FY 2015

Cooperative Biological Engagement Program

ANNUAL ACCOMPLISHMENTS

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LETTER FROM CBEP LEADERSHIP

The Department of Defense (DoD) Cooperative Threat Reduction (CTR) Program's Cooperative Biological Engagement Program (CBEP) is pleased to present its fiscal year (FY) 2015 Annual Accomplishments Report, which focuses on the Program's efforts supporting biosafety and biosecurity (BS&S) and biosurveillance (BSV) lines of effort across four combatant command regions. The past year demonstrated the need for, and effectiveness of, CBEP's unique capabilities in confronting global biological threats. Biological threats, risks, and vulnerabilities have increased dramatically in recent years, even as the U.S. Government's (USG) understanding of, and approach to, these threats has become more sophisticated and comprehensive. The rise of non-state actors has increased asymmetric threats overall, and has particularly increased the vulnerability of the United States and its partners and allies to biological threats. These threats are due to increased diffusion of biological expertise and knowledge, advances in biotechnology, increased movement of people, availability of biological materials, and insufficient reporting of outbreaks globally. This report highlights successes we achieved since FY 2014 that are directly tied to these asymmetric threats.

CBEP activities are driven by security considerations. The Program continues to seek ways to mitigate the potential for acute, destabilizing outbreaks of pathogens of security concern; prioritize activities where non-state actors, pathogens of security concern, and weak biosecurity, biosafety, and biosurveillance capability co-exist; and reduce access to pathogens of security concern. CBEP consistently works with partners to ensure cooperative opportunities, like research, are supporting capability building efforts that improve safe and secure early detection and rapid reporting on outbreaks of diseases of security concern.

CBEP supported the U.S. and international efforts to stem the ongoing Ebola Virus Disease (EVD) outbreak in West Africa and prepare at-risk countries for potential EVD cases. This outbreak underscored the unique and unpredictable nature of the biological threats that CBEP seeks to reduce by enhancing BS&S practices as well as BSV systems. Through provision of equipment, training, and transportable laboratory diagnostic capability, CBEP contributed substantively to the EVD outbreak global response. The Program remains engaged with our existing African partners as it transitions its efforts in West African countries from crisis management to long-term engagements that expand and enhance the long-term, sustainable capabilities and capacities.

In FY 2015, CBEP continued construction of the Central Reference Laboratory in Almaty, Kazakhstan, and has transferred the ownership of the Richard G. Lugar Center for Public Health Research (Lugar Center) in Tbilisi, Georgia, to the Georgian government. The Program is in a new stage of transition to sustainment in the Eurasia region and will continue to support these programs to ensure robust BS&S and BSV capabilities grow. These facilities improve the ability of partners to safely store pathogens of security concern and enhance their BSV capability – a security benefit to the region and the United States. When countries like Georgia and Kazakhstan are invested in, the region is secured and regional leaders amplify the CTR mission.

CBEP cannot address the risks posed by outbreaks of pathogens of security concern without forming broad-based partnerships with traditional public and animal health organizations. As described in the previous two accomplishments reports, collaboration with U.S. Government agencies and international organizations are an essential force multiplier for CBEP's work across the world. In FY 2015, collaboration increased with the U.S. Centers for Disease Control and Prevention (CDC) on the Global Health Security Agenda (GHSA), and this collaboration enabled the Program to advance its security goals across the GHSA countries. GHSA was formalized and CTR's biological threat reduction mission and objectives were actively and consciously sought after to integrate into those goals.

CBEP also partners with the World Health Organization (WHO), the Foreign Agriculture Organization of the United Nations, and the World Organization for Animal Health to advance global health security objectives across multiple regions. These international organizations are key partners, even though DoD's mission and focus areas are different. The CTR Program, specifically CBEP, can forge broad partnerships through outreach to foreign militaries that prefer military-to-military relations, as well as civilian agencies that are willing to engage in a comprehensive partnership to reduce threats.

DoD's approach to biological threat reduction is important for national security and CBEP is a tool to help stop the biological threat "at the source." It accomplishes this mission by continuing to work collaboratively with U.S. interagency, inter-governmental, and nongovernmental organizations to enhance the capabilities of regions and partner countries. Efforts are focused on reducing the threats posed by the intentional, accidental, or natural spread of pathogens of security concern, related materials and expertise, and potential terrorist acquisition and use of biological agents as weapons of mass destruction.

– CBEP Leadership

WHO WE ARE AND WHAT WE DO

THE CBEP MISSION

CBEP recognizes the danger to U.S. and global health security posed by the risk of outbreaks of diseases of security concern. Whether natural or manmade, these disease outbreaks pose a risk to the global community. CBEP strives to address this risk by promoting best practices in biological safety and security, improving partner countries' capacities to safely and rapidly detect and report dangerous infections, and establishing and enhancing international research partnerships.

PROGRAM MISSION AREAS: BS&S AND BSV

The CBEP BS&S mission area strengthens the practices and operations of partner countries by securing collections of pathogens of security concern into safe and secure facilities. CBEP BS&S initiatives provide technical consultations, risk assessments, and training to build capacity and internal expertise to create a sustainable culture of laboratory biorisk management.

The CBEP BSV mission area strengthens the capacity for public and animal health systems to detect, diagnose, and report outbreaks related to pathogens of security concern.

CBEP uses Cooperative Biological Research projects to assist the BS&S and BSV areas by encouraging transparency in all functional areas of human and animal networks, and integrates partner country scientists and institutes into the international scientific community.

LINES OF EFFORT

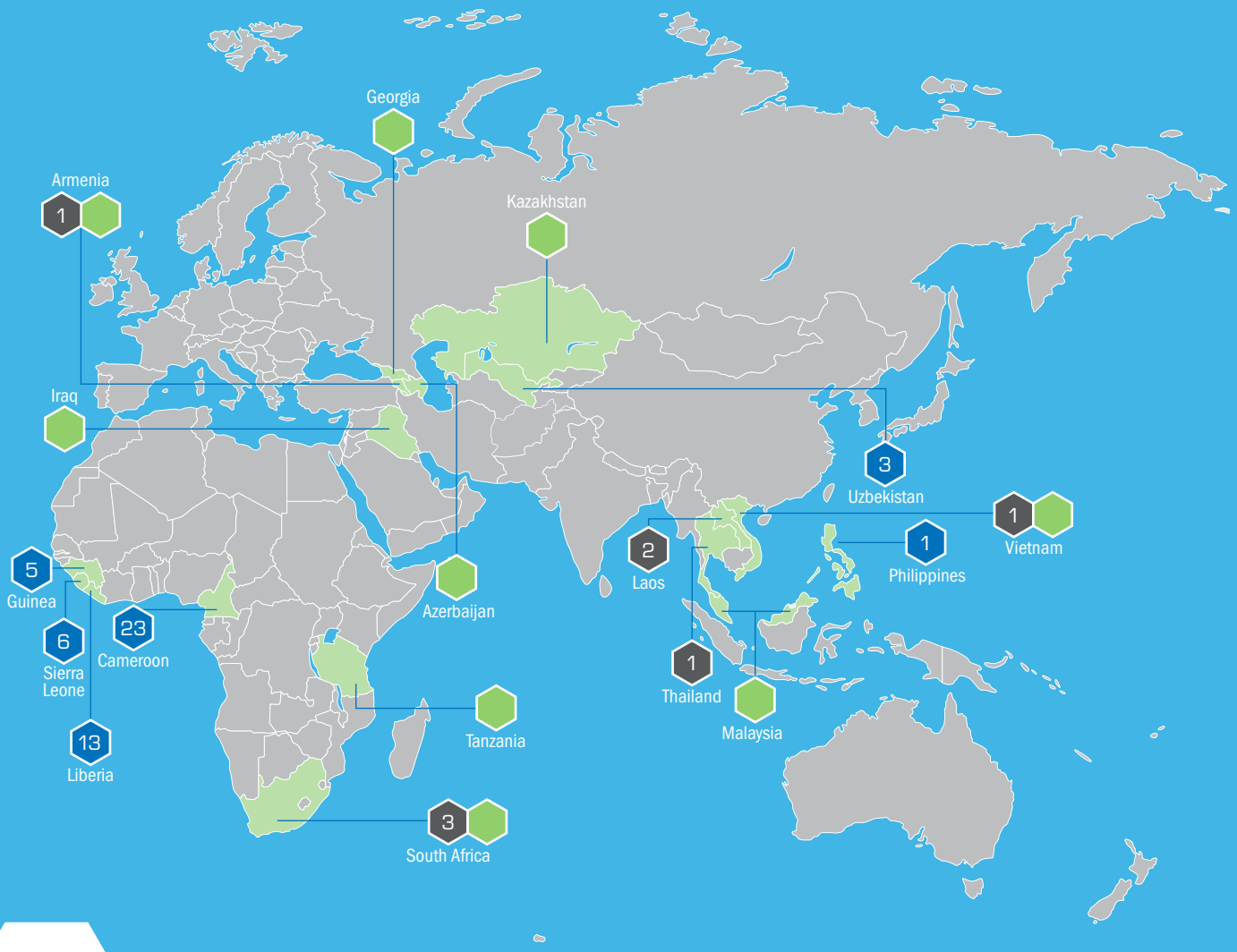
To counter the evolving biological threat, CBEP focuses on seven major lines of effort within BS&S and BSV mission areas. When implemented collectively, these lines of effort strive to make the world a safer place through enhancing a partner country's capabilities to identify, consolidate, and secure collections of pathogens of security concern to prevent the sale, theft, diversion, or accidental release of such pathogens. These efforts also aim to assist partner countries to rapidly and accurately survey, detect, diagnose, and report suspected acts of biological terrorism and outbreaks of said pathogens in accordance with international reporting requirements.

CBEP collaborates with partner countries using these lines of effort to bolster their capacities and capabilities to do the following:

***Secure* by Consolidating and Securing Pathogens of Security Concern**
Consolidate collections of pathogens of security concern into a minimum number of facilities to ensure the control of these pathogens is adequately maintained.

***Safeguard* through Facility-Level Biorisk Management Systems and Culture**
Develop a biorisk management system and culture through the proper selection and use of safety and personnel protective equipment; the safe and secure design and construction of facilities; the development and adherence to relevant Standard Operating Procedures (SOPs) and best practices; and training of facility personnel.

***Influence* via National-Level Regulatory Frameworks**
Ensure that the proper national level regulations, guidelines, or policies for BS&S are in place and followed, and there are mechanisms for oversight and enforcement of BS&S regulations and/or guidelines.



BIOSAFETY & BIOSECURITY EXAMPLES
FOR FY 2015

SECURE
Pathogen Asset Control System (PACS) Implementations

SAFEGUARD
Personal Protective Equipment (PPE) Delivered

INFLUENCE
Supported Enhancement of Legislative Frameworks

***Detect* through Disease Detection**
Detect suspected acts of biological terrorism and outbreaks of pathogens of security concern by ensuring health professionals are trained in, and demonstrate, relevant clinical skills for disease detection and that clinical protocols/guidelines are developed and used within the country.

***Diagnose* via Laboratory Diagnostics**
Diagnose outbreaks of infectious diseases stemming from pathogens of security concern by ensuring that: a National Public health laboratory exists within the country; established protocols (SOPs and job aids) are consistently used for diagnostics and sample referral; laboratory staff are properly trained on level-specific diagnostic testing as well as sample collection and transport, with emphasis on sample viability and preserving sample integrity; and the necessary equipment and reagents are available for rapid detection of priority diseases.

***Analyze* by way of Epidemiological Analysis and Investigation**
Perform rapid and accurate outbreak investigation by ensuring that trained health professionals demonstrate relevant analytic and investigative epidemiology skills and that analysis of disease surveillance data is conducted to identify disease-specific trends and derive baseline data.

***Report* for Disease Reporting and Communication**
Rapidly and accurately report outbreaks through communication protocols that use standardized case definitions and a list of reportable diseases to allow for multi-sectoral and multidisciplinary coordination within the country. Ensure that these protocols are supported by an information and communications technology infrastructure that allows for reporting of surveillance activities via electronic disease surveillance and reporting systems.

BIOSURVEILLANCE EXAMPLES FOR FY 2015

DETECT
Clinical Training Sessions Provided

DIAGNOSE
Reagents Delivered

ANALYZE
Epidemiology Training Sessions Provided

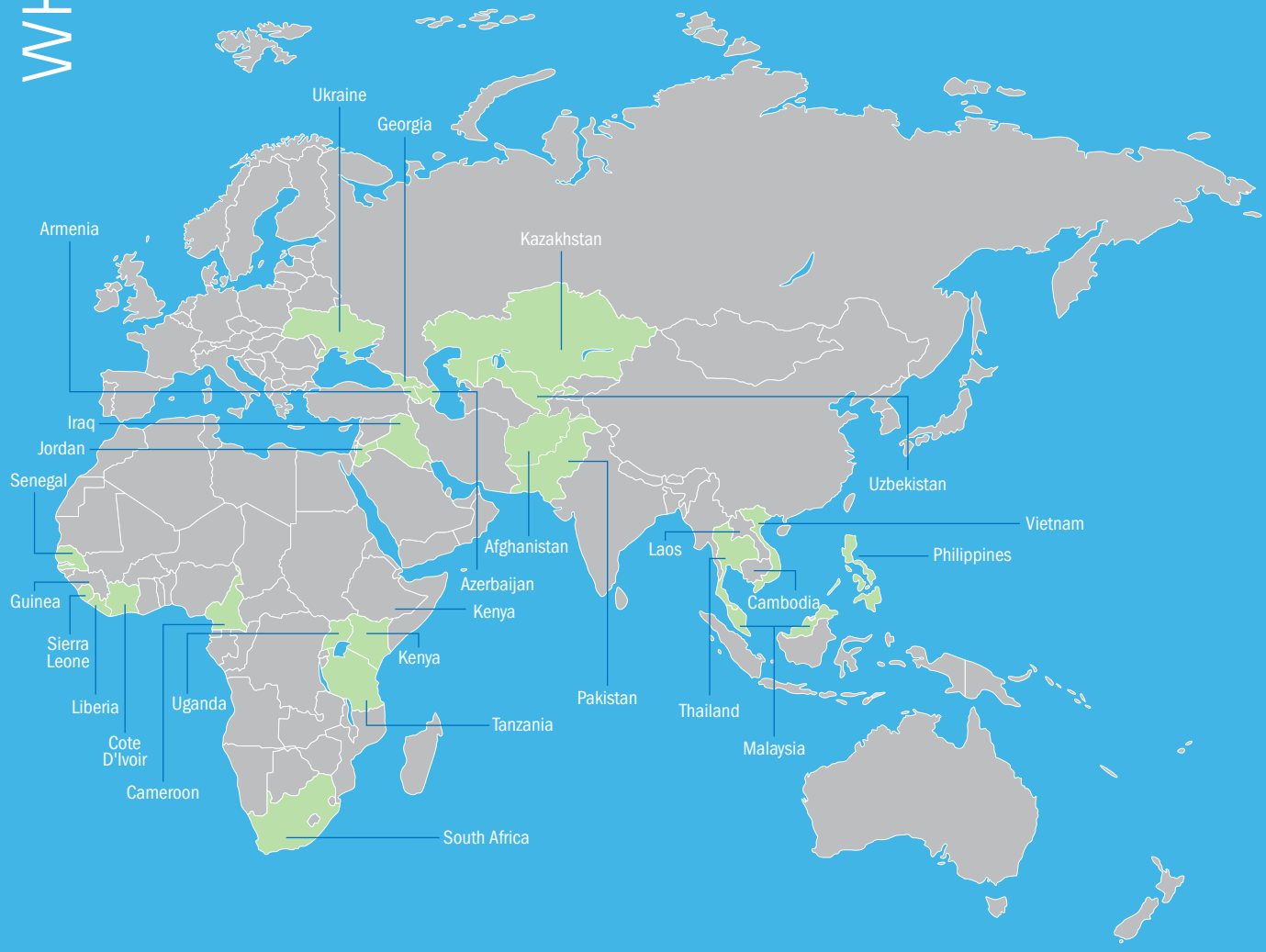
REPORT
Electronic Integrated Disease Surveillance System (EIDSS) Implementations

WHO WE WORK WITH

THE COLLABORATIVE APPROACH

The scope of CBEP's activities increasingly intersects with major USG and international program areas, including national security, force health protection, global health security, science, development, and engagement. CBEP engages and partners with other DoD entities (e.g., Army, Navy, Armed Forces Health Surveillance Center, Chemical and Biological Defense Program); other USG entities (e.g., Department of Homeland Security, Department of Health and Human Services, Department of Agriculture, Federal Bureau of Investigation, Food and Drug Administration; United States Agency for International Development (USAID)); nongovernmental organizations (e.g., World Bank); and international programs (e.g., Foreign Agriculture Organization of the United Nations, World Health Organization, and World Organization for Animal Health). These partnerships complement and leverage, rather than duplicate, CBEP efforts and capabilities.

WHERE WE WORK



CBEP PARTNER ENGAGEMENTS FY 2015

PROGRAM ACCOMPLISHMENTS IN FY 2015

AFRICOM

Since 2010, the engagement in the United States Africa Command (AFRICOM) has highlighted the importance of the CTR Program to the region and in FY 2015 showcased CBEP's nimbleness to support activities in the fight to control the EVD outbreak that devastated Guinea, Sierra Leone, and Liberia. In doing so, CBEP positioned itself as a cornerstone and major contributor to activities in the region carried out by the U.S. interagency and members of the international community handling this emerging threat. Furthermore, CBEP maintained its commitment to reduce the threat posed by non-state actors acquiring biological materials, equipment, and/or expertise by strengthening partner countries' BS&S capacities, securing dangerous pathogens, and enhancing BSV capabilities in West and East Africa. CBEP continues to support collaborative research projects that exercise these capabilities and engage with partner country scientists to aid in the identification and prioritization of biological threats and vulnerabilities. In FY 2015, CBEP continued or initiated funding for projects in Kenya, Uganda, South Africa, and Tanzania and laid the foundation for collaborations in Ethiopia, Cameroon, Senegal, Liberia, Sierra Leone, and Guinea. Highlights of these efforts are a project in Kenya aimed at assessing brucellosis disease burden and a One Health project studying the emergence and spread of Rift Valley Fever in the Republic of South Africa, designed to build capacity for the prevention, detection, and reporting of Rift Valley Fever Virus in humans, livestock, and wildlife.

BS&S

CBEP works with partners in the AFRICOM region to strengthen their capabilities to meet BS&S international best practices such as those outlined in the WHO International Health Regulations (IHR [2005]) and CDC *Biosafety in Microbiological and Biomedical Laboratories, 5th edition.* Through establishing proper standard operating procedures, safety and security infrastructure, and educated human capacity, BS&S engagements build the foundation to secure and consolidate pathogens of international security concern, protect pathogen repositories from insider and outsider threats, and improve operations for biosurveillance of pathogens of security concern.

Secure

- On July 24, 2015, the USG and Government of Kenya signed a Memorandum of Agreement. The Agreement will allow CBEP to proceed with implementing construction and renovation projects at the Kenya Medical Research Institute, Central Veterinary Laboratory, Kenya Veterinary Vaccines Production Institute, and Isiolo and Kajiado regional hospital laboratories to enhance BS&S infrastructure at these facilities.

- In November 2014, CBEP facilitated a workshop at the National Animal Diagnostics and Epidemiology Centre (NADDEC) to develop an Inventory System for Biological Agents Strategy. As a result of the strategy development, in December 2014, CBEP presented their Pathogen Asset Control System (PACS) to NADDEC demonstrating its sample inventory technology. That same month, CBEP received a formal request from NADDEC to proceed with implementation of PACS in early FY 2016 to safely and securely track their sample inventory at the national level.

Safeguard

- CBEP supported international efforts to stem the ongoing EVD outbreak in West Africa and prepare at-risk countries for potential EVD cases. To meet immediate needs of countries fighting the outbreak, the Program procured and delivered $1.17 million in personal protective equipment (PPE) and supplies, including shoes, gloves, masks, and coveralls. Through this funding, CBEP supported needs in Cameroon, Gabon, Guinea, Liberia, and Sierra Leone. This PPE was essential to protecting health workers and controlling further spread of EVD during the outbreak in West Africa.

- In South Africa, CBEP facilitated a Laboratory Biosecurity Awareness Workshop at the African Centre for Integrated Laboratory Training. Participants included attendees from the National Institutes for Occupational Health and biosafety technicians from the National Institutes of Communicable Diseases and the Kimberley Department of Agriculture.

- CBEP provided Global Biorisk Management Curriculum training to 250 participants from Uganda, Kenya, South Africa, and elsewhere in the Africa region.

Influence

- CBEP and the Academy of Science for South Africa completed a 2-year review of existing BS&S legislation in South Africa. The report identified existing BS&S measures and capacity to detect, identify, control, and prevent the natural, accidental or deliberate spread of infectious agents. CBEP plans to incorporate future projects from the Academy of Science for South Africa report into a multi-year project implementation plan with the Republic of South Africa.

- CBEP completed a collaborative effort with the Government of Tanzania to develop a One Health Strategy. The strategy identifies a vision, objectives, and ways, means, and ends for implementing their One Health approach. CBEP will continue to work with Tanzania and other stakeholders to support the strategy's ratification and implementation.

BSV

CBEP works collaboratively with partners in the AFRICOM region to detect, diagnose, surveil and report emerging and re-emerging diseases of international security concern, following WHO IHR (2005), World Organization for Animal Health Guidelines, and international best practices. As the EVD epidemic demonstrated, outbreaks from pathogens of security concern have regional destabilizing effects and can spread globally. CBEP's efforts in AFRICOM continue to build partners' capacities in order to help protect the United States from these threats through sustainable training, interoperable surveillance tools, collaborative research projects, and laboratory diagnostics.

Clinician Training in Uganda – USAMRIID and participants from the Uganda Ministry of Health

Detect

- CBEP and U.S. Army Medical Research Institute for Infectious Diseases (USAMRIID) provided clinical differential diagnosis training to over 200 participants from Uganda, Kenya, and elsewhere in the Africa region. The training strengthens partner countries' health systems' ability to detect, surveil, and report disease outbreaks through increasing capabilities of clinicians to differentiate between diseases of security concern and those causing similar symptoms throughout the region.

Diagnose

- CBEP deployed Transportable Diagnostic Laboratories to Sierra Leone and Guinea to increase EVD diagnostic capabilities. In FY 2015, these laboratories received and analyzed over 6,000 samples for EVD. In Sierra Leone, 22 samples tested positive for EVD. In Guinea, 56 samples tested positive for Ebola. These cases were detected more rapidly thanks to the enhanced capabilities provided by the diagnostic laboratories. CBEP is developing a strategy to transition the current capabilities to the partner countries and will continue to provide diagnostic and training support to ensure partners are able to meet WHO IHR (2005) and international best practices in BS&S.

- In Uganda, CBEP completed a $1.3 million installation of laboratory diagnostics equipment at the Uganda Virus Research Institute, the Central Public Health Laboratory, and 15 District Laboratories under the Ugandan Ministry of Health (MoH) that improved genomic sequencing capabilities and data analyses. Provision of this equipment boosted diagnostics capacity and increased the MoH workforce's capability, at

Defense Threat Reduction Agency Transportable Laboratory in Moyamba, Sierra Leone

the national and district level, to rapidly report and respond to disease outbreaks.

- CBEP partnered with the National Institutes of Health, USAMRIID, and the Naval Medical Research Center provided laboratory diagnostics training to participants in Liberia to safely and securely identify EVD samples. These laboratory technicians were able to sustain EVD diagnostics in Liberia at the Liberian Institute for Biomedical Research and Phebe Hospital.

Analyze

- In collaboration with USAID, CBEP facilitated a Francophone/Lusophone Regional Preparedness Workshop in Douala, Cameroon. The workshop acted as a catalyst for public health discussion among African countries not yet affected by the EVD epidemic in West Africa, but who border countries with confirmed EVD cases. Participants reviewed existing emergency preparedness plans and the WHO framework for Preparedness and Response to Public Health Events of Initially Unknown Etiology. Participants also were engaged in regional deliberations to identify and prioritize existing gaps to address areas of emergency preparedness, multi-sectoral collaboration, laboratory capacity, and manpower development; and gain practical knowledge in key areas of preparedness (e.g., Incident Management, Contact Tracing, Infection Control, and Risk Communication).

- CBEP and CDC provided epidemiology training to over 100 participants in Uganda. The training enhanced Ugandan health professional abilities to identify, analyze, and report disease outbreaks.

- CBEP and CDC facilitated a tabletop exercise in Cote d'Ivoire to support regional biosurveillance efforts and prepare for any suspected EVD cases within Cote d'Ivoire. This tabletop exercise brought together both human and animal health participants from the Government of Cote d'Ivoire to foster a more cohesive inter-ministerial response in the event of an outbreak and identify gaps in the Ivorian emergency response.

Training participants, U.S. interagency partners, and instructors for the Incident Management Systems training

- Collaborators of the CBEP-funded research project "Epidemiologic and Laboratory Assessment of the Burden of Brucellosis in Kenya" published their work in the peer-reviewed *American Journal of Tropical Medicine and Hygiene*. The project's team, which includes partners from CDC-Kenya, the Kenya Ministry of Health, the Kenya Ministry of Agriculture and Livestock and Fisheries, and the Zoonotic Disease Unit, worked together for a year to determine the level of exposure to *Brucella* bacteria in Kajiado, Kiambu, and Marsabit counties in Kenya.

Report

- In collaboration with the Defense Threat Reduction Agency's (DTRA) Chemical, Biological, Radiological, and Nuclear Preparedness Program/Consequence Management Advisory Team, CBEP facilitated "Incident Management Systems" training for the Government of Cameroon. The training involved representatives from various Ministries that are currently preparing for a possible EVD outbreak in Cameroon. The purpose of the 3-day course was to enable personnel to operate efficiently during a public health or other natural or man-made incident and provide training for personnel who are likely to assume a supervisory position within the Incident Management System.

- In collaboration with the CDC, CBEP hosted a 3-day, inter-ministerial workshop on "Simulation Design Training" for the Government of Senegal. The training aimed at teaching emergency responders, planners, and emergency operations center (EOC) operations specialist how to plan, design, and conduct an EOC simulation (exercise). While focusing primarily on health emergencies, the workshop included representatives from various ministries who may play a liaison or coordination role in an emergency response situation.

CENTCOM

CBEP has engaged in the United States Central Command (CENTCOM) region since the late 1990s and looks to mitigate the threat posed by existing and emerging biological threat agents across the region, whether naturally occurring or arising from nefarious intent. In these engagements, the Program expects to reduce the threat posed by non-state actors acquiring biological materials, equipment, and/or expertise by strengthening partner countries' BS&S capacities, securing dangerous pathogens, enhancing BSV capabilities, and engaging technical experts. For example, CBEP engaged Kazakhstan to provide detection capabilities for the disease caused by Middle East Respiratory Syndrome coronavirus (MERS-CoV), which can be harbored by camels. MERS-CoV has not yet been detected in Kazakhstan, despite having a thriving camel economy, including camel imports from the Arabian Peninsula where MERS-CoV is endemic. On the whole, CBEP's proactive engagement will assist Kazakhstan to detect and respond quickly and appropriately in the event of an outbreak. Similarly, there are numerous endemic and emerging biological threats throughout the CENTCOM region, including brucellosis, plague, tularemia, and others, in which CBEP-supported scientific engagements assisted in enhancing capabilities to better understand threats posed by pathogens of security concern. These threats are compounded by social, political, and environmental factors like mass movement of refugee populations across borders and the subsequent compacted living quarters; mass gatherings at social and religious events; and non-state actors who may seek to acquire pathogens for nefarious intent.

BS&S

The BS&S approach for CBEP in CENTCOM has focused on facility upgrades, training of laboratory personnel, and the development and promotion of national biosafety organizations. As capacities grow and mature into capabilities, the Program will work towards supporting a regional biosafety organization whereby national organizations effectively share information and coordinate their efforts.

Secure

- As part of the continuing CBEP engagement in Kazakhstan, CBEP completed construction and commissioning for the Biosafety Level 3 (BSL-3) laboratory at the Research Institute for Biological Safety Problems in Otar, in collaboration with Kazakhstan's Ministry of Education and Science. The laboratory will implement scientific research on pathogens of security concern, and will support Kazakhstan's ability to

Iraqi Ministry of Science and Technology Facility Renovation

understand and combat diseases circulating in the country. Completion of the lab in Otar supports CBEP's goals for the safe and secure storage of pathogens of security concern, as well as enhancing biosurveillance capabilities in Kazakhstan.

Safeguard

- In April 2015, CBEP completed facility and equipment upgrades at Iraq's Ministry of Science and Technology laboratory. Facility upgrades included ventilation system repair, door upgrades, laboratory benches, resurfaced floors, surface painting and cleanup, and electrical power improvements. Additionally, CBEP provided equipment upgrades, including a biosafety cabinet, freezer, centrifuge, water system distiller, shaking incubator, and shaking water bath, to ensure that laboratory technicians could safely and securely perform their duties.

Trained Uzbek Nationals to certify and maintain biosafety equipment

- In August 2015, trainees from the Uzbekistan MoH and the Ministry of Agriculture and Water Resources participated in biosafety cabinet certification training at the Eagleson Institute in Sanford, Maine, a nonprofit organization whose mission is to promote the principles and practices of laboratory safety. This effort includes a continued learning program for the Government of Uzbekistan trainees to accompany CBEP's in-country certification specialists during the course of annual biosafety cabinet certification at CBEP-funded labs through calendar year 2016. Resident Uzbek experts trained in biosafety cabinet certification and maintenance will contribute greatly to the ability to sustain these important resources and ensure continued safe practices in diagnostic laboratories across Uzbekistan.

- In July 2015, CBEP, with assistance from the U.S. Army Corps of Engineers, completed facility renovations at the Kabul Central Public Health Laboratory, in coordination with the Afghan Ministry of Public Health. Facility-related electrical and laboratory equipment (biosafety cabinets, fume hoods, freezers, and Polymerase Chain Reaction (PCR) diagnostic equipment) were also provided. These renovations provide the Central Public Health Laboratory with a functional, safe, and secure laboratory to perform laboratory diagnostic activities, substantially contributing to Afghanistan's ability to safely diagnose, and detect outbreaks caused by pathogens of security concern.

Trained Uzbek Nationals to certify and maintain biosafety equipment

Completed laboratory renovations at Afghanistan's Central Public Health Laboratory (biochemistry lab before and after)

Attendees at the ceremony marking completed facility renovations at the Jordan University of Science and Technology's Biorisk Management and Genomics Training Divisions at the Princess Haya Biotechnology Center

- CBEP provided Biorisk Management (BRM) training materials and audiovisual equipment to the Jordan University of Science and Technology's (JUST) new Biorisk Management and Genomics Training Divisions at the Princess Haya Biotechnology Center. Trainings carried out at the Training Divisions, on topics including key BS&S terminology, assessments, control measures, performance measurements, mitigation measures, basics of acquired infections, and hazardous communication, will ensure that laboratory staff across the region are able to consistently and safely perform laboratory practices. On February 10, 2015, JUST hosted a ribbon cutting ceremony to mark the completed renovations, which featured attendance by distinguished guests including the U.S. Ambassador to Jordan, JUST representatives, Canada's Global Partnership Program, United Kingdom's Ministry of Defense, and U.S. interagency representatives.

Influence

- In May 2015, CBEP convened the fifth workshop in a continuing series to support the Iraqi-led National Biorisk Management Committee (NBMC). Overall committee objectives include the development of a national pathogen list and proposed implementation mechanisms, as well as the development of a national-level policy that will support the legal framework for a nationally-mandated biological risk management system. Having these legislative frameworks in place will improve Iraq's ability to influence and enforce safe pathogen detection, reporting, use, and storage across the nation in support of strengthening its disease surveillance capabilities. The event was attended by representatives from 16 Iraqi ministries, and outcomes include the development of a detailed Action Plan that assigns roles and responsibilities for each ministry involved with the NBMC.

- In August 2015, for the third time, Iraq publicly highlighted CBEP's support to influencing its policies and strengthening national capacities and practices related to biosafety, biosecurity, and disease surveillance in its statement to the Biological Weapons Convention. Specific activities mentioned included the forging of the NBMC, drafting of a national biorisk management policy, and support for scientific fellowships, research projects, and training workshops. The continued

acknowledgement of CBEP activities in Iraq's official statement is a strong and positive indication that the Government of Iraq is a committed global partner to biological nonproliferation.

BSV

CBEP's FY 2015 biosurveillance efforts in CENTCOM included training in diagnostic techniques; the installation of diagnostic equipment and the augmentation of lab capabilities; and the establishment of information technology infrastructure elements to support national disease reporting networks.

Detect

- In June and July 2015, CBEP engaged the Kazakh Ministries of Education and Science, Agriculture, and National Economy on a collaborative project to provide field and laboratory detection capabilities for MERS-CoV. While it has not yet been detected in Kazakhstan, the country imports camels from the Arabian Peninsula increasing the potential for the introduction of MERS-CoV to Kazakhstan. Because MERS CoV has killed 3–4 of every 10 persons infected to date, CBEP's proactive approach will assist Kazakhstan in early detection to deploy rapid response measures to mitigate a potential outbreak.

- In July 2015, CBEP successfully completed the development and hand-off of a Mobile Diagnostic Unit (MDU) to the Government of Pakistan. The Mobile Diagnostic Unit will play a critical role in Pakistan's bio-surveillance system, as it will enable real-time diagnostic testing in remote areas. As part of the effort, CBEP's contractor finalized repairs

Sponsored the establishment of Iraq's National Biorisk Management Committee

Provided functional Mobile Diagnostic Unit capabilities to Pakistan (left)

Convened the first Training on the MERS CoV in Kazakhstan (right)

and provided end-user trainings. The training covered proper use of each piece of laboratory diagnostic equipment in the Mobile Diagnostic Unit and will enable Pakistan to better address emerging threats.

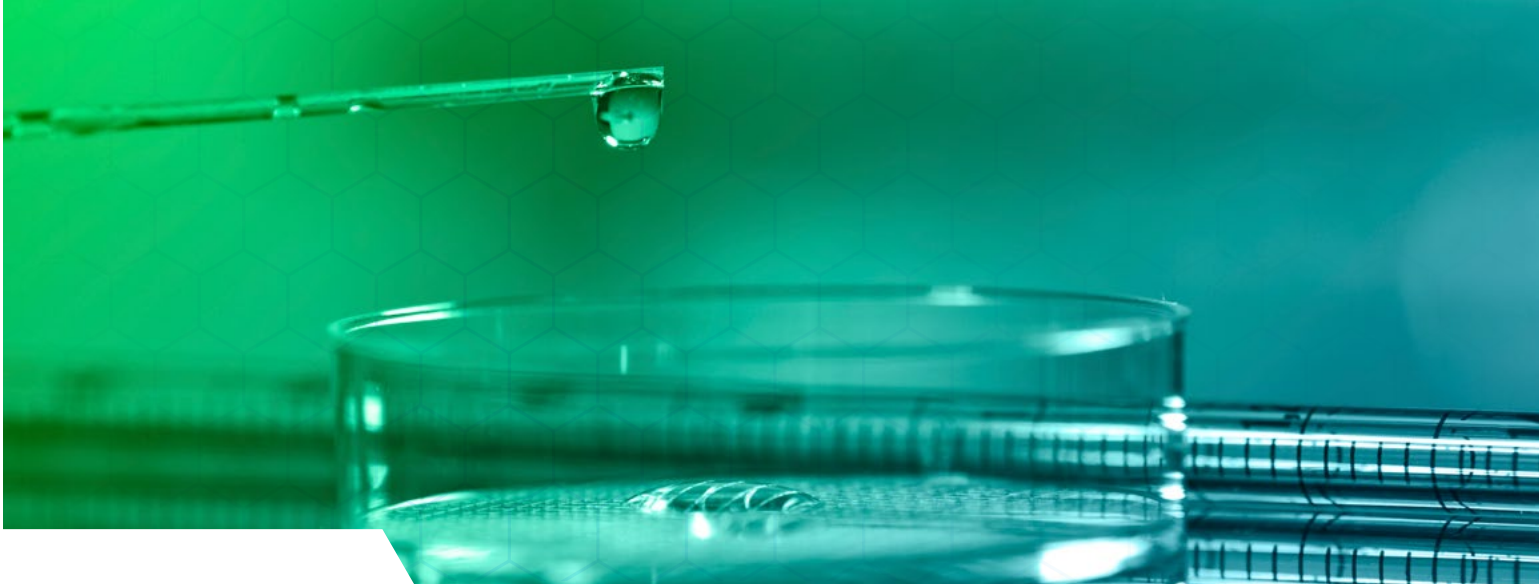
- CBEP facilitated a Biosciences Fellowship Program that provides partner country scientists from Iraq and Afghanistan training and exposure to biological laboratories, experts, and techniques, for them to learn and apply those practices in their home institutions. Partner scientists were placed in prominent U.S. university laboratories for up to 6 months and engaged daily with scientists. Fellows participated in networking opportunities, attended scientific conferences, and were encouraged to publish data in quality peer-reviewed scientific journals. The experiences will expand their collaborative networks, and strengthen their abilities to contribute to pathogen detection and disease baselines in their respective countries.

- CBEP supported a multi-country Public Outreach Project on African Swine Fever (ASF), spanning CENTCOM and U.S. European Command (EUCOM) regions. This project was conceived by an ASF working group formed at the 2012 CBEP Science Review. Kazakh participation was led by the National Reference Veterinary Center in Astana. More than 6,000 Kazakhs were trained on ASF signs and symptoms, prevention and control, and reporting strategies. Additionally, tens of thousands of individuals were reached via fliers, leaflets, posters, and television and radio broadcasts. This project represents the first four-country regional project, and the first public outreach project, sponsored by CBEP. Overall, the project is considered a monumental success toward informing technical experts and lay people about ASF in Kazakhstan and across the region, and established a framework for future regional collaborative engagements geared toward combatting biological threats.

Kazakh participation in CBEP's Regional ASF Project

Diagnose

- In cooperation with CDC's Central Asia Regional Office, CBEP supported an Ebola biosafety and diagnostics workshop in Tashkent, Uzbekistan. The 3-day training was requested by the Government of Uzbekistan to increase its capability to detect and respond to EVD, in the event that EVD crossed into Uzbek territory. The training was



attended by professionals from across the Ministries of Health and Defense, and included background discussions on lessons learned from the international Ebola response in West Africa as well as a review of Uzbekistan's current domestic response plan. This exercise highlighted Uzbekistan's awareness of, and proactive commitment to, preparing to respond to emerging biological threats.

Analyze

- CBEP continued to support the Field Epidemiology Training Program (FETP) in Afghanistan, implemented in partnership with CDC. FETP is intended to train epidemiologists on laboratory-based disease surveillance systems, track priority diseases, and assist in outbreak response activities when requested. Based in Dushanbe, Tajikistan, for security reasons, the Afghanistan program is co-funded with the United Kingdom's Ministry of Defense, who supports training for the Tajiks through the same program and resources. This FETP provides epidemiologists from the Ministry of Public Health with classroom and practical training to enhance their skills in disease surveillance, detection, and response to outbreaks. The program also works with epidemiologists to facilitate publication of epidemiological data, further expanding participants introduction and outreach to the international scientific community.

- In cooperation with CDC, CBEP conducted a workshop for Uzbekistan on "Principals of Clinical Practice Guidelines and Clinical Protocol Development." Clinical Practice Guidelines (CPG) train health care providers how to optimize patient care based on a thorough review of evidence, as well as assess the range of options for care. The goals of the workshop included promoting and implementing a standardized approach in developing the high quality CPGs. Attendees from Tashkent Medical Academy, Tashkent Institute for Postgraduate Medical Education, Center of Evidence-based Medicine, and Center for Quarantine Infectious and Prophylactics discussed revisions to existing national protocols and proposed ways to improve current CPGs. Strengthening Uzbekistan's CPGs provides internationally aligned norms through which to provide healthcare to those impacted by a variety of diseases including those of security concern.

Training of Uzbekistan partners in Ebola diagnostics and biosafety best practices

Clinical, Veterinary, and helath Systems Exchange, Stage II

Facilitated U.S.-Pakistan Mil-to-Mil Health Exchanges

Report

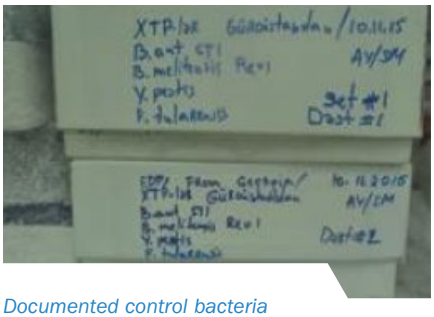
- CBEP began implementing the Electronic Integrated Disease Surveillance System (EIDSS) in the Kurdistan region of Iraq. EIDSS strengthens and supports the monitoring and prevention of diseases by integrating veterinary, human, and vector surveillance data from across the region. CBEP installed EIDSS in eight locations in Kurdistan and provided end-user training, including the analysis, visualization, and reporting module training. EIDSS and related training is providing this autonomous region within Iraq with the capabilities to properly track disease data and better determine how to respond to outbreaks effectively and efficiently.

- Throughout 2015, CBEP participated in the CENTCOM/DTRA-Chemical, Biological, Radiological, and Nuclear Preparedness Program EOC workshop series for Jordan. CBEP provided subject matter expertise for the workshop, as well as logistics support. The EOC series included participants from the Jordan Armed Forces, Ministry of Health, and Ministry of Interior. Three workshops were held in Amman, New York, and Atlanta, and provided an introduction to emergency operations. Discussions focused on crisis communications, SOPs, and resource management. By bringing these ministries together the workshops fostered trust among, and improved communications between, the Jordanian interagency. The EOC workshop series provided valuable information and fostered positive relationships as Jordan stands up EOCs in various ministries.

- CBEP conducted two Mil-to-Mil Health Exchanges entitled “Clinical, Veterinary, and Health Systems Exchange Stage I Workshop.” The purposes of these 5-day exchanges included building a relationship with Pakistan’s military health component, sharing best practices in disease detection, and strengthening Pakistan’s capacity to detect, diagnose, and report endemic and epidemic, man-made, or naturally occurring pathogens of security concern. In addition to these biosurveillance topics, the exchange included presentations on biosafety and biosecurity topics such as sample transport. The Mil-to-Mil health exchanges provide an excellent forum for face-to-face engagement with Pakistan’s military health component.

EUCOM

CBEP has engaged in the EUCOM region since the late 1990s and is actively engaged in the countries of Georgia, Ukraine, Azerbaijan, and Armenia. The Program has focused on the removal or consolidation of all pathogens of security concern. Nearly all construction projects undertaken to further the Program's objectives have been completed. Looking to the future, the Program is now laying the groundwork to emphasize regional capabilities and multilateral, multi-sectoral solutions to sustainably address regional biothreat issues. As an example of the this approach, CBEP supported a four-country, African Swine Fever Public Outreach project aimed to enhance awareness and understanding of clinical signs and reporting requirements of this important pathogen of security concern. This project resulted in trained trainers in Armenia, Georgia, Kazakhstan, and Ukraine, who in turn trained over 20,000 people throughout the four countries. Cooperative biological research projects with a regional focus are a continuing priority. In FY 2015, EUCOM kicked off a collaborative regional project between Georgia and Azerbaijan looking at anthrax foci along the shared border region. Through these efforts and many others, CBEP will promote the One Health Initiative, compliance with international regulations, and integration, coordination, and interoperability of disease reporting systems among partners in the region.



Documented control bacteria strains from Georgia stored in the Azerbaijan Republican Anti-Plague Station freezer

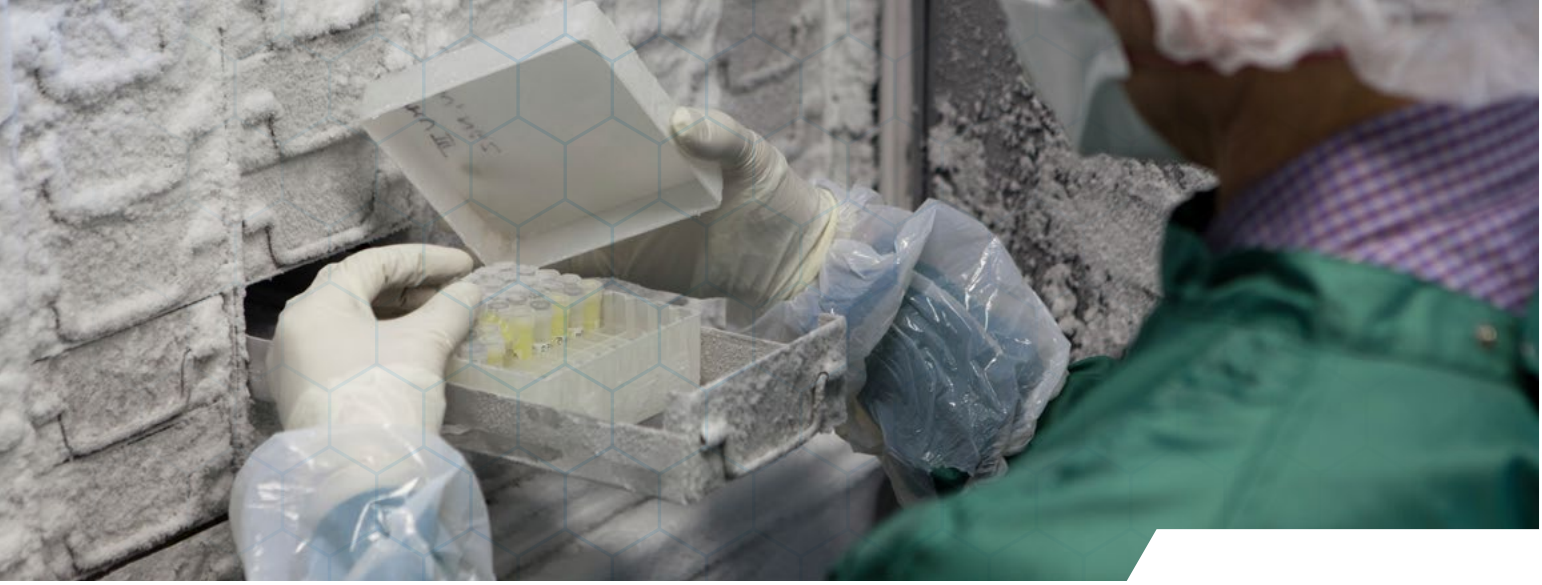
BS&S

A common, primary BS&S goal in EUCOM is the adoption of international norms and standards for BS&S protocols and bio-risk management practices, to include sharing of these practices between CBEP partner nations. CBEP also endeavors to establish a regional network of partnerships and relationships that enhance the indigenous capabilities of EUCOM partner institutes and ministries to self-sustain CBEP-provided capabilities.

Secure

- CBEP procured an ultra-low freezer for the Ukrainian State Scientific Research Institute of Laboratory Diagnostics and Biotechnology and Microorganism Strains in Kyiv. The new freezer will allow the institute to safely and securely store biological samples that are being collected in the course of regular biosurveillance activities in Kyiv.

- In November 2014, CBEP completed the procurement and installation of a generator for the Institute of Laboratory Diagnostics and Veterinary-Sanitary Expertise in Derzhvet, Ukraine. CBEP also provided the



Armenia Biosecurity working group

Institute with freezers for sample storage. These freezers will expand capacity and ensure resilience in the Institute's diagnostic capabilities.

- CBEP facilitated Georgia's support to regional partners in supplying four non-pathogenic strains to be documented control strains for the Human Health and Animal Threat Agent Detection and Response system in Azerbaijan. Having these documented control strains, which mimic pathogens of security concern but do not cause disease, will address the biosafety concerns related to working with undocumented bacteria and enable the Threat Agent Detection and Response system to safely support BSV efforts in Azerbaijan. Additionally, these documented strains can be used to test the Azerbaijani diagnostics capabilities during the upcoming Full Operational Capability Operational Demonstration of the system, scheduled for FY 2016.

Safeguard

- CBEP finalized the BSL-3 Access Agreement with Georgia, to be signed by the National Centre of Disease Control and Public Health (NCDC) and Laboratory of the Ministry of Agriculture (LMA). The agreement outlines the path forward in training, SOPs, and BSL-3 access in order for LMA and future visiting scientists to work with pathogens of security concern at the Lugar Center. It is one of the final elements needed to ensure the Lugar Center successfully supports Georgia's long-term BS&S efforts.

- CBEP conducted a Biosecurity workshop with stakeholders from the Government of Armenia. This was followed by a series of three Biosecurity Working Groups focused on Biological Agent Accountability and Control; Personnel Reliability Programs; and Physical Security. The events contributed to the development of the Laboratory Management Plan and the Biosecurity Plan for the Armenian Central Facility.

Influence

- CBEP facilitated a technical Working Group for Georgia with participants from NCDC, LMA, the Lugar Center, and Eliava Institute. The Working Group finalized the following documents:

  - BS&S Sanitary Norms: This document defines BS&S technical regulations and general sanitary and epidemiological requirements for facilities working on or potentially containing pathogenic biological

New Modular Marneuli Veterinary Laboratory Support Station (left)

Mobile Outbreak Response Unit (right)

agents. The Working Group approved the draft document and will now submit it to the MoH for official review and approval.

- Select Agent List: During the Working Group, NCDC and LMA agreed upon a select agents list to be submitted along with the BS&S Sanitary Norms draft resolution. This list of pathogens of security concern will help facilitate regulation and policies to manage the activities associated with select agents.

- CBEP successfully secured agreement from the Government of Azerbaijan to adopt program training materials into the formal curriculum within their education system. These materials will ensure that the indicated institutions of higher education will train CBEP-developed courses as a part of the mandated curriculum and confer state certificates on the graduates, thereby ensuring the sustainability of the BS&S skills and capabilities

BSV

CBEP's BSV efforts in EUCOM seek to complete a proactive and integrated network of regional institutes, ministries, organizations, and governments capable of effectively detecting, diagnosing, and reporting pathogens of security concern, especially trans-border biological threats. Some of the Program's recent achievements bolster those efforts in partner countries.

Detect

- In Georgia, CBEP finished commissioning of the Marneuli Veterinary Laboratory Support Station. Completion of the renovations returned the facility to normal operations in early November 2015, increasing LMA's sample throughput and ability to assist in Georgia's BSV efforts.

- CBEP transferred full ownership and operation of a Mobile Outbreak Response Unit to the Armenia Ministry of Territorial Administration and Emergency Situations. The Mobile Outbreak Response Unit enhances the Government of Armenia's capability to respond to disease outbreaks and strengthen its disease surveillance capacity. The September 2015 ceremony was attended by distinguished guests including the U.S. Deputy Chief of Mission.

Quality Management System Implementation Workshop for NCDC personnel (left)

Integrated Quality Laboratory Systems debrief to NCDC Director, Walter Reed Army Institute of Research, and DTRA Eurasia (right)

Diagnose

- In September 2015, CBEP held an Integrated Quality Laboratory Systems workshop for Georgia's NCDC to enhance the Lugar Center's performance in quality assurance/quality control. Workshop participants developed a Quality Management System action plan for NCDC to achieve International Standards Organization 15189 accreditation within 18-24 months. With an accredited Quality Management System at the Lugar Center, NCDC can attract international research funding, collaborators, and potentially other fee-for-service activities to support sustainment costs.

Ukrainian veterinary technicians collect samples for testing during ASF outbreak response

- CBEP provided timely assistance to Ukraine for their ongoing ASF outbreak at the request of the Deputy Head of the State Veterinary and Phytosanitary Service. Several oblasts across Ukraine were stricken with ASF at great economic cost, and in support, CBEP rapidly procured laboratory diagnostic equipment and consumables. The diagnostic supplies significantly improved Ukraine's ability to rapidly diagnose suspected ASF cases, and CBEP expects additional requests for assistance as Ukraine responds to this biological threat.

- In Azerbaijan, CBEP conducted laboratory training in the disciplines of PCR, serology, and bacteriology. After completing basic courses, advanced level trainees were also provided with a more in-depth training in advanced laboratory diagnostics. This training augmented the abilities of personnel to perform laboratory testing of samples in accordance with national diagnostic algorithms. These personnel were also trained to promptly report results using EIDSS and transfer samples to Baku for confirmatory testing at the Republican-level laboratories.

Analyze

- CBEP's "Regional Study of the Ecology of Anthrax Foci in Georgia and Azerbaijan" began in FY 2015 at the direction of CBEP. This project seeks to identify regional anthrax foci in the trans-border region of Georgia and Azerbaijan. It will characterize *Bacillus anthracis* isolates from the trans-boundary area and determine environmental risk factors related to outbreaks and pathogen persistence in order to improve regional policy recommendations and outbreak control of this public health threat.

Basic PCR training (left)

Basic Epidemiology/Epizootology Training in Baku at Imishli Agricultural Protection District (right)

- CBEP supported four regional participants from Armenia, Azerbaijan, and Georgia in the Field Epidemiology and Laboratory Training Program (FELTP) Cohort Five. All four successfully completed the program in September 2015. FELTP Cohort Six, consisting of four Armenians, continued in FY 2015 and Cohort Seven, consisting of another four Armenians, started in September 2015. The training this program provides will enhance the region's capability to respond to endemic disease outbreaks.

- In April 2015, CBEP resumed its cooperative biological research efforts with Ukraine's Center for Disease Control and Monitoring and the Institute of Veterinary Medicine. The first project is entitled "Development of the Epidemiological Forecasting System for Zoonotic Disease Employing Geographic Information System Technology". The goal of this project is to establish maps describing the data gathered during disease surveillance for two pathogens of security concern, *Francisella tularensis* and *Bacillus anthracis*. Surveillance includes sampling from arthropods, livestock, and the environment. Two expected outcomes of this project are increasing institutional diagnostic capacity using PCR analysis and improving Ukraine's biosurveillance capabilities by enabling them to analyze pathogen occurrence geographically.

Report

- Thanks in part to CBEP efforts in Georgia, in July 2015, the Prime Minister of Georgia signed the National Integrated Disease Surveillance System Resolution that defines roles and responsibilities for a coordinated interagency response to the detection of dangerous pathogens. The new resolution legalizes requirements and procedures necessary for an effective national response. It also recognizes the CBEP-supported EIDSS system as a common platform for data registration, human and animal health sector information exchange, reporting, and analysis. In the event of a detected threat or infectious disease outbreak, the Resolution will ensure the Government of Georgia contacts the appropriate agency and allocates an appropriate level of resources to the response.

- CBEP provided a customization patch to the EIDSS in Azerbaijan, resulting in increased functionality and usefulness. While EIDSS was formally adopted by the Azerbaijan MoH in 2010 and by the State Vet-

erinary Control Services in 2013, the Government of Azerbaijan continued to work with the U.S. counterparts to improve and customize the system. With the recent EIDSS updates, CBEP incorporated several custom reports requested by the MoH, and added simplified analytical reports for regional users to upload and analyze data, thereby introducing additional dimensions to EIDSS data analysis and cross-discipline dependencies. These include comparative reports for bordering rayons (districts), zoonotic disease reporting, and the ability to identify risks related to patients infected with multiple pathogens.

- CBEP supported the Government of Armenia in developing legal frameworks pertaining to a biosurveillance system and a National Biosurveillance Strategy. In July 2015, CBEP also provided the Ministry of Agriculture with analysis gathered by multiple subject matter experts who reviewed the Ministry's draft laboratory network strategy. These efforts will lay out the national level frameworks required to strengthen the safety, security, and governance of the laboratory network.

PACOM

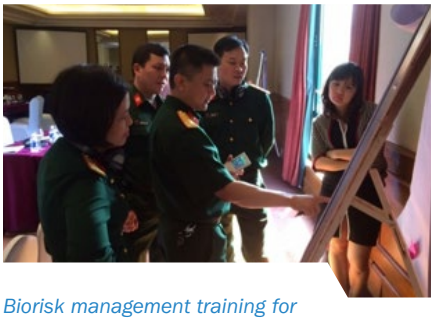
CBEP has engaged in the U.S. Pacific Command (PACOM) region since 2011 with activities in the countries of Cambodia, India, Laos, Malaysia, Philippines, Thailand, and Vietnam. CBEP continues to work with partner countries to create sustainable disease surveillance, detection, diagnosis, and reporting systems; improve biorisk management practices from the field to the laboratory; encourage adoption of international biosafety and biosecurity best practices and standards; and support research projects focusing on improved recognition and understanding of endemic pathogens of concern. In FY 2015, CBEP furthered these efforts by developing plans for a melioidosis Research Coordinated Network, a working group of melioidosis researchers aimed at enhancing linkages between scientists in PACOM-engaged countries and researchers from U.S. partner agencies to foster multidisciplinary research and melioidosis surveillance in Southeast Asia. The Research Coordinated Network will facilitate a better understanding of the impacts and spread of this disease of security concern throughout the region.

BS&S

CBEP promotes international best practices and standards for biosafety and biosecurity within the PACOM region through programs focused on the development of national frameworks for biosafety, establishment of safe and secure locations for pathogen sample storage, conducting biorisk management training, and assisting in the design and development of health facilities to ensure adherence to international standards. Additionally, CBEP implemented a series of events within Southeast Asia that promoted cooperation and coordination between public health and law enforcement and provided a forum to share information on procedures, practices, and policies for response to a bio threat incident.

Secure

- In Vietnam, CBEP conducted a sample storage assessment and design recommendation at the National Institute for Hygiene and Epidemiology (NIHE) located in Hanoi. The assessment was conducted to determine the laboratory requirements and scope of samples to be stored within the laboratory site. This initiative with the Government of Vietnam also provided design recommendations based upon international best practices for biosafety and biosecurity and allows NIHE the opportunity to establish a safe and secure location for pathogen sample storage.



Biorisk management training for the Ministry of National Defense

- In July 2015, CBEP began implementation of PACS in Vientiane, Laos, at the National Center for Laboratory and Epidemiology (NCLE), the National Animal Health Laboratory (NAHL), and the Lao-Oxford Mahosot Wellcome Trust Research Unit. Leading up to this, both NCLE and NAHL reviewed PACS implementation plans and system documentation and approved plans for their laboratories. CBEP, in coordination with the Government of Laos, conducted deployment, user, and administrator trainings followed by on-the-job training to Laotian PACS users at NCLE and NAHL. The implementation of PACS at these laboratories allows for better tracking and archiving of biological materials, to include pathogens of security concern, and promotes an operational capacity that follows internationally recognized biosafety and security practices.
- From September 21–25, 2015, CBEP supported biosafety and biosecurity assessments at nine hospital laboratories in Phnom Penh and surrounding provinces. The assessments received high levels of engagement from hospital laboratory leadership and support from the Government of Cambodia. These efforts, combined with engagement and support from partners and ministries, will continue to strengthen biosafety and assist in the development of a national framework for biosafety and legislation regulating pathogens of security concern in the country.
- CBEP partnered with Chulalongkorn University in Bangkok, Thailand, to install PACS within their laboratory. This system will ensure proper accountability of all samples, and aid Chulalongkorn in managing their large sample volume and repository for research.
- In an effort to build out a more secure pathogen inventory system, CBEP supported the installment and integration of additional terminals procured by NIHE in Hanoi, Vietnam, as an expansion of the pilot PACS effort. This expansion allows NIHE to gauge the integration of additional laboratories into the management systems and determine whether this system should expand to a larger number of laboratories in their institution. The pilot PACS effort, as well as the expansion, will allow for greater regulation, control, and inventory of samples within the 10 laboratories.

Safeguard

- CBEP conducted BRM training in Vietnam with the Ministry of National Defense, Military Medical Department and Military Institute for Preventative Medicine in support of their initiative to develop a certification curriculum on laboratory level biorisk management. The training was executed according to three tracks: laboratory leadership and managers, BRM trainers, and laboratory staff. This was the initial event of a series of training activities to assist Vietnam's Ministry of National Defense in developing a training system on BRM as well as a cadre of BRM trainers. This effort will provide BRM awareness at each level within the respective Ministry laboratory system and assist Vietnam in developing a stronger culture of biosafety and biosecurity management practices.

CBEP Presenting the Detailed Design Document to the National Hospital for Tropical Disease

Commandant of the AFP Medical Service School and Director of Cooperative Threat Reduction participate in ceremonial handover of personal protective equipment at the AFP Medical Center

- In March 2015, CBEP supported the development of detailed construction design documents for both the National Hospital for Tropical Diseases (NHTD) and the National Centre for Veterinary Diagnosis in Hanoi, Vietnam. These design documents will be used for construction of diagnostic BSL-2 laboratories at their respective facilities. CBEP will continue to provide consultation until the designs are complete for NHTD and National Centre for Veterinary Diagnosis to ensure that the documents adhere to international best practices for BSL-2 design and construction.

- In July 2015, CBEP conducted an assessment of NIHE's BRM training in Hanoi, Vietnam. The report will be used by NIHE's training developer to refine and update the training to be more encompassing of international best practices and standards for biosafety and biosecurity. This training is a requirement for all MoH laboratory staff in accordance to ministerial guidance.

- In December 2014, CBEP supported a request from the Armed Forces of the Philippines (AFP) and Research Institute for Tropical Medicine, in collaboration with the U.S. Embassy Medical Unit, for PPE. The PPE was used in training and quarantine of overseas foreign workers returning from West Africa, addressing biorisk concerns stemming from the recent EVD outbreak.

- In August 2015 at the request of the Commandant of the AFP Medical Service School (AFPMSS), CBEP presented a Biorisk Management Workshop. The Workshop's objective was to engage senior military decision makers on the need for establishing a biorisk program and to receive endorsement for incorporating BS&S training into AFPMSS curriculum. In addition to presenting three lectures on basic concepts of BS&S, risk assessments, and risk mitigation, CBEP facilitated a table top exercise at the end of the workshop. The workshop included over 150 senior leaders (comprised of the AFP medical, veterinary, nurse, and medical technologist corps) and marked the first CBEP training event in the Philippines.

- In January 2015, CBEP conducted 3 days of "Orientation to Biorisk Management Training", in collaboration with the World Health Organization, at the International Cooperation and Training Center in Vientiane, Laos. The provincial and central laboratories represented at this training had varying levels of biosafety and biorisk knowledge and training. The orientation included exercises designed to assist biosafety officers and lab managers in identifying and managing risks using the Assessment, Mitigation, Performance Model and provided an overview of risk mitigation strategies. Participants were able to identify priorities and develop training strategies to implement biorisk and biosafety principles in their laboratories.

- In July 2015, CBEP worked with the U.S. Army Corps of Engineers to finalize requirements for repair of the NCLE roof in Vientiane, Laos. Significant breaches in the NCLE roof caused water damage to labora-

Participants working through Biorisk Management priorities during the Global Biorisk Management Training Course in Laos (left)

AFPMSS students present their action plans during the table top exercise, which included evaluating a biological outbreak scenario, conducting a risk assessment, and presenting mitigation strategies (right)

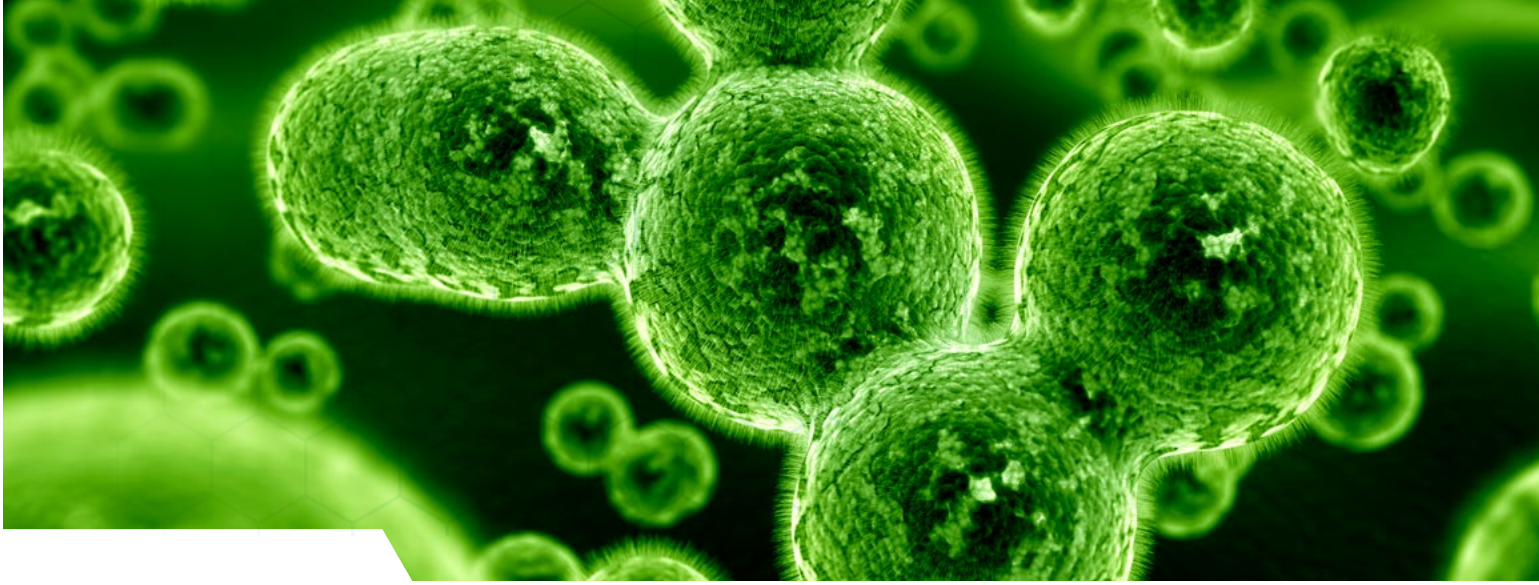
tories on the first and second floor of the facility, triggering interruption of activities and unsafe work conditions in certain laboratories. These repairs greatly enhanced the operational capability of the laboratory and provided a safe and secure workplace for the laboratory staff.

Influence

- From August 25 to 26, 2015, CBEP, in partnership with CDC and USAID colleagues, executed a workshop in Hanoi, Vietnam, in support of the Global Health Security Agenda: Zoonotic Disease Action Package (Prevent-2). The objective of the workshop was to bring together contributing and supporting countries to share best practices, identify weaknesses and gaps, and identify opportunities for collaboration. The 3-day workshop provided several Associations of South East Asian Nations (ASEAN) member state participants with a forum to collaborate and share information on procedures, practices, and policies for response to a biothreat incident. Cross-sector representatives from each country shared their respective country's best practices for enhanced multi-sector and cross-border bio incident coordination, current plans and processes for response to emerging infectious diseases, and other biosecurity threats such as EVD response and preparedness plans.

- In October 2014, CBEP executed SEA Dragons 2014, a Southeast Asia Regional Workshop on Biothreats and Biosecurity in Penang, Malaysia. The workshop provided a dynamic forum for ASEAN countries to build partnerships and share coordination of best practices for multi-sectoral and cross border management of biological incidents. It also promoted a common understanding of biosecurity risks and mitigation measures as they relate to safety and ethical risks and mitigation strategies of biological and biotechnological research. The 3-day workshop was co-hosted by the Malaysia Ministry of Defence's Science and Technology Research Institute for Defence and Ministry of Foreign Affairs and hosted participants from nine ASEAN countries.

- In August 2015, CBEP convened a 4-day National Interagency Joint Bioincident Investigations Workshop in Malaysia, which focused on responding to a bioincident from a joint law enforcement and epidemiological perspective. This training event provided a forum for over 60 participants from Malaysia's law enforcement, public health, and agricultural health communities to work together to enhance relationships



with a focus on collaboratively improving governmental readiness. These efforts promoted cross sector understanding and served as a key opportunity for cooperation and coordination between public health and law enforcement for the identification and response to biological incidents.

- In June 2015, CBEP hosted a Workshop for the Development of a National Code of Conduct (CoC) for Biosecurity in Malacca, Malaysia. This 2-day event provided a forum for professionals in biological, biomedical, biotechnical, and other life sciences research to establish and socialize biosecurity principles among the relevant Malaysian scientific community. Speakers from U.S. National Academy of Sciences, National Bioethics Council of Malaysia, Indonesia's Eijkman Institute for Molecular Biology, and the Royal Netherlands Academy of Arts and Sciences provided presentations to build awareness of and obtain buy-in for a biosecurity CoC as the basis of future policy mechanisms for addressing concerns about dual-use research. The CoC also establishes a detailed set of professional and ethical best practices, tailored to Malaysia's scientific community, to be outlined within the newly drafted National Biosecurity CoC for Malaysia. Through facilitated break-out groups and working discussions, the participants developed a draft National Code of Conduct for Biosecurity that will become a regulatory instrument for biosecurity and safe practice of research, underscoring the intent of Malaysia's pending biosecurity legislation.

- In October 2014, CBEP, in collaboration with Malaysia's Science and Technology Research Institute of Defense and the Academy of Sciences Malaysia, implemented a National Seminar on biothreats and biorisks designed to promote common understanding on implementation of biosecurity measures and biosecurity risks/mitigation strategies. It also highlighted the current challenges in addressing safety, security, and ethics in Malaysia during conduct of biological research.

Inception Workshop on Doctor of Veterinary Medicine Curriculum—Faculty of Veterinary Medicine (left)

Students receive lectures on laboratory procedures and an overview of bioinformatics tools for viral pathogen identification (right)

CBEP participating in the official ribbon cutting ceremony for Vietnam's Emergency Operations Center in February 2015

BSV

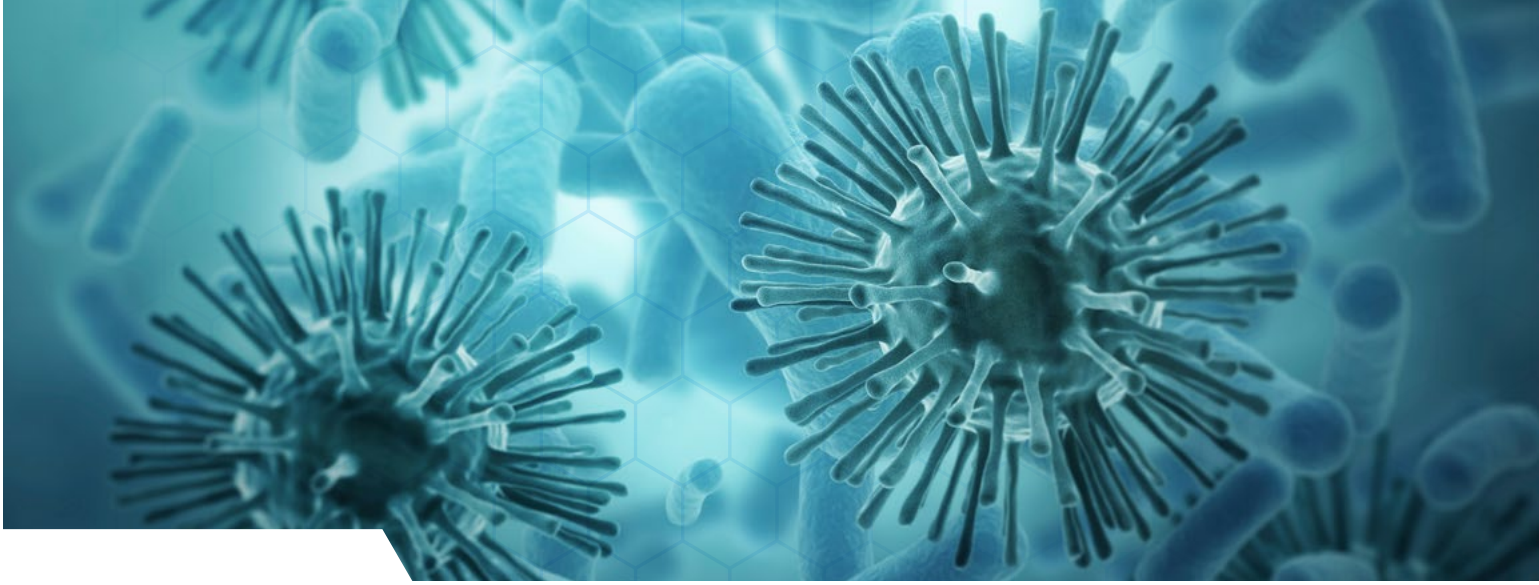
CBEP supported efforts to enhance capability and capacity of human and animal health workforces in the PACOM region through training and mentoring. These efforts included training on novel assays for the detection of rickettsial diseases, field epidemiological investigations, applied veterinary epidemiology, sample preparation for Next Generation Sequencing, and bioinformatics data analysis. CBEP provided equipment to improve communications effectiveness, reporting, and tracking. Additionally, CBEP is funding work within the Southeast Asia region to better understand disease spread and assess human disease reporting systems in the context of GHSA objectives and WHO IHR (2005) reporting requirements.

Detect

- In August and September 2015, CBEP supported the CDC-Global Disease Detection (GDD) office in conducting an assessment of the Integrated Disease Surveillance Program outbreak network of the Punjab and Assam states in India. Through the assessment of two diverse states in India, both CDC and CBEP will have a better understanding of the disease detection network, which will provide insight and awareness of the gaps that exist as well as influence future planning and partnership activities.

- CBEP, along with CDC, and as part of a GHSA Quick Win, procured and installed audiovisual/information technology equipment to Vietnam's national EOC. Training was also conducted for the personnel who would be operating the new equipment. Providing this equipment significantly improved the Vietnam MoH's ability to respond efficiently to infectious disease threats, both intentional and unintentional.

- In February 2015, CBEP supported a workshop with Cambodia to discuss curriculum development for a Doctor of Veterinary Medicine degree program and strengthening of the animal health education system. Cambodia is working to improve their degree systems in both human and animal health. The workshop was a critical step in advancing animal health professionals' knowledge of diseases, biosafety, and surveillance and provides a more sustainable foundation to the human resource capacity in Cambodia.



Diagnose

- In May 2015, CBEP, in collaboration with Armed Forces Research Institute of Medical Sciences (AFRIMS) Department of Virology personnel, conducted a bioinformatics training workshop at St. Luke's Medical Center, Manila, Philippines. Participants from seven major public health institutions in Philippines (St. Luke's Medical Center, Philippines Genome Center, University of Philippines, Diliman, Research Institute for Tropical Medicine, University of Philippines-National Institute of Health, and Philippines AFRIMS Virology Research Unit) attended the intensive next generation sequencing and bioinformatics practicum. The lectures and hands-on laboratory sessions led by AFRIMS enhanced Philippines capabilities in sample preparation for next generation sequencing and bioinformatics data analysis for the safe, rapid, and accurate diagnosis of viral pathogens in clinical samples.

- In March 2015, CBEP, through the Naval Medical Research Center-Rickettsial Diseases Research Program, and in partnership with the NHTD, conducted training on novel assays for the detection of rickettsial diseases and provided mentorship to research staff at NHTD. These assays will provide validation of data extrapolated from existing standard assays, improve sensitivity of results and increase sample throughput. Additionally, through counseling and mentorship to research staff, new methodologies and approaches will be taken into consideration for ongoing and future research projects.

- CBEP, through the CDC- GDD India office, and in partnership with the National Centre for Disease Control, conducted a training workshop on Rickettsial Infections. The workshop had 21 participants from 13 countries. The objective was to provide hands-on training on Gold Standard serologic assays. This will allow for standardization of Rickettsial disease detection and development of SOPs for participating organizations/institutions.

Analyze

- In July 2015, CBEP, in collaboration with the CDC- GDD office, conducted an external review of the Vietnam FETP to assess the progress of the previous 5-year period of performance, analyze gaps within the structure of the program, and provide recommendations to senior Vietnamese public health officials. This external review led into a 2-day meeting with MoH leadership and initiated the drafting of the next 5-year strategic plan (2016–2020). This effort will determine the future vision and scope of the FETP in Vietnam as well as the structure of the Vietnamese epidemiological response to future outbreaks.

- CBEP, through the CDC- GDD office, conducted three 1-week training courses for public health leaders in Bhopal, Shimla, and Odisha, India. These training courses equipped public health leaders with the knowledge and understanding needed to scope requirements for the Integrated Disease Surveillance Program's strategic plan as well as reporting requirements for field epidemiological investigations.

- On April 3, 2015, CBEP participated in a "Lessons Learned" meeting for the Cambodian Applied Veterinary Epidemiology Training (CAVET) program held at the National Veterinary Research Institute Phonom Penh, Cambodia. Institute leadership, CBEP One Health Liaison, and stakeholders reviewed Cohort 1 recommendations from the 20 graduates and trainers of the first cohort to better plan activities and curriculum for the upcoming cohort in 2015. CBEP is enhancing the quality of training for the second year of the CAVET program through curriculum review and training support. The CAVET program provides critical epidemiology training to animal health sector staff that will be responsible for disease outbreak detection and response in Cambodia.

- CBEP, in partnership with CDC, and as part of a GHSA Quick Win, procured, installed, and conducted training on laboratory equipment and supplied reagents to the four regional laboratories within Vietnam. Supplying this equipment and these reagents allowed for the first nationwide surveillance of the six significant pathogens in Vietnam, is working toward standardizing testing methods across the country, and has improved and enhanced the capacity at the four regional institutes for detection of existing and emerging causes of infectious disease.

Report

- CBEP, in partnership with the CDC, utilized a health Informatics systems specialist to conduct a gap analysis on relevant systems in Vietnam as part of the joint collaboration effort between DTRA and CDC under the GHSA. This effort was to assess the current national human disease reporting systems in the context of GHSA objectives and IHR (2005) reporting requirements. Through the 5-month long effort, the specialist was able to identify gaps and provide system recommendations through an evaluation report. This report will provide insight and awareness to future CBEP activities in future planning and engagement with the Vietnamese.

SUPPORTING THE GLOBAL HEALTH SECURITY AGENDA

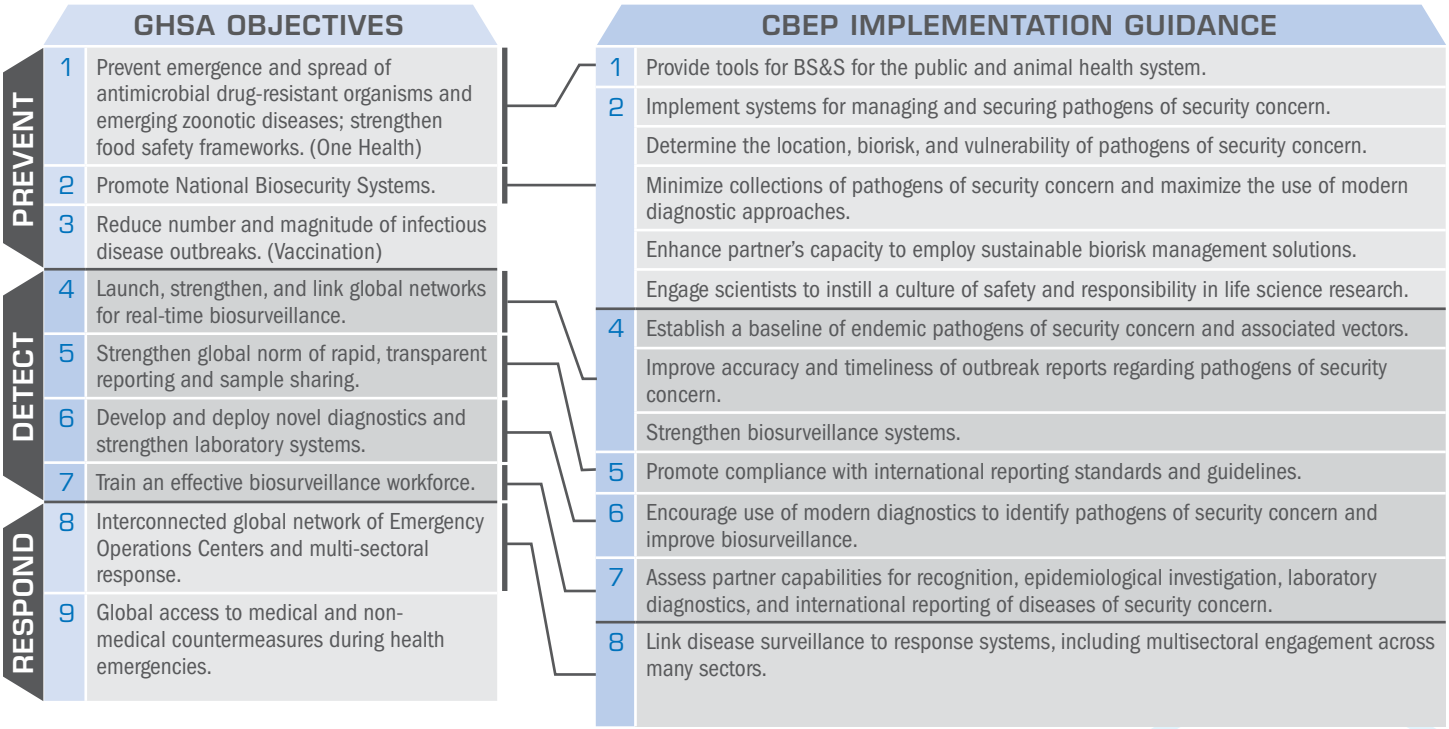
Where possible, CBEP collaborates with other U.S. Government efforts within the mission space such as the GHSA. An international initiative that includes over 100 participating/contributing countries, the GHSA is a Presidential priority for the Obama Administration that seeks to accelerate the achievement of global capacity to prevent, detect, and rapidly respond to infectious disease threats. GHSA was launched in February 2014, and the United States committed to assist at least 30 countries over 5 years. By the end of 2015, the USG identified 31 partner countries to assist in two phases. Phase I countries will receive approximately $900 million in USG Ebola Emergency Funding included in the FY 2015 Consolidated Appropriations Act and Phase II countries will receive USG technical assistance through existing programs. The GHSA provides concrete action in the prevention of epidemics, cross-sectoral collaboration, strengthening health systems, and highlighting the role of international organizations in line with the One Health concept. These concrete actions are listed in 11 "action packages" that are the core of the GHSA. While CBEP did not receive any Ebola Emergency Funding directed at GHSA activities, it supports efforts that are complementary to GHSA goals and is active in 22 of the 31 GHSA countries; eight of the 11 GHSA action packages directly align to CBEP guidance.

During 2015, the USG GHSA country teams were tasked to generate 1-year work plans and 5-year roadmaps with respective partner/recipient countries, based on scoping visit outcomes. Each GHSA work plan and roadmap is framed around the 11 GHSA action packages. In some cases, USG GHSA country teams have already accomplished milestones within these planning documents. Through this planning process, CBEP contributed to the drafting and review of 42 work plans and roadmaps, provided financial and in-kind support of nine country scoping visits, and executed or planned more than 100 initial activities captured in 1-year work plans. The process of generating these documents involved strong coordination within DoD and among CDC, USAID, Department of State, the Office of Management and Budget, and in-country embassy teams to develop common milestones and complementary activities to meet GHSA targets.

During 2015, scoping visits led by the USG GHSA country teams marked a key first step in the process of GHSA execution in a partner country. CBEP participated in and/or contributed funds to GHSA scoping visits with the USG Interagency and GHSA workshops with host country partners in Cameroon, Cote d'Ivoire, Ethiopia, Kenya, Senegal, Tanzania, Thailand, Uganda, and Vietnam. For example, CBEP attended a 2-day Zoonotic Disease Action Package conference in Hanoi, Vietnam, in September. The 2-day conference was co-chaired by the MoH and Ministry of Agriculture and Rural Development in Vietnam and the Government of Indonesia. For the Vietnam conference, CBEP funded the logistics for 19 international participants to attend this conference. In total, 197 people participated from 23 countries and 25 organizations. In Cote d'Ivoire, CBEP attended and supported translation services for a GHSA workshop between the Government of Cote d'Ivoire and the USG Interagency, the outcome of which was the identification of the Government of Cote d'Ivoire's key GHSA priorities for inclusion in the work plan and roadmap.

After scoping visits were completed, USG GHSA country teams worked with partner countries to agree on activities to achieve targets in each of the 11 action packages. Among all GHSA Phase I countries, CBEP is supporting with its own funding eight action packages across 14 countries, with upwards of 100 activities in progress or planned for the first year of GHSA implementation (2015-2016). Among GHSA Phase II countries, CBEP is supporting with its own funding eight action packages across eight countries. Over the next 5 years, CBEP plans to contribute efforts to over 600 milestones across 22 GHSA Phase I and II countries, with most milestones centered in the Biosafety and Biosecurity, Laboratory Systems, Surveillance and Workforce Development action packages.

CBEP ALIGNMENT WITH GHSA



CBEP Alignment with the Global Health Security Agenda

CBEP GHSA ACTION PACKAGE MILESTONE COMMITMENTS 2015–2020

			COUNTRY & GHSA STATUS		PREVENT				DETECT				RESPOND		
Region	Country	GHSA Status	AMR	Zoonotic	BS&S	Immunization	Laboratory Systems	Surveillance	Reporting	Workforce	EOCs	Multisectoral Response	Countermeasures
AFRICOM	Cameroon	Phase I											
	Cote D'Ivoire	Phase I											
	Ethiopia	Phase I											
	Guinea	Phase I											
	Kenya	Phase I											
	Liberia	Phase I											
	Senegal	Phase I											
	Sierra Leone	Phase I											
	Tanzania	Phase I											
	Uganda	Phase I											
CENTCOM	Jordan	Phase II											
	Kazakhstan	Phase II											
	Pakistan	Phase I											
	Ukraine	Phase II											
EUCOM	Georgia	Phase II											
PACOM	Cambodia	Phase II											
	India	Phase I											
	Indonesia	Phase I											
	Laos	Phase II											
	Malaysia	Phase II	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Thailand	Phase II											
	Vietnam	Phase I											

No Milestones Minimal Milestones Moderate Milestones Significant Milestones

CONCLUSION

BENEFIT TO PARTNER COUNTRIES

CBEP has been working with partner countries in four combatant command regions to assess and bolster BS&S and BSV capabilities. These efforts are improving these partner countries' ability to mitigate the potential for devastating outbreaks of pathogens of security concern with respect to global biological threats. CBEP has also been helping to foster cooperative opportunities such as research, in-country and regionally, to improve early detection and rapid reporting. The Program is applying scalable solutions to the needs of each partner country and maintains the ability to build regional BS&S and BSV capabilities while supporting efforts to address emerging crises in partner countries, such as the recent EVD outbreak. CBEP will continue to collaborate with the interagency and international organizations, ensuring these country and regional efforts are complementary and not duplicative.

FY 2016 EXPECTATIONS

In FY 2016, CBEP will continue to strengthen existing partnerships and seek new partnerships around the world. For the existing partnerships, CBEP will focus on completion of the planned construction and renovations in diagnostic laboratories in EUCOM and CENTCOM and continue to build EVD diagnostic capacity in West Africa. For new and emerging partnerships, CBEP will be fostering national and regionally-focused strategic engagements that allow for more flexibility and greater emphasis on tailoring partner capability to the changing needs of each region. The Program has expanded to a more global focus and, as such, has shifted to encompass new strategic engagement models to include capacity building as well as sustainment. CBEP will continue to support the DoD's threat and risk reduction efforts pertaining to pathogens of national security concern – both for existing threats and where new threats might emerge – and will continue to seek to make the world a safer place.

CBEP-SUPPORTED RESEARCH PUBLICATIONS FY 2015

75 Posters presented atInternational Science Conferences

4 Presentations at International Science Conferences

8 Manuscripts Published

APPENDIX

CBEP-FUNDED RESEARCH PUBLICATIONS FOR FY 2015

Armenia. L. Sahakyana, *et al.* (FY15). "The Potential Impact Of Climate Change On Natural Foci Areas Of *Francisella tularensis* In Armenia", 8th International Conference on Tularemia, 2015, Manuscript.

Armenia. Eduard Zardaryan, Lusine Paronyan, *et al.* (FY15). "Intestinal Infectious Diseases Among Febrile Hospitalized", Infection Control and Hospital Epidemiology, 2015, Manuscript.

Armenia. Lusine Paronyan, Eduard Zardaryan, *et al*. (FY15). "A Retrospective Chart Review Study To Describe The Causes Of Febrile Illnesses In Hospitalized Patients In The Republic Of Armenia", BMC Infectious Diseases, 2015, Manuscript.

Azerbaijan. Eric Garges, Emilya Huseynova, *et al.* (FY15). "Seroprevalence Of Antibodies To Arboviral Pathogens In Young Male Volunteers In Azerbaijan", International Meeting on Emerging Diseases and Surveillance, 2014, Poster.

Azerbaijan. Emilya Huseynova, Eric Garges, *et al*. (FY15). "Seroprevalence Of Specific Antibodies To Rickettsial Pathogens In Young Male Volunteers In Azerbaijan", International Meeting on Emerging Diseases and Surveillance, 2014, Poster.

Azerbaijan. Aytan Hajiyeva, Rita Ismayilova, *et al.* (FY15). "Proposed One Health Study Of Q Fever In Dairy Animal And Agricultural Workers In The Central-Lowland Areas Of Azerbaijan", International Conference on Emerging Infectious Diseases 2015, Poster.

Azerbaijan. Rita Ismayilova, Rupal Mody, *et al.* (FY15). "Short Report: Screening Of Household Members Of Brucellosis Cases And Neighboring Community Members In Azerbaijan", Brucellosis 2015, Manuscript.

Azerbaijan. Shalala Zeynalova, Fizuli Guliyev, *et al.* (FY15). "Biosurveillance Of Avian Influenza And Newcastle Disease Viruses Within The Barda Region Of Azerbaijan Using Real Time RT-PCR And Hemagglutination Inhibition", Frontiers 2015, Manuscript.

Georgia. N.G. Vepkhvadze, M. Kokhreidze, *et al.* (FY15). "Detection Of ASF Virus Found In Georgia Using Transmission Electron Microscopy", International Meeting on Emerging Diseases and Surveillance, 2014, Poster.

Georgia. E. Khmaladze, N. Vora, *et al.* (FY15). "Discovery And Further Investigation Of A New Highly Divergent Orthopoxvirus In Country Of Georgia", ASM Biodefense and Emerging Diseases Research Meeting, Poster.

Georgia. Z.Asanishvili (FY15). "Defining Anthrax Foci In Georgia Using", 115th General Meeting - American Society for Microbiology, Poster.

Georgia. L. Avaliani, O. Parkadze, *et al*. (FY15). "Q Fever Surveillance In Animal Populations In Georgia", ESCCAR International Congress on Rickettsia and other Intracellular, Poster.

Georgia. M. Donduashvili, K. Goginashvili, *et al.* (FY15). "Validation Of Immunofluorescent Assay For Q Fever Diagnostics At The Laboratory Of The Ministry Of Agriculture Of Georgia", ESCCAR International Congress on Rickettsia and other Intracellular, Poster.

Georgia. Tinatin Kuchuloria, Marine Karchava, *et al.* (FY15). "Seroprevalence Of *Coxiella burnetii* And Rickettsial Infections Among Febrile", ESCCAR International Congress on Rickettsia and other Intracellular, Poster.

Georgia. Roena Sukhiashvili, Ekaterine Zhgenti, *et al.* (FY15). "Prevalence Of Arthropod-Borne Rickettsia Species, In Georgia", ESCCAR International Congress on Rickettsia and other Intracellular, Poster.

Georgia. E. Khmaladze, Kh. Zakhashvili, *et al.* (FY15). "First Incidence Of Detection Of Infection With A Zoonotic Parapoxvirus In Humans In The Country Of Georgia", International Conference on Emerging Infectious Diseases 2015, Poster.

Georgia. Nino Akhvlediani, Irma Burjanadze, *et al.* (FY15). "Seroprevalence Of Tularemia Among Healthy Individuals In Endemic Regions Of Georgia", 8th International Conference on Tularemia, Poster.

Georgia. Tinatin Kuchuloria, Marina Endeladze, *et al.* (FY15). "A Glandular Tularemia Case Report From An Unusual Geographic Location In Georgia", 8th International Conference on Tularemia, Poster.

Georgia. Eka Elashvili, Irma Burjanadze, *et al.* (FY15). "Environmental Monitoring Of Rodents And Vectors For *Francisella tularensis* Following Outbreaks Of Human Tularemia: Evidence Of Long-Standing Foci, Georgia", The Journal Vector-Borne and Zoonotic Diseases, 2015, Manuscript.

Georgia. Ian Kracalik, Lile Malania, *et al.* (FY15). "Spillover Of Anthrax At The Urban-Rural Interface, Georgia", The American Society of Tropical Medicine and Hygiene, 2015, Manuscript.

Georgia. Ian Kracalik, Lile Malania, *et al.* (FY15). "Changing Epidemiology In The Reemergence Of Anthrax, Georgia, 1985-2013", NCDC AEP 2015, Manuscript.

Pakistan. E.Khan, MT. Long, *et al.* (FY15). "The Role Of Arboviruses As A Cause Of Undifferentiated Febrile Illness In Sindh Pakistan: A Cross-Sectional Observational Study Challenges And Successes In Establishing Field Sites", Global Summit on Virology, Poster.

Pakistan. Amna Nasir, Joveria Farooqi, *et al.* (FY15). "Identification Of Mosquito Vectors Of Arboviral Infections From Karachi, Pakistan", Global Summit on Virology, Poster.

Sierra Leone. James Bangura, Nadia Wauquier and Jean-Paul Gonzalez (FY15). "Regional And National Surveillance Strategies In Response To The Evd Outbreak In Sierra Leone: Successes And Challenges Revealing Lessons Learned", 7th International Symposium on Filovirus, Poster.

Sierra Leone. Nadia Wauquier, James Bangura, *et al.* (FY15). "EVD Emergence In Sierra Leone", 7th International Symposium on Filovirus, Presentation.

Sierra Leone. Nadia Wauquier (FY15). "In The Epicenter Of The West African EVD Outbreak: Clinical, Epidemiological And Laboratory Findings", 7th International Symposium on Filovirus, Presentation.

Sierra Leone. Nadia Wauquier (FY15). "Understanding The Emergency Of Ebola Virus Disease In Sierre Leone: Stalking The Virus In The Threatening Wake Of Emergence", PLOS, 2015, Manuscript.

Singapore. Ian H. Mendenhall, Benjamin P. Y-H. Lee, *et al.* (FY15). "A Bat Bio-Surveillance Workshop: Capacity-Building, Transformative Science And Collaborative Research", 3rd International One Health Congress, Poster.

Ukraine. Borys Stegniy, Denys Muzyka, *et al.* (FY15). "Serological Surveillance Of "Human" Influenza Virus Subtypes H1, H2, H3 Among Wild Birds In Ukraine", International Meeting on Emerging Diseases and Surveillance, 2014, Poster.

Ukraine. Halka Ihor, Nychyk Serhii, *et al.* (FY15). "Simulation Of ASF Prevalence In The Population Of Wild Boars", International Meeting on Emerging Diseases and Surveillance, 2014, Poster.

Ukraine. Sytiuk Mykola, Nychyk Serhii, *et al.* (FY15). "Epizootological Investigation And Laboratory Diagnostics Of CSF Outbreak In Ukraine", International Meeting on Emerging Diseases and Surveillance, 2014, Poster.

Ukraine. Postoienko Volodymyr, Karpulenko Maksym, *et al.* (FY15). "Sensitivity And Specificity Of Diagnostic Assay Loop-Mediated Isothermal Amplification For Identification Of Influenza A Virus", African Society for Laboratory Medicine 2014, Poster.

Ukraine. Larysa Muzykina, Serhiy Nychyk, *et al.* (FY15). "Statistic Epizootic Analysis Of Classical Swine Fever Outbreaks", ASM Biodefense and Emerging Diseases Research Meeting, Poster.

Ukraine. Stegniy B.T., Muzyka D.V., *et al.* (FY15). "Chicken Immune Response Against Newcastle Disease Virus Using DNA Vaccine", 115th General Meeting - American Society for Microbiology, Poster.

Ukraine. Tarasov Oleksandr, Nychyk Serhiy, *et al.* (FY15). "Detection Of *Bacillus anthracis* And Determining The Presence Of Plasmid pXO1 And pXO2 In PCR", International Conference on Emerging Infectious Diseases 2015, Poster.

ACRONYMS

AFP	Armed Forces of the Philippines
AFPMSS	Armed Forces of the Philippines Medical Service School
AFRICOM	United States Africa Command
AFRIMS	Armed Forces Research Institute of Medical Sciences
ASEAN	Association of South East Asian Nations
ASF	African Swine Fever
BRM	Biorisk Management
BS&S	Biosafety and Biosecurity
BSL	Biosafety Level
BSV	Biosurveillance
CAVET	Cambodian Applied Veterinary Epidemiology Training
CBEP	Cooperative Biological Engagement Program
CDC	United States Centers for Disease Control and Prevention
CENTCOM	United States Central Command
CoC	Code of Conduct
CPG	Clinical Practice Guidelines
CTR	Cooperative Threat Reduction
DoD	Department of Defense
DTRA	Defense Threat Reduction Agency
EIDSS	Electronic Integrated Disease Surveillance System
EOC	Emergency Operations Center
EUCOM	United States European Command
EVD	Ebola Virus Disease
FELTP	Field Epidemiology and Laboratory Training Program
FY	Fiscal Year
GDD	Global Disease Detection

GHSA	Global Health Security Agenda
IHR	International Health Regulations
JUST	Jordan University of Science and Technology
LMA	Laboratory of the Ministry of Agriculture
MERS-CoV	Middle East Respiratory Syndrome coronavirus
MOH	Ministry of Health
NADDEC	National Animal Diagnostics and Epidemiology Centre
NAHL	National Animal Health Laboratory
NBMC	National Biorisk Management Committee
NCDC	National Centre of Disease Control and Public Health
NCLE	National Center for Laboratory and Epidemiology
NHTD	National Hospital for Tropical Diseases
NIHE	National Institute for Hygiene and Epidemiology
PACOM	United States Pacific Command
PACS	Pathogen Asset Control System
PCR	Polymerase Chain Reaction
PPE	Personal Protective equipment
SOP	Standard Operating Procedures
US	United States
USAID	United States Agency for International Development
USAMRIID	United States Army Medical Research Institute for Infectious Diseases
USG	United States Government
WHO	World Health Organization

Notes

FY 2015 Cooperative Biological Engagement Program
ANNUAL ACCOMPLISHMENTS