 years. CDC also provides guidance to state and local health departments for dosage and administration of certain MCMs to certain populations. The Children's Preparedness Unit has recently completed a draft implementation plan for the pediatric use of Anthrax Vaccine Adsorbed (AVA) in the case of a large-scale event. AVA is the only FDA-licensed human anthrax vaccine in the U.S., but it is not currently approved for use in children. This implementation plan provides critical activities to ensure that programs are prepared to, and have the resources for, the efficient and safe administration of the vaccine to children.

Federal Select Agent Program

The nearly 300 entities in the U.S. that engage in laboratory research on biological select agents and toxins are regulated under the Federal Select Agent Program (FSAP), which is jointly managed by CDC and the Animal and Plant Health Inspection Service (USDA) to regulate the possession, use, and transfer of biological pathogens and toxins (e.g., anthrax, bubonic plague, smallpox, and ricin) that have the potential to pose a severe threat to human, animal, and/or plant health. The program aims to ensure that work with these dangerous agents is conducted in as safe and secure manner as possible, and that they are stored and transported safely and securely.

Detect

World-class scientific expertise in disease progression, epidemiology, and laboratory methods ensures CDC is ready and able to detect and develop a response to a broad range of threats, including highly hazardous and infectious diseases like Ebola, smallpox, Zika, anthrax, and H7N9 influenza.

CDC uses advanced molecular detection techniques that combine next-generation genomic sequencing, high-performance computing, and epidemiology to identify pathogens faster and more accurately. Laboratories from all over the world send specimens to CDC because they know CDC will be able to identify pathogens that other laboratories cannot.

Through Advanced Molecular Detection investments, CDC is able to detect outbreaks faster, before they have become widespread. These advances are applied in dozens of areas such as foodborne disease, influenza, antimicrobial resistance, hepatitis, pneumonia, and meningitis. Moreover, CDC shares genetic sequencing capabilities with state and local health departments, and funds them to acquire these tools that help them respond more quickly and effectively at the local level, lessening the chances that disease outbreaks will spread.

CDC also maintains unique laboratory capability to rapidly detect exposure to radionuclides and more than 150 chemical threat agents. This information about human exposure helps public health officials rapidly assess health risk, determine the most effective treatment, and reduce additional exposures.

A Strong Laboratory Response Network

Rapid identification of disease is critical to addressing public health threats before they become a crisis. This requires that high quality specialized laboratory testing be available around the country. CDC's Laboratory Response Network is an integrated system of federal, state, and local laboratories that provides early detection and characterization of biological, chemical and other public health threats. The linking of laboratories and close partnership between laboratorians, epidemiologists and clinicians at CDC, state and local health departments, and healthcare facilities ensures the most rapid detection and mitigation of health threats.

For example, in response to the MERS (Middle East Respiratory Syndrome), Ebola and Zika virus outbreaks, CDC provided Laboratory Response Network laboratories across the United States with assays authorized for Emergency Use to quickly identify cases of infection during these outbreaks.

Another important laboratory network, begun in 2016, is CDC's Antibiotic Resistance Laboratory Network, which supports nationwide laboratory capacity to rapidly detect antibiotic resistance in healthcare, food, and community settings, and inform local responses to prevent the spread of antibiotic resistant bacteria, and protect people. The Antibiotic Resistance Laboratory Network includes seven regional laboratories, the National Tuberculosis Molecular Surveillance Center, and laboratories in 50 states, five cities, and Puerto Rico.

Public Health Surveillance

Public health surveillance—the collection, analysis, and use of data to target public health prevention and intervention activities—is the foundation of public health practice at CDC, and continues to represent CDC's core work, whether as detective work in the field, or advanced analysis to understand disease transmission. CDC uses electronic data systems to monitor population health information around the clock to detect and track diseases. For example, following 9/11, CDC invested in using health-related data based on syndromic surveillance in Emergency Departments as an early warning system for a bioterrorist attack. Those investments are paying dividends, as this information technology system now allows officials to detect a wide range of health threats beyond biological attacks, from opioid overdoses to chemical exposures to disease outbreaks.

To ensure a nationwide surveillance capability, CDC supports surveillance infrastructure, including information technology systems, and practice at the state and local levels through the National Notifiable Disease Surveillance System, the National Syndromic Surveillance Program, the National Healthcare Safety Network, the Emerging Infections Program Active Bacterial Core Surveillance, and components of national influenza surveillance.

Beginning in fiscal year 2016, Congress recognized the large and growing threat of antibiotic resistance and appropriated funding for CDC to detect and respond to resistant pathogens, prevent the spread of resistant infections, and collaborate with partners to encourage innovation with respect to new prevention strategies.

CDC has multiple surveillance systems that can detect and track resistant threats across healthcare, food, and community settings.

CDC's Global Disease Detection Operations Center monitors outbreaks 24/7, assesses their potential risk to the United States and communities around the world, and improves global public health surveillance. Since 2017, CDC has tracked more than 170 unique diseases globally and identified outbreaks in more than 190 countries. CDC works with the 17 Phase 1 and the 14 Phase 2 Global Health Security Agenda partner countries to help them build the core public health capacities necessary for identifying and containing outbreaks before they become epidemics that could affect us all. The 17 Phase 1 countries receive direct financial support and technical assistance from CDC; the 14 additional countries receive only technical assistance from CDC. Our work through the Global Health Security Agenda emphasizes four critical areas: surveillance, laboratory, workforce development, and rapid response capability. In addition, CDC medical and public health officers staff United States Quarantine Stations that are located at 20 United States ports of entry and land-border crossings where the majority of international travelers arrive. These health officers are an important defense to prevent the introduction into, and spread of infectious diseases in, the United States.

Respond

CDC's number one priority during any public health emergency is to protect the health of the public. CDC subject matter experts respond regularly to events such as foodborne outbreaks, natural occurring anthrax and botulism cases, smallpox vaccine adverse event cases, and seasonal influenza. CDC's readiness activities, expertise, and infrastructure provides the foundation for all types of public health emergency responses and is scalable and can surge to respond to events such as the 2013 meningitis outbreaks. The expertise and systems used in such responses can be augmented further for larger public health emergency responses such as the 2009 H1N1 response, 2014 Ebola response, and the Zika response.

State and local public health agencies are the front lines of public health preparedness and response. CDC provides ongoing technical assistance and, where requested, on-the-ground personnel and materials to assist with response efforts. CDC's established relationships with state and local health departments ensure that day-to-day public health systems function effectively and efficiently, and that emergency response actions are appropriate to the threat. These continuous relationships, between and during emergency responses, ensure a level of trust and collaboration that cannot be overemphasized. During the stress of an emergency response, having a trusted partner you can turn to immediately can mean the difference between life and death for patients, and ensures the rapid delivery of public health services, such as vaccinations and clean water, for communities.

CDC experts lead and staff every activation of the agency's Emergency Operations Center (EOC), ensuring response activities are effective and efficient. CDC has activated its incident management system for 67 responses over the last 16 years. During a response, in coordination with and, sometimes at the direction/request of the Office of the HHS Assistant Secretary for Preparedness and Response, CDC's EOC rapidly deploys scientific experts, coordinates the delivery of supplies and equipment to the incident site, monitors response activities, provides resources to state and local public health departments, and disseminates timely and accurate information within government, to health care providers and to the public. During the agency's Ebola and Zika responses, 3,700 and 1,700 CDC staff participated in the response, respectively. During the Ebola response, CDC staff completed over 2,000 field deployments to West Africa. CDC also responds to public health events that do not require EOC support. In fiscal year 2017, CDC assisted state, local, and overseas public health authorities in 38 epidemiologic investigations of emerging infectious disease outbreaks. In addition, the Global Rapid Response Team, stood up following the 2014 Ebola outbreaks, has over 400 ready and rostered experts. Since its inception, that team has provided nearly 9,000 person-days of support for response activities.

We are committed to continuously improving our response capability. After each activation, whether for a real event or exercise, we conduct a thorough after-action review to identify strengths to sustain and areas for improvement. Use of this information is key to improving performance for the next incident or event.

Conclusion

I want to leave the Committee with three primary points about CDC's role in biopreparedness.

1. Our responses are built on our longstanding partnerships with state, local, and international public health authorities;
2. Our detection capabilities and surveillance programs are based on our broad and deep scientific, medical, and programmatic expertise; and
3. Our response capacity ensures timely aid to state and local public health systems in times of crisis.

CDC has 72 years of experience in bringing top scientific expertise to health emergencies and remains a trusted partner in the United States and around the world. CDC stands ready to do its part to protect the health and well-being of the American public and save lives. We cannot necessarily predict the next disaster, but we know that being prepared protects health, saves lives, and prevents economic losses.

Thank you for the opportunity to testify.

Mr. HARPER. Thank you, Dr. Schuchat.

The chair will now recognize Dr. Fauci for 5 minutes for your opening statement.

TESTIMONY OF ANTHONY FAUCI, M.D.

Dr. FAUCI. Thank you very much, Mr. Chairman.

Chairman Harper, Ranking Minority DeGette, members of the committee, thank you very much for giving me the opportunity today to present to you the role of the National Institute of Allergy and Infectious Diseases in addressing biodefense and emerging infectious diseases.

Our role in this really dates back many years, but was really solidified following the attacks of 9/11 with the anthrax attacks, which prompted us, together with our colleagues at HHS, to develop a strategic plan and a research agenda. For our role in that, as you know, the NIH for years, with regard to any emerging infectious disease, is involved in having a number of approaches, stemming from basic and clinical research, research resources for both industry and academic communities, with the ultimate goal of developing vaccines, therapeutics, and diagnostics.

We have been in a very strong partnership with BARDA in developing the concepts for interventions, which were then handed over to them for advanced development.

This slide just shows a representative example of some key achievements directed specifically at the category A agents that were in our strategic plan. Very briefly, for example, a better smallpox vaccine, next-generation vaccines for anthrax, antitoxins for botulism, antibiotics for plague, and, interestingly, the development of an Ebola vaccine, which long antedated the outbreak that we experienced in West Africa in 2014.

Having said that, it is important to point out, as we have in the past and as shown in this interesting article from Newsday of 2001, the worst bioterrorist may actually be nature itself.

It is interesting to point out, Mr. Chairman, that I have been testifying before this committee for the last 33 years. The first time I did, I drew a map, and it's shown here. And the reason I drew the map is I wanted to point out that there would be emerging and reemerging infectious diseases. And the first time I testified before this committee, I put HIV on the map as shown there.

Today, the map is the same structurally, but this is what it looks like. And these are the emerging and reemerging infectious diseases. Many of them, many of them are curiosities and are not really of great public health impact, but others are really important and we've experienced them recently, such as Ebola, Zika, and the threat of a pandemic influenza.

Now, let's take one of these, Ebola. You mentioned in your opening statement, as others have, about the West Africa outbreak and the recent outbreak in the Democratic Republic of the Congo. It's important that the CDC, the NIH, and other agencies of the Public Health Service responded very rapidly there.

One thing that was proven that's important is that you can do good research in the context of an outbreak. And we developed, with others, a vaccine, which is called the VSV vaccine, which was first tried in a Phase I trial right in Bethesda at the NIH Clinical

Center, and then went over to Africa in a Phase II trial. This is the vaccine that was used in the ring vaccination program that was actually involved in the West Africa outbreak.

If you then fast forward a couple of years to where we are today, with the outbreak in the Democratic Republic of the Congo, we have actually learned a lot and are applying what we learned to that. Let me give you an example. The experimental vaccine that was used in the ring vaccination program has now been deployed to the Democratic Republic of Congo, and even as we speak today, it is being used in a ring vaccination with 50 rings and 150 vaccinations per ring.

Interestingly, and as I mentioned before we came, that in 1995, there was an outbreak in Kikwit in the Democratic Republic of the Congo. To just show you the connection between clinical care and research, we brought one of the survivors of Kikwit to Bethesda, took their B cells, cloned it, made a monoclonal antibody. And now the Democratic Republic of the Congo has asked us to ship that to them for their discretion use as a countermeasure in the epidemic. So it came full circle that our collaboration with them came back with something that perhaps could help them.

I want to close in the last couple of seconds with influenza. I wrote this article just a few months ago, talking about the need for a universal flu vaccine. And, in fact, we have developed a strategic plan and a research agenda because of the threat, not only of getting a better seasonal flu vaccine, but also a threat of a pandemic. And we could only do that with a vaccine that essentially is able to protect us against all subtypes of influenza.

And I'll close on this last slide—this is not working very well, sorry—which is an article that I actually wrote 17 years ago, but it's very relevant today. And what it says is that emerging infections are a perpetual challenge. We've always had them, we have them now, and we always will have them. So if they are a perpetual challenge and a perpetual risk, we must meet them with perpetual readiness and, hopefully, we'll be able to do that.

Thank you.

[The prepared statement of Dr. Fauci follows:]

DEPARTMENT OF HEALTH AND HUMAN SERVICES
NATIONAL INSTITUTES OF HEALTH

National Institute of Allergy and Infectious Diseases Research Addressing
Biodefense and Emerging and Re-emerging Infectious Diseases

Testimony before the
House Committee on Energy and Commerce
Subcommittee on Oversight and Investigations

Anthony S. Fauci, M.D.
Director of the National Institute of Allergy and Infectious Diseases

June 15, 2018

Mr. Chairman, Ranking Member DeGette, and members of the Subcommittee, thank you for the opportunity to discuss the research response of the National Institutes of Health (NIH) to potential attacks with chemical and radiological/nuclear agents as well as biological threats, including emerging and re-emerging infectious diseases. I direct the National Institute of Allergy and Infectious Diseases (NIAID), the lead NIH institute for biodefense research.

The NIH conducts and supports basic and clinical research to better understand the biological effects of, and to develop medical countermeasures (MCMs) for, chemical, biological, and radiological/nuclear threats. Most of this work is conducted by the NIAID at the NIH. NIAID supports basic research on microbiology and immunology as well as applied and clinical research to evaluate candidate MCMs including diagnostics, therapeutics, and vaccines. This strategic effort includes the pursuit of foundational platform approaches that could be used to develop MCMs against multiple threats or pathogens. These platforms include molecular biological technologies for vaccines, targeted antibody therapeutics, and broad-spectrum antibiotics and antivirals.

NIH coordinates its biodefense research with partners in industry, academia, and the Federal Public Health Emergency Medical Countermeasures Enterprise (PHEMCE) to ensure that promising countermeasures for biological, chemical, and radiological public health threats can proceed to advanced development. Since fiscal year 2012, NIH has supported the early development of more than 20 candidate MCMs for high-priority threats, and ultimately transitioned support for those candidate MCMs to the Biomedical Advanced Research and Development Authority (BARDA) for advanced development, with the goal of Food and Drug Administration (FDA) approval, licensure, clearance, or authorization, and for potential inclusion in the Strategic National Stockpile. NIH funding for emerging infectious disease, including biodefense, research was approximately \$2.6 billion in FY 2017.

NIH MEDICAL COUNTERMEASURE DEVELOPMENT

Innovative technologies and approaches supported by NIH are enabling the development of new medical countermeasures (MCMs) at an unprecedented pace. High-throughput sequencing and platform-based technologies are facilitating the development and manufacture of MCM candidates to expedite their clinical evaluation. For example, during the Zika virus outbreak in the Americas, NIAID scientists used Zika virus genetic sequence information to develop a vaccine candidate that moved from concept to first-in-human trial in less than four months – likely the shortest development period ever for such a vaccine. The vaccine was developed with a readily deployable DNA vaccine platform that is a form of gene-based immunization previously employed by NIAID to develop a candidate vaccine for West Nile virus. These types of genetic platforms could be used to respond similarly to multiple emerging and re-emerging infectious disease threats.

Other broad-spectrum approaches are being used to advance the development of therapeutics that could be used against multiple pathogens. For example, NIAID has supported development of broad-spectrum antiviral agents such as BCX4430 (galidesivir), which has demonstrated activity against Ebola and other RNA viruses, and broad-spectrum antibacterial products, including a compound with activity against the two different bacteria that cause tularemia and plague.

NIAID continues to explore other inventive approaches to treat or prevent bioterrorism threats. Monoclonal antibodies, which precisely bind to a single target, have been used to treat certain cancers, infectious diseases, and autoimmune diseases. Monoclonal antibodies also have the potential to treat emerging and re-emerging infectious diseases, and as a first line intervention to prevent or slow the progress of infectious disease outbreaks as vaccines are being developed. A notable example is ZMapp™, a cocktail of three monoclonal antibodies targeting Ebola virus. ZMapp™ showed promise as a treatment for Ebola virus disease in an NIAID-supported clinical trial during the 2014-2016 outbreak in West Africa. Another innovative approach specific to vaccine development is the use of adjuvants. Adjuvants are valuable tools that can boost immune responses to otherwise modestly effective vaccines, and potentially can expedite development of vaccines for emerging pandemic threats. NIAID supports programs for discovery and development of adjuvants that have led to 50 novel adjuvants and 18 vaccine clinical trials.

NIAID also has invested in critical infrastructure and research resources to encourage the development and testing of biodefense MCMs. NIAID supports research capacity at high-containment laboratories where dangerous pathogens can be studied safely. In addition, NIAID provides qualified scientists with research resources, including microorganisms, research reagents, and preclinical development services that can fill knowledge gaps. These programs lower the financial risk for potential commercial partners and expedite the development of MCMs.

These NIH-supported activities are advancing a robust pipeline of candidate MCMs needed to ensure the development of safe and effective products to protect the public health. Notable successes are outlined below.

Ebola. NIAID partnered with the government of Liberia to establish the Partnership for Research on Ebola Virus in Liberia (PREVAIL). This clinical research partnership enabled a series of clinical trials, including studies testing several Ebola virus therapeutic and vaccine candidates, among them ZMapp™ and the cAd3-EBOZ vaccine developed by the NIAID Vaccine Research Center (VRC) in partnership with industry. Several Ebola countermeasure candidates developed by NIAID have transitioned to BARDA for advanced development, including a novel vaccine approach using two candidate vaccines in a prime-boost regimen. NIAID currently is utilizing its expertise in Ebola research to respond to the ongoing Ebola outbreak in the Democratic Republic of the Congo (DRC). NIAID is providing technical assistance to the DRC-World Health Organization (WHO) effort to plan and implement a research response to the outbreak, including vaccine, therapeutics, and diagnostic research. NIAID also has developed as a therapeutic candidate mAb114, a monoclonal antibody active against Ebola. The antibody, which has shown promise in animal testing, was originally isolated from a survivor of the 1995 Ebola outbreak in Kikwit, DRC, through a research partnership between the NIAID VRC and the DRC's Institut National de Recherche Biomédicale. At the request of the Minister of Health of the DRC, NIAID is providing courses of mAb114 for treatment of Ebola Virus Disease, with specific research protocol design to be determined. NIAID also has deployed a team to the National Public Health Laboratory in nearby Brazzaville,

Republic of the Congo, to establish additional Ebola diagnostic and sequencing capacity in case the epidemic spreads to that country.

Nipah. NIAID conducts and supports research on countermeasures for Nipah, a deadly virus with case fatality rates of 40 to 75 percent. NIAID researchers have developed a candidate Nipah vaccine that was shown to protect against infection in a monkey model. NIAID-funded researchers, in collaboration with NIH scientists, discovered a potential monoclonal antibody treatment for Nipah virus. This treatment candidate, m102.4, effectively protected ferrets and non-human primates after exposure to Nipah virus. Based on this research, NIAID is assisting with the research response to the ongoing Nipah virus outbreak in India. At the request of the WHO, NIAID researchers have been working with scientists and clinicians from India to develop a clinical trial protocol to test the experimental monoclonal antibody m102.4 against Nipah virus. NIAID researchers also have evaluated an antiviral treatment for Nipah virus in collaboration with CDC and industry. This candidate, GS-5734, has been shown to protect against Nipah virus disease in monkeys.

Smallpox. NIAID supported the early-stage development of a novel smallpox vaccine, IMVAMUNE[®], and a therapeutic, TPOXX[®] (tecovirimat), prior to their transition to BARDA for advanced development. IMVAMUNE[®] was shown to produce a superior immune response compared to the currently licensed smallpox vaccine. TPOXX[®] currently is under consideration for FDA approval pursuant to the Animal Rule, using pivotal animal model data supported by NIAID.

Anthrax. NIAID supported the preclinical and clinical development of the anthrax countermeasure ANTHIM[®] (obiltoximab), prior to its transition to BARDA for advanced development. ANTHIM[®] was approved by the FDA in 2016 for the treatment and prevention of inhalational anthrax, the deadliest form of the disease. NIAID also has supported the development of AV7909, a third-generation anthrax vaccine with a dry formulation that is easy to store and has increased shelf life. AV7909 has been transitioned to BARDA for further development.

Pneumonic Plague. NIAID supported critical animal model studies of ciprofloxacin and levofloxacin for FDA approval, pursuant to the Animal Rule, as treatments for pneumonic plague. In addition, NIAID scientists conduct foundational research on the bacteria that cause plague, and the fleas that transmit them, to understand plague biology and to aid in the design of new MCMs.

Pandemic Influenza. NIAID is partnering with BARDA to support the development of vaccine candidates for influenza strains with the potential to cause a pandemic, including H7N9 avian influenza. NIAID also is working to develop broadly protective, or “universal,” influenza vaccines that could protect against multiple strains of seasonal and pandemic influenza. NIAID recently developed a Strategic Plan to guide research efforts focused on the design and development of universal influenza vaccines.

Radiological/Nuclear Threats. NIH investment in radiation/nuclear research revitalized physician training and infrastructure for studying radiation injury and developing effective

medical countermeasures. Since 2005, NIAID has transitioned 29 radiation/nuclear countermeasure candidates to BARDA for advanced development. Recent successes include FDA approval of NEUPOGEN® (filgrastim) and Neulasta® (pegfilgrastim) to treat radiological or nuclear injuries. In addition, NIAID is funding animal studies of Nplate® (romiplostim) for acute radiation syndrome for consideration for FDA approval under the Animal Rule.

Chemical Threats. NIAID administers a trans-NIH chemical countermeasures program that supports research and development of therapeutics for people exposed to dangerous chemicals, including nerve agents such as Sarin and VX; metabolic poisons such as cyanide; chemicals affecting the skin, eyes, and mucous membranes such as sulfur mustard; chemicals affecting the respiratory tract such as chlorine; and toxic industrial chemicals. NIH recently transitioned several candidate therapeutics to BARDA for advanced development, including those for nerve agent poisoning (midazolam and galantamine), sulfur mustard exposure (tissue plasminogen activator), and inhalation chlorine exposure (R-107 and GSK2798745).

CONCLUSION

NIAID has moved strategically toward a MCM research paradigm that features broader, more flexible platform technologies. This effort is yielding significant scientific advances that help protect against multiple emerging public health threats, whether man-made or naturally occurring. Together with academia, industry, and PHEMCE partners, NIAID remains committed to meeting public health emergency needs by advancing high-priority research toward development of MCMs for radiological/nuclear, chemical, and biological threats, including emerging and re-emerging infectious diseases.

Mr. HARPER. Thank you very much.

We now have the privilege of hearing from Rear Admiral Denise Hinton.

Admiral Hinton, you are recognized for 5 minutes.

TESTIMONY OF REAR ADMIRAL DENISE HINTON

Admiral HINTON. Thank you.

Chairman Harper, Ranking Member DeGette, and members of the committee, thank you for the opportunity to appear today to discuss the state of biopreparedness.

Medical and public health preparedness and response is critically important to the health and security of our nation. And I am pleased to be here today to discuss how FDA is working towards the shared goal of making sure that we have the medical products necessary to protect our nation from a range of public health threats, whether naturally occurring, accidental, or deliberate.

The outbreak of Ebola virus disease in the Democratic Republic of the Congo serves as a reminder that biological threats can and often do emerge with little to no warning and can rapidly become global challenges. I can assure you that FDA is dedicated to helping end this outbreak as quickly as possible, as we are actively engaged in supporting international response efforts.

FDA plays a critical role in facilitating preparedness for and response to biological threats. Our role focuses largely on facilitating the development and availability of medical countermeasures, or MCMs, such as vaccines, therapeutics, and diagnostic tests to protect against and respond to these threats.

Toward that end, we work closely with our HHS partners testifying here with me today as well as other U.S. Government partners, product developers, and nongovernmental organizations to facilitate the development and availability of MCMs. FDA also works closely with the Department of Defense to facilitate the development and availability of MCMs to support the needs of our nation's military personnel.

Prior to joining FDA and the U.S. Public Health Service Commissioned Corps, I proudly served as an officer in the United States Air Force. So these efforts are near and dear to me, and we are fully committed to closely working with our colleagues at the DOD to support the unique needs of the U.S. military personnel.

At FDA, we have made it a priority to utilize our authorities to proactively work with our private sector and government partners to help facilitate the translation of discoveries in science and technology into safe and effective MCMs as part of advancing public health and strengthening our national security.

We share Congress' goal of having safe and effective MCMs available in the event that they are needed, and we have made significant progress toward this important goal. For example, since 2012, FDA has approved, licensed, or cleared more than 120 MCMs, including supplemental changes to already approved products and modifications to diagnostic devices for a diverse array of threats, including anthrax, botulinum toxin, plague, smallpox, and pandemic influenza.

We have also issued more than 60 emergency use authorizations since 2005 to enable access to products to respond to threats, in-

cluding for Zika virus, Ebola virus, H7N9 influenza virus, and the Middle East Respiratory Syndrome Coronavirus.

While the close collaboration and coordination among the agencies represented here today has achieved many successes in the development of MCMs, I would emphasize that developing MCMs is highly complex and there remain regulatory science gaps that can challenge development programs, such as a lack of models and biomarkers to enable the extrapolation of data generated in animal models to humans. Without such tools, it is difficult to generate the data necessary to support regulatory decisionmaking.

Addressing these regulatory science gaps remains a high priority for the FDA, and we have established a broad and robust portfolio of cutting-edge research under our MCMs Initiative regulatory science program to develop these tools and to promote innovation in the development of MCMs.

FDA is acutely aware that biothreats can emerge from an accidental release or exposure to threat agents during the course of conducting research. As such, we are working to ensure that our laboratories and workplaces are operated in a safe and secure manner to protect employees, the surrounding communities, and the environment. As the FDA's chief scientist, I can assure you that the laboratory safety is a high priority for me and the agency.

FDA remains deeply committed to working closely with its partners and fully using the authorities Congress provides to help facilitate and accelerate the development and availability of safe and effective medical countermeasures. While we have made significant progress, we know that more work remains to be done. We look forward to partnering with Congress and stakeholders as we work together to further enhance biopreparedness.

Thank you for inviting me to testify today. I look forward to answering any questions you may have.

[The prepared statement of Admiral Hinton follows:]



**U.S. FOOD & DRUG
ADMINISTRATION**

**TESTIMONY
OF
REAR ADMIRAL DENISE HINTON
CHIEF SCIENTIST
FOOD AND DRUG ADMINISTRATION
DEPARTMENT OF HEALTH AND HUMAN SERVICES
BEFORE THE
COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS
UNITED STATES HOUSE OF REPRESENTATIVES
"THE STATE OF U.S. PUBLIC HEALTH BIOPREPAREDNESS:
RESPONDING TO BIOLOGICAL ATTACKS, PANDEMICS, AND EMERGING
INFECTIOUS DISEASE OUTBREAKS"**

JUNE 15, 2018

RELEASE ONLY UPON DELIVERY

Introduction

Chairman Harper, Ranking Member DeGette, and members of the committee, thank you for the opportunity to appear today to discuss the Food and Drug Administration's (FDA or the Agency) efforts to prepare our Nation to respond to biological threats, such as biological weapons and naturally-emerging infectious diseases, like pandemic influenza, Zika virus, and Ebola virus.

Biological threats—whether deliberate, naturally occurring, or accidental—can and often do emerge with little to no warning. This was the case with the anthrax attacks of 2001, the 2009 H1N1 influenza pandemic, the 2014 Ebola outbreak in West Africa, the emergence of Zika virus in 2016, and the recent Ebola outbreak in the Democratic Republic of Congo (DRC), to name just a few.

We are continually reminded that biological threats know no borders, and that biological threats can rapidly become global challenges. As such, we must remain vigilant and continue to work to optimize our preparedness and response capabilities.

FDA's Public Health Preparedness and Response Mission

FDA plays a critical role in facilitating preparedness for, and response to, biological threats (as well as chemical, radiological, and nuclear (CBRN) threats). FDA's role focuses largely on facilitating the development and availability of medical countermeasures—such as vaccines, therapeutics, and diagnostic tests—to protect against, and respond to, these threats.

FDA works closely with its HHS and other U.S. government partners through the Public Health Emergency Medical Countermeasures Enterprise (PHEMCE), as well as with regulated industry and non-governmental organizations (NGOs), to sustain and optimize the medical countermeasure framework necessary to effectively respond to public health emergencies. FDA also works closely with the Department of Defense (DoD) to facilitate the development and availability of medical countermeasures to support the unique needs of our nation's military personnel.

FDA's operations within its medical countermeasures mission cover a broad range of activities vital to facilitating the development of, and access to, safe and effective medical countermeasures, including:

- Reviewing marketing applications for medical countermeasures and approving those that meet standards for safety and efficacy;
- Providing regulatory advice, guidance and technical assistance to sponsors developing medical countermeasures, as well as to U.S. government partners, international regulators, and international organizations such as the World Health Organization;
- Supporting efforts to establish and sustain an adequate supply of medical countermeasures, including averting supply disruptions when feasible and, in certain situations, allowing products to be used beyond their labeled expiration dates when supported by appropriate scientific evaluation;
- Enabling access to medical countermeasures that are not yet approved—when necessary—through an appropriate mechanism, including through FDA's Emergency Use Authorization (EUA) authority;
- Proactively identifying and resolving regulatory challenges associated with medical countermeasure development and ensuring that FDA regulations and policies adequately support timely medical countermeasure development and enable preparedness and response activities and capabilities;
- Fostering the professional development of FDA scientists to ensure that FDA personnel maintain the skills and abilities to support the medical countermeasure mission; and
- Supporting regulatory science to create the tools, standards, and approaches necessary to develop and assess the safety, efficacy, quality, and performance of medical countermeasures.

Fostering Medical Countermeasure Development and Availability

FDA's Medical Countermeasures Initiative (MCMi)—established in 2010—brought enhanced resources to FDA that enabled FDA to hire additional expert staff, and to become more deeply

and thoroughly engaged in medical countermeasure activities. This program continues to be key to providing certainty regarding regulatory pathways for medical countermeasures, advancing medical countermeasure regulatory science to support regulatory decision-making, and advancing important policies and mechanisms to facilitate the timely development and availability of medical countermeasures.

At FDA, we fully appreciate that the development of medical countermeasures can present complex and unique challenges. FDA's increased engagement in medical countermeasure activities has helped to resolve many challenges associated with medical countermeasures development so that programs continue to move forward. For example, since 2012, FDA has approved, licensed, or cleared more than 120 medical countermeasures (including supplemental changes to already approved applications and modifications to diagnostic devices) for a diverse array of threats including anthrax, botulinum toxin, plague, smallpox and pandemic influenza. Thirteen of these medical countermeasures have been approved under the Animal Rule, which enables animal efficacy studies to substitute for efficacy trials in humans if the results can reasonably be extrapolated to the expected human use.¹ These approvals underscore the critical role the Animal Rule and animal studies can play in advancing medical countermeasures for some of the most challenging threats. And of note, through the use of regulatory science, FDA was able to approve inhalational anthrax therapeutics and a botulism antitoxin for use in children as well as adults, despite the fact that ethical concerns precluded studying pediatric patients in clinical trials.

¹ To date, a total of 13 medical countermeasures have been approved under the Animal Rule, including inhalational anthrax therapeutics, a botulism antitoxin, antibiotics for the treatment and prophylaxis of plague, and treatments for acute radiation syndrome, prophylaxis against the lethal effects of soman nerve agent poisoning, and treatment of known or suspected cyanide poisoning.

In the area of pandemic influenza preparedness, FDA has approved several influenza diagnostic tests, which can help facilitate an effective response to an influenza pandemic by rapidly identifying infected persons and facilitating appropriate care. In addition, FDA has approved several seasonal influenza vaccines, helping increase and sustain pandemic influenza vaccine production capacity. These approvals include the first seasonal influenza vaccine produced using modern cell culture techniques licensed in the United States, and the first seasonal influenza vaccine made through recombinant deoxyribonucleic acid (DNA) technology. Both of these vaccines offer an alternative to the egg-based process and a potential for a faster manufacturing startup in the event of a pandemic. FDA also approved the first adjuvanted influenza vaccine for use in people 18 years of age and older who are at increased risk of exposure to the avian influenza H5N1 virus subtype contained in the vaccine. This vaccine is not for commercial distribution but will be part of the national stockpile in the event it is needed. Furthermore, FDA has continued to collaborate closely with the Biomedical Advanced Research and Development Authority (BARDA), the National Institute of Allergy and Infectious Diseases (NIAID), and the Centers for Disease Control and Prevention (CDC) on developing avian influenza H7N9 virus vaccine candidates.

Additionally, FDA approved the first intravenous antiviral drug to treat acute, uncomplicated influenza infection in adults and expanded its indication to include treatment of children ages two years and older. FDA also expanded the indications for use of the influenza antiviral, oseltamivir, to treat children as young as two weeks of age.

FDA also continues to facilitate the development of products to address antimicrobial resistance, including antibacterial drugs to treat patients with antimicrobial resistant infections, vaccines that can help prevent the emergence and spread of antimicrobial resistance, and diagnostic tests that can help rapidly identify the appropriate treatment for infected individuals. For example, FDA has been implementing Title VIII (Generating Antibiotic Incentives Now (GAIN)) of the Food and Drug Administration Safety and Innovation Act (FDASIA) since it became law in July 2012. GAIN created incentives to help develop new antibacterial and antifungal drugs intended to treat serious or life-threatening infections. Those meeting requisite criteria are determined to be qualified infectious disease products (QIDPs).² FDA has granted 147 QIDP designations through the end of FY 2017—approximately 74 of which were for novel drugs. Since the enactment of GAIN, 12 QIDPs have been approved.

With respect to supporting the development of diagnostic tests for antimicrobial resistant threats, FDA and CDC have collaborated to develop the AR Isolate Bank, a centralized repository of microbial pathogens with well-characterized resistance profiles. The AR Isolate Bank, which currently contains three bacterial isolate panels of pathogens of national medical concern (representing more than 160 total pathogens), provides a valuable resource to biotech and diagnostic groups in researching, designing, validating and evaluating next generation clinical tests. These tests in turn may support earlier diagnosis and development of more effective treatment options that can slow antibiotic resistance. As of January 2018, the AR Isolate Bank shipped more than 2,000 isolate panels.

² A QIDP is defined as an antibacterial or antifungal drug for human use intended to treat serious or life-threatening infections, including those caused by an antibacterial or antifungal resistant pathogen, including novel or emerging infectious pathogens.

There are still regulatory science gaps that can challenge development programs, however, such as a lack of animal models to support medical countermeasure development or insufficient biomarkers to enable the extrapolation of data generated in animal models to humans. Without such tools, it is difficult to generate the data necessary to support regulatory decision making. Given the urgency inherent in our medical countermeasure work, addressing these regulatory science gaps remains a high priority for the Agency.

To that end, FDA has established a broad and robust portfolio of cutting-edge research under the MCMi Regulatory Science Program to help develop these tools and promote innovation in the development of medical countermeasures. A few examples of projects include: supporting the development of “organ-on-a chip” models to assess radiation damage in lung, gut, and bone marrow, and then using these models to test candidate medical countermeasures; collaborating to establish a publicly-available genomic sequence reference database for use by developers seeking to validate candidate multiplex *in vitro* diagnostic tests that could be used to diagnose multiple pathogens simultaneously (FDA-ARGOS); developing reference materials for developers to use to validate nucleic acid-based and serological diagnostic tests for Zika virus; supporting a project to identify and correlate biomarkers of host response to Ebola virus infection in animal models and humans to support medical countermeasure development; developing methods for obtaining safety and limited efficacy data from patients who receive medical countermeasures during public health emergencies; and establishing the Animal Model Qualification Program designed to support medical countermeasure development by promoting

the development of animal models for use across multiple product applications, thereby minimizing duplication of effort and resources.

FDA is acutely aware that biothreats can also emerge from accidental release or exposure to threat agents during the course of conducting research. As such, the Agency works to ensure that its laboratories and workplaces are operated in a safe and secure manner to protect employees, the surrounding communities, and the environment. This includes ensuring that FDA is in compliance with the Select Agent Regulations as well as with Federal, state, and local occupational safety and health requirements (as appropriate), and environmental regulations.

FDA also works to establish and sustain an adequate supply of medical countermeasures. For example, FDA supports the Shelf Life Extension Program (SLEP), a Federal fee-for-service program, for extending the useful shelf life of military-significant and contingency-use medical products, including medical countermeasures that are owned by components of DoD or other Federal program participants, such as the Strategic National Stockpile (SNS).³ FDA laboratory personnel test and evaluate drugs submitted for shelf-life extension to ensure stability and quality before a shelf-life extension is approved.

In addition, FDA works to ensure that the U.S. Government is as prepared as possible to rapidly deploy medical countermeasures when necessary. For example, FDA has worked with government partners to prepare for potential EUA authorization of stockpiled medical

³ SLEP is designed to defer drug replacement costs for date-sensitive stockpiles of drugs by extending their useful shelf life beyond the manufacturer's original expiration date.

countermeasures against a diverse array of threats including smallpox, anthrax, and pandemic influenza.⁴

There are tremendous opportunities to continue to further the development of groundbreaking, innovative medical countermeasures, and the Agency intends to fully seize, and build upon, these opportunities.

Responding to Threats

When threats emerge, FDA works proactively with U.S. government partners, medical product developers, and, as necessary, international partners (including the World Health Organization (WHO) and international regulatory counterparts) to respond. Key FDA response activities include accelerating the development of investigational medical countermeasures, when needed, by working with U.S. government agencies that support medical countermeasure development and medical product sponsors to clarify regulatory and data requirements. For example, FDA continues to work closely with U.S. government agencies, the international community, and product developers—providing regulatory advice, guidance, and technical assistance—to advance the development and availability of medical products, including vaccines and therapies, to address Ebola virus and Zika virus. These activities are essential not only for advancing the development of investigational medical countermeasures to respond to ongoing outbreak and epidemics, but also to improve response to future outbreaks and epidemics. For example, FDA

⁴ To facilitate the issuance of EUAs, FDA has developed a pre-EUA submission process. FDA works with product sponsors or government agencies, such as CDC and DoD, to develop pre-EUA packages that will form the basis of an EUA request and decision, when circumstances justify. Pre-EUA packages contain data and information about the safety and efficacy of the product, its intended use under an EUA, and information about the potential emergency situation that might unfold.

worked closely with NIH in response to the 2014 Ebola epidemic in West Africa to design an innovative and robust common clinical trial protocol to evaluate the most promising investigational products for Ebola. The experience and information gained from those efforts have been instrumental in supporting a rapid response to the recent Ebola outbreak in the DRC.

FDA also works to protect the safety of the nation's blood supply and human cells, tissues, and cellular/tissue-based products for transplantation when threats emerge. For example, FDA worked closely with developers to make rapidly available two investigational tests for blood screening for Zika virus. One of those tests has since been approved.

Another key FDA response activity to emerging threats is to enable access to investigational medical countermeasures, when necessary, through an appropriate mechanism such as under an investigational new drug (IND) application, an Emergency Use Authorization (EUA), or under expanded access mechanisms when the clinical circumstances warrant. Enabling access to available medical countermeasures in response to emerging threats is a high priority for FDA and FDA uses its authorities to the fullest to help protect public health. For example, since 2013, FDA has issued nearly 40 EUAs to enable the emergency use of in-vitro diagnostic devices for H7N9 Influenza virus, Enterovirus D68 (EV-D68), Middle East Respiratory Syndrome Coronavirus (MERS-CoV), Ebola virus, and Zika virus.

FDA also works to protect consumers against fraudulent products claiming to prevent, treat or cure conditions associated with emerging threats.

Throughout these response activities, FDA works to establish and maintain good lines of communication with WHO and regulatory authorities in affected countries, as necessary, to enable technical and information exchange, and to make sure that the needs of the affected countries are understood and addressed.

Conclusion

At FDA, we have made it a priority to proactively work with our private sector and government partners to help facilitate the translation of discoveries in science and technology into safe and effective medical countermeasures. FDA takes seriously its responsibility to help drive and foster innovation as part of advancing public health and strengthening our national security. Active FDA involvement is essential to encouraging industry engagement in medical countermeasure development. Working closely with its partners and exercising the authorities Congress provides to the fullest extent, FDA remains deeply committed to protecting and promoting public health, both domestically and abroad, in response to public health threats.

FDA appreciates Congress's support in continually optimizing its authorities, and providing resources, to enable FDA to achieve its public health emergency preparedness and response mission. FDA stands ready to work with Congress and stakeholders to enable us to better achieve this critical work in our mission to protect the American people.

Thank you for inviting me to testify today. I look forward to answering any questions you may have.

Mr. HARPER. Thank you very much.

I ask unanimous consent that the contents of the document binder be introduced into the record and to authorize staff to make any appropriate redactions. Without objection, the documents will be entered into the record with any redactions that staff determines are appropriate.

It is now time for members to have the opportunity to ask you questions, and I will recognize myself for 5 minutes.

Let me begin by saying that in my 10 years of service in Congress, I don't know if I've ever been at a committee hearing with a better lineup of witnesses. And so thank you all for being here. We look forward to your responses today.

And this is a question that will go rather quickly for all of you. And for each witness, which biological threat is of greatest concern to you and why? Let's start with Dr. Bright and then go down.

Mr. BRIGHT. That's a difficult question. As Dr. Fauci has laid out, there are so many threats. They're constantly emerging. And I wish I could take some of them off the table, but they keep coming at us. And even more concerning is technology advancing so much that they can change the biological threats that we know today into something different that we may not be prepared for.

I think our greatest threat for any of those is our response capabilities and being able to respond to anything that comes our way.

Mr. HARPER. Dr. Schuchat, is there one biological threat that is at the top of your list? I know they're all important, but is there one that gives you the greatest concern?

Dr. SCHUCHAT. I think influenza needs to be at the top of my list. It can affect everyone rapidly and is constantly changing. And with pandemics, all of the population of the world can be susceptible. So the threat of a pandemic has to be at the top of the list, because it can all happen fast.

Mr. HARPER. Dr. Fauci.

Dr. FAUCI. My number one and maybe number two and number three is influenza also. I agree, for the reasons that Dr. Schuchat has mentioned.

When you have a respiratory virus that can be spread by droplets and aerosol, and then you have the situation if there's a degree of morbidity associated with that, you can have a catastrophe. We've experienced in real world those types of things. The one that we always talk about is the 1918 pandemic which killed between 50 and 100 million people.

It is likely that it would be an influenza, but if not influenza, an influenza-like respiratory virus. We had a scare with SARS. Fortunately, public health measures were able to contain it, but influenza first or something like influenza is the one that keeps me up at night.

Mr. HARPER. Admiral Hinton.

Admiral HINTON. Thank you for the question. I would say the threat that would keep me up at night would be the unknown. If we don't know what that threat may be, we have to be able to anticipate. So with the emerging spectrum of diseases, it would be the unknown that would keep me up at night.

Mr. HARPER. Thank you.

For each witness, what area of biopreparedness is of the highest priority and why? Dr. Bright.

Mr. BRIGHT. The area of biopreparedness of the highest priority would be the ability to rapidly detect something that has entered our community or has been used as a weapon. The sooner we detect something, the sooner we can turn on the machinery and call in the capabilities to begin making vaccines and drugs.

Mr. HARPER. Dr. Schuchat.

Dr. SCHUCHAT. I would say our global health security would be at the top of my list, because, as you know, a threat anywhere is a threat everywhere. And I think our greatest vulnerabilities are in the weakest countries of the world.

We saw in Ebola how rapidly West African countries were overwhelmed, and that was an issue for us as well. So I think being able to strengthen the ability of every country to be able to prevent, detect, and respond to threats is where I'd place my focus.

Mr. HARPER. Dr. Fauci.

Dr. FAUCI. I would agree with those two. But let me add an additional one that may not necessarily be my first, is in our ability to respond, for example, with a vaccine, the modern day 21st century technologies of platform technology, where you don't have to wait 6 to 7 months to get a vaccine, where you can really get it out there within a period of a couple of months, which is doable if we put our mind and our resources to it.

Mr. HARPER. Thank you.

Admiral Hinton.

Admiral HINTON. Our continued efforts in the Ebola, and then making sure that we contain it within the specific regions and not letting it cross the borders.

Mr. HARPER. Thank you.

Dr. Bright, if I could ask you, obviously, the need to rapidly respond to a biological threat is essential. Does the public health system have the capability to deliver and administer medical countermeasures rapidly and effectively in a timely manner as you sit there today?

Mr. BRIGHT. As we sit here today, we are much better and can respond much more quickly than we were in the past 10 years. We've built a national response capability and an international capability incorporating new sciences and technologies. There is a lot of room for improvement. It still takes too long to respond to respond adequately to protect everyone in our nation.

Mr. HARPER. Thank you very much.

I will now recognize the ranking member, Ms. DeGette, for 5 minutes for her questions.

Ms. DEGETTE. Thank you very much.

Well, building on the question by the chairman just now, Dr. Bright, what changes do we need to make to make the system for developing countermeasures work more effectively and efficiently? ASPR has been a good start, but, you know, where do we need to go?

Mr. BRIGHT. Well, given the 12 years' experience with ASPR and the enterprise, working across government and working with our public-private partnerships, we've learned a lot in the past 12 years. Not everything is working as effectively or efficiently—

Ms. DEGETTE. So what do we need to do?

Mr. BRIGHT. We need to improve our communications and our transparency and how we bridge our different agencies and bridge government with industry. We need to ensure there's consistency in funding and availability so the partners that we work with can better align their business models with our government models as well. And we need to improve the efficiency at which we communicate and respond to proposals and other contractual mechanisms that we use to work with our industry partners.

Ms. DEGETTE. Are efforts underway being made to do all of those things?

Mr. BRIGHT. Yes, efforts are underway.

Ms. DEGETTE. And is there something Congress can do to help you?

Mr. BRIGHT. Congress has been very generous with the authorities to date. There are things that we can do to improve our language in our other transactional authorities to be able to work more fluidly and flexibly with our industry partners, and we would be happy to submit language to assist in that.

Ms. DEGETTE. We would be delighted to have that language. That would really help.

Dr. Fauci, none of these hearings can go without me asking you about what's going on with pandemic flu. And you had said that we are getting closer to being able to develop a universal vaccine. And you've said that before, because you've been trying to do it for a long time.

What does your timeframe look like now and what are the barriers?

Dr. FAUCI. Congresswoman DeGette, the timeframe really varies about the level that you're talking about. There's not going to be one home run universal flu vaccine. There will be various iterations.

So I would say the timeframe. And I know every time when asked about a timeframe, people back off, and I don't want to get in court to be able to say something that's not going to be able to deliver. But since we spoke last, we have put into a Phase 2 trial a universal flu vaccine with a company called BiondVax, which is a multiple peptide prime followed by a killed vaccine boost.

Being in a Phase 2 trial means that you're another step closer to getting a product that you'll be able to use.

Ms. DEGETTE. Right.

Dr. FAUCI. So I would think that if you—

Ms. DEGETTE. How long is this trial going on for?

Dr. FAUCI. The trial will probably take—it's a Phase 2 trial, so that probably is going to take at least a year to determine if this induces the kind of response that you would predict would have some broad protection.

The first iteration of a universal flu vaccine is not going to be against all flu, absolutely. What we're hoping for is that the first iteration will cover, for example, all of a particular type, like all of the H3N2s. If we get that successful, then maybe all of the H1N1s.

There are two major groups of influenzas. The ultimate perfect one would be one that covers all of them. I think that's years and

years and years away, but the first iteration may be 5 or so years away.

Ms. DEGETTE. And I'll ask you the same question I asked Dr. Bright. What can Congress do to help you?

Dr. FAUCI. I think Congress has been extraordinary in their positive effect on us in helping us. For example, in the 2018 omnibus, we were given an additional \$40 million to develop a universal flu vaccine, and we're getting additional money in the proposal of the House for our 2019 budget. So you've been very supportive and we really appreciate it.

Ms. DEGETTE. We think it's a high priority. I think I can speak for everybody in this room.

One more question. You're developing lots of different vaccines: smallpox, flu, anthrax, Ebola. How do you prioritize your efforts to target the pathogens and toxins that provide the greatest risk?

Dr. FAUCI. That's a very good question. We do two things, Congressman. We target specific pathogens based on the threat. If you're talking about a bioterror threat, it's the intelligence that we get. And if you're talking about the possibility of an emerging infection, it's very difficult to guess what's going to come out.

Ms. DEGETTE. Right.

Dr. FAUCI. So we know, and it was mentioned in one of the opening statements, that H7N9, for example, if you look at the CDC chart, it's way up there as a threat. So we clearly made an investment of a considerable amount of money to develop a vaccine for that.

But as I mentioned in answer to one of the other questions, it's to develop platform technologies that's applicable to any disease, as opposed to picking out all the diseases and preemptively making a vaccine. In other words, making a kind of a vaccine that you could easily apply to whatever is the outbreak.

Ms. DEGETTE. Thank you. Thank you, Mr. Chairman.

Mr. HARPER. The gentlewoman yields back.

The chair will now recognize Dr. Burgess for 5 minutes.

Mr. BURGESS. Thank you, Mr. Chairman, and thanks to our panel for being here today.

Dr. Fauci, I wasn't going to do it, but you brought it up. And you said sometimes you'll give a timeframe, and then if it doesn't work out, then people will point that out to you. A couple of years ago, I think you gave us an 18-month figure on a Zika virus vaccine. How close are we today?

Dr. FAUCI. Thank you for that question. So when you're proving that a vaccine works or not, in the classical way, you have to get what's called an efficacy signal. There has to be infections in the community to get an efficacy signal.

Right now, thankfully for the countries involved, the Zika infections have plummeted almost to very, very few. However, the Phase IIb trial that I spoke to you about some months ago is still ongoing, and it's accruing volunteers in the study. So there's an interesting possibility here.

Let's say there are not enough Zika cases to be able to get an efficacy signal. We have been in discussions, with a lot of help from the FDA, about the possibility that if we get a considerable amount, and I say thousands of volunteers with safety data,

immunogenicity data, namely inducing the kind of response that you would predict would be protective, and you bridge it to the animal studies, there's a possibility that they would at least consider that there would be an accelerated approval. You never can guarantee anything, but that's at least on the table.

So my short answer to your question, Congressman Burgess, is that we are on the road to getting a Zika vaccine, and I feel pretty confident about that.

Mr. BURGESS. And from the FDA's perspective, that expedited approval that was talked about, is that something we can look for?

Dr. FAUCI. Well, I'll let the FDA speak for themselves, but you never want to anticipate what they're going to do. You can just give them the data and the information that they ask for, but—

Mr. BURGESS. I may submit that in writing, because I do want to ask you about another—on the golly gee whiz slide that you put up with all of the things that can happen to us, enterovirus D68 was included on that list.

Dr. FAUCI. Yes.

Mr. BURGESS. And CDC has put out a paper on acute flaccid myelitis and the incidence of that. And I recognize that it's low, but it does seem to peak every other August. So as we are coming up on one of those every other Augusts, do we know any more about this illness and why it has had the effect that it has?

Dr. SCHUCHAT. Yes. The outbreak of severe respiratory disease in children from the enterovirus D68 a few years ago was of concern. It was contemporary with the outbreak of acute flaccid myelitis. Very difficult to confirm that one caused the other, but there's a good probability that they did.

The family of enteroviruses are known to be able to cause neuro-pathic problems. And when you have a very common set of infections, it could be that that was a real rare end of the spectrum among the common ones.

So I think we do need to be ready for that. Unfortunately, there are so many different enteroviruses that it's very difficult to pick one that you would necessarily focus on for countermeasure development. There's some work on antivirals that might be promising as having a broader protection, but that's the state of it right now.

Mr. BURGESS. As you'll recall, fairly frightening when that did occur, the concern we heard from parents.

Dr. SCHUCHAT. Exactly. It was happening the same time as Ebola in Africa. When the President visited CDC, he was briefed on Ebola and on enterovirus D68.

Mr. BURGESS. Admiral Hinton, let me ask you. When Ebola was really a much more significant problem, September of 2014, the monoclonal antibody ZMapp was in trials, and then FDA put a clinical hold on it. My understanding at the time, there was a Herxheimer-type reaction that was fairly severe and so we stopped looking at it.

Is there a way—when we've got a problem of that order of magnitude going on, I guess I want some reassurance that the regulatory side is not going to interfere with the delivery of what may be a very potent tool, because several people have mentioned ZMapp. I mean, it's now a recognized tool in the toolbox. Is that correct?

Admiral HINTON. That's correct. And Dr. Fauci can please feel free to add in, but that is correct. And the FDA is not there to be a roadblock; it's to ensure that the drugs are safe and efficacious. So the reasons behind that may not be privy to us, but we do make sure that we have safe and effective available drugs on the market to treat these and in emergency situations as well.

Dr. Fauci.

Dr. FAUCI. So ZMapp was part of a randomized controlled trial that was run by the NIH. It was published in The New England Journal of Medicine. The results, because of the diminution of cases at the time, were very strongly suggestive of efficacy, but not enough to be statistically significant. So the trial is technically still on. And right now, in DRC, they could use ZMapp either on a trial or, if they want, as compassionate use. But it is available.

Mr. BURGESS. It is available. Thank you all very much. Thanks for your testimony this morning.

Mr. HARPER. The gentleman yields back, who also serves as the chair of our Health Subcommittee.

Mr. BURGESS. Mr. Chairman, I'm also going to ask unanimous consent to place into the record the report of the Independent Panel of the United States Department of Health and Human Services to the Ebola response from 2015.

Mr. HARPER. Without objection, so entered.

[The information has been retained in committee files and can be found at <https://docs.house.gov/meetings/IF/IF02/20180615/108422/HHRG-115-IF02-20180615-SD003.pdf>.]

Mr. HARPER. The chair now recognizes the gentlewoman from Illinois, Ms. Schakowsky, for 5 minutes.

Ms. SCHAKOWSKY. Thank you, Mr. Chairman. I want to agree with you, Mr. Chairman, that this is an extraordinary panel.

Dr. Fauci, 33 years before this committee, that's a long time, and we appreciate you every time we see you.

I also want Dr.—I looked this up. Dr. Schuchat, it looks like you're about 28 years. Is it more than that? How many?

Dr. SCHUCHAT. It's 30 in July.

Ms. SCHAKOWSKY. OK, 30 in July. And such experience in all of you. It's just really remarkable. I thank all of you for being here today.

I'm particularly concerned about the improper and overuse of antibiotics that's driving the growth of antibiotic resistance around the world. I noticed, Dr. Fauci, in your new map with all the lines, right at the top was antibiotic resistance on the left there.

I feel an obligation to raise this issue too for my sister and colleague, the late Louise Slaughter, who was always raising this issue. In the United States, somewhere between 20 and 50 percent of all antibiotic prescriptions in hospitals are either unnecessary or inappropriate. Evidence suggests that antibiotic stewardship programs in hospitals can improve prescribing practices and help reduce the occurrence of antibiotic resistance.

So I'm interested in hearing more from our witnesses on this program. Whoever wants to go first. Dr. Schuchat.

Dr. SCHUCHAT. Yes. The problem with antimicrobial resistance is a transformational challenge for us because it obviously threatens modern medicine. CDC has been investing in efforts to improve

stewardship of antibiotics, and at this point, by our latest data, two out of three hospitals had an antibiotic stewardship program, which is a big increase from before. But we think that there's much more to be done.

In addition, we have 850 hospitals around the country are reporting on their antibiotic use data to the National Healthcare Safety Network. So we're tracking data.

What we find in the healthcare system is when you track antibiotic use and feed back to clinicians how they're doing, they can improve. A lot of clinicians are test takers, and we like to do really well on those tests. And so learning that we're not doing as well as our peers in terms of the appropriateness of our prescribing can help improve that.

We're also tracking resistance. And we've really invested, thanks to the congressional support, we've been able to invest in much better timely, accurate, quality antimicrobial resistance detection around the Nation. It's where we got those nightmare bacteria reports that we came out with recently.

So I would say that behavior change in clinicians is difficult, but we're making progress. And a stewardship program in every hospital is a good start, but it takes more than the hospital to make that happen. We need the whole plans, the outpatient prescribers as well, to be part of the system.

Ms. SCHAKOWSKY. But you're saying that we do have a tracking system now for clinicians, for hospitals?

Dr. SCHUCHAT. Right. In our National Healthcare Safety Network, I'm told that 850 hospitals are already reporting to us on their antibiotic use. It includes 80 VA hospitals and 30 military hospitals. And they're having that be part of their—it's voluntary, but it's part of their ability to monitor what's going on in their own institution and then look across institutions.

Ms. SCHAKOWSKY. What percentage of hospitals does that represent, do you know?

Dr. SCHUCHAT. I don't actually have that information, but we could get that for you.

Ms. SCHAKOWSKY. OK. Has the CDC identified any obstacles to successfully implementing stewardship programs? If so, how are you addressing those?

Dr. SCHUCHAT. I would say that incorporating the outpatient facilities in the stewardship is important. We also found that rural areas, critical areas, we're challenged in being able to do all the things that we recommend in terms of antibiotic stewardship.

Our program convened a batch of the rural or critical area hospital stewardship leads, who had figured out ways to make a difference, and we're working with them to share their best practices more broadly. So I would say that large hospitals are really on the case now, and helping the smaller facilities get up to speed is important.

Ms. SCHAKOWSKY. Thank you. In the remaining seconds, does anybody else—

Dr. FAUCI. Yes. How we address antibiotic resistance is really governmentwide, and it's a program called CARB, Combating Antibiotic-Resistant Bacteria, that was established years ago, a few years ago, that involves what Dr. Schuchat had mentioned regard-

ing the CDC. It involves the FDA research component from the NIH to develop new drugs to understand the mechanisms of resistance to harness the immune system, but also an organization called CARB-X, which BARDA has a major role in.

So maybe, Rick, you want to just mention that briefly.

Mr. BRIGHT. Very briefly. So since 2010, BARDA has invested over a billion dollars in addressing the development of new antibiotics to address antimicrobial resistance. We have, just in the last year, had the first antibiotic drug licensed in our program. We have several more in Phase 2 and Phase 3.

We also realized that the early stage pipeline was not sufficient to have a stream of new candidates going into advanced stage development. So we did launch a public-private partnership called CARB-X, in collaboration with NIAID, also sponsored by Wellcome Trust, now Bill and Melinda Gates Foundation in the U.K. Government. So we have now funded 34 different novel technologies to address new mechanisms of action for new antibiotics and vaccines.

Ms. SCHAKOWSKY. Thank you. My time is up, but I hope that in addition to development, that we're looking at prevention here as well.

Thank you for your courtesy, Mr. Chairman. Thank you.

Mr. HARPER. Thank you. The gentlewoman yields back.

The chair will now recognize the chair of the House Ethics Committee and a valuable member of this subcommittee, the gentlewoman from Indiana, Mrs. Brooks, for 5 minutes.

Mrs. BROOKS. Thank you, Mr. Chairman.

Dr. Schuchat, and if, Rear Admiral Hinton, if you could pass that binder, please, over to Dr. Schuchat. The last page of that binder has a chart that I would like to enter into the record and ask unanimous consent to enter into the record. It's PHEMCE's budget report for fiscal year 2016–2020.

Mr. HARPER. Without objection.

[The information appears at the conclusion of the hearing.]

Mrs. BROOKS. A large percentage of the CDC's Strategic National Stockpile budget appears to not go to procuring and updating medical countermeasures for the stockpile, but instead, goes to a category entitled nonprocurement costs. And in an effort to inform the discussion today, committee staff did ask CDC to provide a breakdown for what is in this nonprocurement, but we never got it.

Can you please share with us very briefly, and you might need to supplement with written response, what makes up the nonprocurement spending for the Strategic National Stockpile?

Dr. SCHUCHAT. Thanks so much for your question. As you know, the Strategic National Stockpile has an inventory of about \$7 billion. So the annual appropriation is just a piece of that. Most of the dollars that are in the nonprocurement go for sustaining and operating. So that would be the rental space, the security for the warehouses, the staff that work, the salaries for the staff, as well as the clinical expertise that's helping with the guidance on how to use the product.

Mrs. BROOKS. Thank you. Could we get a written breakdown of what that is?

Dr. SCHUCHAT. Absolutely.

Mrs. BROOKS. Because we could not tell what that was.

Dr. SCHUCHAT. That should be on its way to you.

Mrs. BROOKS. Thank you very much.

Dr. Bright, last year, HHS OIG issued a report after conducting five site audits at the various Strategic National Stockpile locations over a 2-year period, and they talked about systemic issues, putting that \$7 billion that was just mentioned into great concern.

So, Dr. Bright, what actions does ASPR plan to take in the transfer that is anticipated October 1 to ensure the Strategic National Stockpile assets will be available in case of public health emergencies?

Mr. BRIGHT. As you probably know, we have several working groups working very closely between CDC and ASPR to evaluate various components of the stockpile transfer. So we are still—

Mrs. BROOKS. Can I interrupt one second? We just heard, in her opening testimony, Dr. Schuchat talk about all the many things CDC does relative to public health and these emergencies. And so are you going through all of those things to make sure there is coordination? And is that what the working groups are actually doing, figuring out what part CDC is going to maintain and what part ASPR will have? Is that what the working groups are doing?

Mr. BRIGHT. Absolutely. There's five different working groups. They're meeting weekly actually, and some of them have daily communications, to understand the various components, understanding how we maintain and sustain the best science and expertise that's currently in the SNS, understanding how we're building and augmenting the relationship with States and locals to ensure that that is also maintained for a robust SNS enterprise. We're also looking at the contracting and the financing. We're looking at the non-procurement cost as well.

We assure you that we are doing everything we can to make sure that those nonprocurement costs are supporting the SNS and its mission.

Mrs. BROOKS. I have a question with respect to—I understand there have been instances where BARDA—and you mentioned it—had to use Project BioShield funds to procure FDA-approved clinical countermeasures or medical countermeasures, because, for whatever reason, CDC declined to procure those countermeasures for the stockpile.

How does that uncertainty affect BARDA's ability to partner with industry, and is that being addressed in your working groups?

Mr. BRIGHT. That uncertainty is critical. As you know, it's very difficult to make these countermeasures. It's very lengthy, very risky, and the companies put aside other very profitable and successful endeavors to work with us in these areas. That marketplace assurance is absolutely essential to them working with us.

So we realize that, as we've been more successful with our partners and making additional countermeasures, it has created an additional burden on the SNS. We are working with the SNS at the CDC and our internal staff now to make sure that we are able to address those lapses or those gaps in communication or transparency to make sure that we have a successful—

Mrs. BROOKS. Thank you. I'd also like to enter into the record a letter from the Blue Ribbon Study Panel on Biodefense that was

sent to Dr. Kadlec with a very detailed seven recommendations to improve our biodefense posture.

Mr. HARPER. Without objection.

[The information appears at the conclusion of the hearing.]

Mrs. BROOKS. And among those was the need to improve the coordination with State and local partners and to address problems that have existed in the past.

Can you tell us how ASPR plans to engage with State and local partners once it assumes control of the stockpile, which is of great concern to State and local partners?

Mr. BRIGHT. I agree that it is an essential part of an effective enterprise, the end-to-end approach, from early detection down to distribution. The State and local and tribal and territorial partners are the front line. They are the ones who are distributing and administering the vaccines and treatments. So we are dedicated to working with them, making sure they have a voice in the structure, in our system, to understand how they need those medical countermeasures and how they need them to be delivered most effectively.

It doesn't do us any good to make new drugs and vaccines if they're not suitable for our frontline workers at the State and local and tribal and territories to deliver and administer those.

Mrs. BROOKS. And so they know how to deliver and administer.

Mr. BRIGHT. Absolutely.

Mrs. BROOKS. Thank you. With that, I yield back. Thank you for your time.

Mr. HARPER. The gentlewoman yields back.

The chair will now recognize the gentlewoman from Florida, Ms. Castor, for 5 minutes.

Ms. CASTOR. Thank you, Mr. Chairman.

Good morning. Last year, Florida recorded 262 known cases of Zika. They were overwhelmingly travel-related cases, but of those known cases, 136 were pregnant women, and three babies were born in Florida with congenital Zika syndrome. Thankfully, those statistics are down substantially from 2015 and 2016, but the threat to young women of childbearing years and families remains very serious.

A study was just published where researchers from the CDC and the Annenberg Public Policy Center determined that most people have let their guard down now, that they're not taking the precautions that they should when it comes to Zika.

So, Dr. Schuchat, now that you have the results of that study and the threat of congenital Zika syndrome remains very serious, what do you plan to do to help keep families informed and make sure they're taking all precautions?

Dr. SCHUCHAT. Thank you. Zika was such a devastating new problem to have. For a mosquito bite to be able to cause birth defects, not something that was on any of our radars, really.

I think you know that, in May, we issued one of our monthly high-visibility reports of vital signs on mosquito and tick-borne diseases, which have really been increasing, trying to get that word out in advance of the mosquito season so people would take these threats seriously.

We have another report that's focused on Zika that will be coming out in about 2 months, really highlighting what have we

learned from the, unfortunately, thousands of pregnancies that were complicated by Zika in folks who reside in the 50 States, to show what the followups have been and what has happened to the babies as they develop.

We need to make mosquito protection much easier for individuals and we need to have better tools for countering mosquitoes, in terms of environmentally safe and acceptable tools for them. We have been appreciative of the investments in strengthening our vector control so that there's better surveillance for vector-borne disease, and also better understanding of resistance patterns so we have the right products that can be used.

Ms. CASTOR. And there must be more we can do to communicate to young women and young men, especially now that—I mean, it was very strange that Zika became transferable via sex as well. So—

Dr. SCHUCHAT. Yes. The signs are still up in the airports, but people turn them off. So I think continuing to raise concerns is a challenge when people become complacent. So it's sort of our perpetual challenge in prevention.

Ms. CASTOR. Thank you.

Responding to public health emergencies requires us to have a good understanding of what is happening on the ground in real time. And doctors and nurses and others who work directly with patients are likely to be the first to interact with individuals affected in a public health emergency.

How does CDC gather data from these clinicians to detect emerging illnesses and other threats?

Dr. SCHUCHAT. We have a variety of surveillance systems to try to identify both the known threats and then the unknown or the new unusual clusters. Most important is for there to be a close connection between the clinical community, the doctors and nurses on the front line, and their local and State public health authorities.

The first cases of West Nile virus disease in New York City were detected, there were some animal losses, but it was that link between clinicians and the local health department. So part of our day-to-day everyday public health system is vital for the unknown emerging—

Ms. CASTOR. And CDC has a Laboratory Response Network that plays a vital role in biopreparedness by ensuring that we are able to quickly diagnose public health threats using rapid testing methods known as assays, but I understand that right now, there are no assay kits or rapid tests available for many dangerous pathogens and toxins.

What is going on here, and what are the barriers to developing assays targeting a wide variety of pathogens and toxins?

Dr. SCHUCHAT. Yes. What I would say is that the Laboratory Response Network, or LRN, is a group of 125 hospitals around the— or laboratories around the country that are within a 2-hour drive of 85 percent of all of the population. They are equipped to use validated, standardized assays to detect a variety of conditions.

The CDC has the ability to detect and confirm a longer list of the select agents and dangerous pathogens, and we prioritize which of the detection methods or assays need to be deployed close to where people live, which ones can be deployed and maintained centrally,

because it's quite expensive to have the standards high enough to be able to reproduce the results in all of the 125 hospitals.

So while there's 45 select agents, we have assays for nearly all of them. Many of those are managed at the CDC or at Regional Centers of Excellence, while the 125 laboratories can test for the things that we think are the most likely, including things like MERS, where we rolled out an emergency use authorization for a new diagnostic test for that, Ebola, et cetera, the H1N1 initially. So we try to deploy distally the assays for the threats that are the most important to have local ability to detect rapidly.

Mr. BRIGHT. If I can add just a second on that too. That is another area of innovation that BARDA has been focusing on with our industry partners is to drive diagnostics, not only out of centralized labs to augment that centralized laboratory network, but put the diagnostics in the hands of the physicians in the physician's office at point-of-care testing. And even go further now, to drive diagnostics into the home, so people will know earlier when they've been infected with something so they can take responsible action to either get treated sooner when drugs are more effective and also to take activities to reduce the further spread or transmission of that virus. This area is ripe for innovation to augment our national laboratory support system.

Ms. CASTOR. Thank you very much.

Mr. HARPER. The gentlewoman yields back.

The chair now recognizes the gentleman from New York, Mr. Collins, for 5 minutes.

Mr. COLLINS. Thank you, Mr. Chairman.

I want to thank our witnesses and follow up a little bit more on the Laboratory Response Network, Dr. Schuchat. I understand that's been around about 9 years or thereabouts, since I think 1999?

Dr. SCHUCHAT. Yes, since 1999.

Mr. COLLINS. Actually, I've lost 10 years. Twenty years. I deliberately lost those 10 years, by the way.

So I know you mentioned 125 labs here in the country, but this is, from what I understand also, there's international labs. We all know the key to a lot of this is early detection, whether it was Ebola or some other things, SARS, which initially people thought they had the flu, even anthrax. But early detection's the key to jumping on top of this, which means the laboratories that are located outside the country. And I know this is a collaborative effort.

Are you, let's use the word "comfortable," and how is that collaboration between the United States and other countries around the world—as you mentioned, in many cases, these could be in Africa and other places—for the ability to identify these select agents?

Dr. SCHUCHAT. The Laboratory Response Network is in other countries as well, but I would say there's other means, other laboratories that we collaborate with around the world to help have that rapid detection and response. And actually, that's really what the global health security agenda is about, making sure that there are abilities to find, stop, and prevent epidemics wherever they occur, natural or not.

And the international collaboration, I think, is strengthened by the daily links we have in partnership on other threats. As you heard, we're working on Ebola in DRC right now. The Nipah virus detection in India was based on training that CDC had given to the laboratory in India years before so that India could recognize that pathogen themselves without having to take the time to ship the specimens out of the country.

Mr. COLLINS. So, following up on that, what I would call proficiency testing that we do for all of our labs, whether it's on influenza or HIV or any of the STDs, I'm assuming there's also a proficiency testing program related to our LRNs, which is always maybe a little more complicated because the 45 select agents are not nearly as prevalent as influenza. But can you speak to the proficiency program, how often these laboratories are tested, their workers, how their grades are, so that, in fact, we're comfortable that, if there is an outbreak, they're properly identifying it?

Dr. SCHUCHAT. Yes. The proficiency testing and assuring the quality of the laboratory test is vital. That's one of the reasons that we don't have assays for every one of the select agents in each of the LRN labs, because we want to certify that lab for that test and make sure that they maintain their reagents adequately and that everyone who's working on that test is doing it the right way. So we really try to prioritize which assays will be run regularly in every lab, because we do have to make sure that year in and year out, they're getting the accurate results. Otherwise, it makes no sense to run the test.

Mr. COLLINS. Is that done yearly, more than yearly? How often is that done? And does the CDC conduct the proficiency tests themselves or do you use outside agencies like CAP or someone like that?

Dr. SCHUCHAT. Let me get the details on that for the committee in followup, because I don't have all of them myself.

Mr. COLLINS. OK. Thank you. I think that's an important piece.

In the remaining time, Admiral Hinton, egg-based versus cell-based vaccines, could you comment? YIs the FDA looking at—as we're moving forward certainly through our influenza season, are you making progress on the cell-based? Are you seeing positive potential there?

Admiral HINTON. Absolutely. And we actually have both. We have the egg-based versus the cell-based vaccines available, and continue to do evaluation and work in that area. But both are available, both are promising.

Mr. COLLINS. Because, there's always been some folks—if anyone else would like to comment on potential problems with the egg-based. Are we seeing positive steps in the other or—

Admiral HINTON. We are seeing positive steps in the other direction. And then as far as the egg-based, I know we run into issues with people having allergens and the like to them and not being able to have them. So having different options there to be able to provide and treat people with is promising and is available.

Mr. HARPER. Dr. Fauci.

Dr. FAUCI. There are other problems with egg-based, which is the reason why we're really trying to get away from egg-based and get more towards more advanced platform technologies.

One of the accidental mismatches that we had in 2016–2017, particularly in Australia, was that the virus was chosen for the vaccine, was put into eggs, and as it mutated in the eggs as it was growing, it mutated so that the virus that came out of the eggs was not the virus that you put into the egg. So we had an accidental mismatch.

That doesn't happen all the time by any means, but the idea of having to grow a virus in a 6-month process is something that we really need to, as I often say, graduate into the 21st century and do it a little bit better with more advanced technologies.

Mr. COLLINS. Thank you for that.

Mr. Chair, I yield back.

Mr. HARPER. The chair is going to allow Dr. Bright to finish his response that he wanted to make here quickly.

Mr. BRIGHT. Thank you very much. I'd like to add just a little bit more to that as well. It's very important to understand the need for diversified vaccine production systems for influenza. Influenza's a tricky virus. Eggs have been a reliable vaccine substrate for a number of years. We are working to find ways to not only diversify and augment our cell-based and recombinant-based influenza vaccines, but also to improve egg-based vaccines. It's important not to completely discard a reliable technology without having a modernized technology to replace that. So we are working with each of the manufacturers now to identify ways to make our flu vaccines more effective now while we wait for that universal flu vaccine candidate in the future.

Mr. HARPER. The chair will now recognize the gentleman from California, Mr. Ruiz, for 5 minutes.

Mr. RUIZ. Thank you, Mr. Chairman.

Emerging infectious diseases are a major threat to the health of American citizens and to people around the world. This includes both new diseases that emerge in populations, as well as previously known diseases that re-emerge. In just the past 2 months, for example, we have seen outbreaks of Ebola in the Congo and Nipah in Northern India.

Dr. Schuchat, what steps are we taking to monitor emerging and re-emerging infectious diseases in the developing world, and how are we partnering with international players on this?

Dr. SCHUCHAT. Yes. CDC works closely with dozens of ministries of health around the world, as well as with international partners like the World Health Organization and the World Food Organization to—or the World Animal Health Organization to be able to find, stop, and prevent epidemics.

Mr. RUIZ. Give me an example of how you do that in a very underdeveloped, poor infrastructure nation.

Dr. SCHUCHAT. Right. As you know, in Liberia, they suffered from a devastating outbreak of Ebola in 2014. We have a country office in Liberia that's working closely with them focused on four key areas: strengthening laboratory systems, strengthening surveillance, strengthening emergency operation centers and rapid response, and workforce development through the disease detective program that we call the field epidemiology training program.

That means they can shorten the time to recognition of Ebola or something else and respond capably.

Mr. RUIZ. Thank you.

And in 2014, 2016, the Ebola epidemic killed more than 11,000 people in West Africa, and we know in October 2014, a physician who traveled from West Africa to Dallas in Texas died of Ebola; two others that contracted the Ebola virus survived.

What did we learn from that experience? And what are the changes that you've made because of that?

Dr. SCHUCHAT. There are three key lessons learned. One was that we need every country to have the ability to find, stop, and prevent epidemics, and that's what we call this Global Health Security Agenda.

A second thing was that we need the world organizations, the global organizations, to be able to surge rapidly when a country's capacity is overwhelmed. And that has actually happened effectively in the Democratic Republic of Congo with this Ebola outbreak recently.

And the third thing that we've learned is that infection control is essential; that an issue that is one illness or a couple illnesses can amplify into a very large-scale problem when we don't have adequate infection control. That's important in the United States for antimicrobial resistance, it's important in developing countries for TB, and it's very important for Ebola in SARS.

Mr. RUIZ. This patient and these two other healthcare workers who contracted Ebola, obviously, were in emergency departments, went to emergency departments, were treated in emergency departments. The first line of defense against any emerging infection or outbreak in the United States is going to be the emergency departments and also the first responders.

So what are you doing in terms of the CDC to coordinate to make sure that they are well-equipped? And then I'm going to ask Dr. Bright that same question.

Dr. SCHUCHAT. Yes. We have a family of efforts to educate and keep up-to-date clinicians that include tens of thousands of clinicians regularly getting updates from us, whether it's through phone calls—

Mr. RUIZ. It's hard for very busy clinicians who work in emergency departments, seeing 20 patients at once to—

Dr. SCHUCHAT. Right. And that's—

Mr. RUIZ. How do you integrate that into their daily practice?

Dr. SCHUCHAT. Yes. The system changes are really important. When I saw a doctor at Emory last week, before I could even talk to anyone, I was asked, Have you traveled out of the country the last 3 weeks? It's actually on their phone line before you make an appointment.

So institutions instituting systemwide checks can help make sure that you don't have problems with human error.

Mr. RUIZ. Dr. Bright?

Mr. BRIGHT. Also, I'd like to highlight that ASPR has spent a lot of time with our hospital protection program and our healthcare coalitions to establish now even a national Ebola training center and education center, so we can train the hospital and first responders.

We now have 178 Ebola assessment hospitals. We have 69 State or jurisdictions designated Ebola treatment centers. We have 10 regional Ebola and other special pathogen treatment—

Mr. RUIZ. Well, I'm an emergency physician. I have to take exams like crazy just to keep my board certifications and my licensing. So I think integrating it as part of their continuing medical education and training would be very essential.

Now, the President's budget—or the administration wants to move the strategic National Stockpile under the ASPR. I'd like to ask Dr. Schuchat what are your competitive advantages and why should I think about even considering keeping it at the CDC?

Dr. SCHUCHAT. What I could say is that there's already been an administrative decision to move the stockpile, and so currently, CDC is working diligently very closely with ASPR to make that transfer as seamless as possible and to mitigate any negative consequences that may have been unintended but that may occur.

I think the critical areas that we are going to focus on are to make sure that State and local support is seamless, and that we work with State and local health departments every day on a variety of things and know them and know where our gaps are and where we need to make progress. We need to make sure that that close relationship continues in a way that doesn't jeopardize the American public.

Second area is the deep scientific expertise that we have across the agency that has contributed to maintenance of the SNS so that when we need clinical guidance for children for anthrax countermeasures, we can get that best advice incorporated. We need to make sure that that continues, but we are well on the way to executing that seamless transition.

Mr. HARPER. The gentleman yields back.

The chair will now recognize the vice chair of the subcommittee, the gentleman from Virginia, Mr. Griffith, for 5 minutes.

Mr. GRIFFITH. Thank you, Mr. Chairman.

After a series of safety lapses in 2014 involving the mishandling of anthrax and smallpox, in response to recommendations from a lab safety expert panel, both the FDA and CDC formed new offices to provide centralized oversight of laboratory safety and science.

Rear Admiral Hinton, I have several questions for you regarding the FDA's Office of Laboratory Science and Safety.

First, how many labs does the FDA have, or oversee?

Admiral HINTON. The FDA has 56 lab facilities.

Mr. GRIFFITH. And do you oversee more than that?

Admiral HINTON. No.

Mr. GRIFFITH. And are you counting everything in a single building, or is that all your labs combined?

Admiral HINTON. Those are the facilities. Within those facilities, there might be a total of 2,800 rooms, with those rooms being described as a space, an office, a closet.

Mr. GRIFFITH. Yes, ma'am.

How many safety inspections of these labs were conducted by the OLSS over the past year?

Admiral HINTON. No inspections have been conducted by OLSS in the past year. However, their labs have been inspected by other entities.

Mr. GRIFFITH. OK. Have there been any laboratory-acquired infections at FDA labs during the past year?

Admiral HINTON. There have been two noted infections within the last year. The staff that had acquired those infections have been observed and the case is closed.

Mr. GRIFFITH. All right. And can you get us the reports on those two incidences, please?

Admiral HINTON. I'll work with my staff to get that to you.

Mr. GRIFFITH. Thank you very much.

Likewise, have there been any potential exposures to threat agents at FDA labs during the past year?

Admiral HINTON. Not to my knowledge. No.

Mr. GRIFFITH. All right. At tab 5 in the document binder is a September 2016 letter to the FDA sent the committee indicating its intention to hire 13 permanent full-time employees in the Office of Laboratory Science and Safety, OLSS.

The FDA told the committee this week that OLSS is staffed by only three permanent full-time employees, and three detailees.

Why doesn't the OLSS have the 13 permanent employees that were promised in a September letter of 2016?

Admiral HINTON. Sir, we have put forth the proposal, and as soon as we have the dedicated budget for OLSS, we expect for their current staff to double.

They actually have three permanent staff and three detailed working on this space.

Mr. GRIFFITH. That still only puts you at six as opposed to the 13 that was indicated in 2016.

Admiral HINTON. I agree. And we note that, and then with the approval of the upcoming budget, we will be able to double that and they will have the 13 staff.

Mr. GRIFFITH. The FDA, in the September 2016 letter, committed to this committee, and in July of 2017, published a notice in the Federal Register evaluating the OLSS so the office would directly to the FDA commissioner instead of the chief scientist.

Earlier this week, the FDA told committee staff that the FDA has decided to reorganize again, and that under the new proposal, OLSS will no longer be a direct report to the commissioner and will report to the chief scientist again, just as they did when we had the lapses back in 2014 and contrary to the expert panel's recommendations.

I just would like to know, first, is the chief scientist reporting to you now?

Admiral HINTON. I am the chief scientist. But the Director of OLSS—

Mr. GRIFFITH. Is OLSS reporting to you?

Admiral HINTON. Yes, sir.

Mr. GRIFFITH. And then you report on up the line?

Admiral HINTON. Yes. I do.

Mr. GRIFFITH. So why did FDA reverse course in less than a year and decide to have the OLSS revert back to reporting to the chief scientist?

Admiral HINTON. Well, sir, since that was announced, we have had the chance over the past year to observe and to see where it might be best fit for the alignment within the office.

Within the office of the chief scientist, which reports into the office of the commissioner and to the commissioner, we work on cross cutting cross-scientific issues to include those within laboratory science space.

So we thought that the OLSS would be best aligned there under my direct supervision on their day-to-day activities. The commissioner will be fully apprised of those activities.

Mr. GRIFFITH. Well, and I certainly mean no disrespect to you, but that was the same setup we had when there were problems being reported and we had the expert panel come in and give us recommendations, which FDA agreed to, and now you all are backtracking.

I understand some different personnel, but it seems to me we're just creating the same problem we had before.

I see my time is up, and I have to yield back. Thank you, Mr. Chairman.

Mr. HARPER. The gentleman yields back.

The chair will now recognize the gentlewoman from California, Ms. Walters, for 5 minutes.

Ms. WALTERS. Thank you, Mr. Chairman.

Dr. Bright and Dr. Schuchat, either through stockpile procurement or through other means, how do your agencies ensure we have sufficient diagnostic test capacity to identify cases of pandemic influenza or other infectious diseases?

Mr. BRIGHT. In terms of development, so we have worked with a number of different manufacturers through the last 10 years to develop diagnostics for influenza, not only laboratory-based diagnostics, but to standardize and update the point-of-care diagnostics for influenza to make sure those are available and in the marketplace for use for pandemic and seasonal influenza detection.

Dr. SCHUCHAT. Yes. And I would say that CDC both develops assays and helps with validation.

You know, a number of years ago, there were quite a few point-of-care tests for influenza detection, and some of them didn't perform as well in the field as we had hoped. So we did quite an effort of validation comparison, shared the data with FDA, and new labeling and improvements in the tests followed from that.

So we will develop tests against pandemic or avian flu and other high-threat concerns, develop them through to emergency use authorization when appropriate, 501(k) when possible.

The 501(k) final process is very labor intensive, very expensive, and there's a limited number of our tests that we are able to put through to that level. But we do work closely with FDA and BARDA on a number of the priority ones.

Ms. WALTERS. Thank you.

Dr. Fauci, you mentioned work by the National Institute of Allergy and Infection Diseases to support research involving diagnostic testing.

From a Homeland Security and public health perspective, multiplex point-of-care technologies are beneficial because they can be used to simultaneously test for multiple infectious disease pathogens with a single blood or urine sample.

Can you tell us about the research NIAID is doing with respect to multiplex point-of-care technologies and how these technologies enhance our ability to detect material threats and infectious diseases?

Dr. FAUCI. Thank you very much for that question.

Yes. We are very heavily involved in that, both with our grantees to get concept to develop into something that's translatable, as well as contract.

There's multiplex, as you mentioned in your statement, is a very important tool of the future now for detecting outbreaks. For example, we have multiplex assays involving a whole series of particular types of viruses. For example, the flaviviruses, which are many of them that we have, particularly in the Western Hemisphere, that we are involved right now in research for the development of a multiplex that would essentially cover all of the associated flaviviruses, and we're doing that with a number of other viruses.

So there's really a very important, I believe, and aggressive ongoing research program at the NIH, mostly through our grantees and contractors.

Ms. WALTERS. OK.

Mr. BRIGHT. If I can jump in, the challenge with the beauty of multiplex assays is that they can do a lot. And the challenge with them is they're very large instruments generally in centralized laboratories in a hospital or a public health laboratory.

The innovation that we're driving today with companies that move multiplex assays to point of care into a physician's office, and even to work with those multiplex technologies to push some of those now out into the home, one of our greatest challenges with our diagnostics for any disease is how long it takes for a patient to get to that system and into the system so they can get a sample drawn and can get a result.

Too much time elapses in that. So we're trying to also use this new technology for multiplex point of care to multiplex point of need into the home to get people earlier notification to empower patients to get treated sooner.

Ms. WALTERS. OK. Thank you.

Rear Admiral Hinton, how many multiplex point-of-care diagnostic tests has the FDA approved for use?

Admiral HINTON. Thank you for your question, ma'am.

Work in this area is progressing well at FDA. We've cleared more than 25 multiplex tests that could be suitable for point-of-care tests.

Ms. WALTERS. OK. And how many others are currently under assessment by the FDA?

Admiral HINTON. I'll have to get back to you. I don't have the exact number.

Ms. WALTERS. OK. Can you describe the range of capabilities that these tests have? You know, how many diseases can one multiplex point-of-care diagnostic test detect?

Admiral HINTON. It can detect many. We can do up to 20—and more than—at one time, which is incredibly important, especially at the point of care so that we can help to easily detect in order to find the best treatment.

Ms. WALTERS. OK. Thank you, and I yield back the balance of my time.

Mr. HARPER. The gentlewoman yields back.

The chair will now recognize the gentleman from Georgia, Mr. Carter, for 5 minutes.

Mr. CARTER. Thank you, Mr. Chairman.

And, Mr. Chairman, I want to echo your comments earlier about what an outstanding panel this is. Thank you all for the very important work that you do. It is extremely important to our country, and we appreciate it very much.

Dr. Bright, I want to start with you. Being, of course, from Georgia, I am somewhat concerned, even still, about the move of the strategic National Stockpile and the management of that from the CDC to ASPR, and I just want to be assured again from you. I've met Dr. Redfield, and I think he's doing a great job. Dr. Schuchat and I have worked together, and I just can't say enough good things about the CDC and the outstanding work that they do for our country.

And I just want to make sure that they're still going to have the opportunity to stay involved and to be involved in the medical counter-measurement development and everything else that goes along with the SNS.

Mr. BRIGHT. Sir, you have my complete assurance. I echo your comments about the CDC and the great work they are doing. Many people don't know I got my first start in science at the CDC as an ORISE fellow coming from Emory University in Georgia.

I understand and appreciate the great scientific leadership of the CDC and their relationship with state and local and the value of that.

We plan to always include that in our assessment and our programs for the new strategic National Stockpile management.

Mr. CARTER. We talked on it earlier. One of my colleagues had mentioned about the concern particularly that the transfer is not disruptive for the state and local agencies.

What would you suggest that we do to make that as least disruptive as we can?

Mr. BRIGHT. Well, the most important thing is to recognize the value of their voice in the entire process, not just in the transition of the management of the SNS, but an entire end-to-end process of our efficient response to any emergency or public health emergency threat.

So we already have an intentional working group focusing on the state and local and tribal and territory partners and their specific needs and their specific interests to make sure those are encapsulated in our management of the SNS.

Mr. CARTER. Great.

Dr. Schuchat, would you care to comment on that as well? How can we assure that this is not disruptive to our local and state communities?

Dr. SCHUCHAT. I think that change is, by necessity, disruptive, and I think our job is to mitigate that disruption so that people aren't harmed. So I think it's on our radar. We're working really closely together. The Association of State and Territorial Health

Officers Board was just at CDC yesterday talking to us about how we can make sure this all goes as well as possible.

Mr. CARTER. And let me ask you—I run the risk of being a little self-serving here—but wouldn't it make sense to look at perhaps just having ASPR colocate down to Atlanta with the CDC? I recognize you're part of HHS, but we have to get out of the mindset that not everybody's got to be in Washington, D.C. We have a big country out here. Dr. Bright, I'm looking at you.

Mr. BRIGHT. We have a big and beautiful country, sir, and I agree with you, and there is no intent to move the strategic National Stockpile from Atlanta to Washington, D.C. There might be one or two individuals who are located in our ASPR office to ensure we have smooth and efficient ongoing communication with the expert staff that is in Atlanta, Georgia.

Mr. CARTER. OK. Well, that might be a good compromise, and we appreciate that very much.

The Ebola crisis that we had, obviously we learned a lot of lessons there, but I was so proud of the public/private partnership between Emory University and the CDC, and all four patients recovered.

And I just wanted to know, will you be using that model in the future for other pandemics and other risks that we might run into? Because we're very proud of the work that was done at Emory University, and I think it's a great example of what we can do in the future.

Dr. Schuchat?

Dr. SCHUCHAT. I would say that CDC benefits tremendously from being located right next to Emory, and there's a really close working relationship. We were fortunate that they such a terrific job in the Ebola—in the care of the patients there.

There's ongoing collaboration and communication and support.

I think ASPR may have a more direct role in the hospitals and the care of such patients, and Dr. Bright might want to comment.

Mr. BRIGHT. I also want to make sure that we capitalize and not lose that expert and lessons learned from Emory University.

As you may know, we stood up a National Ebola Training and Education Center. It's based in Nebraska as collaboration with Emory University, University of Nebraska, and Bellevue. It is an example of one the finest educational centers on Ebola and other epidemic treatments in the world now.

Mr. CARTER. OK. Again, I want to thank all of you for the work that you do. Extremely important, and especially shout out to CDC and the work that they do.

Thank you, and I yield back, Mr. Chairman.

Mr. HARPER. The gentleman yields back.

The chair will now recognize the gentlewoman from California, Ms. Eshoo, for 5 minutes.

Ms. ESHOO. Thank you, Mr. Chairman, for extending the legislative courtesy to me, since I'm not a member of this subcommittee, but I have a great interest in the subject matter, since we're looking to reauthorize PAHPA and all of the listening to what's taken place in this hearing and the superb testimony from each one of you. We've made great progress since the legislation was first written in 2006.

So I'm pleased, but in America, we're never satisfied with exactly where we are. We always want to improve. And so there's been an important pathway of improvement, and I thank each one of you.

I'm very proud of the two women that are here. Rear Admiral Hinton, it's really a source of pride to me to hear you respond to the tough questions that have come your way. To Dr. Schuchat, it's always a pleasure to hear you. Dr. Bright, the partnership with BARDA has been a very important one, and I think that you're taking it to new places.

And to Dr. Fauci, I don't have any questions to ask you. I wish I could canonize you. You are such a gift to our country. You could be in the private sector probably making millions of dollars. You've devoted your entire life to the people of our country, and you make the National Institutes of—the NIH really stand for the National Institutes of Hope. You're a leader in that, and I just revere your record, your leadership, and what you've done and what you continue to do.

To Dr. Bright, how has restoring BARDA as a contracting authority led to increases in the efficiency and the certainty that surrounds the medical countermeasures at research and development? That's my first question.

And my second one is, does your agency interpret your existing authority to allow the stockpile to invest in countermeasures other than those explicitly mentioned in the current statute?

Maybe start with the second question.

Mr. BRIGHT. Thank you very much.

Ms. ESHOO. Do you need any additional authorities?

Mr. BRIGHT. To be more effective, I believe we need to modify some of the authorities that we have to allow us to work more flexibly with our industry.

Ms. ESHOO. So you don't need additional authorities?

Mr. BRIGHT. We don't need additional authorities. I believe we need to modify the authorities that we have.

Ms. ESHOO. What does that mean, modify the authorities?

Mr. BRIGHT. Our other transactional authority, for example, does have limitations on how we can interface with our industry partners and how they might qualify for that type of partnership. So we have a draft of suggested language that might allow us that greater flexibility to do so.

Ms. ESHOO. And have you gotten that to us?

Mr. BRIGHT. If it hasn't been sent to you yet, we will make sure that it is quickly.

Ms. ESHOO. Do BARDA's existing additional authorities promote work on the, and it's been brought up, not only at this subcommittee, but at others, of the antimicrobial resistance and the antibiotic development, or does your agency need additional authorities to engage in that work?

Mr. BRIGHT. We've been working with the authorities we have since 2010 to address antimicrobial resistance.

One area of authority that is lacking, we believe, would be beneficial would be a specific authority for the appropriations for pandemic influenza, because there's a lot of critical work that needs to happen in pandemic—

Ms. ESHOO. Have you gotten that to us?

Mr. BRIGHT. I do not have that authority yet.

Ms. ESHOO. Are you going to make that request of us?

Mr. BRIGHT. I believe that request has been submitted. I hope so.

Ms. ESHOO. There was some mention earlier about how important the advanced—I think you might have raised it in your opening statement, on advanced appropriations. I believe that, because the Senate has different rules on this, that we will meet the standard that needs to be met. That's probably the tidiest way for me to say it.

But it is critical, because if you don't have the advanced appropriations at BARDA, then our partners in the private sector are not going to be able to continue the important work that they're doing.

Mr. BRIGHT. That's absolutely correct. They are business partners working in long-term cycles and forward-looking cycles, and the consistency and assurance of that advanced appropriations allows them to have that assurance that we will still be there doing our part so they can plan appropriately as well.

Ms. ESHOO. Thank you very much to each one of you for what you're doing for our country. You're all heroes of mine.

Thank you, Mr. Chairman. Yield back.

Mr. HARPER. The gentlewoman yields back.

The chair will now recognize Ranking Member DeGette for concluding remarks.

Ms. DEGETTE. Thank you very much, Mr. Chairman, for the moment of personal privilege.

I wanted to bring up another issue that I think is a real crisis right now in this country.

I know we have a lot of HHS agency representatives here, and, of course, ASPR is under the purview of HHS.

Yesterday, our ranking member, Frank Pallone, wrote a letter to Secretary Azar about the HHS Office of Refugee Resettlement. And these kids who are being taken from their parents at the border, and then being put under the auspices of this agency, we have real concerns about what's happening to these children. And we have real concerns about their long-term prospects, being taken from their parents.

And, Mr. Chairman, I just wanted to bring this up, because you're going to be getting a request from the minority to have a hearing about this, and we would hope that you would seriously consider this, because we are quite concerned about the human aspects of this situation.

Thank you, and I yield back.

Mr. HARPER. The gentlewoman yields back.

The chair will recognize Dr. Burgess for a concluding remark.

Mr. BURGESS. Well, Mr. Chairman, thank you for the recognition.

I would just point out that this committee, and this subcommittee in particular, has a significant history of oversight on the ORR. I do feel obligated to point out this is not the agency that makes the decision about whether or not a family unit is kept together, but they are obligated to take care of—whether a child arrives unaccompanied or is separated from their family at the DHS facility. But that is the responsibility of, in fact, the Health Subcommittee, and we do take that responsibility very seriously.

In fact, it was our work in July of 2014 that allowed them to acquire an actual physician to be in those facilities to assess those children as they were brought in.

And it was our committee that raised the question shouldn't we at least have some way of contacting the children after they have been placed with a family, at least on a voluntary basis.

So it was our committee that did that work, and that work will continue. I've been in contact with both Secretary Azar and with the gentleman that runs ORR, and I expect to have robust discussions with them going forward, and I yield back.

Ms. DEGETTE. If the gentleman will yield, thank you very much, and I look forward to working with you on this, because it's really a critical issue, and I'm on that subcommittee, too. Thank you.

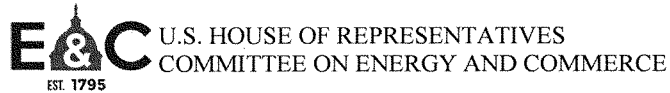
Mr. HARPER. I want to thank each of you for being here. Great insights and expertise, and I thank you for participating in today's hearing.

I remind Members that they have 10 business days to submit questions for the record, and I ask that the witnesses agree to respond promptly to any such questions.

With that, the subcommittee's adjourned.

[Whereupon, at 10:58 a.m., the subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]



June 13, 2018

TO: Members, Subcommittee on Oversight and Investigations

FROM: Committee Majority Staff

RE: Hearing entitled "The State of U.S. Public Health Biopreparedness: Responding to Biological Attacks, Pandemics, and Emerging Disease Outbreaks."

The Subcommittee on Oversight and Investigations will hold a hearing on Friday, June 15, 2018, at 9:00 a.m. in 2123 Rayburn House Office Building. The hearing is entitled "The State of U.S. Public Health Bio-preparedness: Responding to Biological Attacks, Pandemics, and Emerging Disease Outbreaks."

The purpose of this hearing is to follow up on the past biopreparedness oversight issues examined by the Subcommittee, and to receive updates from the agencies on current assessments and strategies. This hearing will also highlight the need to reauthorize the Pandemic and All-Hazards Preparedness Act (PAHPA), which is due to expire at the end of September 2018.¹

I. WITNESSES

- Rick A. Bright, Ph.D., Director, Biomedical Advanced Research and Development Authority; Deputy Assistant Secretary, Office of the Assistant Secretary for Preparedness and Response, U.S. Department of Health and Human Services;
- Anne Schuchat, M.D. (RADM, USPHS), Principal Deputy Director, Centers for Disease Control and Prevention, U.S. Department of Health and Human Services;
- Anthony Fauci, M.D., Director, National Institute of Allergy and Infectious Diseases, National Institutes of Health; and
- Denise Hinton (RADM, USPHS), Chief Scientist, U.S. Food and Drug Administration.

¹ PAHPA created and expanded programs to enhance the public health system's capacity to monitor and respond to public health emergencies. The act expanded programs for state and local public health emergency preparedness activities and mandates the use of evidence-based benchmarks and standards to measure levels of preparedness. Ass'n of State and Territorial Health Orgs., *ASTHO Legal Preparedness Series Emergency Authority & Immunity Toolkit - Pandemic and All-Hazards Preparedness Act*, <http://www.astho.org/Programs/Preparedness/Public-Health-Emergency-Law/Emergency-Authority-and-Immunity-Toolkit/Pandemic-and-All-Hazards-Preparedness-Act-Fact-Sheet/> (last visited June 11, 2018).

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II. BACKGROUND

This section will outline four areas of continuing oversight interest in the area of biopreparedness: biological threats; detection and diagnostics; development and stockpiling of medical countermeasures (MCMs); and science, safety and security of laboratories in the life sciences-biodefense complex.

A. Biological Threats

Biological threats fall into three main categories: natural infectious diseases, synthetic biology/engineered pathogens, and bioterrorism. Synthetic biology could cause harm either intentionally (e.g., an engineered pathogen used in a bioterrorist attack) or accidentally (e.g., through the accidental release of dangerous agents from a lab conducting dual use research).²

In this century, the nation has witnessed the impacts of naturally occurring outbreaks such as influenza, Ebola, and SARS.³ Health authorities are currently monitoring other potential emerging infectious diseases that could cause a pandemic, such as the H7N9 influenza strain circulating in China.⁴ Further, as recently noted by Department of Health and Human Services (HHS) Assistant Secretary for Preparedness and Response (ASPR) Robert Kadlec, “[t]errorist organizations such as ISIS and al-Qaida remain determined to attack; further ISIS has demonstrated no compunction about using chemical and other unconventional weapons in attacks overseas. State actors have already threatened our homeland with nuclear weapons and have shown the means to employ both chemical and biological weapons.”⁵

The Subcommittee explored the growing nature of these biological threats and the need for an elevated response at a hearing held on February 12, 2016.⁶

An attachment to this memorandum provided by the National Institute of Allergy and Infectious Diseases (NIAID) shows examples of emerging and re-emerging infectious diseases as of June 2018.

² GiveWell, *A conversation with George Poste on February 12, 2014*, <https://www.openphilanthropy.org/sites/default/files/Poste%202-12-14%20%28public%29.pdf> (last visited June 11, 2018). George Poste, DVM, PhD., is Director, Complex Adaptive Systems Institute, Arizona State University and an ex officio member of the Blue Ribbon Study Panel on Biodefense.

³ See *Examining the Reauthorization of the Pandemic and All-Hazards Preparedness Act Before the Subcomm. on Health of the H. Comm. on Energy and Commerce*, 115th Cong. (2018) (written testimony of Hon. Robert Kadlec, M.D., Assistant Sec’y for Preparedness and Response, U.S. Dep’t of Health & Human Services).

⁴ *Id.*

⁵ *Id.*

⁶ See *Outbreaks, Attacks, and Accidents: Combating Biological Threats Before the Subcomm. on Oversight and Investigations of the H. Comm on Energy and Commerce*, 114th Cong. (2016) Serial No. 114-117.

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B. Detection and Diagnostics

Laboratory Response Network

The Centers for Disease Control and Prevention (CDC) Laboratory Response Network (LRN) is a network of 134 local, state and federal laboratories that can provide the laboratory infrastructure and capacity to quickly respond to public health emergencies, and incidents of biological and chemical terrorism. The network, established in 1999 and overseen by the CDC, enables rapid detection of and response to emerging infectious diseases such as Zika, Ebola and influenza, as well as select agents and toxins. All 50 states have at least one member laboratory and 85 percent of the U.S. population lives within a two-hour drive of an LRN lab.

The ability of the LRN to respond to quickly unfolding emergencies is essential and, as such, the network was designed to deploy rapid detection technology and laboratory tests (known as assays) to quickly test suspicious materials and detect the presence of biological or chemical agents in the event of a bioterrorism attack.

In August 2016, the Committee launched a bipartisan investigation about the current capabilities of the CDC LRN, and two additional information request letters followed on October 26, 2016, and February 28, 2017.⁷ These letters requested information regarding the LRN's lab capacity, funding levels, and laboratory test development.

In response to questions about funding for the network, the CDC provided documentation indicating that spending decreased over the last decade. The LRN's expenditures have gradually decreased from \$15 million in 2007 to \$9 million in 2016. Expenditures for the LRN totaled \$116.2 million during that 10-year period.⁸ The CDC has also at times received funding from other federal agencies to help support network activities. The Department of Homeland Security's Science and Technology Directorate, Department of Defense's Defense Threat Reduction Agency and its Joint Program Executive Office, and the Department of Health and Human Services' Office of the Assistant Secretary for Preparedness and Response (ASPR) and Biomedical Research and Development Authority (BARDA) have each provided funding for LRN support over the last 10 years. Funding has varied year-to-year by agency, but the total amount the four agencies have provided to the LRN since Fiscal Year 2008 is \$21.5 million.⁹

⁷ Letter from Hon. Fred Upton, Chairman, H. Comm. on Energy and Commerce, et al. to Thomas Frieden, M.D., Dir., Centers for Disease Control and Prevention (Aug. 11, 2016) *available at* <https://archives-energycommerce.house.gov/sites/republicans.energycommerce.house.gov/files/documents/114/letters/20160811CD C.pdf>; Letter from Hon. Fred Upton, Chairman, H. Comm. on Energy and Commerce and Hon. Tim Murphy, Chairman, H. Comm. on Energy and Commerce, Subcomm. on Oversight and Investigations to Thomas Frieden, M.D., Dir., Centers for Disease Control and Prevention (Oct 26, 2016) (On file with the Committee); Letter from Hon. Greg Walden, Chairman, H. Comm. on Energy and Commerce and Hon. Tim Murphy, Chairman, H. Comm. on Energy and Commerce, Subcomm. on Oversight and Investigations to Anne Schuchat, M.D., Acting Dir., Centers for Disease Control and Prevention (Feb. 28, 2017) *available at* <https://archives-energycommerce.house.gov/sites/republicans.energycommerce.house.gov/files/documents/114/letters/20170228CD C.pdf>.

⁸ Letter from Anne Schuchat, M.D., Acting Dir., Centers for Disease Control and Prevention, to Hon. Greg Walden, H. Comm. on Energy and Commerce. (May 23, 2017) (On file with the Committee). In the letter to the Committee, the CDC represented that there may be additional funding sources for the LRN than those it had identified.

⁹ *Id.*

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In response to questions on lab test development, the CDC provided information about the process by which it selects and develops new assays the LRN can use to detect for biological agents, toxins and emerging infectious diseases. The CDC has indicated that the Food and Drug Administration (FDA) has approved 510(k) clearances for four assays and issued emergency use authorization for another six assays.¹⁰ Out of a total of 45 select agents affecting humans on the current select agents and toxin list,¹¹ the CDC LRN has assays cleared by FDA under the 510(k) process for three, after nearly 20 years of the LRN program and more than \$135 million in funding during the last decade.¹²

Most recently, the CDC arranged for the evaluation and deployment of a Department of Defense Ebola Zaire assay by the LRN amid the 2014 Ebola epidemic in West Africa. After the 2015 Zika outbreak in Brazil, the CDC also began development of an LRN diagnostic for the Zika virus.¹³

Biosurveillance

Two areas of biosurveillance of interest to the Subcommittee have been BioWatch and multiplex point-of-care technologies (MPOCTs). BioWatch is an early warning system designed to detect a large-scale, covert attack that releases anthrax or other agents of bioterrorism into the air. Overseen by the Department of Homeland Security (DHS), the BioWatch program involves a system of aerosol collectors deployed in more than 30 cities, as well as laboratory facilities and personnel to analyze samples from these collectors. This program relies heavily on CDC, and the state and local public health laboratories that are members of the CDC LRN. The program aims to reduce the time required to recognize and characterize potentially catastrophic aerosolized attacks by monitoring for the presence of certain biological agents considered to pose high risk for an aerosolized attack. A committee investigation and a U.S. Government Accountability Office (GAO) report found that DHS lacked reliable information about BioWatch's technical capabilities to detect a biological attack and therefore lacks the basis for informed cost-benefit decisions about upgrades to the system.¹⁴ DHS continues to work on ways to upgrade the BioWatch system.

MPOCTs are technologies that can simultaneously test for more than one type of human infectious disease pathogen from a single patient sample (such as blood, urine, or sputum) in one run at or near the site of a patient. MPOCTs can enable rapid testing while the patient is at the doctor's office, clinic, or other testing location, including the home. From a homeland security and public health perspective, MPOCTs are of interest as an early detection tool, and can help assess the potential spread and effect of the disease in the case of dangerous pathogens. At the

¹⁰ *Id.*

¹¹ See Fed. Select Agent Program, *Select Agents and Toxins List*, <https://www.selectagents.gov/selectagentsandtoxinslist.html> (last visited June 11, 2018).

¹² Schuchat, *supra* note 8.

¹³ *Id.*

¹⁴ See *Continuing Concerns Over BioWatch and the Surveillance of Bioterrorism Before the Subcom. on Oversight and Investigations of the H. Comm. on Energy and Commerce* 113th Cong. (2013) Serial No. 113-56; U.S. Gov't Accountability Office, *Biosurveillance: DHS Should Not Pursue BioWatch Upgrades or Enhancements Until System Capabilities Are Established*, GAO-16-99 (Oct. 2015) available at <https://www.gao.gov/assets/680/673309.pdf>.

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Committee's request, the GAO conducted a technical assessment of MPOCTs.¹⁵ The GAO found that MPOCTs have a range of performance characteristics that describe, among other things, the ability of the technology to correctly identify the presence or absence of a pathogen. Developers identified several technical challenges to developing multiplex assays that can slow MPOCT development and raise costs. GAO also identified potential benefits of MPOCTs included improved patient health care and management, more appropriate use of antibiotics, improved ability to limit the spread of disease, and health care cost savings.

C. Development and Stockpiling of Medical Countermeasures

Public Health Emergency Medical Countermeasures Enterprise

In 2006, HHS established the Public Health Emergency Medical Countermeasures Enterprise (PHEMCE) to coordinate federal efforts to prepare for, and respond to, public health emergencies from a MCM perspective.¹⁶

Pursuant to the 2013 Pandemic and All-Hazards Preparedness Reauthorization Act, the PHEMCE is led by the ASPR and is comprised of senior leadership from the CDC, the NIAID at the National Institutes of Health (NIH), the FDA, the Department of Defense (DoD), the DHS, the Department of Veteran's Affairs (VA) and the Department of Agriculture (USDA).¹⁷

The PHEMCE's mission components include:¹⁸

- **Requirements Setting:** The PHEMCE is responsible for establishing requirements for MCMs based on factors such as threat and risk assessments, which are principally conducted by the DHS.
- **Early Stage Research:** The NIH is the lead federal PHEMCE agency for conducting and facilitating research into areas of public health concerns, which could ultimately lead to the development of MCMs to diagnose, treat, and prevent a wide-range of public health threats.
- **Advanced Development/Manufacturing:** The Biomedical Advanced Research and Development Authority (BARDA), within HHS' ASPR, develops MCMs for emerging public health threats and partners with industry to accelerate development and increase MCM manufacturing capacity. In the past decade, BARDA's efforts, supported by industry and government partnerships, have resulted in 35 FDA approvals for 31 unique

¹⁵ U.S. Gov't Accountability Office, *Medical Devices: Capabilities and challenges of technologies to enable rapid diagnoses of infectious diseases*, GAO-17-347 (Aug. 2017) available at <https://www.gao.gov/products/GAO-17-347>.

¹⁶ See 71 C.F.R. § 129 (2006) and U.S. Dep't of Health & Human Services, Assistant Sec'y for Preparedness and Response, *Public Health Emergency Medical Countermeasures Enterprise*, <https://www.phe.gov/Preparedness/mcm/pheemce/Pages/default.aspx> (last visited June 11, 2018).

¹⁷ 42 U.S.C. § 300hh – 10.

¹⁸ U.S. Dep't of Health & Human Services, Assistant Sec'y for Preparedness and Response, *PHEMCE Mission Components*, <https://www.phe.gov/Preparedness/mcm/pheemce/Pages/mission.aspx> (last updated Feb. 27, 2015).

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MCMs for threats to the public health.¹⁹ BARDA has also supported the development of 27 MCMs against threats that have been identified by the DHS, through Project Bioshield, as being national security threats.²⁰

- **Regulatory Science Management:** The PHEMCE endeavors to ensure MCMs are safe and effective, which is generally the responsibility of the FDA.
- **Procurement / Inventory Management / Stockpiling:** The PHEMCE oversees the procurement and management of MCMs to respond to public health threats. Currently, the CDC and BARDA are the lead PHEMCE agencies for this mission component.
- **Response Planning, Policy, Guidance and Communication:** The PHEMCE, led by CDC and ASPR, coordinates federal medical response and communication strategies when faced with a public health emergency.
- **Deployment / Distribution / Dispensing / Administration:** The CDC and ASPR engage and coordinate with state and local partners to facilitate the distribution of MCMs and administration of other medical assets in times of public health emergencies.
- **Monitoring / Evaluation / Assessment:** The CDC and FDA are the principal PHEMCE agencies for monitoring the safety and performance of MCMs that have been deployed in response to public health emergencies response.

Concerns have been raised about the length of time it takes to classify a hazardous pathogen as a material threat and then approve the development of medical countermeasures. According to ASPR, it can take upwards of two years for the DHS to designate a pathogen as a material threat.²¹ For example, carfentanil, a highly potent form of fentanyl, was known as a weapon of mass destruction after Russian forces used it in the Moscow theatre against Chechen terrorists in 2002,²² but pharmaceutical-based agents, such as fentanyl, were only recently added as a material threat. ASPR would like to reduce the time it takes for the DHS to designate a material threat to 90-days or less.²³ After a pathogen is classified as a material threat, PHEMCE can approve the development of MCMs for a material threat. ASPR is currently considering other steps that could reduce the timeframe to approve countermeasure development while still maintaining an adequate level of input from all PHEMCE partners and experts, and hopes to devise a plan to reduce the MCM development timeframe by year's end.²⁴

¹⁹ Kadlec, *supra* note 3.

²⁰ *Id.*

²¹ Briefing by staff, U.S. Dep't of Health & Human Services, Assistant Sec'y for Preparedness and Response with staff, H.Comm. on Energy and Commerce, June 11, 2018.

²² See, e. g. Erika Kinetz and Maria Danilova, *Lethal chemical now used as a drug haunts theater hostages*, Associated Press, Oct. 8, 2016, <https://apnews.com/256605b7679d4a61bde9a8eac8906ea9>.

²³ Assistant Sec'y for Preparedness and Response, *supra* note 21 and E-Mail from staff, Assistant Sec'y for Preparedness to staff, H. Comm on Energy and Commerce (June 12, 2018 9:13am).

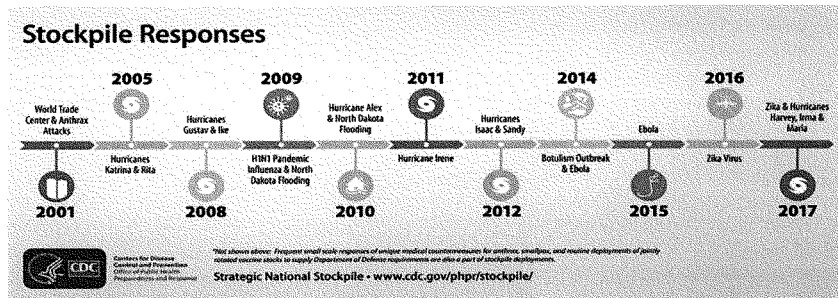
²⁴ Assistant Sec'y for Preparedness and Response, *supra* note 21.

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Strategic National Stockpile

The CDC is the primary federal agency responsible for public health surveillance, epidemiologic investigations, and public health communications. The CDC is also currently responsible for managing the Strategic National Stockpile (SNS), though the President's Fiscal Year (FY) 2019 Budget Request transfers SNS management authority from the CDC to HHS' ASPR.²⁵

The SNS is a federal repository of MCMs such as vaccines, antibiotics, and other medical supplies that are to be used in public health emergencies.²⁶ For FY 2018, the SNS received a total of \$610 million, including supplemental funding included in the omnibus spending bill passed earlier this year. Since FY 1999, the federal government has appropriated more than \$9.15 billion to the SNS, with annual SNS funding levels significantly increasing in the years following the September 11, 2001, terror attacks and 2001 anthrax attacks.²⁷

Through coordination with the PHEMCE, CDC's current responsibilities regarding the SNS include MCM procurement, shelf life analysis, and MCM replenishment. In addition, the CDC, through its Office of Public Health Preparedness and Response (OPHPR), is also responsible for the delivery of MCMs to areas that have been affected by public health emergencies. OPHPR also provides training to state and local medical personnel and public health officials on how to properly receive and distribute MCMs from the SNS in the case of a public health emergency. In 2017, OPHPR provided such training to more than 3,700 state and local personnel and led a total of 12 medical emergency simulation exercises.²⁸



Source: Centers for Disease Control and Prevention

²⁵ U.S. Dep't of Health & Human Services, Centers for Disease Control and Prevention, *Fiscal Year 2019 Justification and Estimates for Appropriation Committees*, available at <https://www.cdc.gov/budget/documents/fy2019/fy-2019-cdc-congressional-justification.pdf>.

²⁶ 42 U.S.C. § 247d-6b.

²⁷ Source: Total tabulated from tables in Congressional Research Service e-mail to staff, H. Comm. on Energy and Commerce (June 1, 2018).

²⁸ Centers for Disease Control and Prevention, *Public Health Preparedness and Response 2018 National Snapshot*, available at https://www.cdc.gov/phpr/pubs-links/2018/documents/2018_Preparedness_Report.pdf.

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Over the last few years, independent audits have raised concerns over CDC's logistical management of the SNS. In June 2017, HHS' Office of Inspector General (OIG) issued a report which called into question the readiness of the CDC to effectively deploy SNS resources during a public health emergency.²⁹ In its review, OIG identified "systemic issues [that] could put at risk approximately \$7 billion of Stockpile inventory and negatively affect Stockpile readiness during a national emergency."³⁰ The OIG's conclusion was based on a review of findings from each of five SNS site audits that covered FYs 2013 and 2014, and additional information related to the value of the SNS, security, and funding.

Questions have also been raised about the SNS Division of State and Local Readiness (DSLRL), which oversees expenditures of about \$8.6 million. The DSLRL initiatives are meant to ensure that local partners have the resources and training in place to distribute and properly use products from the SNS in the event they need to be deployed. ASPR, however, has identified concerns with state and local partners' current state of readiness, specifically regarding "last mile" distribution and how quickly partners are able to distribute products on the ground after receipt from SNS.³¹ Among the concerns highlighted by ASPR is that state and local partners currently do not know what products are in the SNS and therefore do not know how to properly deploy the products.³² To improve state and local readiness, ASPR intends to bolster education and training programs so local partners and first responders have familiarity with SNS products. ASPR also intends to review assessment tools used to rank state and local partners' readiness status and to design an array of distribution models that could be implemented by local entities to improve their response plans.³³

Other issues raised regarding the CDC's management of the SNS include instances in which the CDC failed to fund the procurement of an MCM for the SNS after the MCM's development and FDA approval.³⁴ For example, there have been instances where BARDA has had to use Project Bioshield funding to procure MCMs that have been FDA-approved but were not ultimately purchased by the SNS. The reason for this was due to the fact that the government has to not only ensure that the specific MCMs remain available, but also must sustain a company since they are developing MCMs that do not have a traditional commercial market. Some of the MCMs that have been produced in this manner include: anthrax vaccine adsorbed; axibacumab; and obiltoxaximab.³⁵

Recently, members of the Blue Ribbon Study Panel on Biodefense wrote to Dr. Robert Kadlec, HHS ASPR, with a number recommendations to enhance the United States' MCM infrastructure. Included among the Panel's recommendations were proposed SNS management

²⁹ U.S. Dep't of Health & Human Services, Office of Inspector Gen., *Readiness of CDC's Strategic National Stockpile Could Be at Risk in Case of a Public Health Emergency* (A-04-16-03554) (June 2017) available at <https://oig.hhs.gov/oas/reports/region4/41603554RIB.pdf>.

³⁰ *Id.*

³¹ Assistant Sec'y for Preparedness and Response, *supra* note 21.

³² *Id.*

³³ *Id.*

³⁴ E-Mail from staff, Assistant Sec'y for Preparedness to staff, H. Comm on Energy and Commerce (June 12, 2018 4:02pm).

³⁵ *Id.*

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reforms, which, according to the Panel, were precipitated by the CDC's inadequate management of the SNS.³⁶

Pursuant to the President's FY 2019 budget, the transfer of the SNS from the CDC to the ASPR will be effective October 1, 2018.³⁷ According to HHS, the benefits of moving the SNS to ASPR include that: (1) a unified command for the SNS as the reorganization will vest the MCM production and stockpiling responsibilities with a single agency; (2) ASPR's mission is more targeted than that of the CDC's, enabling it to be a better advocate for the SNS; and (3) ASPR has established relationships with state/local emergency responders, who would play a critical role in a SNS deployment.³⁸

National Pre-Pandemic Influenza Stockpile

In November 2005, the White House Homeland Security Council issued the *National Strategy for Pandemic Influenza*, designating HHS as the department to lead the nation's medical response to pandemic influenza.³⁹ According to the CDC, a pandemic influenza occurs when a new influenza A virus emerges, usually originating in animals, that is able to easily spread from person to person due to lack of effective treatments and acquired immunity.⁴⁰ The *National Strategy* also emphasized the need to ensure that the nation had an adequate MCM production capacity and stockpile to respond to potentially pandemic strains of influenza.⁴¹ The Homeland Security Council reiterated the importance of having a pre-pandemic MCM stockpile in its *National Strategy Implementation Plan*, which was released in May 2006, categorizing the pandemic threat as a national security issue.⁴²

BARDA, which was established by the Pandemic and All-Hazards Preparedness Act, is responsible for the procurement and management of the nation's pre-pandemic influenza stockpile as well as the development of influenza MCMs. BARDA is also tasked with accelerating the development and procurement of MCMs related to chemical, biological, radiological, and nuclear threats as well as threats related to emerging infectious diseases.⁴³

³⁶ Letter from the Blue Ribbon Study Panel on Biodefense to Hon. Robert Kadlec, M.D., Assistant Sec'y for Preparedness and Response, U.S. Dep't of Health & Human Services (May 15, 2018) (on file with the Committee).

³⁷ U.S. Dep't of Health & Human Services, *Fiscal Year 2019 Public Health and Social Services Emergency Fund Justification of Estimates for Appropriations Committee*, available at <https://www.hhs.gov/sites/default/files/fy-2019-phssecf-cj.pdf>.

³⁸ *Id.*

³⁹ Executive Office of the President of the United States, Homeland Security Council, *National Strategy for Pandemic Influenza*, Nov. 2005 available at <https://www.cdc.gov/flu/pandemic-resources/pdf/pandemic-influenza-strategy-2005.pdf>.

⁴⁰ Centers for Disease Control and Prevention, *Influenza (Flu) Questions and Answers*, available at <https://www.cdc.gov/flu/pandemic-resources/basics/faq.html> (last updated May 15, 2017).

⁴¹ Executive Office of the President, *supra* note 39.

⁴² Executive Office of the President of the United States, Homeland Security Council, *National Strategy for Pandemic Influenza Implementation Plan*, May 2006 available at <https://www.cdc.gov/flu/pandemic-resources/pdf/pandemic-influenza-implementation.pdf>.

⁴³ 42 U.S.C. § 247d-7e.

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In June 2017, and at the Committee's urging,⁴⁴ HHS issued an update to its *Pandemic Influenza Plan*, which was initially published in 2005 and had been last updated in 2009.⁴⁵ In the 2017 update, HHS stated that the national pre-pandemic influenza stockpile "satisfies requirements for vaccine and adjuvants to address influenza viruses that are assessed to be the highest risk for human infection."⁴⁶ BARDA, in collaboration with other HHS agencies, utilizes CDC's Influenza Risk Assessment Tool (IRAT) to assess pandemic risks that are associated with emerging novel influenza viruses and make determinations regarding a potential update to the pre-pandemic stockpile or the development of new vaccine candidates.⁴⁷

CARB-X

CARB-X is a non-profit public-private partnership dedicated to accelerating antibacterial research to tackle the global rising threat of drug-resistant bacteria.⁴⁸ With more than \$500 million to invest between 2016 and 2021, CARB-X funds the research and development of new antibiotics, vaccines, rapid diagnostics and other life-saving products to tackle the global threat of drug-resistant bacteria. CARB-X was created in response to the U.S. government's 2015 Combating Antibiotic Resistant Bacteria (CARB) initiative, and the United Kingdom's government's call in 2016 for concerted global effort to address the growing drug-resistance public health crisis. Launched on July 28, 2016, CARB-X is a cooperative effort between BARDA and the NIAID. CARB-X is funded by BARDA and Wellcome Trust, the world's largest medical charity which is based in the U.K.

D. Science, Safety and Security of Laboratories in the Life Sciences-Biodefense Complex

Currently, there are about 1,200 high-containment laboratories in the U.S. conducting research on diagnostics and cures for highly dangerous pathogens. For more than a decade, the Subcommittee has held hearings and conducted investigations related to the Federal Select Agent Program, including on the safe handling of federal select agents and other dangerous pathogens.

Federal Select Agent Program

The Federal Select Agent Program regulates the possession, use, and transfer of biological select agents and toxins to ensure laboratory research conducted on the materials is done in a safe and secure manner. Sixty-six select agents and toxins that could potentially be

⁴⁴ See Letter from the Hon. Greg Walden, Chairman, H. Comm. on Energy and Commerce, et al., to Hon. Thomas Price, M.D., Sec'y, U.S. Dep't of Health & Human Services (Apr. 20, 2017), available at <https://archives-energycommerce.house.gov/sites/republicans.energycommerce.house.gov/files/documents/20170420HHS.pdf>.

⁴⁵ U.S. Dep't of Health and Human Services, *Pandemic Influenza Plan 2017 Update* (last visited June 7, 2018) available at <https://www.cdc.gov/flu/pandemic-resources/pdf/pan-flu-report-2017v2.pdf>.

⁴⁶ *Id.*

⁴⁷ See Letter from Hon. Nicole Lurie, M.D., Assistant Sec'y for Preparedness and Response, U.S. Dep't of Health & Human Services to Hon. Fred Upton, Chairman, H. Comm. on Energy and Commerce (Mar. 15, 2016) available at <https://archives-energycommerce.house.gov/sites/republicans.energycommerce.house.gov/files/documents/114/letters/20160229HHS%20Response.pdf>.

⁴⁸ CARB-X, *About CARB-X*, <https://carb-x.org/about/overview/> (last visited June 11, 2018).

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used in bioterrorist attacks – including anthrax, smallpox, and plague – are currently regulated through the program. Managed jointly by HHS and the USDA, the program provides oversight of more than 275 entities that have registered through the program in order to conduct research on the hazardous pathogens.⁴⁹

The Federal Select Agent Program was established in 1996 through the passage of the Antiterrorism and Effective Death Penalty Act. The law, passed in the aftermath of the Oklahoma City bombing, required HHS to identify a list biological agents and toxins that could threaten public health and safety and establish regulations regarding the transfer of those agents. The September 11, 2001, terrorist attacks and the 2001 anthrax mailings led to increased concern about the threat of bioterrorism attacks, and additional restrictions which banned certain individuals from transporting or receiving select agents were included in the USA Patriot Act of 2001.⁵⁰ Congress expanded the program through the passage of the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 to include regulation of the transfer and the use and possession of select agents and increased safeguards and security requirements.

Concerns raised by the mishandling of dangerous pathogens prompted the Committee to request an assessment of the select agent program by the GAO. In response to the Committee's request, the GAO reviewed oversight procedures of the select agent program and issued a report in October 2017 that highlighted deficiencies in the program's capabilities.⁵¹ The report raised concerns about potential conflicts of interest as the select agent program is not independent from all the laboratories it oversees. The report also noted that the program has historically focused more on security and preventing thefts of select agents and toxins than on biological safety issues within the labs using the pathogens for research. The Subcommittee, which has held multiple hearings on the select agent program and safety lapses at federal labs, questioned USDA and CDC officials about the GAO report's conclusions and recommendations at a November 2, 2017, hearing.⁵²

Prioritizing lab science and safety

Following the 2014 incidents involving anthrax mishandling at the CDC and the smallpox discovered in storage for an FDA lab on the NIH campus, federal efforts intensified to improve the management of government labs. In particular, an external scientific working group recommended improvements to the CDC and FDA for overhauling their lab safety programs. This included the recommendation that a program director would be a single point of accountability and would have a direct reporting relationship to the head of the agency. When Stephan S. Monroe, the CDC's Associate Director for Laboratory Science and Safety (ADLSS), testified before the Subcommittee in April 2016, he said the formation of the director position

⁴⁹ Federal Select Agent Program, *About Us*, <https://www.selectagents.gov/about.html> (last visited June 11, 2018)

⁵⁰ See USA Patriot Act of 2001, Pub. L. No. 107-56, 115 Stat. 272 (2001).

⁵¹ U.S. Gov't Accountability Office, *Coordinated Actions Needed to Enhance the Select Agent Program's Oversight of Hazardous Pathogens*, GAO-18-145 (Oct. 2017) available at <https://www.gao.gov/assets/690/687868.pdf>.

⁵² See *Concerns Over Federal Select Agent Program Oversight of Dangerous Pathogens Before the Subcom. on Oversight and Investigations of the H. Comm. on Energy and Commerce* 115th Cong. (2017) available at <https://docs.house.gov/meetings/IF/IF02/20171102/106574/HHRG-115-IF02-Transcript-20171102.pdf>.

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was “the most fundamental change implemented in the wake of the 2014 incidents.”⁵³ Further, Dr. Monroe noted that the fact that the ADLSS reported directly to the CDC director provided “high-level oversight and coordination of critical laboratory policies and operations” across all CDC campuses.

In response to the 2014 safety lapses,⁵⁴ the FDA’s Office of Laboratory Science and Safety (OLSS) was formed in order to provide oversight and to improve security and safety across all divisions of FDA. The formation of the office was announced in 2016 as a means to consolidate oversight responsibilities and standard policies for all FDA laboratories. In 2017, the FDA issued a strategic plan outlining the goals of the new office.

According to the OLSS strategic plan, the office’s mission is to:

- Ensure FDA’s laboratories and workplaces are operated in a safe and secure manner to protect employees, the surrounding communities, and the environment;
- Research and disseminate innovative ideas and validated methods for safe and secure laboratory practices;
- Support high-quality (i.e., accurate, reliable, and timely) FDA laboratory results; and
- Promote a culture of shared responsibility and safety.⁵⁵

Just as the ADLSS was organized to directly report to the CDC Director, the OLSS was also envisioned to directly report to the FDA Commissioner. A reorganization issued by the FDA in 2017 made the OLSS a direct report to the FDA Commissioner.⁵⁶ However, the FDA now plans to have the OLSS report to the Office of the Chief Scientist instead of directly to the Commissioner.⁵⁷

In addition, the budget and staffing for the OLSS have not been consistent. In 2016, the FDA informed the Committee that the office’s budget for FY 2017 was \$5.2 million and that it would support 13 full time employees.⁵⁸ FDA officials subsequently told Committee staff that the FY 2017 budget for OLSS was \$9 million, but that funding levels would support not just

⁵³ *Laboratory Safety at the Centers for Disease Control and Prevention Before the Subcomm. on Oversight and Investigations of the H. Comm on Energy and Commerce*, 114th Cong. (2016) (written testimony of Hon. Stephan S. Monroe, PhD., Assoc. Dir. for Laboratory Science and Safety, Centers for Disease Control and Prevention) available at <https://docs.house.gov/meetings/IF/IF02/20160420/104823/HHRG-114-IF02-Wstate-MonroeS-20160420.pdf>.

⁵⁴ Brady Dennis and Lena H. Sun, *FDA found more than smallpox vials in storage room*, WASH. POST, July 16, 2014, https://www.washingtonpost.com/national/health-science/fda-found-more-than-smallpox-vials-in-storage-room/2014/07/16/850d4b12-0d22-11e4-8341-b8072b1e7348_story.html.

⁵⁵ U.S. Food and Drug Admin., 2017-2022 Operating Model – *Office of Laboratory Science and Safety*, Updated Oct. 13, 2017, available at <https://www.fda.gov/downloads/AboutFDA/CentersOffices/OC/OLSS/UCM583016.pdf>.

⁵⁶ See 82 Fed. Reg. 34540 (July 25, 2017) available at <https://www.federalregister.gov/documents/2017/07/25/2017-15564/office-of-the-commissioner-statement-of-organization-functions-and-delegations-of-authority>.

⁵⁷ Briefing by staff, U.S. Dep’t of Health & Human Services, U.S. Food and Drug Admin. with staff, H. Comm. on Energy and Commerce, June 11, 2018.

⁵⁸ Letter from Dayle Cristinzio, Acting Assoc. Comm’r for Legislation, U.S. Food and Drug Admin., to Hon. Fred Upton, Chairman, H. Comm. on Energy and Commerce, (Sept. 9, 2016) (On file with the Committee).

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OLSS operations (including staff and contractor support) but also the Employee Safety and Environmental Management staff that were transferred to OLSS.⁵⁹ The FDA later informed the Committee that no permanent full-time employees (FTE) were hired by OLSS in FY 2017, rather the office recruited 19 individuals through temporary detail assignments and contract support.⁶⁰ In a briefing with Committee staff, the FDA confirmed that the office's FY 2018 budget is \$5.6 million and the FY 2019 budget is \$6 million.⁶¹ The office currently employs three FTEs and three contractors. At this time, FDA has not reported the total number of FDA laboratories to the Committee staff. FDA has not yet reported to the Committee the number of audits that OLSS has conducted.

By contrast, the CDC's ADLSS office's FY 2016 budget was \$14.5 million and supported 34 FTEs.⁶² As of this month, the office had 43 FTEs with three slots vacant and oversaw audits of laboratories used by 239 teams of scientists.⁶³ The CDC recently reported to Committee staff that it had submitted a proposed reorganization to the Department that would eliminate the Associate Director's direct reporting relationship to the Director, and instead would report to a Deputy Director.⁶⁴

III. ISSUES

The following issues may be examined at the hearing:

- How timely are the PHEMCE decisions regarding biological threats being made? Can the timeliness of these decisions be improved?
- How can the number of FDA-approved assays for threat agents be increased?
- Is there adequate oversight to ensure the efficacy of MCMs in the SNS and the pre-pandemic vaccine stockpile?
- Are U.S. public health agencies implementing recommendations to improve laboratory science and safety?

⁵⁹ E-Mail from staff, U.S. Food and Drug Admin. to staff, H.Comm. on Energy and Commerce (May 17, 2017, 3:57pm) (On file with the Committee).

⁶⁰ E-mail from staff, U.S. Food and Drug Admin. to staff, H. Comm. on Energy and Commerce (Aug. 20, 2017, 12:50pm) (On file with the Committee).

⁶¹ U.S. Food and Drug Admin., *supra* note 57.

⁶² Letter from Hon. Fred Upton, Chairman, H. Comm. on Energy and Commerce and Hon. Tim Murphy, Chairman, H. Comm. on Energy and Commerce, Subcomm. on Oversight and Investigations to Hon. Robert M. Califf, M.D. Comm'r, U.S. Food and Drug Admin. (May 18, 2016) (citing E-mail from staff, Centers for Disease Control and Prevention to staff, H. Comm. on Energy and Commerce (Apr. 15, 2016)) (On file with the Committee).

⁶³ Briefing by staff, U.S. Dep't of Health & Human Services, Centers for Disease Control and Prevention with staff, H. Comm. on Energy and Commerce, June 8, 2018.

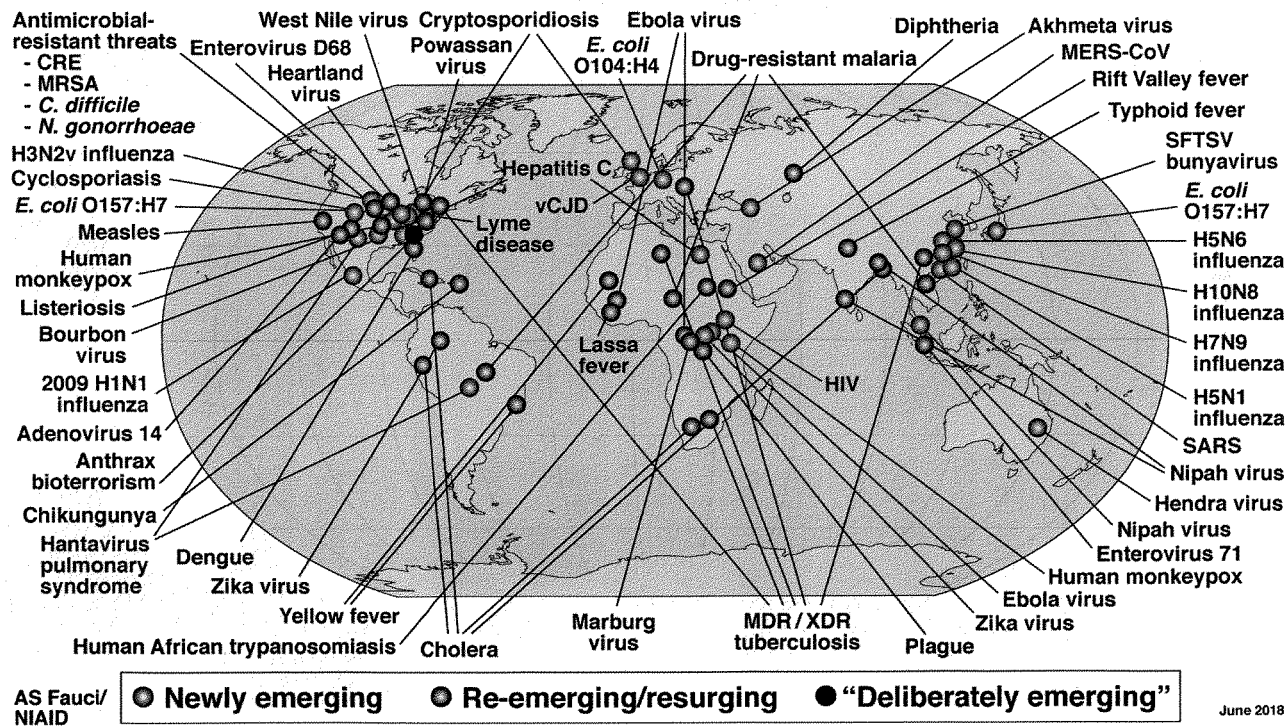
⁶⁴ *Id.*

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IV. STAFF CONTACTS

If you have any questions regarding this hearing, please contact Alan Slobodin, Christopher Santini, or Andrea Noble of the Committee staff at (202) 225-2927.

Global Examples of Emerging and Re-Emerging Infectious Diseases



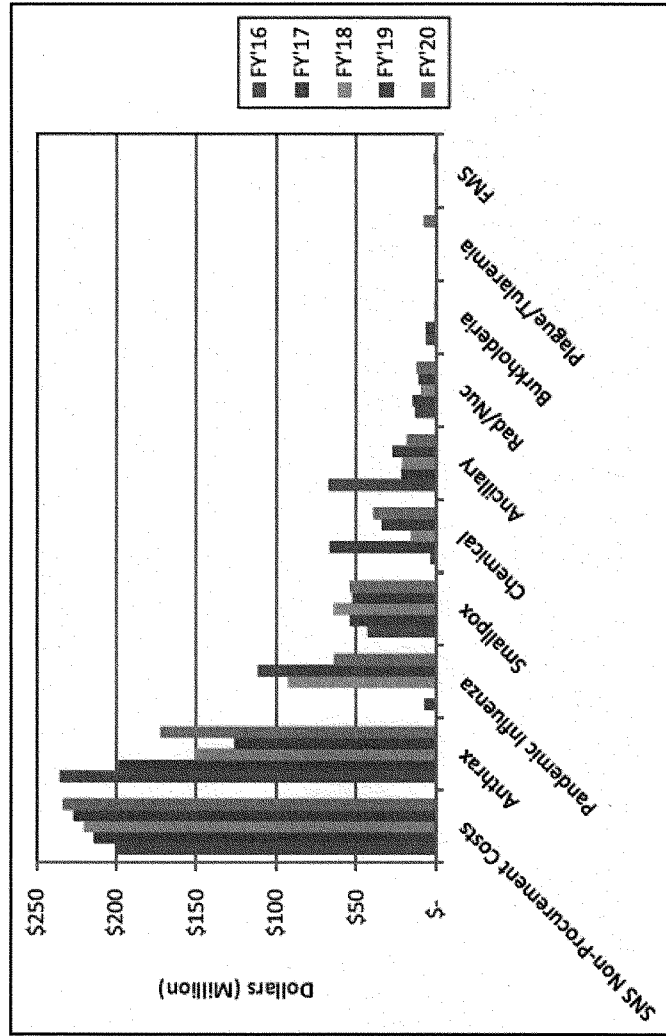


Figure 5: Estimated DSNS Spending, by Portfolio



May 15, 2018

The Honorable Robert Kadlec
 Assistant Secretary for Preparedness and Response
 U.S. Department of Health and Human Services
 200 Independence Ave., SW
 Washington, DC 20201

Re: Transforming medical countermeasure technology and partnerships

Dear Dr. Robert Kadlec:

The Blue Ribbon Study Panel on Biodefense recently moderated two roundtables to identify ways to overcome some of the most vexing medical countermeasure (MCM) technology, business, and policy challenges across the biological threat domain. Private sector pharmaceutical, scientific, academic, and governmental affairs representatives attended and were joined at the second meeting by federal officials from the Department of Agriculture (USDA), Department of Defense (DOD), Department of Health and Human Services (HHS), and the White House.

The MCM assets now available to civilians and to military personnel have grown substantially in the last decade. The partnerships needed to continue to build these assets to meet persistent and advancing biological threats, however, are now at considerable risk. Real and perceived under-investment, unsustained investment, process uncertainty, and strategic disparity undermine what must be a vibrant enterprise. We maintain that advancing the national MCM infrastructure needed for research, development, and procurement will reduce the risk associated with biological warfare, bioterrorism, emerging infectious diseases, and biological accidents. We urge you to demonstrate your commitment to this core national security function by advancing the following recommendations.

1. **Integrate animal health into the national security approach to medical countermeasures.** The gross inequality between human and animal funding levels and the segregation of research between the two sectors constitute a national security liability. Many material threats, select agents, and emerging infectious diseases are human diseases with veterinary counterparts, some of which regularly cause outbreaks elsewhere in the world in livestock and wildlife. Yet conversations about the protection of human health by controlling emerging infectious diseases in animal hosts have been extremely limited, and the authority of animal health agencies to regulate has been based on animal health, not public health.
 - a. **Establish a framework for combatting emerging infectious diseases.** Most emerging infectious diseases in people originate in animals. No MCM were ready when the largest Ebola outbreak the world had ever seen – likely caused by a spillover from bats to humans – occurred. In the preceding years, the government had not sufficiently determined what to fund with its limited resources. At present, HHS prioritizes efforts to address biological threat agents via Department of Homeland Security material threat determinations (MTDs), but the U.S. government has not instituted and budgeted for an analogous process for emerging infectious diseases. In accordance with Blue Ribbon Study Panel Recommendation 7c (*A National Blueprint for Biodefense*, 2015), HHS, in coordination with DOD and USDA, should create a similar prioritization framework for emerging infectious disease threats. This framework should address pathogens and pathogen families with the potential to cause a catastrophic public health emergency and include agents known to infect wildlife and domestic animals. It should drive funding for MCM development and other areas (e.g., biosurveillance, response planning) and engage and motivate the private sector to develop and manufacture MCM. Funders must establish a vision for an emerging infectious disease MCM enterprise, define what constitutes successful emerging infectious disease MCM, and communicate this vision along with specific product requirements to industry partners.

- b. **Create process certainty.** PHARMACEUTICALS AND BIOLOGICS ADMINISTRATION (FDA) has been successful in developing MCM products for animal health. BARDAs were envisioned to be part of – not the entire – MCM enterprise. USDA should also participate in PHEMCE. Many diseases that could necessitate USDA MCM acquisitions are the same for DOD and HHS. USDA also has lessons to share about how it works with industry to develop effective MCM for production animals, a market in which the cost must be low and efficacy must be high. Some veterinary companies are already using platforms to develop their animal products, and the veterinary development timeline is much shorter. This means animal health pharmaceutical companies get products to market earlier. These companies also possess extensive experience in areas like animal models and manufacturability that can help inform human MCM endeavors. These experiences are relevant and should not be ignored.
 - c. **Require animal disease risk assessment.** USDA should develop a risk assessment for animal diseases and work with HHS to assess the risk of diseases with zoonotic potential. USDA should assess the ability of the National Veterinary Stockpile to deploy sufficient MCM to combat high-consequence animal diseases within 24 hours of request. USDA should also use these risk assessments to prioritize the pathogens identified on the USDA *High-Consequence Foreign Animal Diseases and Pests* list. USDA should use the findings to inform its budget request; drive federal priorities for MCM innovation; and incentivize public-private partnerships to develop, transition, approve, license, and procure these products.
2. **Reduce market and process uncertainty at BARDA.** Variability and lack of certainty are two of the foremost hurdles to expanding industry participation in MCM advanced development and manufacturing. Indeed, these hurdles may prove so significant for some companies, even those that have successfully delivered MCM, that they may exit the market entirely. Although all biopharmaceutical ventures carry risk, larger companies can manage this risk through a balanced portfolio of projects, the most successful of which can yield a high return on investment. Pervasive market uncertainty in the far less profitable MCM enterprise makes business endeavors unattractive and unsustainable.
- a. **Create fiscal certainty.** In order to develop national security MCM, industry partners forego potential profit margins orders of magnitude higher than for commercial products. These companies need certainty in procurement to convince them and their investors that engaging in MCM development makes reasonable business sense. The annual appropriations process for advanced development and procurement, and dependency on emergency supplemental appropriations for unanticipated threats, make doing business with companies that base their operations on multi-year outlooks and planning unsustainable. In accordance with Blue Ribbon Study Panel Recommendation 28b (*A National Blueprint for Biodefense*, 2015), Congress must reinstate the advanced appropriation for Project BioShield for ten years at a minimum of \$7.1 billion. Additionally, in accordance with Blue Ribbon Study Panel Recommendation 28c, Congress and the HHS Assistant Secretary for Preparedness and Response (ASPR) should address prioritization and the need for guaranteed, sustained funding for pandemic influenza preparedness. The appropriation levels must be tied to rigorously established MCM requirements based on risk analysis.
 - b. **Create process certainty:** In the last several years, the HHS Biomedical Advanced Research and Development Authority (BARDA) noticeably shifted away from process and partnership toward product. Prioritizing products over partnerships has damaged partnerships and preparedness. The rules governing BARDA and DOD processes for advanced development and manufacturing should be defined with industry partners up front and with far greater clarity and commitment. Companies need to understand when and how much of their proposed product the government will procure, as the frequent moving of goalposts throughout development and procurement creates an untenable business environment. For projects in which the government is not interested, federal public health security leaders need to relay that quickly (i.e., white papers should be reviewed and comment provided within 45 days). The BARDA process at this stage of review should be more like that of the Defense Advanced Research Projects Agency (DARPA), for which program managers, not contracting officers, are the central deciding figures.
3. **Accelerate platform technologies.** One way to create MCM quickly, safely, and effectively for unpredictable emerging infectious diseases and outbreaks is to develop a suite of platform technologies. Generally, platform technologies rely upon a common manufacturing process backbone that uses a standard process to insert foreign genes. By relying upon a well-established manufacturing process and customization though standardized processes, platform technologies can reduce the risk associated with development. These production platforms may be based on, but not limited to, RNA expression systems; DNA cloning vectors; various virus, plant, or

bacterial expression vectors; and viral-vectored vaccines. With targeted government and industry investments, these technologies could come to fruition within three to four years, especially for vaccines and diagnostics. To mature the technology, however, the government must mature the way it invests in the technology and ensure that partnership and business plans accompany technical plans for leveraging any platform capability. There is presently no business model in place that addresses how the government can work with industry to develop MCM platforms. At a minimum, elements of certification, expedited review, and the role of the HHS Centers for Innovation in Advanced Development and Manufacturing must be addressed.

- a. **Certify platforms:** The Food and Drug Administration (FDA) approves products, not platforms. FDA, in consultation with DOD, BARDA, and other PHEMCE partners, should establish an MCM platform certification process. A regulatory construct that allows for the consideration of a company's novel platform as a basis for future MCM products would serve as an industry incentive. Its establishment would effectively reduce the risk of future product development using that platform. Determining what constitutes a platform will be difficult, but the definition should include a regularized chemistry, manufacturing, and controls (CMC) process and standardized general release criteria. The USDA Center for Veterinary Biologics policy, "Licensing Guidelines for Production Platform-Based, Non-Replicating, Nonviable Products," allows for rapid swapping of closely related immunogenic determinants, and could provide a starting point from which FDA could build a platform certification process for human products.
 - b. **Priority review platforms:** The platform certification process described above is likely to be extensive and should result in a thorough FDA understanding of the platform technology (e.g., CMC, clinical experience). This advanced understanding will enable subsequent review by the FDA under the expedited Priority Review process of other products based upon that certified platform. FDA commitment to the accelerated approval times associated with Priority Review for subsequent products utilizing a certified platform would provide significant incentive for industry to utilize appropriate platform technologies.
 - c. **Leverage CIADMs:** The HHS CIADMs and the DOD MCM Advanced Development and Manufacturing facility (ADM) were envisioned to make such platform-based products a reality. They could enable advanced development and manufacturing of platform technologies if aggressively integrated into the product development process. They should become places where companies want to go to advance their promising technologies. They should shrink development schedules and address significant business difficulties. At present, two major challenges prevent this: small companies are concerned about protecting their intellectual property when handed over to a privately owned ADM with its own MCM interests, and large companies are concerned about risks to their commercial business during regulatory review. The Salk Institute, a private nonprofit organization, was essentially the forerunner of what we think of as an ADM today, and BARDA should consider Salk's example as it revisits the business model for these kinds of facilities. DOD and BARDA should undertake planning for CIADM reconfiguration immediately. Planning should include industry and all federal agencies with MCM responsibility. Considerable thought must be given to contracting reform (discussed below) as the Federal Acquisition Regulation (FAR)-based, cost-reimbursable contract system in place does not work. An independent assessment (outside of DOD and HHS) of the existing CIADM model is needed to support this reconfiguration. This planning must consider the role of the USDA and its industry partners in using the CIADMs to enable mutually beneficial technologies and to keep the facilities in use.
4. **Reform FDA process to develop products faster.** We can get closer to on-demand MCM in just a few years and investments to improve production cycling by days or weeks are possible. These kinds of advances, however, will not provide the same near-term relief that FDA could achieve on release testing. Investment in enabling technologies must go, therefore, hand in hand with reform of regulatory process. FDA needs to be part of the advanced development process early on, describing what it wants to see in a product or an investigational new drug. Advances in the speed with which products are marketed should not compromise the FDA's high safety and efficacy standards.
- a. **Standardize and clarify regulatory process.** The FDA, in collaboration with its upstream development government partners, must address development and standardization of regulatory processes that will provide needed transparency to MCM developers. The MCM industry needs to understand all elements of the process, and the government needs to mitigate the inherent risk. Several areas of regulatory reform should be considered – for example, reducing risk associated with clinical trials, and allowing companies to

focus their resources on development. Through P.L. 115-92, Congress authorized DOD to request, and FDA to provide, assistance to expedite the FDA review process for MCM for military personnel. DOD and FDA have now put a work plan in place to coordinate planning for this process. FDA and BARDA should develop a parallel plan. Expedited release testing and a plan for increased usage of emergency use authorizations (EUAs) should be addressed as part of this plan.

- b. **Expedite release testing:** Even with a vaccine platform, the response time to produce a vaccine for the foreseeable future will be 6-12 months for mass-produced product. While maintaining safety and efficacy standards, acceptable FDA release testing during an outbreak might be different from acceptable release testing at other times. FDA should consider options. For instance, FDA might release products for use on an interim basis with final release testing to follow. FDA might identify suitable surrogates in place of full toxicology panels – or at least utilize a process to pre-identify what those surrogates would be. FDA should describe what an accelerated schedule would look like in an emergency. This will be especially important for platforms that could address multiple infectious diseases. Once in place, manufacturers could then propose specific schedules for a given MCM.
 - c. **Examine increased usage of Emergency Use Authorizations:** EUAs are designed for those MCM that are sufficiently well characterized to be of likely clinical benefit in an emergency. FDA essentially certifies that a given MCM fulfills EUA requirements. FDA should determine when more aggressive utilization of EUAs would be appropriate.
 5. **Improve contracting authorities.** BARDA must be empowered to make decisions in the best interest of fulfilling its mission. This means ensuring that the contracting process is as smooth, flexible, and transparent as possible. Other Transactional Authority (OTA) is most prominent among the existing contracting authorities that would incentivize MCM partnerships, yet it is utilized very rarely and limited by the statute that provided OTA authority to BARDA.
 - a. **Amend the OTA statute.** Congress modeled the OTA authority addressed in the *Pandemic All-Hazards Preparedness Act (PAHPA)* after DOD's OTA statute. In its reauthorization of *PAHPA*, Congress should customize OTA authority to fit BARDA's needs. Congress should also remove references to DOD and the need for approval by the senior executive for projects above \$20 million (as it did previously for DOD). OTA contracts should become far more common than they are now, perhaps as common if not more than FAR-based contracts.
 - b. **Adopt OTA for the CIADMs:** FAR-based contracting does not work for rapid response procurements. Using OTA for the ADMs is critical to prevent abandonment of partnerships when rapidity is imperative, when the science does not go as planned, and when intellectual property and FAR-based requirements arise. DOD has adopted this OTA-based model for its ADM.
 - c. **Move contracting authority back to BARDA.** In accordance with Blue Ribbon Study Panel Recommendation 29a (*A National Blueprint for Biodefense*, 2015), and the *21st Century Cures Act* Section 3082, contracting authority should be the exclusive responsibility of BARDA, not the office of Acquisition, Management, Contracts and Grants in the Office of the ASPR. This move must be finalized.
 6. **Foster innovation and new capabilities.** The government often bases MCM-related plans on budgets instead of basing budgets on need. A similar mindset is seen with the government's approach to industry, often issuing solicitations to assess existing capabilities, rather than fostering new capabilities to meet national security needs. At the time of its authorization in *PAHPA*, Congress envisioned BARDA to be on the leading edge of MCM innovation. Over the past decade, BARDA has focused on more, well-established, product development technologies and investments in technologies closer to full maturity. This approach certainly justified much of the development portfolio. Live viral vaccine platforms and therapeutics based on monoclonal antibodies may well provide near- to medium-term solutions. Yet BARDA needs to devote sufficient resources to novel and high-risk product development activities in parallel with their less risky investments.
 - a. **Invest in novel and high-risk products.** Meeting emerging national security threats will require BARDA to employ a high-risk, high-reward model for at least a portion of its investments. Instead of issuing solicitations to assess current industry capabilities, agencies should aggressively work with the private

sector to build capabilities to meet national security needs. While investment in tried-and-true technologies will remain important, aggressively pursuing technologies that fall outside BARDA's comfort zone is imperative. The *21st Century Cures Act* authorized the Director of BARDA to engage an independent, non-profit innovation partner. BARDA should leverage this opportunity to dedicate additional resources to high-risk, high-reward outputs. It should further consider the role of the animal sector in providing needed technological advancements. The animal sector has existing markets for certain pharmaceuticals (for instance, with respect to coronaviruses and influenza viruses, which happen to be the most significant viral pandemic threats to the human population) that are lacking in the human sector. A shared interagency approach to planning for, and funding in, such areas could lead to needed innovative breakthroughs. Precedence for interagency funding mechanisms can be found in the funding HHS provided to USDA in 2009 to conduct domestic biosurveillance for swine influenza virus, a pathogen with minimal health impacts on the animal carrier but large potential impacts on public health.


- b. **Invest in rapid diagnostics.** The nation needs to invest far more in patient-side, point-of-care diagnostics. Diagnostics can guide prioritization of MCM resources, but MCM conversations often refer only to vaccines and therapeutics, omitting diagnostics altogether. Rapid diagnostics cannot continue to be an afterthought. In accordance with Blue Ribbon Study Panel Recommendation 30a (*A National Blueprint for Biodefense*, 2015), DOD and BARDA need to invest in rapid diagnostics as a core element of their MCM portfolios. This work should identify generalized biomarkers that would enable such technologies.
 - c. **Drive decision-making with early warning and predictive tools.** Leadership has yet to embrace predictive science as a core capacity that can support traditional and transformative MCM development. Advances in genomics and proteomics, risk mapping, and biosurveillance data analytics should all be leveraged to create early warning that could both inform and spare the stockpile. Budget requests and corresponding appropriations should support these efforts and ensure that they are an integral part of the federal MCM development and procurement strategy by aligning MCM investments with the threats identified through early warning programs.
7. **Establish end-to-end enterprise coordination.** Although PHEMCE was envisioned as a coordinating body for the federal MCM enterprise, it has been too HHS-centric to do this effectively. Development of a far more forward-looking process – from idea to procurement to dispensing – is needed. As the Office of the ASPR reimagines the end-to-end nature of the enterprise, it has an opportunity to address some specific challenges in the current construct.
- a. **Improve interagency product transitions.** Successful research projects at the National Institutes of Health, DARPA, or other agencies, must begin competition anew for advanced development – if advanced development funding is even available or prioritized. This creates major bureaucratic hurdles to product advancement. The National Biodefense Strategy should direct the creation of more streamlined interagency transition mechanisms. Awards can be structured to assume transition from one agency to the next.
 - b. **Transfer management of the Strategic National Stockpile under specific conditions.** In the President's Budget Request for FY 2019, the Administration moved management responsibility of the Strategic National Stockpile (SNS) from the Centers for Disease Control and Prevention (CDC) to the ASPR. CDC management of the SNS has been inadequate, resulting in industry confusion and losses when the agency suddenly decided to remove elements from the stockpile that it had previously approved. The Administration made this move, in part, to better enable HHS leadership to direct acquisition for, and deployment of, the SNS. The move has the potential to create a more cohesive development-to-distribution structure and apply more process certainty to procurement decisions. Concerns about how BARDA and the SNS will interact once the move is finalized, and whether investments made by BARDA will inadvertently or intentionally force the SNS to acquire those MCM it developed, must be addressed. Congress should authorize the transfer of management of the SNS to the ASPR only if it also requires the ASPR to fix SNS-related problems that the CDC and state, local, tribal, and territorial (SLTT) partners previously encountered or created, and to put controls in place to prevent automatic uptake of BARDA products by the SNS just to demonstrate BARDA success. Congress should also direct the ASPR to establish a meaningful SNS training program for SLTT partners that focuses on more

than just anthrax, takes SLTT ability to distribute SNS pallets upon receipt into consideration, and does not assume distribution will occur the same as in the military.


- c. **Produce an MCM response framework.** In accordance with Blue Ribbon Study Panel Recommendation 22a (*A National Blueprint for Biodefense*, 2015), the Office of the ASPR, CDC, and the Federal Emergency Management Agency should, together with non-federal partners, identify requirements and capacities needed to achieve successful distribution and dispensing of MCM from the SNS as well as from local caches. The framework they develop must address unresolved issues. A progressive and innovative approach should push beyond what a given agency might devise and the bureaucratic impediments associated with a federal-only distribution system. If implementation exceeds funding available through current grant allocations, additional funding must be requested.

Thank you for considering these findings and recommendations. Please contact Dr. Asha M. George, Panel Executive Director, at (202) 974-2416 or Asha.George@BiodefenseStudy.org with further questions.

Sincerely,



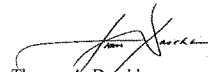
Joseph I. Lieberman, Chair



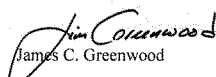
Thomas J. Ridge, Chair



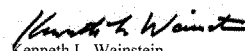
Donna E. Shalala



Thomas A. Daschle



James C. Greenwood



Kenneth L. Wainstein

CC BARDA Director Rick Bright
Jenn Alton

GREG WALDEN, OREGON
CHAIRMAN

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ONE HUNDRED FIFTEENTH CONGRESS
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July 12, 2018

Dr. Rick A. Bright
Director, Biomedical Advanced Research and Development Authority
Deputy Assistant Secretary, Office of the Assistant Secretary for Preparedness and Response
U.S. Department of Health and Human Services
200 Independence Avenue, S.W.
Washington, DC 20201

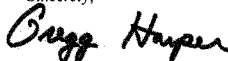
Dear Dr. Bright:

Thank you for appearing before the Subcommittee on Oversight and Investigations on June 15, 2018, to testify at the hearing entitled "The State of U.S. Public Health Biopreparedness: Responding to Biological Attacks, Pandemics, and Emerging Disease Outbreaks."

Pursuant to the Rules of the Committee on Energy and Commerce, the hearing record remains open for ten business days to permit Members to submit additional questions for the record, which are attached. To facilitate the printing of the hearing record, please respond to these questions with a transmittal letter by the close of business on Thursday, July 26, 2018. Your responses should be mailed to Ali Fulling, Legislative Clerk, Committee on Energy and Commerce, 2125 Rayburn House Office Building, Washington, DC 20515 and e-mailed in Word format to Ali.Fulling@mail.house.gov.

Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,



Gregg Harper
Chairman
Subcommittee on Oversight and Investigations

cc: The Honorable Diana DeGette, Ranking Member, Subcommittee on Oversight and Investigations

Attachment

House Energy and Commerce Committee

Subcommittee on Oversight and Investigations

“The State of U.S. Public Health Biopreparedness: Responding to Biological Attacks, Pandemics, and Emerging Infectious Disease Outbreaks”

Dr. Rick Bright, Director of ASPR's Biomedical Advanced Research and Development Authority

Friday, June 15, 2018

The Honorable Gregg Harper

- 1) In the 2017 update to HHS' Pandemic Influenza Plan, HHS provided benchmarks for manufacturing and distributing vaccines during declared influenza pandemics. HHS stated that it aims to ensure that limited vaccine distribution occurs within 12 weeks of a pandemic being declared, with distribution sufficient to meet overall public demand occurring within 16 weeks. Could you tell us why this process seemingly takes so long, and provide any recommendations for improving it? If the 12 and 16-week benchmarks are HHS's goals, what are our current capabilities?

ASPR Response: Domestic manufacturing capacity for pandemic influenza vaccine is a critical component of pandemic preparedness to ensure vaccine is available as soon as possible after emergence of a pandemic virus. ASPR/BARDA has made significant gains in pandemic influenza vaccine preparedness over the last 10 years, including supporting the licensure of faster, more flexible cell-based, recombinant and adjuvanted influenza vaccines and modernizing and expanding domestic manufacturing capabilities. These advancements have dramatically increased the domestic influenza vaccine antigen capacity – increasing from 60 million doses to 600 million doses.

Building on these successes, and to ensure vaccine is available within 12 weeks of pandemic declaration, ASPR/BARDA has a multifaceted approach in place. First ASPR/BARDA is partnering with companies to support the development of novel technologies that rely less on viral growth properties to improve the speed and robustness of vaccine production. For example, ASPR/BARDA supported the first licensed recombinant influenza vaccine (Flublok®), and ASPR/BARDA continues to fund recombinant vaccine-related efforts, moving away from the slow, inflexible production of vaccine in eggs. Second, ASPR/BARDA is supporting the sustainment of domestic production capabilities to ensure vaccines are available when necessary. Third, ASPR/BARDA is supporting further development of recombinant and cell-based vaccines through comparative efficacy clinical studies to expand use indications for a broad range of high-risk and special populations. Fourth, ASPR/BARDA is supporting the addition of currently approved adjuvanted influenza vaccines for all ages into both seasonal and pandemic vaccines, while also developing additional adjuvant options that provide safe and enhanced effectiveness to influenza vaccines that are faster to produce. Lastly, ASPR/BARDA is targeting advancements in vaccine delivery and administration to develop new approaches that would

reduce reliance on needles and syringes supply chain surge capacity and allow faster and more efficient immunization with pandemic vaccine.

- 2) In general, what is the shelf-life for the H7N9 influenza strain vaccine that is in BARDA's pre-pandemic stockpile that will protect against the 2013 H7N9 strain? When was the last time BARDA performed a potency test on these vaccines?**

ASPR Response: The pre-pandemic vaccine made in eggs against the 2013 H7N9 avian influenza virus strain is very stable, with over 80% stability as of the last potency test conducted November, 2017. The most recent potency testing for the egg based vaccine was performed in May 2018 and we are awaiting results of this testing.

- 3) How serious of a pandemic threat does the BARDA view the 5th wave H7N9 influenza strain, currently circulating in China? If a pandemic were to occur, how severely would it impact public health? Is BARDA currently overseeing the manufacturing of a vaccine for storage in its pre-pandemic stockpile which will match this H7N9 influenza strain?**

ASPR Response: BARDA views the 5th wave H7N9 influenza outbreak as a serious concern, as reflected by the high Influenza Risk Assessment Tool (IRAT) score assigned by CDC. Since this assessment system, which assesses the threat of influenza viruses with pandemic potential, was initiated in 2011, the 5th wave H7N9 strain has the highest Potential Impact Risk of any influenza strain evaluated.

Given the human mortality rate seen to date, if the viruses changed to allow them to spread easily between humans, the impact on public health could be catastrophic in the absence of effective medical countermeasures such as vaccines. There is also evidence that some H7N9 influenza viruses may be resistant to most available antiviral drugs.

In response, BARDA produced bulk vaccine, currently held in storage, which matches the 5th wave H7N9 strain. Additionally, the National Institutes of Health (NIH) and BARDA are conducting clinical trials to better understand optimal vaccination approaches in the event mass vaccinations are necessary.

- 4) How much is BARDA currently spending on CARB-X? Does the agency anticipate maintaining this level of spending over the next five years?**

ASPR Response: BARDA established CARB-X in collaboration with the NIH's National Institute of Allergy and Infectious Diseases in 2016. CARB-X, an innovative public-private partnership that addresses the threat of antibiotic resistant bacteria, has received \$85 million in support from BARDA over two years. CARB-X is also funded by the Wellcome Trust. In 2018 the Bill & Melinda Gates Foundation and the United Kingdom Government's Department of Health and Social Care joined as funding partners. BARDA's support for new antibiotics and diagnostics is critical to address 21st century health security threats including genetically engineered bacterial pathogens, complications of bacterial infections as a result of exposure to priority threats such as nuclear and chemical agents, and to quickly identify bacterial pathogens and their susceptibility to antibiotics. BARDA anticipates continued support based on availability of funds.

5) What is the PHEMCE's role in making a material threat determination, and how can the length of time it takes for such a determination be reduced?

ASPR Response: The Public Health and Emergency Medical Countermeasure Enterprise (PHEMCE), a Federal advisory and coordinating body led by ASPR, does have a role in advising on medical countermeasure requirements for national security material threats identified by the Department of Homeland Security (DHS). DHS's newly established Countering Weapons of Mass Destruction Office issues material threat assessments (MTAs) and the Secretary of the Department of Homeland Security (DHS) issues material threat determinations (MTDs). MTAs and MTDs are done in collaboration with other interagency departments, but the responsibility for generating these national, strategic overviews and quantification of the threat is identified by statute (section 319F-2(c)(2) of the Public Health Service Act (42 U.S.C. 247d-6b(c)(2)), added by the Project BioShield Act of 2004") as a DHS authority and responsibility. The PHEMCE benefits from these determinations and uses them to forecast medical countermeasure requirements (type, quantity, special considerations). ASPR is currently working with other PHEMCE interagency partners to evaluate and identify opportunities to streamline and speed up these deliberative steps. We would be pleased to brief the Committee on potential process improvements after the evaluation is completed.

6) After ASPR assumes operational control of the Strategic National Stockpile on October 1, 2018, what role will CDC play in support of the stockpile's mission?

ASPR Response: ASPR recognizes and appreciates the tremendous expertise of CDC subject matter experts including on infectious diseases, other public health threats, epidemiological and laboratory surveillance, as well as understanding of the capabilities of state and local public health departments. CDC is an active partner on the PHEMCE, which is led by ASPR and provides a venue for sharing information across HHS agencies and with interagency partners with a role in medical countermeasures requirement setting, research, development, regulatory review, procurement, stockpiling, distribution and use. CDC will remain an active participant in all PHEMCE workgroups and committees.

In order to ensure a smooth transition of the Strategic National Stockpile with no degradation of operational capability, ASPR and CDC have set up several joint transition workgroups to evaluate all aspects of the program transition. Some of the details involved in the transition have not been finalized. However, we would be pleased to provide a full briefing for Committee staff at any time before the end of the fiscal year. Subsequent to this hearing, the SNS successfully transferred from CDC to ASPR on October 1, 2018.

CDC will maintain its strong working relationships with state and local public health agencies, playing a key role in distribution and dispensing of medical countermeasures. CDC will accomplish this by continuing to provide technical guidance and funding through cooperative agreements and embedding experts in state and local health departments. Coordination with state and local agencies will be enhanced by incorporating ASPR's extensive relationships with health care organizations and emergency management agencies.

Further, to continue to increase collaboration across the Department, ASPR has invited and instituted a new senior CDC liaison who is working within the ASPR Immediate Office.

7) How prepared are the nation's hospitals to respond to biological threats or infectious diseases? What are the most pressing challenges facing non-governmental health systems and what could we do to improve their response capabilities?

ASPR Response: Since the Hospital Preparedness Program (HPP) was established, investments have been made to enhance the overall preparedness of the nation's healthcare infrastructure. Initially, HPP supported the procurement of materials and supplies (e.g., generators, masks, etc.) that would be used should a community be impacted by a public health or medical event. In 2012, HPP shifted its focus from purchasing supplies to investing in health care coalitions (HCCs). HCCs are groups of health care and response organizations that collaborate to prepare for and respond to medical surge events. HCCs incentivize diverse and often competitive health care organizations to work together. During recent events, ranging from mass shootings (e.g., Las Vegas, Florida night club), hurricanes (e.g., Matthew, Harvey, Irma, and Maria), and the most recent tornados in Iowa, we have witnessed the value of the HCCs in enabling communities to quickly assess healthcare capabilities to continue to support communities without requesting assistance from the federal government.

Prior to the 2014 Ebola outbreak in West Africa, the United States did not have an organized, systematic approach to preparing for, and responding to, an outbreak of a highly infectious pathogen. CDC in collaboration with ASPR developed a tiered approach to prepare U.S. health care facilities to safely and rapidly identify, isolate, evaluate, and manage, travelers or patients who have possible or confirmed Ebola. This included providing rapid technical assistance to hospitals strategically located near airports with a large number of travelers returning from Ebola-affected countries and in communities where large numbers of persons from these West African countries reside. To support this, HPP provided awardees with approximately \$214 million of Ebola emergency supplemental funding to establish a nationwide, regional treatment network for Ebola and other infectious diseases. The funding provided through HPP Ebola Preparedness and Response activities is intended to establish the foundation required for the nation's health care system to safely and successfully identify, isolate, assess, transport, and treat patients with Ebola virus disease or under investigation for Ebola (or other highly infectious diseases). Through this mechanism, ASPR awarded cooperative agreements to all 50 states, Washington D.C., all U.S. territories and freely associated states, and select metropolitan jurisdictions, over a five-year project period. Additionally, ASPR competitively awarded funding to 10 regional Ebola and other special pathogen treatment centers (i.e., one in each of the 10 HHS regions).

Additionally, to prepare for, and provide safe and successful care of patients with Ebola, HHS (in a collaboration between ASPR and CDC) awarded funding to establish a National Ebola Training and Education Center (NETEC). The NETEC provides expertise, training, technical assistance, peer review, monitoring, and recognition to state health departments, regional Ebola and other special pathogen treatment centers, state- and jurisdiction-based Ebola treatment centers, and assessment hospitals. NETEC is a consortium of three U.S. health facilities that safely and successfully treated a confirmed Ebola patient – Emory University in Atlanta, Georgia; University of Nebraska Medical Center/Nebraska Medicine (UNMC) in Omaha,

Nebraska; and the New York City Health and Hospitals Corporation/HHC Bellevue Hospital Center in New York, New York.

Going forward and leveraging the best practices from investments made with the Ebola supplemental appropriations, ASPR is developing innovative tiered regional demonstration projects that can serve as a model for building a regional disaster health response system across the country. Subsequent to this hearing, ASPR awarded two grants – Nebraska Medicine in Omaha, Nebraska and Massachusetts General Hospital in Boston, Massachusetts – to conduct pilot projects that show the potential effectiveness and viability of a Regional Disaster Health Response System (RDHDS).

The Honorable Michael C. Burgess

- 1) **Dr. Bright, in 2010, BARDA established three centers to develop and manufacture medical countermeasures, such as vaccines and therapeutics, to protect our citizens during public health emergencies. Texas A&M's Center for Innovation in Advanced Development and Manufacturing is one of these centers, and was intended to focus on surge capacity for flu vaccines. I understand that the initial contract period with the Texas facility expires at the end of this month. How does BARDA plan to utilize these centers in the future? Will BARDA maintain and grow existing partnerships that have the infrastructure to deploy capabilities in the wake of a crisis?**

ASPR Response: BARDA established the Centers for Innovation in Advanced Development and Manufacturing as public private partnerships in 2012. The program has made important investments in the domestic capacity for medical countermeasure production for public health emergencies. Each of the three centers in Texas, Maryland and North Carolina were funded to establish pandemic influenza vaccine manufacturing surge capacity, core service capabilities, and workforce development programs. Program successes include: process updates that resulted in a fourfold increase in yield for the domestically-produced cell based inactivated influenza vaccine; the development of commercially run facilities in Texas and Maryland; and a well-established workforce development program at Texas A&M in College Station, Texas. BARDA recently issued a six month extension to the base period for the Texas A&M center to facilitate additional partnering opportunities.

BARDA is currently evaluating how best to sustain and strengthen the domestic medical countermeasure manufacturing capabilities needed for the nation to be optimally prepared for 21st century health security threats.

- 2) **How do you communicate with centers such as Texas A&M about what medical countermeasures they should develop? How involved is BARDA in helping these "centers" identify additional partners with whom they can work?**

ASPR Response: Each Center has a designated federal contracting officer representative and contracting officer. These officials monitor completion of contract requirements and subsequent

task orders that the centers have to meet per the terms of the contract. BARDA also holds frequent site visits and regular status calls with each of the Centers and has encouraged potential partner discussions through those interactions. Lastly, the Centers are required to maintain other commercial business/partnerships to make use of established capacity, to offset costs, and be a shared resource.

The Honorable Frank Pallone, Jr.

- 1) With respect to the three types of threats we often hear about – natural, intentional, and accidental—to what extent do preparedness efforts for the different types of threats overlap?**

ASPR Response: ASPR coordinates with states and local officials before, during, and after emergencies to test existing response capabilities. While each incident, whether naturally occurring, man-made, or accidental, has its own considerations, there are common requirements that spread across all emergencies. Common elements include supporting situational awareness and information sharing between and among all supporting officials, supporting and augmenting local healthcare entities in treating the impacted population, ensuring critical assets are available to communities in need, and supporting the recovery of the community.

Investing in technologies that have the potential to yield multiple diagnostics, vaccines or therapeutics against different pathogens ensures that capabilities are nimble and flexible to support vaccines and therapeutics for future threats. Examples of this type of investment are how BARDA is supporting development of vaccines against the Ebola Zaire virus. Currently, BARDA is supporting two candidates under Project BioShield. There is the potential that same vaccine platform used to develop the Ebola Zaire virus vaccines could be used to develop vaccines against Ebola Sudan or Marburg viruses, by replacing just one element (glycoproteins). In addition, the vaccine platform could be used to express proteins from newly identified pathogens and expedite development of a vaccine for clinical trials.

- 2) How can we plan long-term therapeutics and vaccines in order to respond to outbreaks that we cannot yet anticipate?**

ASPR Response: It often takes 10 or more years and over \$1 billion to develop a new drug or vaccine.

ASPR/BARDA utilizes many of the innovative authorities authorized by amendments made by the Pandemic and All-Hazards Preparedness Act to the Public Health Service Act to support development of medical countermeasures. Authorities like Other Transaction Authorities (OTA) mean ASPR/BARDA can enter into innovative agreements to support development and procurement. As an example, the first BARDA OTA was within the broad spectrum antimicrobial program. Currently three out of six BARDA OTAs are focused on development of antimicrobial products. BARDA has also utilized CARB-X – an innovative public-private partnership conducted under a cooperative agreement – to address the threat of antibiotic resistant bacteria. CARB-X involves seven partners in the U.S. and U.K. and is backed with half a billion dollars in funding. \$85 million in BARDA CARB-X investment resulted in nearly \$500

million in private equity follow on investment. The partnership has 28 different companies making novel antibacterial drugs, vaccines, and diagnostics, including eight new classes of antibiotics.

3) BARDA's CARB-X program is developing many nontraditional products at the preclinical stage. Can you briefly explain why you have supported these products, and what BARDA is doing to make sure that enough products move on to clinical trials?

ASPR Response: Under the National Action Plan for Combating Antibiotic Resistant Bacteria (CARB), published by the White House in 2015, ASPR was directed to establish a biopharmaceutical accelerator in collaboration with NIH. BARDA established CARB-X in collaboration with the NIH's National Institute of Allergy and Infectious Diseases (NIAID), in NIH, in 2016. This was two years ahead of the three year milestone to establish the partnership. CARB-X is an international consortium of funders including BARDA, NIAID, Wellcome Trust, the Bill & Melinda Gates Foundation, and the UK Government's Department of Health and Social Care.

BARDA does not support the product portfolio alone; instead it is a collaborative effort across multiple, international organizations. BARDA funds non-traditional products because antibiotics are a solution but not the only solution for antibiotic resistant bacteria. In addition, all of the candidate products supported under CARB-X can support new treatment options for genetically engineered biothreat pathogens or the secondary bacterial infections that will result from exposures to threat agents, such as ionizing radiation from a nuclear blast or burn injuries resulting from nuclear or chemical agents.

Five products under the CARB-X portfolio have advanced to phase I clinical trials with more expected in the coming years. Candidate products may move into clinical trials when clinical trial proposals and data to support investigational new drug status are submitted to the FDA and data review does not show prohibitive adverse risk-benefit concerns. BARDA, as a funder and as a member CARB-X, works closely with the cooperative agreement awardee's program team to make sure that products are meeting the scientific milestones to advance in development.

4) Can you explain what BARDA is doing to foster public-private partnerships, and why this is important?

ASPR Response: BARDA established and manages the Tech Watch Program (<https://www.phe.gov/about/barda/Pages/BARDA-techwatch-Mtgs.aspx>). Under Tech Watch, companies can come and discuss their technologies with BARDA to determine if the product is appropriate for BARDA to consider funding in the future. If the program does not align with BARDA priorities, we will refer them to other federal agencies that may be able to assist them with development. BARDA holds 150-200 Tech Watches per year.

BARDA also holds an annual BARDA Industry Day (BID), consistent with its authorities under the Public Health Service Act. This meeting brings together BARDA and other PHEMCE partners with industry, academic, and non-government organizations. It provides an opportunity for BARDA to highlight current and future strategic plans and priorities. BID also provides companies the opportunity to discuss their programs and how they might be able to address existing or future requirements.

Lastly, BARDA attends national and international conferences to discuss our portfolio of products, potential additional candidates, and our strategic plans. Numerous stakeholders attend these conferences allowing for another venue for BARDA to meet with potential partners.

BARDA cannot develop countermeasures alone. Public-private partnerships are critical to the continued success of BARDA and all of the ongoing medical countermeasure development initiatives.

5) ASPR has a number of programs in place, including the Hospital Preparedness Program and the Medical Reserve Corps, which are designed to help ensure readiness at the state and local level. How do these programs ensure that our front-line responders are able to respond effectively in a public health emergency situation?

ASPR Response: ASPR's mission is to save lives and protect Americans from 21st century health security threats. On behalf of the Secretary of HHS, ASPR leads public health and medical preparedness for, response to, and recovery from disasters and public health emergencies.

All of ASPR's programs and capabilities work together to create "unity of command" by consolidating Federal nonmilitary public health and medical preparedness and response functions. ASPR coordinates across HHS and the Federal interagency to support state, local, territorial, and tribal health partners. ASPR works to enhance medical surge capacity by organizing, training, equipping, and deploying HHS public health and medical personnel, such as National Disaster Medical System (NDMS) teams, and providing logistical support for HHS personnel responding to public health emergencies. ASPR supports readiness at the state and local level by coordinating federal grants and cooperative agreements, such as the Hospital Preparedness Program (HPP), by programs like the Medical Reserve Corps (MRC), and carrying out drills and operational exercises. For example, HPP prepares the nation's health care system to save lives during emergencies and disasters. It is the only source of federal funding for health care system readiness. HPP prepares the health care system to save lives through the development of health care coalitions (HCCs). HCCs are groups of health care and response organizations that collaborate to prepare for and respond to medical surge events. HCCs incentivize diverse and often competitive health care organizations to work together, allowing them to plan together and respond jointly in emergencies.

Specific to how ASPR supports first responders, ASPR routinely partners with state and local governments, hospitals, and responders to conduct drills and exercises to test various aspects of medical response capabilities. Drills and exercises provide opportunities at all levels to examine

plans, procedures, and capabilities and to work with all government partners to employ resources in response to a specific event or scenario. One recent example is ASPR's Tranquil Terminus Exercise that brought together four regions, seven states, eight cities and three federal departments to test the nation's ability to transport patients with a highly infectious disease. Communities and responders benefitted by having the opportunity to test and rehearse plans with all partners participating. They learned from each other as well as identified best practices for inclusion in their plans and procedures.

6. **CDC recently concluded an operational readiness review to assess whether state and local governments and public health services will be able to effectively get medical countermeasures to the appropriate person at the appropriate time. How does BARDA work with CDC and health departments to ensure that we develop countermeasures with this "last mile" of delivery in mind?**

ASPR Response: Through its active role in PHEMCE, CDC shares information across HHS agencies, including ASPR/BARDA, who have a role in medical countermeasures requirement setting, research, development, regulatory review, procurement, stockpiling, distribution and use. Through this channel, as well as through established direct program-to-program collaborations with BARDA, CDC provides input on how countermeasure development can better meet end user needs. This includes criteria for how products developed may be stored and packaged to improve/simplify stockpiling and distribution, improved product delivery systems, simplified dosing considerations, etc. These factors assessed by CDC, impact how products are distributed, dispensed/administrated and used.

GREG WALDEN, OREGON
CHAIRMAN

FRANK PALLONE, JR., NEW JERSEY
RANKING MEMBER

ONE HUNDRED FIFTEENTH CONGRESS
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July 12, 2018

Dr. Anne Schuchat
Principal Deputy Director
Centers for Disease Control and Prevention
1600 Clifton Road
Atlanta, GA 30329

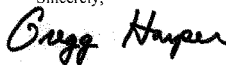
Dear Dr. Schuchat:

Thank you for appearing before the Subcommittee on Oversight and Investigations on June 15, 2018, to testify at the hearing entitled "The State of U.S. Public Health Biopreparedness: Responding to Biological Attacks, Pandemics, and Emerging Disease Outbreaks."

Pursuant to the Rules of the Committee on Energy and Commerce, the hearing record remains open for ten business days to permit Members to submit additional questions for the record, which are attached. To facilitate the printing of the hearing record, please respond to these questions with a transmittal letter by the close of business on Thursday, July 26, 2018. Your responses should be mailed to Ali Fulling, Legislative Clerk, Committee on Energy and Commerce, 2125 Rayburn House Office Building, Washington, DC 20515 and e-mailed in Word format to Ali.Fulling@mail.house.gov.

Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,



Gregg Harper
Chairman
Subcommittee on Oversight and Investigations

cc: The Honorable Diana DeGette, Ranking Member, Subcommittee on Oversight and Investigations

Attachment

Attachment—Additional Questions for the Record

The Honorable Gregg Harper

1. Have there been any laboratory-acquired infections or potential exposures to pathogens at CDC labs during this past year? If so, what was the nature of the exposure or infection, and were any hospitalizations required as a result?
2. How serious of a pandemic threat does the CDC view the 5th wave H7N9 influenza strain, currently circulating in China? If a pandemic were to occur, how severely would it impact public health?
3. What are the present challenges that are preventing the broader utilization of cell-based influenza vaccines, and what steps can be taken to become less reliant on egg-based vaccines? What are the advantages of utilizing cell-based influenza vaccines over egg-based ones?
4. Is there currently an approved anthrax vaccine that can be administered to children? If so, what are the dosing guidelines for pediatric administration? If not, are there any pediatric anthrax vaccines currently under development, and what is the status of this development?
5. Were any FY 2017 funds for the non- procurement costs of the Strategic National Stockpile (SNS) used for any CDC expenses outside of the SNS program? If so, please identify the type and amount of these expenses.
6. How many laboratories currently make up the Laboratory Response Network (LRN)?
7. How much funding is there for the LRN in FY 2018?

The Honorable Michael C. Burgess

1. Dr. Schuchat, in your written testimony you mentioned CDC's use of electronic data systems to monitor population health information. How does CDC use and disseminate this data such that it can coordinate a timely response? Is the data platform that CDC uses integrated or interoperable with other biosurveillance platforms?

The Honorable Frank Pallone, Jr.

1. How does CDC ensure that its laboratories are gathering data from as many sources as possible?
 - a. Do you need additional resources to help you analyze this data more effectively?
2. Please provide an update on CDC's concerns about the growth of antibiotic resistant bacteria?

3. In the case of an emergent biological threat, how does CDC's Emergency Operations Center coordinate the response at the front lines, such as at the state and local level?
4. Please describe how CDC uses its Public Health Emergency Preparedness Cooperative Agreement Program to help states and local municipalities identify and address gaps in preparedness. Is there anything you need from Congress to make sure this program works as intended?
5. What are the biggest challenges to successfully deploying countermeasures at the state and local level? How is CDC addressing these challenges?

GREG WALDEN, OREGON
CHAIRMAN

FRANK PALLONE, JR., NEW JERSEY
RANKING MEMBER

ONE HUNDRED FIFTEENTH CONGRESS
Congress of the United States
House of Representatives

COMMITTEE ON ENERGY AND COMMERCE

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July 12, 2018

Dr. Anthony S. Fauci
Director
National Institute of Allergy and Infectious Diseases
National Institutes of Health
9000 Rockville Pike
Bethesda, MD 20892

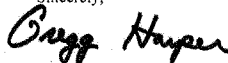
Dear Dr. Fauci:

Thank you for appearing before the Subcommittee on Oversight and Investigations on June 15, 2018, to testify at the hearing entitled "The State of U.S. Public Health Biopreparedness: Responding to Biological Attacks, Pandemics, and Emerging Disease Outbreaks."

Pursuant to the Rules of the Committee on Energy and Commerce, the hearing record remains open for ten business days to permit Members to submit additional questions for the record, which are attached. To facilitate the printing of the hearing record, please respond to these questions with a transmittal letter by the close of business on Thursday, July 26, 2018. Your responses should be mailed to Ali Fulling, Legislative Clerk, Committee on Energy and Commerce, 2125 Rayburn House Office Building, Washington, DC 20515 and e-mailed in Word format to Ali.Fulling@mail.house.gov.

Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,



Gregg Harper
Chairman
Subcommittee on Oversight and Investigations

cc: The Honorable Diana DeGette, Ranking Member, Subcommittee on Oversight and Investigations

Attachment

House Energy and Commerce Committee
Subcommittee on Oversight and Investigations
**“The State of U.S. Public Health Biopreparedness: Responding to Biological Attacks,
Pandemics, and Emerging Infectious Disease Outbreaks”**

Friday, June 15, 2018

The Honorable Gregg Harper

- 1. What do we need to do as a country to be better prepared for an outbreak of pandemic influenza in the U.S.?**

NIAID response:

The National Institute of Allergy and Infectious Diseases (NIAID), the lead institute for research on influenza at the National Institutes of Health (NIH), is conducting and supporting basic, translational, and clinical research that will improve our ability to prepare for and respond to potential pandemic influenza outbreaks. A particular challenge in preparing for an outbreak of seasonal or pandemic influenza is that current influenza vaccines do not provide protection that is long-lasting or effective against a large number of influenza virus strains. To address this challenge, NIAID is prioritizing the development of universal influenza vaccine candidates that could provide long-lasting protection against multiple influenza strains including those with pandemic potential.

NIAID is galvanizing research efforts to develop universal influenza vaccine candidates and convened influenza experts from the U.S. and throughout the world at a research agenda-setting workshop in 2017. Following this meeting, NIAID outlined its universal influenza vaccine research priorities in a strategic plan that focuses on three key areas: improving knowledge of the transmission and pathogenesis of influenza infection; characterizing influenza immunity and immune factors that correlate with protection against influenza; and supporting the design of universal influenza vaccines. NIAID is actively engaging federal partners, including U.S. Department of Health and Human Services agencies and other key domestic and international stakeholders involved in influenza vaccine research, to coordinate and advance activities outlined in the strategic plan. For example, NIAID continues to collaborate with the Biomedical Advanced Research and Development Authority (BARDA) to advance the development and clinical testing of promising influenza vaccine candidates. The additional \$40 million in funding for universal influenza vaccine research provided through the Consolidated Appropriations Act, 2018 (P.L. 115-141) will support targeted research investments for the development of universal influenza vaccines that could protect vaccinated individuals against seasonal or pandemic influenza virus strains.

In addition to pursuing universal influenza vaccine strategies, NIAID is working to develop novel vaccine production strategies – such as recombinant DNA manufacturing techniques – that may allow for a more rapid production of targeted vaccines in response to newly emerging or changing strains of influenza virus than current egg and cell-based technologies. These vaccine production techniques could help to speed the availability of vaccines that protect against new or evolving pandemic influenza virus strains.

While investing in research to improve influenza vaccines, NIAID also continues to support the development of novel diagnostics to rapidly identify influenza viruses, including potential pandemic strains, and antiviral drugs that could help to limit influenza morbidity and mortality in a pandemic. NIAID will continue to play a key leadership role in seasonal and pandemic influenza outbreak preparedness and response efforts by conducting and supporting the basic, translational, and clinical research needed to identify and develop effective medical countermeasures.

- 2. In your testimony, you mentioned that there will be several iterations of a 'universal' flu vaccine. How many universal vaccine candidates are currently being developed at, or supported by, NIAID and what strains will they target? Where does this research currently stand? How many iterations of a universal flu vaccine does NIAID ultimately envision?**

NIAID response:

A truly universal influenza vaccine would represent a groundbreaking advance in the fight against influenza by providing protection against a number of seasonal and pandemic influenza virus strains. NIAID currently is exploring at least 10 different strategies toward the development of universal influenza vaccine candidates. Each of these strategies may have multiple vaccine candidates in various stages of development that are being investigated by NIAID intramural researchers or NIAID-supported grantees in academia and industry. Notable highlights of NIAID universal influenza vaccine research include the development of a ferritin nanoparticle-based vaccine candidate by the NIAID Vaccine Research Center (VRC), Phase I clinical trials of a VRC-developed DNA vaccine candidate using a prime-boost strategy with a standard inactivated seasonal influenza vaccine, and the recent launch of a NIAID-sponsored Phase II clinical trial to evaluate the M-001 vaccine candidate, which contains several influenza fragments recognized by the immune system that are common among multiple influenza virus strains. Additionally, NIAID is sponsoring a Phase I clinical trial to evaluate the safety and immunogenicity of a prime-boost regimen using an intranasal vaccine candidate followed by a licensed, quadrivalent seasonal influenza vaccine.

We anticipate that progress toward the goal of a universal influenza vaccine will occur in several stages, with each intermediary stage represented by several vaccine candidates that protect against progressively greater numbers of influenza virus strains. NIAID is pursuing strategies that could protect against all strains of a single subgroup of influenza virus, such as the H3N2 strains. This could be considered a universal influenza vaccine Version 1.0. As we make progress towards more broadly protective influenza vaccines, a Version 2.0 could protect against two or more subgroups of influenza, such as all H1N1 strains and all H3N2 strains. This may lead to developing a universal influenza vaccine candidate that by itself could durably protect against all subgroups of influenza, thereby protecting against virtually any influenza strain. Each universal influenza vaccine candidate will need to be evaluated over several influenza seasons to determine the level of protection that is induced, and the durability of that protection. Version 1.0 of a universal influenza vaccine may be available in a few years, representing an incremental improvement on currently available influenza vaccines. A universal influenza vaccine that covers all major influenza strains may be many years away, with several iterations may be likely needed to ultimately achieve a broadly protective vaccine against all or nearly all influenza strains.

- 3. What are the present challenges that are preventing the broader utilization of cell-based influenza vaccines, and what steps can be taken to become less reliant on egg-based vaccines?**

NIAID response:

NIAID supports the development of flexible vaccine manufacturing processes, including the use of molecular biological techniques, to help shorten manufacturing times and increase production efficiency for current and future influenza vaccines. Barriers to the broader utilization of cell-based and recombinant technologies to produce influenza vaccines include differences in manufacturing needs, development costs, and public awareness of alternatives to egg-based influenza vaccines.

NIAID is working to address these challenges through the support of basic and translational research for the development and manufacture of novel influenza vaccine strategies. NIAID scientists have devised a new method to manufacture an experimental whole virus inactivated influenza vaccine using a cell-based system. This method would provide another alternative to currently licensed egg-based and cell-based influenza vaccines. NIAID researchers also are developing and evaluating an additional cell-based system for whole virus influenza vaccine candidates to try to determine the most efficient cell-based system to produce influenza vaccines, both in terms of manufacturing time and cost. Data from these NIAID-supported studies will help improve vaccine manufacturing processes and vaccine efficacy, leading to the design of better influenza vaccines. NIAID also has supported studies of improved vaccine strain selection and optimized high-yield vaccine strains as part of the Seasonal Influenza Vaccine Improvement (SIVI) initiative, an interagency collaboration launched in 2016.

In addition to supporting the development of innovative seasonal influenza vaccines, NIAID has made a strategic shift toward a research paradigm that features broader, more flexible vaccine platform technologies such as recombinant DNA manufacturing techniques that can be rapidly mobilized when pandemic influenza viruses emerge. NIAID continues to support the early development of candidate pandemic influenza vaccine candidates that can be transitioned to BARDA for advanced development, with the goal of Food and Drug Administration (FDA) licensure and potential inclusion in the Strategic National Stockpile. NIAID also will continue to work closely with industry partners to advance promising influenza vaccine candidates, including cell-based and recombinant vaccine strategies.

The Honorable Michael C. Burgess

- 1. Dr. Fauci, the National Institute of Allergy and Infectious Diseases is on the front lines of vaccine development, especially in the wake of Ebola and Zika hitting the United States. You wrote an article in the Journal of the American Medical Association in November 2017 that detailed the critical role of biomedical research in pandemic preparedness. Can you share with us some of the research approaches NIAID uses to prepare for pandemics, such as a new flu strain, that have yet to hit our shores?**

NIAID response:

As outlined in the 2017 article in the Journal of the American Medical Association, *The Critical Role of Biomedical Research in Pandemic Preparedness*, comprehensive pandemic preparedness requires a multifaceted approach. A critical component is biomedical research to support the development of vaccines, diagnostics, and therapeutics that may be quickly deployed in response to an emerging or re-emerging infectious disease of pandemic potential. NIAID supports a comprehensive portfolio of basic research on microbiology and immunology to better understand the mechanisms of pathogenesis and immune responses, as well as applied and clinical research to evaluate candidate diagnostics, therapeutics,

and vaccines. This strategic effort includes the pursuit of several research approaches, including: (1) research targeting specific pathogens; (2) prototype pathogen efforts, in which fundamental research to understand the disease caused by one pathogen may inform the development of countermeasures for a closely related pathogen; and (3) development of platform-based technologies and broad-spectrum products that may be easily and quickly deployed against multiple pathogens. NIAID research complements other elements of pandemic preparedness by improving understanding of infectious disease pathogenesis and by developing candidate medical countermeasures that could be used in a pandemic.

NIAID supports a broad portfolio of pathogen-specific basic, translational, and clinical research. NIAID investments in pathogen-specific research include priority pathogens of the United States Government as designated by the Centers for Disease Control and Prevention (CDC), as well as other emerging and re-emerging diseases identified as priority pathogens by NIAID. For example, NIAID supported development of m102.4, a candidate monoclonal antibody treatment for Nipah virus infection. NIAID also is supporting the development of improved influenza vaccine candidates, including universal influenza vaccines that could provide broad protection for a range of pandemic and seasonal influenza strains. Additionally, it was an NIAID investment in basic research nearly 40 years ago that enabled the development of the novel influenza antiviral Xofluza (baloxavir marboxil), which was approved for use in Japan in early 2018 and is currently undergoing FDA priority review for use in the United States.

NIAID has built upon increased understanding of infectious disease pathogenesis to move strategically toward a medical countermeasures research paradigm that features broader, more flexible platform technologies that can be used to respond to several biological threats. High-throughput sequencing and platform-based technologies are facilitating the development and manufacture of vaccines, targeted antibody therapeutics, and broad-spectrum antibiotics and antivirals by significantly decreasing the time from identification of a public health threat of an emerging infection to clinical evaluation of candidate countermeasures. For example, in 2015-2016 when Zika virus emerged in the Americas, clusters of microcephaly and other birth defects were identified, and a Public Health Emergency of International Concern was declared by the World Health Organization. NIAID scientists rapidly used Zika virus genetic sequence information to develop a DNA-based vaccine candidate that moved from concept to a first-in-human trial in less than four months. The experimental DNA-based Zika vaccine, which currently is in Phase II/IIb clinical testing, was developed with a readily deployable DNA vaccine platform that is a form of gene-based immunization previously used by NIAID to develop a candidate vaccine for West Nile virus. The development of a broadly applicable platform technology facilitated an accelerated response to a previously unrecognized public health threat. As mentioned in the 2017 article in the *Journal of the American Medical Association*, NIAID is supporting development of additional vaccine platform technologies, including nanoparticle, virus-like particles, and mRNA platforms. NIAID also supports development of broad-spectrum therapeutics, including antiviral and antibacterial agents that have demonstrated activity against multiple viral or bacterial pathogens.

Together with academia, industry, and Public Health Emergency Medical Countermeasures Enterprise (PHEMCE) partners, NIAID remains committed to meeting public health emergency needs by advancing high-priority research to support development of medical countermeasures for emerging and re-emerging infectious diseases, including influenza viruses with pandemic potential. NIAID-supported research into specific pathogens, prototype pathogens, and the development of platform-based technologies will continue to play an essential role in PHEMCE pandemic preparedness and response efforts.

The Honorable Frank Pallone, Jr.

1. How can we plan long-term for therapeutics and vaccines in order to respond to outbreaks that we cannot yet anticipate?

NIAID response:

NIAID supports a comprehensive portfolio of basic research on microbiology and immunology to better understand the mechanisms of pathogenesis and immune response, as well as applied and clinical research to evaluate candidate diagnostics, therapeutics, and vaccines. This strategic effort includes the pursuit of foundational platform approaches that could be used to develop medical countermeasures against multiple pathogens.

NIAID is pursuing the development of platform approaches including molecular biological technologies that could be rapidly mobilized to generate candidate vaccines against emerging infectious disease threats. For example, during the 2015-2016 Zika virus outbreak in the Americas, NIAID scientists developed a novel DNA-based vaccine for Zika virus using viral genetic sequence information. The candidate vaccine moved from concept to a first-in-human trial in less than four months, and currently is in a Phase II/IIb trial. In order to respond so quickly, NIAID utilized a readily deployable DNA vaccine platform that was previously used by NIAID to develop a candidate vaccine for West Nile virus. These types of genetic platforms could be used to respond similarly to multiple emerging and re-emerging infectious disease threats.

NIAID investments in basic, translational, and clinical research also are contributing to the development of novel broad-spectrum therapeutics that can target several pathogens. For example, NIAID has supported early-stage development of broad-spectrum antiviral agents such as BCX4430 (galidesivir), which has demonstrated activity against Ebola and other RNA viruses, and broad-spectrum antibacterial products, including a compound with activity against the two different bacteria that cause tularemia and plague. Such broad-spectrum therapeutics may decrease the time necessary to identify and distribute an effective treatment during an outbreak setting.

NIH, led by the Fogarty International Center and NIAID, also supports the development of research infrastructure and partnerships in foreign countries to aid in the identification, monitoring, and response to the emergence and reemergence of infectious diseases. Long-standing international investments in disease monitoring and response made by NIH were vital in the immediate response to the 2014-2016 Ebola outbreak in West Africa and provided critical in-country expertise that helped to contain the spread of the disease. In addition, the clinical research partnership between NIAID and the government of Liberia, the Partnership for Research on Ebola Virus in Liberia (PREVAIL), demonstrated the ability to do rigorous scientific research in developing countries. The PREVAIL partnership enabled in-country clinical trials testing of several Ebola virus therapeutic and vaccine candidates, among them the ZMapp™ therapeutic, the Merck VSV vaccine, and the cAd3-EBOZ vaccine developed by the NIAID VRC in partnership with industry. NIAID, through a partnership with the French National Institute of Health and Medical Research (Inserm), the London School of Hygiene and Tropical Medicine, and the host country governments, has launched the Partnership for Research on Ebola VACCination (PREVAC), a Phase II clinical trial comparing three experimental Ebola vaccination strategies in Mali, Guinea, Sierra Leone, and Liberia. Medical countermeasures tested by the PREVAIL partnerships were recently deployed in the Democratic Republic of the Congo to help address an Ebola outbreak from May to July 2018, emphasizing the key contributions of this effort. NIAID-supported international research partnerships also contribute to the development of site infrastructure and sustainable research capacity in developing countries, enhancing

global preparedness to respond to unanticipated outbreaks and to conduct clinical research to better understand the disease and to test candidate countermeasures during these outbreaks.

2. In your view, are there specific pathogens or diseases we should be most concerned with?
 - a. With so many dangerous pathogens, how do we prioritize research to try to target those posing the greatest threat?

NIAID response:

NIAID prioritizes research and early-stage development of medical countermeasures against bioterror threats and emerging and re-emerging infectious diseases of public health importance. The persistent threat of pandemic influenza and other respiratory viruses that may spread quickly and cause significant morbidity and mortality, such as severe acute respiratory syndrome coronavirus (SARS-CoV) or Middle East respiratory syndrome coronavirus (MERS-CoV) remain a particular area of concern. NIAID maximizes its efforts to develop effective medical countermeasures against these, and other potential emerging and re-emerging diseases, by prioritizing research into broad-spectrum antibiotics and antiviral drugs, as well as efficient platform technologies to more rapidly develop vaccines and diagnostics for a variety of threat pathogens.

NIAID's efforts to develop a broader, more flexible research paradigm is yielding scientific advances that will facilitate public health emergency preparedness and our ability to respond to emerging public health threats. NIAID is supporting the development of diagnostics platforms capable of distinguishing between several pathogens, as well as broad-spectrum therapeutics, including novel antiviral agents, effective against several pathogens. In addition, NIAID is prioritizing the development of several vaccine platforms that could be used to quickly develop vaccine candidates against newly identified threats. This includes the DNA-based platform used to develop a candidate vaccine against Zika virus that moved from concept to a first-in-human trial in less than four months. The development of these and other broad-spectrum therapeutics and platform technologies remains a NIAID priority.

In addition to supporting the development of platform technologies and broad-spectrum therapeutics that may decrease response time in the event of a pandemic, NIAID also supports a targeted portfolio of basic, translational, and clinical research on priority pathogens with pandemic potential, including influenza and other respiratory viruses. This includes detailed studies of immune system responses to infection, as well as research to better understand the transmission, evolution, and pathogenesis of the viruses to inform the development of vaccines, diagnostics, and therapeutics that could be deployed during a pandemic. The NIAID Vaccine and Treatment Evaluation Units currently are conducting two Phase II clinical trials of a new vaccine candidate to protect against emerging H7N9 influenza virus strains, and NIAID intramural scientists are conducting clinical studies of prime-boost vaccine regimens for swine (H1) and avian (H7) influenza viruses.

NIAID is galvanizing research efforts to support the development of universal influenza vaccine candidates. A universal influenza vaccine that is effective against both seasonal and pandemic influenza strains would be a vital tool to prepare for future pandemics, as well as to improve our ability to prevent seasonal influenza. In addition, NIAID is supporting novel antiviral therapies for influenza, including RNA polymerase inhibitors, peptide inhibitors, and next-generation neuraminidase inhibitors. NIAID support for influenza diagnostics research has led to the development of a rapid molecular *in vitro* assay recently cleared by the FDA to accurately distinguish influenza A from influenza B in nasal swab specimens.

NIAID continues to make progress against other respiratory viruses with pandemic potential. NIAID is supporting early-stage clinical trials of antibodies designed to treat people infected with MERS-CoV, as well as development of a vaccine candidate for MERS-CoV based on information from previous vaccine studies on SARS-CoV. NIAID-funded researchers also have identified a novel SARS-related virus, swine acute diarrhea syndrome coronavirus (SADS-CoV). SADS-CoV was responsible for 25,000 piglet deaths in China in 2016-17; however, no infections in humans have been identified. The identification of pathogens with zoonotic potential such as SADS-CoV that may emerge as human diseases contributes to our preparedness, as it may facilitate early identification if the pathogen becomes capable of causing disease in humans. NIAID will continue to prioritize research on pathogens with pandemic potential such as influenza and other respiratory viruses and support the development of platform-based technologies and broad-spectrum products that may be easily and quickly deployed against multiple pathogens.

3. Can you briefly explain the barriers that make it harder for scientists to discover new antibiotics?

NIAID response:

NIAID supports a comprehensive basic research portfolio on antibiotic resistance to aid in the discovery of new antibiotics. NIAID antimicrobial resistance research includes the elucidation of major mechanisms of pathogenesis, host-pathogen and drug-pathogen interactions, and the identification of new candidate antibiotics. NIAID has found that the major challenges in the development of new antibiotics are in the later stages of clinical development of these drugs. NIAID has identified three main barriers to the advanced development of new antibacterial therapeutics: 1) the scarcity of new antibacterial drug candidates effective against Gram-negative infections; 2) the challenge of enrolling patients in clinical trials needed to show efficacy of new therapeutics, especially in the case of Gram-negative drug-resistant infections; and 3) a lack of market incentives for pharmaceutical companies to invest in the final stages of antibiotic development and licensure. NIAID is working to address these challenges in several ways, including through the support of basic, translational, and clinical research to identify and advance promising antibacterial candidates to late-stage development. NIAID estimates that more than 25 percent of the antibacterial candidates currently in clinical development previously received some form of NIAID support.

NIAID is addressing these challenges by supporting early-stage development and clinical trials of new therapeutics to help offset the investment required to successfully test these therapeutics and bring them to market. The NIAID-supported Antibacterial Resistance Leadership Group (ARLG) has supported over 35 clinical studies investigating new therapeutics, optimized treatment regimens, diagnostic devices, and projects on antimicrobial stewardship. The ARLG places a priority on research involving Gram-negative bacteria that represent a major antimicrobial resistance threat. NIAID-supported scientists also completed two Phase I clinical trials for a new class of antibiotics (CRS3123) to treat *Clostridium difficile* infections, which are increasingly difficult to treat effectively. In addition, NIAID is supporting clinical trials to evaluate the efficacy of new therapeutic candidates, as well as new treatment regimens that utilize existing antibiotics in new combinations or regimens. NIAID also has solicited research for the development of tools to advance drug discovery of agents against Gram-negative pathogens through the "Partnerships for the Development of Tools to Advance Therapeutic Discovery for Select Antimicrobial-Resistant Gram-Negative Bacteria" program. NIAID is facilitating scientific discussions and partnerships to address key questions and challenges in the development of new antibiotics. NIAID and The Pew Charitable Trusts sponsored the 2017 scientific workshop entitled, "Challenges in the Discovery of Gram-

negative Antibacterials: The Entry & Efflux Problem.” The goal of the workshop was to identify next steps and opportunities for collaborations to determine factors that affect the entrance of antibiotics into, and accumulation within, Gram-negative bacteria to inform the identification and design of new types of antibiotics. Resolving these early-stage research questions will help address the growing threat of resistant Gram-negative bacteria by facilitating the later-stage development of promising new therapeutic candidates.

NIAID also addresses barriers to the advanced development of new antibacterial therapeutics by helping to de-risk antibacterial product development for researchers in industry and academia through targeted research support and services. NIAID supports the National Database of Resistant Pathogens, which contains genomic data for more than 205,000 drug-resistant microbes. This database was established by the NIH, in partnership with FDA and CDC, as a publicly available resource that scientists from all over the world can access to inform the development of novel antibacterial products. NIAID also funds the Centers of Excellence for Translational Research that have recently discovered a new class of antibiotics produced by soil-dwelling bacteria. These antibiotics, known as malacidins, have a unique mechanism of action that may make the development of resistance less likely. NIAID also supports CARB-X, a unique public-private partnership led by BARDA. CARB-X is dedicated to accelerating the development of innovative antibacterial products from target/candidate identification and characterization through Phase I clinical trials. CARB-X is currently supporting 29 therapeutic candidates, including 11 new classes of antibiotics, as well as 6 diagnostics products. To facilitate the discovery and development of promising therapeutic candidates, NIAID provides unique no-cost preclinical and clinical services that include screening tests for antimicrobial activity and access to research reagents to assist in product testing. Additionally, NIAID supported preclinical development and first-in-human Phase I clinical testing of VNRX-5133, a novel beta-lactamase inhibitor (BLI). VNRX-5133 is the first BLI in clinical development that inhibits all known classes of beta-lactamases – bacterial enzymes involved in resistance to the beta-lactam class of broad-spectrum antibiotics such as penicillin.

NIAID continues to support the development of antibacterial products in collaboration with academia, industry, and federal partners. A concerted research effort is required to combat the growing public health threat of antibiotic resistance. NIAID remains committed to facilitating the development of new antibiotics by supporting innovative research and offsetting the development costs of industry and academia.

GREG WALDEN, OREGON
CHAIRMAN

FRANK PALLONE, JR., NEW JERSEY
RANKING MEMBER

ONE HUNDRED FIFTEENTH CONGRESS
Congress of the United States
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July 12, 2018

Rear Admiral Denise Hinton
Chief Scientist
U.S. Food and Drug Administration
10903 New Hampshire Avenue
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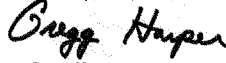
Dear Admiral Hinton:

Thank you for appearing before the Subcommittee on Oversight and Investigations on June 15, 2018, to testify at the hearing entitled "The State of U.S. Public Health Biopreparedness: Responding to Biological Attacks, Pandemics, and Emerging Disease Outbreaks."

Pursuant to the Rules of the Committee on Energy and Commerce, the hearing record remains open for ten business days to permit Members to submit additional questions for the record, which are attached. To facilitate the printing of the hearing record, please respond to these questions with a transmittal letter by the close of business on Thursday, July 26, 2018. Your responses should be mailed to Ali Fulling, Legislative Clerk, Committee on Energy and Commerce, 2125 Rayburn House Office Building, Washington, DC 20515 and e-mailed in Word format to Ali.Fulling@mail.house.gov.

Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,



Gregg Harper
Chairman
Subcommittee on Oversight and Investigations

cc: The Honorable Diana DeGette, Ranking Member, Subcommittee on Oversight and Investigations

Attachment

Attachment—Additional Questions for the Record

The Honorable Gregg Harper

1. Medical countermeasure (MCM) development can be a costly, time-consuming venture for the private sector. It is often one of the reasons why companies are reluctant to enter the MCM product space. How could the FDA provide better guidance and get involved earlier in the development process to help reduce this burden?

The Honorable Michael C. Burgess

1. Pharmaceutical companies face economic barriers to discovering and developing urgently needed new antibiotics to address drug resistant infections. I was encouraged by Commissioner Gottlieb's announcement earlier this week that FDA is working with CMS and other agencies to develop new payment models that would incentivize antibiotic research and development and the appropriate use of new antibiotics. Can you describe how these new models may work? Does Congress need to provide additional authorities or resources?

The Honorable Frank Pallone, Jr.

1. When a crisis does occur, what can FDA do to fast-track approval of countermeasures like vaccines and therapeutics?
2. How have GAIN and ADAPT helped FDA to incentivize antibiotic development in the private sector?