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"Examining Medical Product Development in the Wake of the Ebola Epidemic: The Biomedical Advanced Research and Development Authority's Response"

Statement of

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Good morning, Chairman Pitts, Ranking Member Pallone, and distinguished Members of the Subcommittee. Thank you for the opportunity to speak with you today about our Government's Ebola epidemic response efforts. I am Dr. Robin Robinson, Director of the Biomedical Advanced Research and Development Authority (BARDA) and Deputy Assistant Secretary to the Assistant Secretary for Preparedness and Response (ASPR) of the Department of Health and Human Services (HHS).

Ebola is simultaneously a biothreat and an emerging infectious disease. The current Ebola epidemic is the worst on record. As the Centers for Disease Control and Prevention (CDC) has stated, we do not view Ebola as a significant public health threat to the United States; however, the best way to continue to protect our country from any domestic threat posed by Ebola is to take action to address the epidemic in West Africa with robust infection control measures and possibly vaccination.

ASPR is supporting the Federal Government's Ebola response effort through policy development, advancements in medical countermeasures (MCM), logistical support for deployed personnel, and broader community and health care preparedness and resilience through grant funding, dissemination of information to state and local partners, and communication with international partners concerning health security issues. Originally authorized by the Pandemic and All-Hazards Preparedness Act (PAHPA) in 2006 and then reauthorized in 2013, ASPR leads the country in preparing for, responding to, and recovering from the adverse health effects of emergencies and disasters by supporting

communities' ability to withstand adversity, strengthening our health and response systems, and enhancing national health security.

Last year, the Pandemic and All-Hazards Preparedness Reauthorization Act of 2013 (PAHPRA) reauthorized many programs and authorities within ASPR to improve preparedness, response, and recovery activities. ASPR is currently implementing the provisions required in PAHPRA. Programs authorized under PAHPRA build on successes from the original legislation in 2006 as well as lessons learned.

ASPR is comprised of six supporting offices. All six are working together closely to leverage resources, target communications, and enhance coordination at Federal, state, and local levels as well as internationally. Three of ASPR's offices are the Office of Policy and Planning (OPP), which supports development of policy options during this response, as well as international public health emergency preparedness and response activities; the Office of Emergency Management (OEM), which is responsible for the Secretary's Operations Center, supports all operations, logistics and deployment, and our regional activities, as well as the Hospital Preparedness Program; and BARDA.

BARDA is the Federal Government Agency mandated to support advanced research and development and procurement of novel and innovative MCMs such as vaccines, antimicrobial drugs, diagnostics, and medical devices for the entire Nation to address the medical consequences of chemical, biological, radiological, and nuclear (CBRN) agents

of terrorism. It also addresses naturally-occurring and emerging threats like the H1N1 pandemic, last year's H7N9 influenza outbreak, and the current Ebola epidemic.

BARDA exists to address the medical consequences of these threats and to bridge the gap between early research and development and eventual Food and Drug Administration (FDA) approval and procurement of MCMs for novel threats by supporting advanced research and development of MCM candidates. Advanced development includes critical steps needed to transform a candidate to a product that is ready to use. These steps include optimizing and validating manufacturing processes such that products can be made at commercial scale; optimizing product formulation for optimum field usage, storage, and product longevity and effectiveness; creating and optimizing assays to assure product integrity; conducting late-stage clinical safety and efficacy studies; and carrying out pivotal animal efficacy studies that are often required for approval. Since 2006, BARDA has funded and successfully managed the advanced development of more than 150 MCMs for CBRN threats and pandemic influenza. Seven of these products have received FDA approval in the last two years alone, and twelve of these products have been made available for use under Project BioShield.

Over the last decade, the Public Health Emergency Medical Countermeasures Enterprise (PHEMCE) has supported basic research and early stage development of numerous Ebola and Marburg virus MCM candidates. BARDA is now coordinating with, providing funding, and providing technical assistance for the development and scaled-up manufacturing of the ZMapp monoclonal antibody therapeutic and several Ebola vaccine

candidates that the National Institutes of Health's (NIH) National Institute of Allergy and Infectious Diseases (NIAID) and the Department of Defense's (DoD) Defense Threat Reduction Agency (DTRA) supported through early development. BARDA aims to ensure that these MCM candidates are available for clinical evaluation for safety and efficacy as soon as possible and that these products can be manufactured reproducibly and robustly at commercial scale in a controlled manner to produce large enough quantities for use in a meaningful public health response. Ultimately, we strive with our partners to have these MCMs approved by the FDA as soon as it is feasible, if results of these clinical evaluations so warrant.

Specifically, BARDA, along with its PHEMCE partners, uses public-private partnerships with industry to ensure that we have the MCMs to protect the national health security of the United States in emergencies. Over the past five years, BARDA—with NIH, CDC, FDA, and industry partners—has built a flexible and rapidly-responsive infrastructure to develop and manufacture MCMs. Last year, for example, in response to the H7N9 influenza outbreaks in China, the PHEMCE mobilized these partnerships to design, develop, manufacture, clinically evaluate, and stockpile several vaccine candidates in record time. In the current Ebola response, BARDA is working with a wide array of partners that include other countries, specifically the affected and at-risk African countries; the World Health Organization (WHO); the Bill and Melinda Gates Foundation; and others. These expanded partnerships are critical to our efforts to address the current Ebola epidemic.

BARDA has established an MCM infrastructure to assist product developers on a daily basis and enable rapid response in a public health emergency. We are now employing this infrastructure to respond to the current Ebola epidemic by expediting the rapid development and manufacturing of several investigational Ebola therapeutics and vaccines. BARDA's Nonclinical Studies Network is conducting critical animal challenge studies on several promising investigational Ebola monoclonal and small molecule therapeutic candidates that may be developed further. Established in 2012, BARDA's Centers for Innovation in Advanced Development and Manufacturing are working to expand the production of Ebola monoclonal antibodies, like those in ZMapp. Last year, as part of its pandemic preparedness efforts, BARDA established the Fill Finish Manufacturing Network, which is now being used to formulate and fill multiple Ebola antibody and vaccine candidates into vials for the potential clinical efficacy studies in West Africa. Our new Clinical Studies Network is working with CDC to conduct vaccine clinical trials in Sierra Leone. BARDA is coordinating Federal and international modeling efforts for Ebola epidemiology and interventions as domestic and international scenarios and capabilities evolve. The investments that we have made since 2010 to create this infrastructure are playing a major role in the Nation's response to the current Ebola epidemic.

BARDA also supports large-scale production of MCMs as an essential part of the response to public health emergencies. BARDA led the manufacturing of vaccine and antiviral drugs in response to the H1N1 pandemic in 2009 and of vaccines as a preparedness measure for H7N9 outbreaks in 2013. In the current Ebola epidemic,

BARDA is providing assistance to vaccine and therapeutic manufacturers to scale-up production from pilot scale, in which a handful of doses can be made, to commercial scale, producing millions of doses.

For Ebola immunotherapeutics, as previously mentioned, BARDA is supporting the development and manufacturing of Mapp Biopharmaceutical's ZMapp monoclonal antibody combination therapeutic candidate, which was provided over the past three months to several Ebola patients under emergency Investigational New Drug applications. That drug is currently being manufactured to provide sufficient doses for the initial clinical safety and efficacy studies in Ebola-affected countries in West Africa. Furthermore, BARDA has enlisted the help of Genentech and Regeneron to develop Ebola monoclonal antibody therapeutic candidates rapidly using state-of-the art monoclonal antibody technologies and mammalian cells capable of immediate commercial scale production. With funds from the President's Emergency Request, we can expand production capacity to other domestic manufacturers and produce larger quantities of Ebola monoclonal antibodies using tobacco plants or mammalian cells. Such funding will also enable BARDA to support advanced development and manufacturing of two additional Ebola therapeutic candidates, if current NIH animal challenge studies yield favorable results.

With respect to vaccines, BARDA is supporting the development of a vaccine candidate (rVSVN4CT1 EBOV) from Profectus in clinical trials next year and is working with NewLink Genetics to develop and scale-up the manufacturing of their promising

investigational Ebola vaccine candidate (rVSVΔG EBOV) to commercial scale. However, additional funds are needed to support commercial manufacturing scale-up of other promising Ebola vaccine candidates from NIAID/GlaxoSmithKline, Johnson & Johnson, and Bavarian Nordic to ensure that additional vaccines are available for clinical trials and vaccination campaigns, if needed.

BARDA and its Federal and industry partners are fully engaged in the development and manufacture of these Ebola MCM candidates in record time. The immediate challenge is being able to provide sufficient quantities early enough to support clinical studies and ensuring that commercial scale manufacturing processes are robust enough to support mass usage. BARDA is prepared to meet those challenges and provide resources, expertise, and technical assistance for these and other promising investigational Ebola vaccine and therapeutic candidates. We are working with our partners across the Federal Government, new and existing industry partners, and international partners including the WHO, non-governmental organizations, West African countries, and other allied donor nations to meet these challenges.

In addition to BARDA's efforts in the Ebola response, ASPR is supporting a number of other response activities including: supporting health care system preparedness through the Hospital Preparedness Program (HPP); developing policies and guidance on patient movement, repatriation, standards of care, and clinical guidance; supporting the logistical aspect of deploying U.S. Public Health Service (USPHS) officers to West Africa; and,

ongoing critical coordination and communication within the national and international communities responding to the threat.

Beginning with efforts to support health care system preparedness, over the past 12 years, state and local health departments have purchased health care facility-based equipment and supplies, exercised and trained for a number of different emergency scenarios, including highly infectious diseases, and developed partnerships and coalitions across regional health care systems to address situations just like Ebola by utilizing HPP grant funding. Through the HPP grant, ASPR is supporting domestic preparedness by producing and disseminating educational materials on awareness and response to potential Ebola patients. It is working to ensure state and local partners have relevant information to understand the emerging situation and have the right protocols and procedures in place to mitigate the threat. Specifically, HPP, along with other ASPR and HHS partners, including CDC, helped develop and disseminate checklists to prepare health care providers, hospitals, emergency medical services, and community health care coalitions.

HPP is helping CDC recruit U.S. hospitals that are willing and able to care for confirmed cases of Ebola among U.S. citizens who are medically evacuated to the United States from the affected countries in West Africa. Finally, HPP awardees may use their current HPP funds to prepare for suspected or known Ebola patients, including the development of action plans, purchase of supplies for health care facilities, and training for all personnel. In emergency circumstances, HPP awardees may request approval to use

grant funds for activities outside the currently approved scope of work. Some awardees have already initiated these requests.

We understand there is a high demand nationwide for personal protective equipment (PPE) to prepare for and respond to domestic Ebola cases, and that PPE suppliers are experiencing significant backorders for some products. ASPR has formed a PPE supply chain workgroup of departments and agencies to coordinate the Federal Government's response to this situation. The workgroup is in regular discussions with PPE manufacturers and distributors to assess the availability of products and to develop strategies to address supply chain challenges.

ASPR is working with CDC and the Association of State and Territorial Health Officials to identify hospitals willing to accept Ebola patients via medical evacuation and is also engaged with government-wide partners to resolve Ebola-related waste removal concerns. In collaboration with other HHS colleagues, ASPR and CDC developed Ebola Medical Waste Management guidelines with input from the Department of Transportation, the Environmental Protection Agency, and the Occupational Safety and Health Administration, providing hospitals and health care providers with key guidance to safely handle, transport, and dispose of waste generated from the care of persons diagnosed with or suspected of having Ebola.

Regarding the international response, ASPR, through its international health security efforts, continues to receive and share information with the WHO and countries around

the world about Ebola. In addition, ASPR maintains regular communications and coordination with G7 countries, Mexico, and the European Commission on public health measures, development and deployment of MCMs, and support for West African countries.

In order to ensure that appropriate Federal resources are brought to bear in our international and domestic fight against Ebola, on November 5, the Administration proposed an emergency funding request totaling $6.18 billion, including $2.43 billion for HHS. As the Congress considers this request, I want to highlight some of the ways these funds would impact ASPR programs. All in all, $323 million would apply to ASPR activities. BARDA's additional funding would be used to support advanced development and manufacturing of Ebola vaccine and therapeutic candidates. OEM's additional funding would allow supplemental HPP grants for PPE purchases, for training, and for renovation, construction, and retrofitting facilities to create isolation units and separate laboratories.

In conclusion, we have established a solid track record in developing and manufacturing MCMs and coordinating successful emergency responses. ASPR, in coordination with the rest of the PHEMCE, is using all of its capabilities to address the Ebola epidemic in West Africa, and has identified crucial courses of actions that can be supported through the end of FY2015. These investments in Ebola MCMs and response will not only address the current epidemic and any future Ebola outbreaks, but will also help the United States to become better prepared to defend against bioterrorism.

Again, I would like to thank the Subcommittee for its generous and continued support and for the opportunity to testify. I look forward to your questions.