

UPDATES FROM THE FIELD

DIVISION OF GLOBAL HEALTH PROTECTION 2016 ACCOMPLISHMENTS



Centers for Disease
Control and Prevention
Center for Global Health



“ The health and safety of Americans is inextricably linked to the health and safety of the world. We must make sure every nation is able to prevent, detect, and respond to infectious disease threats where they occur. ”

— Rebecca Martin, PhD
Director, Center for Global Health



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Director's Message



In 2016 the Division of Global Health Protection (DGHP) contributed immensely towards making Americans and the world at large safer. From Ebola to cholera to Zika and beyond, our division played a critical role in supporting the agency's mission of protecting the health of Americans and saving lives. We responded to urgent public health threats and stopped new pandemics at the source.

Our Global Disease Detection Operations Center (GDDOC) continued working 24/7 monitoring potential outbreaks across the globe. In 2016 alone, the GDDOCs tracked over 35 outbreaks in more than 130 countries. Our Field Epidemiology Training Program trainees investigated more than 400 potential outbreaks around the world. And in the wake of Hurricane Matthew, our Emergency Response and Recovery Branch activated an Incident Management System for the first time and deployed nearly 20 staff to Haiti to provide essential surveillance, lab, water, sanitation and hygiene, epidemiology

and policy support to the response. We also worked with our partners to complete Joint External Evaluations (JEE) in 28 countries. We know that no one nation can ensure global health security alone. Completing a JEE helps countries identify abilities and limitations within their health system and to prioritize opportunities for capacity development in disease prevention, detection, and response. Twenty more evaluations are scheduled for early 2017, putting us on target to complete JEEs in at least 50 countries by the World Health Assembly in May 2017.

History and experience have taught us that health security is an integral part of national security in the United States. As the world becomes more interconnected, an effective way to protect Americans from disease threats that begin abroad is to stop them at their source before they spread to our borders. In 2017 and beyond, it is critical that we remain vigilant: we must look at global health security from a universal perspective, knowing that weak systems in one country impact the health and well-being of communities worldwide. Global health protection requires focus beyond one country, one issue, or one pathogen as well as strong collaboration with internal and external partners across the globe.

At DGHP we remain committed to working with our partners, including strong collaboration and coordination with subject matter experts across CDC as well as US government and global partners, in protecting America from potential health threats and improving global health security. The division's 2016 - 2020 Strategic Plan will keep us focused on prioritizing global health across three interrelated goals that unify our work across the division:

- I. Develop and maintain preparedness, rapid detection, response, systems for global public health emergencies
- II. Build country capacity to prevent, detect, and respond to public health threats using scientific research and evidence-based approaches
- III. Sustain and strengthen strategic partnerships for global health security

The world relies on the work of CDC, and our division in particular by virtue of its cross-cutting work, to provide critical leadership and on the ground support to protect the health of Americans here at home and ensure the long-term sustainability of health gains abroad.

We are confident that with sustained investments in strong health systems, we can build country capabilities, improve global health security and accelerate progress toward a world safe and secure from public health threats. Together, we can continue to protect the health of Americans and make the world safer and more secure.


Kashef Ijaz, MD, MPH
Director (Acting), Division of Global Health Protection
Center for Global Health

DIVISION OF GLOBAL HEALTH PROTECTION 2016 ACCOMPLISHMENTS BY THE NUMBERS


Detecting and Identifying Diseases



35+
Dangerous Pathogens
Tracked in
132 countries



30-40
Potential Outbreaks
Monitored daily by the
Global Disease Detection
Operations Center



400
Potential Outbreaks
Investigated by Field
Epidemiology Training
Program (FETP) residents

Advancing Public Health Capabilities



20
CDC-Supported Countries
Developed or strengthened
their National Public
Health Institutes



28
Countries
Completed Joint
External Evaluations



1200+
Disease Detectives
Graduated from 24 new
FETP- Frontline programs


Responding to Global Emergencies




40
CDC Experts
Deployed to Angola
in response to
yellow fever



350
Global Rapid Response
Team Members
Ready to deploy
anywhere within
24-48 hours



3000
FETP Trainees and
Graduates
Mobilized to respond to
Zika in Central America
and Caribbean



8000
Person-days
Supported responses
to cholera, yellow
fever, Ebola, measles,
polio and Zika



Enhancing Disease Detection and Outbreak Response

“ The recent Zika virus and Ebola outbreaks remind us that health threats are not limited to one country, one issue, or one pathogen. Until the capacities to prevent, detect, and respond to health threats are strong globally, Americans remain vulnerable. The U.S. cannot protect the health of its population without addressing infectious disease problems that are occurring elsewhere in the world. ”

— Maureen Bartee, MPH
Principal Global Health Security Agenda Coordinator, DGHP



Global Rapid Response Team: Enhancing CDC's Global Emergency Response Capacity



Keeping the world safe from diseases requires the right people, surveillance, labs, public health organizations and a way to manage and integrate these elements into effective response systems. In recent years there have been a number

of severe global public health emergencies including population displacements, infectious disease outbreaks, and natural disasters. As we learned from the recent Ebola epidemic, these emergencies require a rapid response if they are to be contained and managed, in order to save lives.

To address the public health challenge of such emergencies and increase the global emergency response workforce, CDC established the Global Rapid Response Team (Global RRT). Housed within DGHP, the Global RRT is an agency-wide resource which supports CDC's response to global outbreaks and other emergencies. The Global RRT infrastructure enables more than 50 CDC staff to deploy anywhere in the world within 24–48 hours of a declared public health emergency. Maintaining a roster of public health experts ready to mobilize and rapidly contain outbreaks at the source enhances global health security. These staff are trained to support CDC experts and partners in complex multi-agency responses to global health threats in difficult settings.

The Global RRT is a three-tiered team with both dedicated staff and surge staff from across the agency with specialized expertise. Since being established in 2015, the Global RRT has provided response staff for public health emergencies including countries affected by Hurricane Matthew where they helped assess the public health impact of the storm. This highly trained workforce also led the response during a significant yellow fever outbreak in Angola, helping quickly contain the disease's spread. In its first year of existence, the Global RRT staff supported more than 140 responses, including outbreaks of cholera, yellow fever, Ebola, measles, polio, and Zika, and assistance for public health emergencies at mass gatherings, and during natural

disasters in 18 countries. This translated to more than 8,000 person-days of CDC staff in the field.

By enhancing CDC's capability to more rapidly and efficiently respond to health emergencies worldwide, the Global RRT is enhancing global health security and saving lives.

The Global RRT Provides Support and Expertise in:

- Capacity building
- Coordination
- Epidemiology
- Field logistics
- Health promotion
- Lab support
- Long-term staffing
- Management
- Partnership building
- Rapid assessment
- Risk communication
- Surveillance



Mental Hospital in Marfranc, Haiti after Hurricane Matthew struck.

GLOBAL RAPID RESPONSE TEAM THREE TIERED STRUCTURE

1

CORE TEAM

- Dedicated staff
- Fully ready trained
- Atlanta-based
- Deployed overseas
- Dakar Regional Office

2

CGH/DGHP

- Staff who routinely work on international emergencies
- Experts in public health emergency response

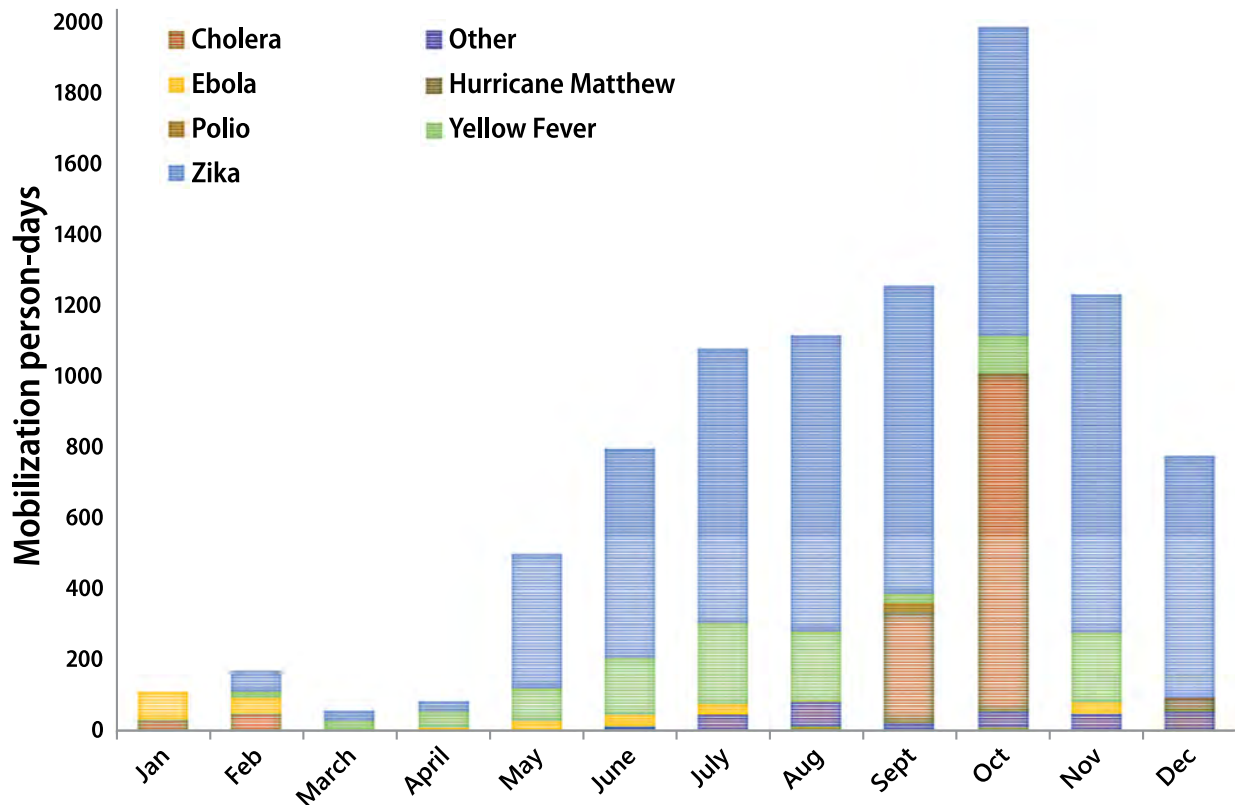
3

SURGE

- Agency-wide roster of full-time staff
- 50+ on call at any time
- Variety of skills/expertise
- Epidemic Intelligence Service officers

GLOBAL RRT OPERATIONS IN 2016

Mobilized staff over 230 times. Provided nearly 8,000 person-days of support.



CDC Establishes Command Center in Response to Hurricane Matthew



Members of CDC's Global Rapid Response Team assess Category 4 Hurricane Matthew's path to Haiti to inform the nature of the agency's response. Photo courtesy: Carlos Navarro Colorado

On October 3, 2016, as Haiti braced itself for the onslaught of Hurricane Matthew, a Category 4 hurricane, DGHP's Emergency Response and Recovery Branch (ERRB) swung into action. For the first time the team activated the Incident Management System (IMS) of ERRB's Operations Room to support the agency's Hurricane Matthew international response efforts. Although Hurricane Matthew was not projected to make landfall in Haiti until October 4, ERRB's technical teams began coordinating with the CDC Haiti Country Office and the CDC Office of Public Health Preparedness and Response's Division of Emergency Operations on September 30, three days before the storm hit. ERRB mobilized its Global Response Preparedness Team (GRPT) and Global Rapid Response Team (Global RRT) to staff the ERRB Operations Room at CDC's Century Center campus. Using its on-call deployment roster, the Global RRT quickly identified CDC staff with the technical and language skills needed for the first wave of responders to deploy to Haiti. Members of ERRB's Humanitarian Health Team and Global Water, Sanitation, and Hygiene Team were among the first responders to deploy to Haiti after Hurricane Matthew struck.

On November 10, 2016, the ERRB Operations Room stood down and the IMS was deactivated. As an after-action exercise, ERRB is evaluating its role in the response and will use that feedback to improve the next branch-level IMS response.

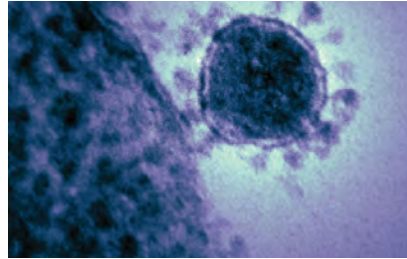
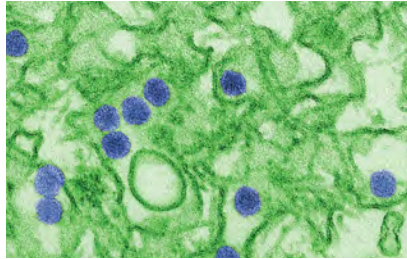
The presence of ERRB's Operation Room, the capability to quickly activate the IMS and deploy staff through the Global RRT improves CDC's ability to rapidly respond to a public health emergency and therefore enhances global health security.



Ashley Greiner (Global RRT Tier 1 Epidemiologist) working long hours conducting cholera case investigations in Haiti, after Hurricane Matthew. Photo courtesy: Coralie Giese, Global RRT

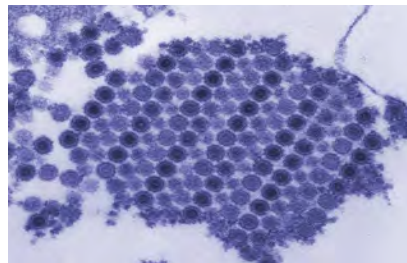
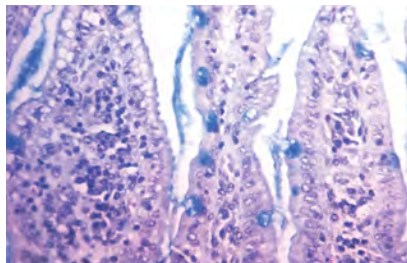
TOP 10 PUBLIC HEALTH EVENTS REPORTED TO GLOBAL DISEASE DETECTION OPERATIONS CENTER IN 2016

Zika



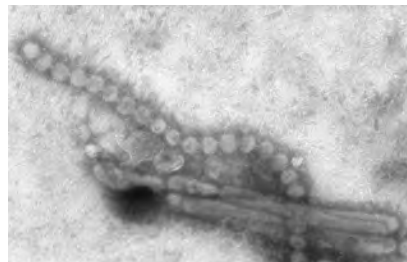
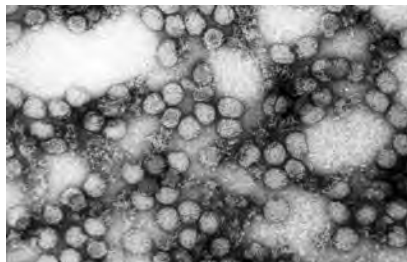
Middle East Respiratory Syndrome

Cholera



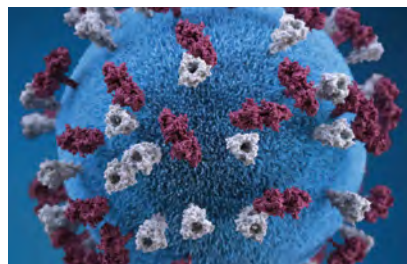
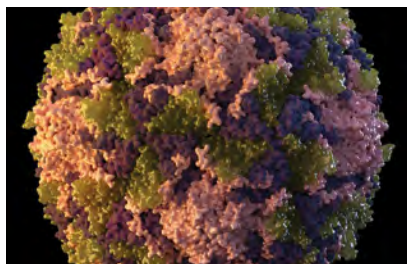
Chikungunya Fever

Yellow Fever



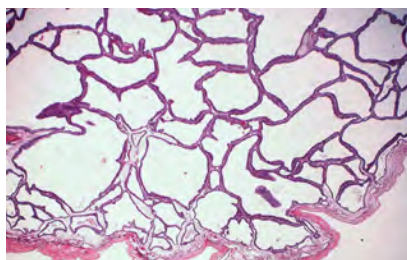
Influenza A (H7N9)

Polio (Wild Type)



Measles (Rubeola)

Congenital Malformation



Influenza (Animal)

GDD Operations Center: Detecting and Monitoring Health Threats Across the Globe 24/7

In today's interconnected world, a disease threat anywhere is a threat everywhere. The public health emergencies following the 2014–16 West Africa Ebola outbreak and the ongoing Zika outbreak in the Americas have demonstrated that public health threats and disease outbreaks are not restricted by geographic boundaries. Yet emergency preparedness and response continues to be very limited in most countries. To help protect Americans from potential health threats, CDC's Global Disease Detection Operations Center (GDDOC) housed in DGHP works 24/7 detecting and monitoring global public health events of international importance and assessing their potential risk to the global community. Over the past 10 years, the GDDOC has been the centralized operations unit for event-based surveillance (EBS) that conducts global disease surveillance; consolidates and shares international outbreak information; systematically conducts risk assessments and reports CDC-wide; and supports and coordinates outbreak response through operational support and funding for rapid deployment of CDC assets and field teams.

Event-based public health surveillance looks at reports from different sources—including traditional channels

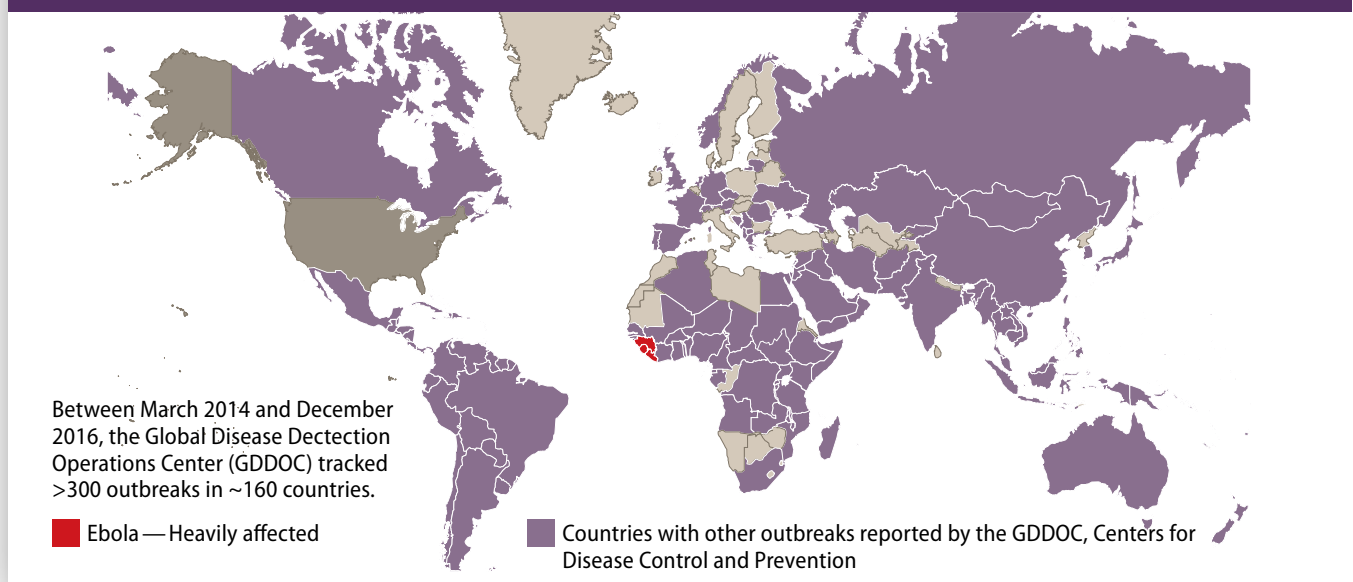
like hospitals and health departments. Numerous information channels are scanned worldwide, including the web, health-related blogs, and advanced internet text-mining systems, to directly push relevant reports to the detection analysts. The team also scans social media which, in some instances, is the only or earliest source of information for an evolving emergency. This real-time detection enables the team to rapidly bring together experts from around the agency, assess the risk and respond appropriately to health threats before they reach our shores.

Between March 2014 and December 2016, GDDOC tracked more than 300 outbreaks in more than 160 countries. In 2016 alone, 37 dangerous pathogens were tracked in more than 130 countries. From MERS in the Middle East to yellow fever in West Africa and Zika virus in the Americas, these outbreaks ignited global concern and affected countless lives.

The GDDOC's team of disease detection analysts are epidemiologists dedicated to tracking and detecting outbreaks across the globe and assessing their potential risk to Americans and people around the world. These individuals work tirelessly to identify and contain threats to the health and national security of Americans.

Outbreak-Affected Countries

Data as of 31 Dec 2016



Angola: Yellow Fever Outbreak

In early January 2016, CDC Angola Country Director contacted the DGHP's GDDOC in Atlanta to request assistance to determine the cause of an unknown illness, later confirmed to be yellow fever. A month earlier, four men who living and working in Luanda Province in Angola developed the same symptoms and died; the outbreak then spread throughout the province. GDDOC quickly brought together experts from around CDC to investigate the illness. When the Angola Ministry of Health officially requested assistance from CDC, GDDOC rapidly assembled and deployed a response team; the team arrived within two weeks of being contacted about the outbreak. Finding fluent Portuguese speakers and subject matter experts who were available to deploy to Angola on short notice was a major challenge, because a large number of staff were already deployed to support the Zika response.

Despite these challenges faced during the course of the field investigation, GDDOC in collaboration with the Global RRT, deployed over 40 staff members to Angola from across CDC, including overseas staff. Deployed staff included epidemiologists, laboratorians, public health advisors, emergency management specialists, Epidemic Intelligence Service Officers, and CDC locally employed staff. Global RRT responders integrated seamlessly into the response, and took on major roles, including that of WHO Incident Manager.

Yellow fever spread from Luanda to 16 of the country's 18 provinces; imported cases were also detected in China, Kenya and the Democratic Republic of the Congo. By the end of the epidemic, Angola had registered more than 800 confirmed cases and 4,400 suspected cases of yellow fever. The last case was reported on June 23, 2016.



Mozambique FELTP and WHO using GPS for disease detection.

In response to the outbreak, a large-scale vaccination campaign was launched and Angolan health authorities and partners immunized 18 million people in 85 high-risk municipalities, representing 70 percent of the target population of approximately 25.7 million people.

The yellow fever outbreak investigation in Angola is one of many field investigations that GDDOC has supported in recent years, and illustrates that with information, expertise, and collaboration from partners within and outside of CDC, swift and effective public health responses can be accomplished anywhere in the world.

Rapidly providing CDC technical assistance internationally increases the likelihood of containing disease outbreaks at their source, protecting the world from a potential global pandemic.

“Disease outbreaks are inevitable and cannot always be predicted. But if systems are in place to detect an outbreak in time, and if there is an appropriate rapid response, these dangerous pathogens can be contained and controlled at the source.”

— Rebecca Martin, PhD
Director, Center for Global Health

Global Response Preparedness Work in Jordan

DGHP’s Emergency Response and Recovery Branch’s Global Response Preparedness Team (GRPT) is helping Jordan build sustainable capacity to prepare for and respond to public health emergencies. Through two separate, partner-based capacity building programs, GRPT is making a difference in emergency preparedness and response in Jordan.

(1) Biosecurity Engagement Program Capacity Building Project

Supported by U.S. State Department’s Biosecurity Engagement Program (BEP), GRPT is working in partnership with the Jordanian Ministry of Health to develop a public health Emergency Operations Center (EOC). A key component of global health security, an EOC brings together decision makers to analyze, validate, and efficiently exchange information during a public health emergency and coordinate with emergency response partners.

GRPT’s role includes equipping and constructing the EOC, training Ministry of Health staff, and participating in the development of an EOC strategic plan, emergency operations plan, and standard operating procedures. In early 2017, GRPT plans to lead a meeting to discuss a simulated emergency situation for the EOC in which their plans will be put to the test.

(2) Defense Threat Reduction Agency Capacity Building Project

GRPT is collaborating with the U.S. Department of Defense’s Defense Threat Reduction Agency (DTRA) to build Jordan’s emergency response capacity at the

national level. Representatives from cross-cutting fields, including various ministries and the Jordanian Armed Forces, work together on health-focused trainings and exercises to learn about coordinated responses during emergencies.

In 2016, GRPT and DTRA worked closely to facilitate Incident Command System (ICS) 300 and 400 level courses with participants from across the Jordanian government. By using case studies and exercises based on potential public health emergencies, the participants were able to see how their ministry or agency could potentially be involved in the ICS, and how public health emergencies affected not just the Ministry of Health.

In September 2016, DTRA and GRPT hosted officials from the Jordanian Armed Forces and government ministries, including the Ministry of Health, in Washington D.C. to participate in a tabletop exercise to test their emergency plans and procedures, as well as to see a functioning EOC. GRPT observed and evaluated the tabletop exercise, providing an “after action report” with key recommendations to improve their emergency response operations.

Enhancing the capacity of the Jordanian Ministry of Health to rapidly detect and respond to public health emergencies, and to manage their public health response through with an EOC, will help control public health emergencies in Jordan health emergencies in Jordan at their source. A safer, more secure Jordan means a safer, more secure world.

Enhanced Ebola Detection and Response in Guinea and Liberia



FETP resident Gauthier Mubenga reviewing data collection forms with laboratorians at the Yomou Prefectural Hospital in N'Zérékoré region in Guinea.

A Tale of Two Outbreaks

Helping to strengthen public health systems around the world not only helps to protect populations where outbreaks begin; it's an effective and efficient way to protect Americans from diseases and other health threats that begin abroad. In March 2014, limited public health infrastructure and workforce capabilities, as well as weak surveillance and response systems in Guinea, Liberia, and Sierra Leone catalyzed widespread transmission of the Ebola virus in West Africa. The 2014 outbreak recorded more than 28,000 cases of Ebola and more than 11,000 deaths. CDC joined other partners to help contain the epidemic and build the capacities of public health staff in the affected countries.

The enhanced ability to rapidly detect and respond to Ebola created by the improved capacities in Guinea and Liberia were demonstrated when, two years later, new cases of Ebola were identified in Guinea and spread to Liberia. The response to the new cluster was swift and robust; instead of spreading unchecked, the new outbreak was limited to a total of 13 cases and 9 deaths. This "Tale of Two Outbreaks" reinforces the impact of strong surveillance and response systems, and a trained workforce, resulting from investments in building public health capacity and illustrates how such efforts enhance global health security.

Leveraging Resources and Program Expertise to Respond to Zika

Zika virus remains a serious health threat that is likely to continue until a safe and effective vaccine becomes available and is widely implemented. Threats from mosquito-borne infection are likely to continue until better vector control interventions are developed. The severe consequences of Zika virus infection require a long-term approach with dedicated resources (MMWR Weekly/January 6, 2017/65(52);1482-1488).

DGHP branches—Epidemiology, Informatics, Surveillance, and Laboratory Branch (EISLB), Emergency Response and Recovery Branch (ERRB), and Workforce Institute and Development Branch (WIDB)—received Zika funds from Congress to build capacity, enhance response activities, and develop and conduct research to support the Zika response efforts and address outstanding questions about Zika virus infections.

Global Disease Detection's Response to Zika

EISLB works with ministries of health in multiple countries to develop and enhance public health capacity to rapidly detect, accurately identify, and promptly contain emerging diseases. Zika research activities are ongoing at nine of the 10 Global Disease Detection (GDD) Regional Centers in Bangladesh, China, Egypt, Georgia, Guatemala, India, Kenya, South Africa, and Thailand and at the CDC-Haiti office. EISLB is also partnering with the Naval Medical Research Unit-Six in Peru and CDC colleagues from the Division of Vector Borne Disease to conduct ecology studies in Peru, Colombia, and Brazil. EISLB's activities focus on implementing needed surveillance activities and research studies to determine the incidence of Zika virus infection, understand where Zika is found and how it spreads, study pregnancy and birth outcomes, understand the relationships between humans, animals, and the environment in relation to Zika and evaluate new ways to

diagnose Zika virus infection. EISLB can conduct these activities because of its ongoing global work with ministries of health, ministries of agriculture, universities, U.S. government agencies, and other research partners.

Field Epidemiology Training Program in Zika-Affected Countries

WIDB's Field Epidemiology Training Program (FETP) team trains workforce on the ground to help countries build sustainable capacity for detecting and responding to health threats. The program develops in-country expertise so that disease outbreaks can be detected locally and prevented from spreading. FETP and collaborating partners, RedSur, TEPHINET, CONSEJO DE Ministros de salud de centro America (COMISCA), Council of Ministries of Health of Central America, and Universidad del Valle de Guatemala, work toward enhancing the epidemiological skills among health workers in Latin America and the Caribbean to detect and respond to Zika infection.

The Zika-affected countries included in the FETP work plan include the countries of Central America and the Caribbean, and Brazil, Colombia, Paraguay, Peru, Haiti, Mexico, Uruguay, Guyana, Surinam, and the Dominican Republic.

Global Response Preparedness Team's Zika Response in Central America Region and the Caribbean Community

To support efforts in the preparedness and response to the Zika Virus, ERRB's Global Response Preparedness Team (GRPT) performed needs assessments for emergency preparedness and response capacities, and has provided emergency response assistance to five countries of the Central America Region (CAR) and the Caribbean Community (CARICOM).

Since June 2016, basic needs assessments were completed in Guatemala, the Dominican Republic,

Continued



Morning Incident Management update meeting at Puerto Rico Department of Health Public Health Emergency Program building where the Emergency Operations Center was located.

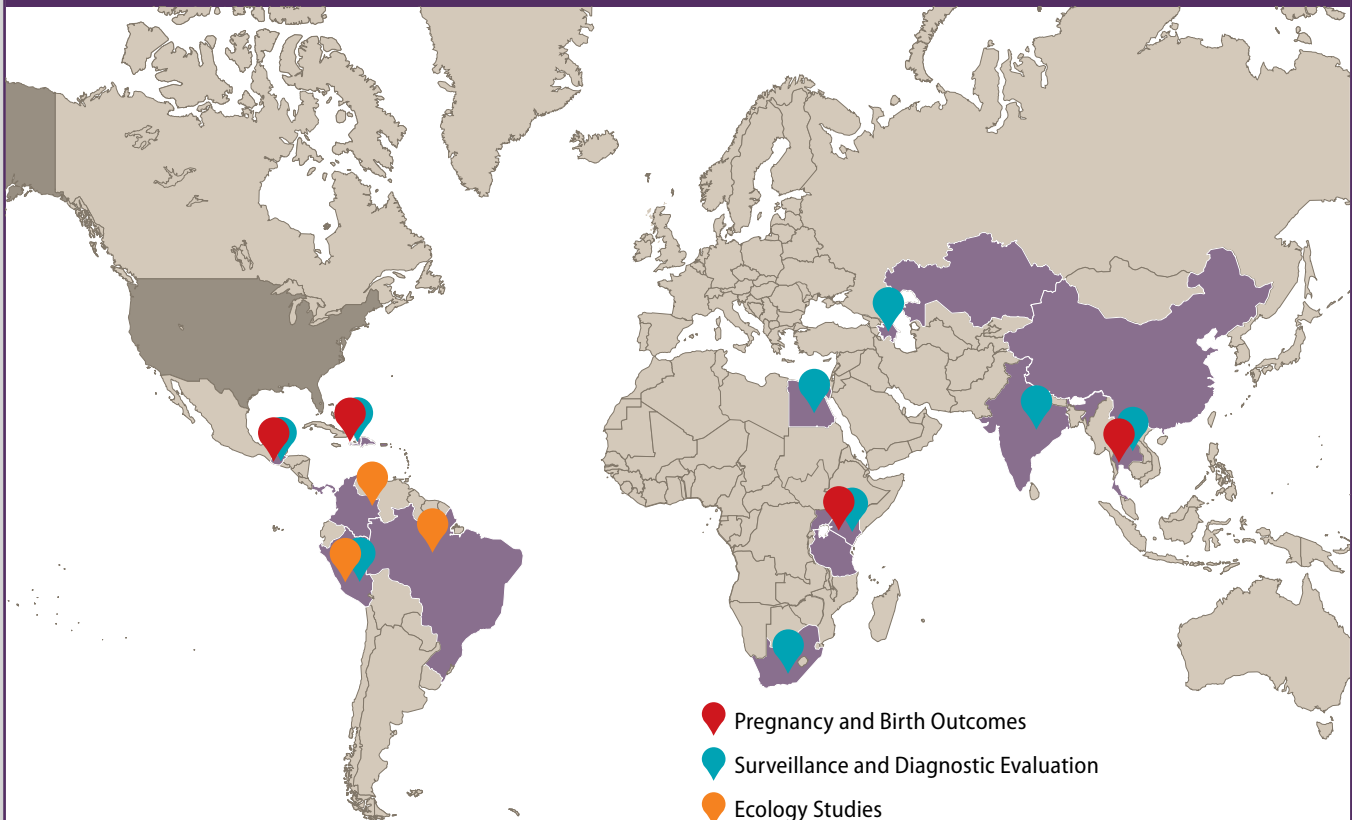
Panama, and Colombia. The Barbados assessment is scheduled for completion in late January 2017. The assessments and assistance provided by GRPT and the Office of Public Health Preparedness and Response's Global Emergency Management

Capacity Development Branch will enhance participating countries' abilities to respond to the Zika virus outbreak.

Supported by the Zika funds, DGHP has helped build capacities and conducted studies to address outstanding questions about Zika virus infections. These activities will build the detection and response capacity of public health institutes in numerous countries, increase the likelihood

of controlling public health problems like Zika infections at their source, and therefore enhance global health security.

GDD Response to Zika Map







Advancing Public Health Capabilities Globally

“ The bedrock of outbreak and emergency preparedness and response is a functioning, resilient national health system—with the financing, human resources, infrastructure, information and supply management systems capable of detecting and responding to public health events. ”

—Dr. Matshidiso Moeti
WHO Regional Director for Africa

FETP: Building Workforce Capabilities on the Frontline of Surveillance

As we witnessed with Ebola and other infectious disease outbreaks, a disease outbreak in a remote village or large metropolitan city, can spread, even within hours, across borders and threaten the health and security of other countries. It is important that every country has a well-trained public health workforce on the ground, prepared to quickly detect and respond to health threats and stop them close to their source.

For more than three decades, CDC has worked with ministries of health and other partners around the world to build local capacities and strengthen national public health workforce through flagship programs like the Field Epidemiology Training Program (FETP). FETP graduates in over 70 countries have responded to some of the world's most urgent public health emergencies including Ebola in West Africa; MERS-CoV in the Middle East, South Korea and the Philippines; polio in Pakistan and Nigeria; Nipah virus in Bangladesh; acute encephalitis in India; and earthquake recovery in Haiti.

Modeled after CDC's Epidemic Intelligence Service, FETP provides supervised, on-the-job, competency-based training to develop field epidemiologists (disease detectives) at all levels of a country's health system. FETPs focus on training through service and the program is deliberately designed to allow participants to learn important outbreak investigation and response skills while providing key services to their health organization. FETPs offer three levels of training—frontline, intermediate, and advanced, depending on the needs of a country's public health system.

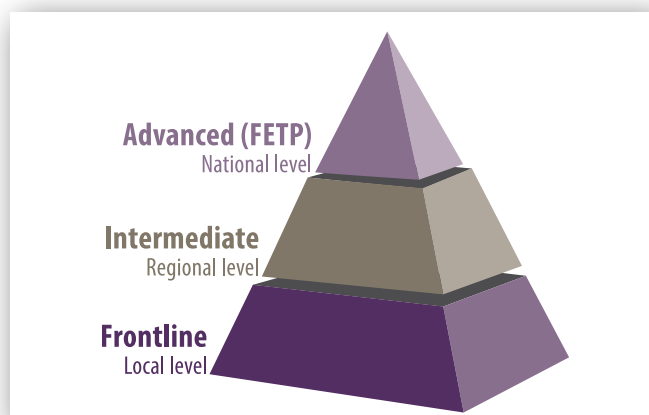


Placido Cardoso (right), Director of the National Institute of Health, and Serifo Monteiro, Director of the National Public Health Laboratory, flanking Sabado Fernandes, an FETP-Frontline graduate in Guinea Bissau. (Photo courtesy: Ken Johnson)

To expand workforce capabilities at the local level, DGHP's Workforce Institute and Development Branch and home of FETP, launched FETP-Frontline in 2015—a three-month training program focused on detecting and responding to diseases and events of public health importance or international concern. FETP-Frontline participants include government public health workers in charge of surveillance data collection, compilation, analysis, reporting, and response at the local level of the health system. FETP-Frontline trainees have two weeks of classroom sessions and 12 weeks of hands-on field experience in surveillance, monitoring and evaluation, and data analysis and interpretation for public health decision-making.

Impact of FETP-Frontline—More programs, more graduates, and more security

Within 16 months of establishing FETP-Frontline, 24 programs were launched in 24 countries, 22 of them identified as priority countries to advance global health



Teachers, trainees, and graduates of the Cohort 3 of the FETP Guinea-Bissau at the closing ceremony. (Photo courtesy: Aissa Vaz)

security. More than 1,200 trainees graduated from new FETP-Frontline programs by the end of 2016. Efforts are underway to expand FETP-Frontline in 2017, and increase focus on the Zika-affected countries in the Americas and the Caribbean.

FETP-Frontline programs worldwide are making a remarkable impact in increasing and training frontline disease detectives better able to rapidly detect and respond to public health emergencies. These efforts contribute to an increased likelihood of controlling public health problems at their source and enhanced global health security.

FETP-Frontline trainees and graduates have actively participated in responses to cholera, measles, yellow fever, and other disease outbreaks, identifying suspected outbreaks early and raising standards for quality investigations. For instance, FETP-Frontline trainees from the Democratic Republic of Congo (DRC) participated in the investigation of a cholera outbreak after a suspected case was reported in Mbandaka. From August through September 2016, teams worked in three different locations and helped to rapidly identify the source of the outbreak and implement measures to control the spread of cholera in DRC.

Liberia: FETP-Frontline



FETP -Frontline participants responding to measles outbreak investigation, Lofa County, Liberia 2016.

Prior to the 2014 Ebola outbreak, which claimed thousands of lives in West Africa, Liberia, one of the countries most affected by Ebola, had few trained disease detectives. By the end of 2016, the country had a pool of 115 frontline disease detectives, enough to cover all 15 counties and 92 health districts in Liberia. The disease detectives were either still in training or had completed the three-month FETP-Frontline training course and were prepared to identify and report potential disease threats. At the close

of 2016, nearly all graduates had participated in at least one outbreak investigation or response, including suspected Lassa Fever cases, measles outbreaks, and an Ebola cluster reported in March 2016. Plans are underway to launch the intermediate FETP course in 2017. The increased availability of trained disease detectives in Liberia makes this country more able to rapidly detect and respond to disease outbreaks, helping keep the world safe from possible global pandemics.

Improving Public Health Management for Successful Public Health Action

A country with a strong public health management workforce will be better prepared to:

- Prevent or mitigate the impact of naturally-occurring outbreaks and intentional or accidental releases of dangerous pathogens
- Rapidly detect and transparently report outbreaks when they occur
- Employ an interconnected global network that can respond rapidly and effectively.

IMPACT Core Competencies

- Program planning and management
- Communications and use of communications tools
- Community partnership development and community assessment
- Analysis and assessment
- Organizational leadership and systems awareness
- Basic public health sciences and practice
- Budget and financial planning skills
- Emergency planning, preparedness, and response skills

Effective and efficient management is critical for translation of research and scientific innovation into successful public health action. In many countries, however, mid-level and senior-level public health officials commonly lack the management experience needed to efficiently and effectively coordinate and direct public health systems. To address this challenge, CDC developed an initiative called Improving Public Health Management for Action (IMPACT). IMPACT aims to grow a cadre of highly-trained public health managers in partner countries to work alongside scientists to prepare for, and respond to, disease threats and effectively implement public health programs.



Kenya's first cohort of Distinguished Fellows graduated from IMPACT program in October 2016.

IMPACT was launched in 2016 in Bangladesh and Kenya. Kenya has a two-tier program—a five-month Distinguished Fellows course for senior-level managers, and a two-year Master of Public Health program for early-career professionals. Bangladesh has a single-tier two-year program that targets medical doctors who are pursuing public health-focused careers.

As of December 2016, Kenya's Distinguished Fellows program had graduated 12 senior managers; 78 percent of the fellows reported using their new management skills prior to graduation. Five of the graduates will serve as mentors and supervisors for the two-year master's program to begin at Kenyatta University in February 2017.

Bangladesh's program was launched in Spring 2016 with six top-performing doctors from the Ministry of Health. Each of the fellows was placed at a different district site and was assigned a mentor and supervisor. The program strategically placed fellows in field assignments outside of the national Ministry of Health offices to build capacity in areas beyond the capital city. "I am grateful for this program. It is a great opportunity to increase our knowledge and experience and to help our country too," noted a current Bangladesh fellow.

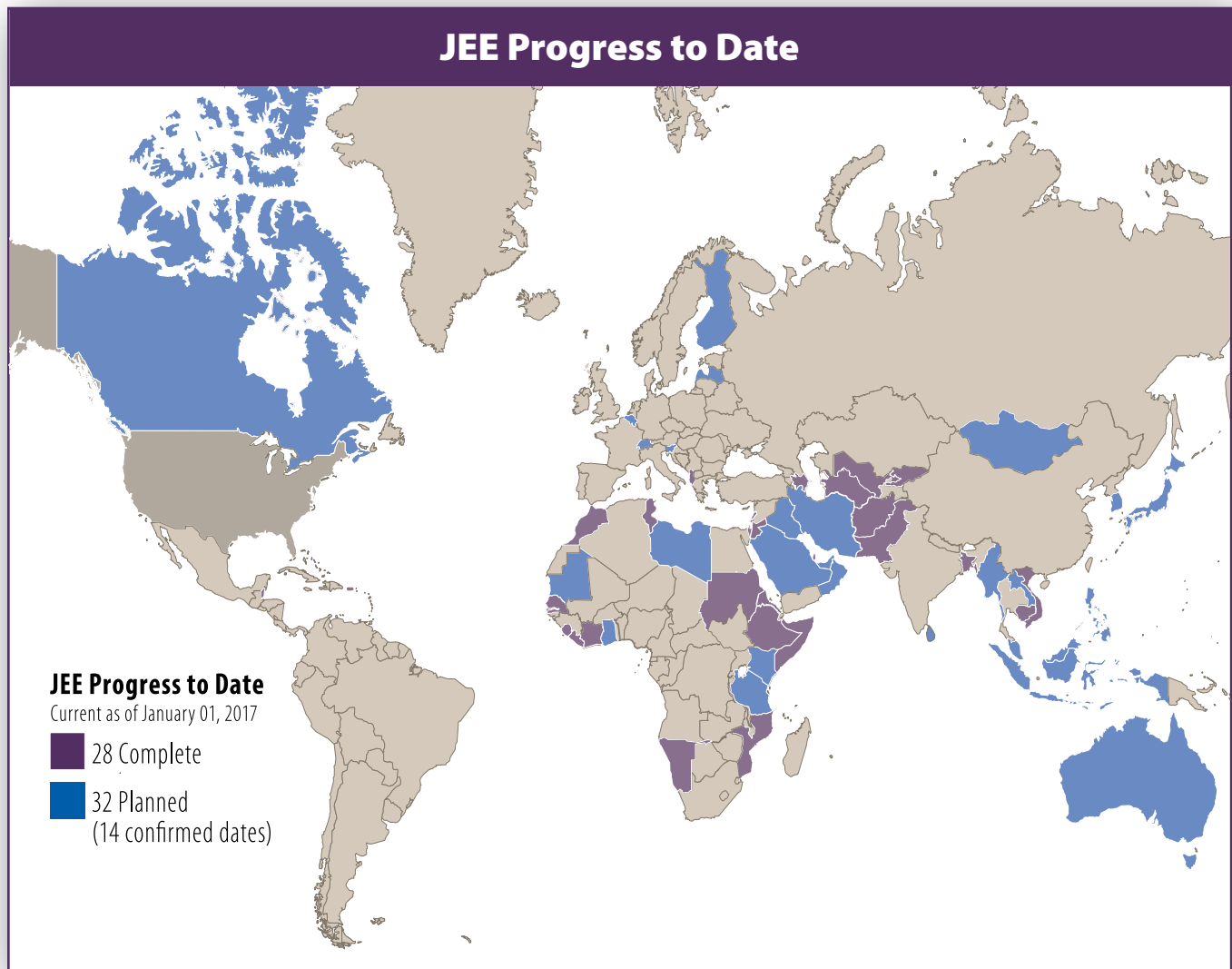
IMPACT is increasing the number of managers highly trained in effective and efficient public health management. Countries where IMPACT has been implemented will be better equipped to rapidly detect, respond, and manage public health emergencies at their source source, before they become global threats.

Joint External Evaluation

In 2016, DGHP worked closely with CDC colleagues, partners from World Health Organization and other international organizations to develop and roll out the International Health Regulations (2005) Joint External Evaluation (JEE). The JEE, a multi-sectoral external assessment of country-level health security capacity, is based on the Global Health Security Agenda (GHSA) external assessment, but has been expanded to cover 19 technical lanes with One Health collaboration.

Completing a JEE makes it easier for countries to identify abilities and limitations within their health system using a One Health approach. A JEE also

helps countries prioritize opportunities for capacity development in disease prevention, detection, and response. A comprehensive JEE informs a country's roadmap, guiding allocation of national resources and engagement of current and prospective donors and partners to effectively target resources. Additionally, it summarizes the level of system development in scoring of key agreed upon aspects of global health security development and act as a baseline to help track progress. The map below shows the number of completed and planned JEEs as of January 1, 2017.



Strengthening National Public Health Institutes Globally

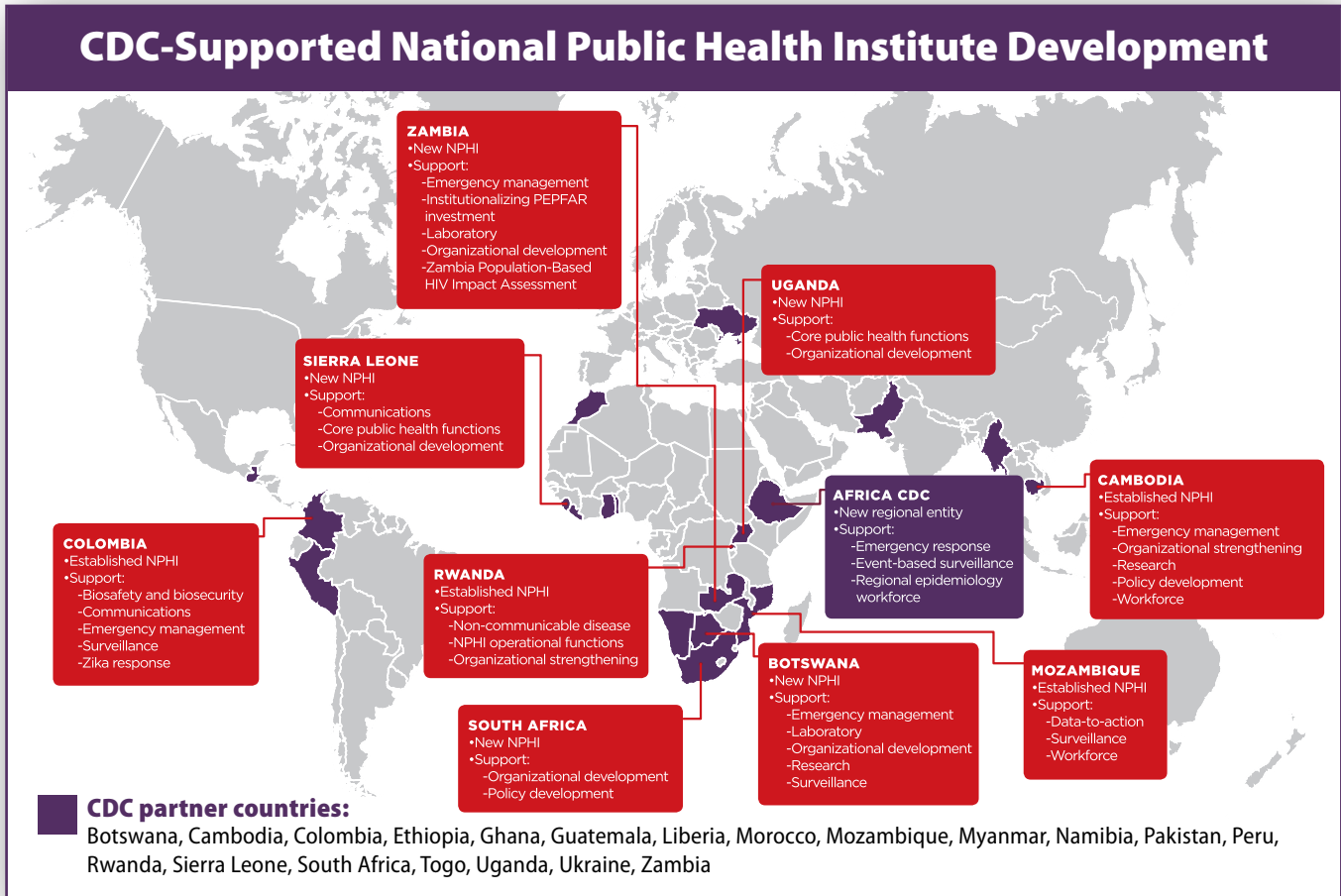
Prevention, detection, and response to public health emergencies, requires every country to be equipped to carry out a set of functions that are the cornerstone of strong public health systems.

Many countries consolidate these functions organizationally in a national public health institute (NPHI) – a science-based organization, or network of organizations, that provides leadership and coordination for public health at the national level. In most cases, the NPHI is part of the government, usually within or attached to the Ministry of Health. NPHIs promote evidence-based decisions, policies, and programs, and become the logical partner in government-to-government public health relationships.

CDC is helping to establish NPHIs in other countries. This assistance includes linking governments with an existing NPHI in another country or with U.S. State Health Departments. As of December 2016, CDC was supporting 20 countries to either develop or strengthen their NPHIs.

New and stronger NPHIs are developing in both high- and low-resource countries. During times of emergency, the need for NPHIs becomes most apparent because leadership and timely reliable data are critical for an effective response that saves lives. For example, following the Ebola outbreak which devastated Sierra Leone from 2014 to 2015, the country determined that establishing an NPHI would help improve its response to future outbreaks.

Since August 2016, DGHP experts in Workforce and Institute Development Branch and others from across CDC, have been working with Sierra Leone’s Ministry of Health and Sanitation to help establish the Sierra Leone National Public Health Agency (NPHA). With an NPHA, the government will be able to detect and respond to public health emergencies more effectively, increase the likelihood of controlling public health problems at their source, and enhance global health security.





A team from the Zambia Ministry of Health administers a questionnaire to a family in Siavonga District.

Stopping cholera early requires a strong national public health system, this is part of the vision of the new Zambia National Public Health Institute (ZNPPI). A response to a 2016 cholera outbreak gave ZNPPI the opportunity to identify strengths and set priorities as it develops Zambia's first Public Health Emergency Operations Center (PHEOC).

A Stronger National Public Health Institute Helps Colombia Tackle Zika Virus and Other Health Threats

Colombia knows first-hand the benefits of a strong NPHI. When Zika hit the country in October 2015, the Instituto Nacional de Salud (INS), with support from CDC and the International Association of National Public Health Institutes (IANPHI), was ready to provide leadership and coordination for the response at the national level. INS rapidly mobilized staff to contribute to the response and ensured necessary supplies got to where they needed to be in time. Additionally, engagement with the media, a key component of the response, highlighted INS's critical leadership role in Colombia's Zika response.

Before Zika hit, CDC and IANPHI were helping INS improve its biosafety, biosecurity, and surveillance systems. The project also included risk communication training, which taught INS leaders how to be empathetic and to go beyond the technical aspects of

the disease and emphasize sharing important public health messages for behavior change.

"CDC and IANPHI have helped transform our institution. We are increasingly transparent and open. We are striving to advance public health in Colombia by engaging with experts, the general public, and all the groups that depend on us for information and guidance in ways that meet their needs," said Dr. Martha Lucía Ospina, INS Director.

Strengthening the INS in Colombia increases its capacity to rapidly detect and respond to disease outbreaks, such as Zika. Outbreaks may continue to occur in or around Colombia but the country now has the systems and expertise to keep itself, and the world, safer and healthier.



Building Sustainable Partnerships

“ Not only is it the right thing to do, but the relationships and systems we build during emergencies can help protect us all in the future. ”

— RADM Jordan W. Tappero, MD, MPH
Senior Global Health Advisor, CGH



CDC and WHO Launch New Global Hearts Initiative to Strengthen CVD Prevention



*Presenters at the Global Hearts Initiative launch in New York City on September 22, 2016.
From left to right: Richard Besser, Margaret Chan, John Boyce (Minister of Health of Barbados), Michael Bloomberg, Tom Frieden*

Worldwide, more people die annually from cardiovascular diseases (CVDs) than any other cause. In 2012, an estimated 17.5 million people died from CVDs. By 2030, CVDs are projected to cause 22 million deaths a year. Thirty-four percent of CVD deaths occur in people under 70 and are largely preventable. About 80 percent of CVD

deaths are due to heart attacks and strokes and occur in low-and middle-income countries (LMICs), where barriers to accessible and affordable health care may be more prevalent. High blood pressure, or hypertension, is the leading risk factor for heart disease and stroke, and accounts for over 12 percent of total deaths.

Partnering for Impact: Addressing the global burden of noncommunicable diseases— a threat to sustainable development

Noncommunicable diseases (NCDs) are responsible for approximately 75 percent of all deaths worldwide. The increasing prevalence and associated high costs of NCDs undermine countries' ability to provide quality health care for all types of disease threats, including infectious diseases. If current trends continue in the next two decades, the impact of NCDs will result in \$7 trillion (USD) in economic losses in low- and middle-income countries. CDC is working with partners to accelerate the implementation of effective health promotion initiatives to support robust health systems that can respond to any public health need and improves global health security.

The Three-pronged Approach

On September 22, 2016 the WHO and CDC launched the Global Hearts Initiative (Global Hearts) to support governments in strengthening CVD prevention and control. DGHP's Global Noncommunicable Diseases Branch is part of the CDC team engaged with the initiative. Global Hearts takes a three-pronged approach to addressing the CVD crisis by bringing together complementary population-based prevention strategies in tobacco control (through MPOWER), salt reduction (through SHAKE) and primary care (HEARTS) to advance CVD prevention and control.

- **MPOWER** focuses on tobacco cessation interventions.
- **SHAKE** supports governments with evidence-based policy options and examples to help lower sodium consumption.
- **HEARTS** provides primary care health systems with best practices and tools to improve clinical preventive care for cardiovascular disease.

Barriers to CVD control

Many LMICs face several challenges that contribute to their CVD burden. Rates of CVD risk factors including high blood pressure, high blood cholesterol, and tobacco use, as well as more sedentary lifestyles, are rising in these countries. Additionally, barriers to quality accessible and affordable care also contribute to disparities between LMICs and high-income countries when comparing global incidence, morbidity, and mortality of CVDs.

The economic costs of CVD and hypertension due to premature death, disability, health care costs, and income and productivity losses are enormous. The current economic burden associated with CVD in LMICs accounts for US \$3.76 trillion.

Accelerating progress

Global Hearts supports countries with tools and monitoring systems to take immediate action to reduce heart attacks and strokes. Through the use of evidence-based strategies, Global Hearts



Patients in Barbados being screened for high blood pressure.

aims to accelerate progress towards the United Nations Sustainable Development Goal to reduce premature deaths from heart attacks and stroke by one-third by 2030. Combined, these packages provide a set of high-impact, evidence-based interventions that, when used together, will have a major impact on improving global heart health.

The initiative will be piloted in 2017 and global scale-up will follow. So far, 24 countries have expressed interest in participating. Global Hearts provides countries already working on cardiovascular health projects with the opportunity to prioritize, improve, accelerate scale-up and share best practices. For example, Barbados piloted the Standardized Hypertension Treatment Project, and improved blood pressure control rates by 14.5 percent in one year. Using Hearts resources, the Caribbean island will be able to improve all aspects of cardiovascular health nationwide.

Bloomberg Data for Health Initiative: Making Strides in NCD Mobile Phone Survey Platforms

Without accurate and timely data, countries cannot prioritize resources and make sound policy decisions to address the growing burden of NCDs. Innovations in mobile phone technology can be used to quickly collect data on NCDs and supplement traditional household surveys.

To address this global challenge, in 2015, DGHP in collaboration with Bloomberg Philanthropies, CDC Foundation, and other partners, established the Bloomberg Data for Health Initiative to strengthen the collection and use of critical public health information in up to 20 low- and middle-income countries. In 2016, the Data for Health partners made significant strides in developing an open source, mixed-mode technology platform for NCD surveillance. This platform enhances the capacity of 10 participating countries to collect and disseminate data and evaluate the impact of interventions.

A core principle of the project is learning from national and local officials how to customize the survey. For example, in China, Shanghai CDC offers mobile phone

health promotion services to its 26 million residents through the 12320 phone hotline and gathers information using interactive voice response (IVR) and short message service (SMS). IVR allows respondents to use a touch-tone keypad to respond to questions that are audio recorded. SMS allows respondents to answer survey questions through text messages. Understanding the local infrastructure will help when the survey is implemented in Shanghai in 2017.

On a visit to Atlanta in September 2016, representatives from the Zambian Ministry of Health provided valuable feedback to enhance the user experience of the mobile phone survey platform. They tested creating survey questions, selecting whether to respond with IVR or SMS, and monitoring survey progress.

Partner engagement ensures that each country will have a survey that applies to the local context. The mobile phone surveys will be conducted in 2017 in Ecuador, Morocco, Philippines, and Zambia and in two cities—Shanghai and Mumbai.

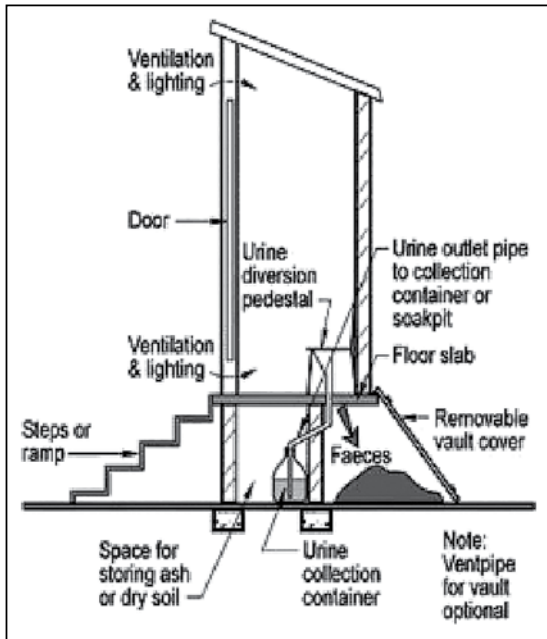


Shanghai CDC hosted the U.S. CDC's NCD Mobile Phone Survey team in August 2016.



Eduardo Jezerski, CEO of Innovative Support to Emergencies Diseases and Disasters describes the platform to officials from the Zambian Ministry of Health in September 2016.

Global WASH: Partnering to Increase Access to Clean and Safe Toilets for Vulnerable Populations



Urine-Diverting Dry Toilet

Clean and safe toilets are essential for health. Yet 2.4 billion people (40% of the world's population) do not have toilets. Poor sanitation (i.e., lack of access to clean and safe toilets) and the risks associated with poor management of human waste can lead to the spread of potentially deadly diseases such as cholera. The risk of acquiring diseases associated with poor sanitation is particularly high among people living in crowded temporary settings where toilets may be unavailable. Therefore, adequate sanitation is a major concern for vulnerable populations, such as those affected by humanitarian emergencies or natural disasters.

In 2014, the Global Water, Sanitation, and Hygiene Team in DGHP's Emergency Response and Recovery Branch (ERRB), in collaboration with United Nations High Commissioner for Refugees (UNHCR), was awarded a grant from Research for

Health in Humanitarian Crises (R2HC) to evaluate the safety and acceptability of urine-diverting dry toilets (UDDTs) in a refugee setting in Ethiopia. UDDTs are installed above ground which makes them appropriate for flood-prone areas where traditional dug pit latrines may not be feasible.

CDC works to improve health outcomes by strengthening the evidence for health interventions during crises. Findings of the evaluation will help UNHCR and other agencies determine whether UDDTs, as currently designed, are an appropriate option for certain emergency settings.

Through these efforts, DGHP is working to increase the evidence base needed to provide clean and safe toilets for emergency-affected populations. This will prevent and control the spread of cholera and other diarrheal diseases, keeping populations safer and healthier.

Central America and the Caribbean Region's United Front to Fight Zika is a Winning Formula

Central America's landscape and ease of movement from one country to another presents many opportunities for travel and trade, but it can also pose serious public health challenges when an outbreak occurs. "If there's an outbreak in Guatemala, it is likely that an outbreak is soon to follow in Honduras or El Salvador," said Luis Hernandez, a DGHP emergency management specialist in Central America, a region hard hit by the Zika virus outbreak.

Therefore, it was no surprise that Zika in El Salvador and Guatemala soon spread to other countries in the area and required a regional outbreak response. More than 3,000 trainees and graduates from the Central America Field Epidemiology Training Program (CA-FETP), which extends to seven countries in Central America, the Dominican Republic and Haiti, were mobilized to respond to the outbreak. Working with the ministries of health and other partners, the disease detectives are hard at work. El Salvador and Belize have both made participating in Zika virus investigations a requirement for their intermediate-level CA-FETP trainees. These trainees are collecting data that is being used to guide decision-making throughout the region.

The CA-FETP has a long history in Central America with nearly 4,000 graduates from three levels of training (basic, intermediate, and advanced) who continue to work in local public health, making it easier to reach everyone who might be at risk. The region also has established systems to monitor selected diseases. For Zika virus, CA-FETP expanded surveillance to additional

sites, including areas where the mosquito population was unknown. Successful prevention against Zika virus requires controlling the *Aedes aegypti* and *Aedes albopictus*, the mosquitoes that spread the virus. Controlling these types of mosquitoes would also reduce the spread of dengue and chikungunya. With more to be known about the effects of the virus on unborn babies, CA-FETP prioritized following up with pregnant women potentially infected with Zika virus.

CA-FETP trainees and residents have strong community ties and their training builds the skills and relationships required to become trusted sources of information for the communities they serve. Mosquito control requires strong community participation to remove standing water habitats where mosquitoes lay eggs, which includes some unexpected places, such as flower vases left at cemeteries and car tires stacked on the side of the road. With Zika virus linked to microcephaly and other birth defects, CA-FETP communication outreach efforts continue to stress the importance of pregnant women and women of childbearing age to use repellants and bed nets to protect themselves and their families from getting infected with Zika virus.

Beyond Zika virus control, CA-FETP is improving the capacity of partners in Central America to more quickly detect and respond to public health emergencies, making it more likely that countries in the region can control outbreaks close to their source, regardless of how they spread or where they start.



CDC staff from the Central America region meet with Guatemalan Social Security Epidemiology staff to coordinate improving Zika surveillance in Guatemala—a health care provision system that services about 20% of Guatemala's general population.

GHSA/Ebola Preparedness Grantee Meeting



Participants at GHSA/Ebola Preparedness Meeting.

CDC's Division of Global Health Protection awarded 50 cooperative agreements to partners in more than 20 countries to support global health security and Ebola preparedness activities. On February 10–12, 2016, grantees and other partner organizations gathered at CDC's headquarters in Atlanta to:

- Learn about global health security
- Gain practical tools and skills for grants and risk management
- Enhance understanding of the health security agenda and Ebola technical areas and approaches
- Understand CDC's reporting frameworks
- Promote collaboration among partners and across countries through the sharing of experiences and lessons learned

Many of the attending grantees were new to working with CDC and the US government, so it was critical to meet in-person to ensure clear understanding of both the technical aspects



of grant management as well as the objectives of the Global Health Security Agenda. Partners had the unique opportunity to brainstorm with colleagues from around the world and share best practices and tools for preventing, detecting, and responding to avoidable epidemics. The activities that are supported by the grants are diverse but share the common theme of enhancing worldwide public health capacity, improving the ability of countries to more rapidly detect and respond to public health emergencies, and enhancing global health security.

Science, Policy, Applied Research and Evaluation, and Communication: An Integrated Approach

DGHP established the Office of Science, Policy, Applied Research and Evaluation, and Communication (SPAREC - pronounced "SPARK") in May 2016. SPAREC coordinates scientific, evaluation and communications work to advance DGHP's goal of ensuring sustained support for global health protection. SPAREC is a multi-disciplinary

team supporting the division's mission, strategic goals, and objectives. Working under the shared vision of keeping America safe and saving lives, the team has promoted the strategic scientific, applied research and evaluation activities that advance DGHP's policy and programmatic goals.

SPAREC BY THE NUMBERS IN 2016

SCIENCE



185

Scientific publications authored or co-authored by DGHP staff

70+

Unique journals published DGHP articles

30+

Countries represented in DGHP publications

POLICY



1000

Data and information requests completed

280+

High level visits and meetings supported

50+

Countries participated in strategic engagements with DGHP

APPLIED RESEARCH AND EVALUATION



90+

Country specific GHSA quarterly reports completed

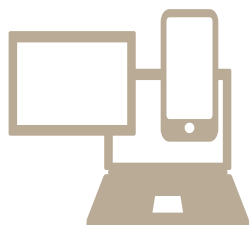
11

GHSA logic models developed

4

Quarterly NSC leadership reports for GHSA year 1 completed

COMMUNICATIONS



2.5M+

Twitter impressions (up 65% from 2015)

220K+

DGHP website views (up 145% from 2015)

60+

DGHP stories published online



MAJINUHAI

“ Having seen firsthand the devastating toll diseases take on people and communities, I’ve realized how vital it is to help countries develop their own ability to prevent, detect, and respond to health threats. This is not a new concept, but it is an increasingly relevant one in a world where the next outbreak is only a plane ride away.”

— Joel Montgomery, PhD
Branch Chief, DGHP

Acknowledgments

DGHP is honored to have worked with many partners across CDC and around the world in 2016. We appreciate your efforts and thank you in advance for your continued support to improve national capacities to prevent, detect and respond to health threats at the source and protecting the health of Americans through enhanced global health security.



To learn more about the Division of Global Health Protection:

Web: <https://www.cdc.gov/globalhealth/healthprotection/index.html>

Read Online: <https://www.cdc.gov/globalhealth/healthprotection/fieldupdates/index.html>

Email: dghpcommunication@cdc.gov