

## Introduction

The United States Government is committed to supporting the establishment and sustainability of comprehensive global disease surveillance. Many agencies across the U.S. Government, working in a coordinated fashion in every region of the world, are engaged in this essential mission.

This commitment is based on the recognition that a weakness in the surveillance system in one part of the world is a weakness for the entire globe, and that every nation needs the infrastructure to prepare for, respond to, and recover from health emergencies. This work is also in support of Article 44 of the Revised International Health Regulations [IHR (2005)], which directs countries that are able to provide assistance to other nations through technical cooperation and financial resources to develop, strengthen and maintain core disease surveillance capacities [1].

Several U.S. Government agencies have been engaged in efforts to support global disease surveillance for years,

and in some cases, for decades. Agencies work together to coordinate efforts, ensure sustainable programs, and address the needs of partner countries. In this paper, we present an overview of each individual agency, their particular interests and strengths, and the focus of their operations. This overview is intended to help the international community better understand the U.S. Government partner agencies, how they operate, and how they differ from their partners.

## U.S. Government agencies engaged in supporting global disease surveillance

The following section provides a brief overview of each U.S. Government agency. Agencies are presented in alphabetical order.

### U.S. Agency for International Development *Emerging Pandemic Threats Program*

The U.S. Agency for International Development (USAID) launched the Emerging Pandemic Threats (EPT) program

USAID anticipates that the EPT program will develop predictive models for early identification of viral and other biological threats in “hot spot” regions and that it will enhance regional, national, and local capacities for surveillance, laboratory diagnosis, and field epidemiology in both the animal- and human-health sectors in these areas. The EPT program’s investments in disease detection and response will be reflected in their routine application in the management of more normative diseases in these areas, such as malaria, cholera, and meningitis. These contributions more broadly support the tenets outlined in the IHR(2005) and equivalent international health standards of the World Organization for Animal Health (OIE).

**U.S. Department of Agriculture  
Agricultural Research Service**

The Agricultural Research Service (ARS) [3] is the principal in-house research agency of the U.S. Department of Agriculture (USDA). ARS is actively engaged in implementing research programs that support global disease surveillance initiatives for plants and animals, including emerging diseases and zoonotic agents that pose a threat to human health. ARS research programs support disease surveillance initiatives in several U.S. Government agencies, such as USDA’s Animal and Plant Health Inspection Service (APHIS), the Centers for Disease Control and Prevention (CDC), and the State Department’s Biosecurity Engagement Program (BEP). In addition, ARS actively collaborates with international partners worldwide on research projects dedicated to support disease surveillance programs. ARS is one of the founding members of the Global Foot-and-Mouth Disease Research Alliance (GFRA), which has as its primary mission to support the United Nations’ Food and Agricultural Organization (FAO) and OIE global efforts to control and eradicate Foot-and-Mouth Disease (FMD).

***Animal and Plant Health Inspection Service***

USDA’s Animal and Plant Health Inspection Service (APHIS) [4] plays a significant role in increasing global food security by promoting technology- and science-based solutions and capacity-building activities in countries around the world. A cornerstone of this concept is enhanced coordination between the agriculture and public health sectors for disease surveillance, detection, and control. APHIS plays a direct role in public health, especially in efforts to mitigate veterinary diseases and ensure the healthfulness of agricultural practices and products. APHIS has programs in disease detection and surveillance, disease exclusion, animal disease information

(CBEP) [7] is to counter the threat posed by select agents, related materials, expertise, other emerging infectious disease risks, and to prevent these agents from reaching any state or non-state actors who may use them against the United States or its allies. The program focuses on delivering tailored approaches that recognize and build upon partner countries' indigenous capacities. The CBEP mission is achieved through execution of three key product lines: Biological Safety & Security capacity building; Disease Surveillance, Detection, Diagnosis, and Reporting; and Cooperative Biological Research. Through these three product lines the Program aims to secure dangerous pathogens; promote open and active disease reporting and response; and advance transparent research to understanding pathogens and developing potential countermeasures. CBEP works with a number of partner countries to assist in compliance with the IHR(2005), the OIE reporting guidelines, and the FAO reporting guidelines. CBEP also works with partner countries to implement a disease surveillance, detection, diagnosis, reporting, and response system that is safe, secure, and sustainable; and to integrate existing surveillance efforts to improve global disease surveillance and ensure timely, accurate situational awareness of infectious disease threats.

Like the Global Disease Detection and Emergency Response Division, the Division of Public Health Systems and Workforce Development [11] sits in the Center for Global Health at CDC. The purpose of this division is to work with Ministries of Health and other public health partners to build strong public health systems and workforce capacity. The Division operates several training programs, including the Field Epidemiology Training Program (FETP), the Field Epidemiology and Laboratory Training Program (FELTP), and the Sustainable Management Development Program. FETPs and FELTPs are typically Ministry of Health-based in-service training programs in applied epidemiology aimed at strengthening countries' epidemiology, surveillance, outbreak response, and laboratory systems and workforce. As of mid-2010, the division is supporting 15 FETP/FELTPs covering 29 countries with another 8 programs covering 11 countries currently in development. An additional 20 programs, previously supported by CDC, are operating independently.

The division is also collaborating extensively with the World Health Organization's Regional Office for Africa (WHO/AFRO) on implementing the Integrated Disease Surveillance and Response (IDSR) strategy. The IDSR strategy aims to improve surveillance and response capacity in African countries and is WHO/AFRO's primary strategy for improving early detection and response to infectious disease outbreaks.

## **U.S. Department of State**

### *Biosecurity Engagement Program*

The U.S. Department of State manages America's relationships with foreign governments, international organizations, and the people of other countries. The Biosecurity Engagement Program (BEP) [12] seeks to engage biological scientists and combat biological threats worldwide by providing assistance to improve biosecurity and biosafety, conduct cooperative research, and improve infectious disease detection and surveillance. Specifically, BEP provides assistance in: biosafety and biosecurity, through technical consultations, risk assessments, and training courses that build human capacity and internal expertise to create a sustainable culture of laboratory biorisk management; disease detection and control, by strengthening the capacity for public health and veterinary health systems to detect, report, and control infectious disease outbreaks; scientist engagement, by encouraging a safe, secure and sustainable bioscience capacity through joint scientific collaborations designed to help prevent, detect, and respond to biological threats; and sustainable capacity, with a focus on long-term sustainability and capacity building that creates an infrastructure for biorisk management.

BEP leverages technical resources and experts from numerous U.S. agencies, universities, international

organizations, NGOs, and the National Academies of Sciences to meet its core objectives. In addition to inter-agency and organizational collaborations, BEP works closely with host-country governments, U.S. Embassies, and other nations to identify needs and implement assistance necessary to ensure safe, secure, and sustainable bioscience capacity, while achieving the larger goal of reducing global biological risks. BEP efforts are threat-driven and designed to prevent, detect, and respond to both existing and emerging global biological threats.

## **Discussion**

Effective global engagement in support of disease surveillance capacity building requires coordination and partnership. Each of the above-mentioned agencies and offices has unique resources and technical expertise.

These entities first must coordinate with each other and then with international partners to ensure that global engagement efforts are efficient, build off of each other's expertise, and are best combined to promote effective disease surveillance capacity building. This internal coordination is not without challenges, as each entity has different organizational cultures, administrative processes, and substantive expertise. Agencies do, however, actively try to work around these challenges, and use the White House National Security Staff as an overarching coordinating body.

In addition to internal U.S. coordination, agencies require a strong working relationship with partner countries in order to be most effective. Ideal country engagement involves a commitment on the part of the partner country to an agreed upon strategy for engagement that includes plan.8000dm lan.8000dm14.60990032 -1.6eg12.699

**Abbreviations**

AFHSC, Armed Forces Health Surveillance Center; APHIS, Animal and Plant Health Inspection Service; ARS, Agricultural Research Service; ASPR, Assistant Secretary for Preparedness and Response; BEP, Biosecurity Engagement Program; CBEP, Cooperative Biological Engagement Program; CDC, Centers for Disease Control and Prevention; DOE, Department of Energy; DTRA, Defense Threat Reduction Agency; EPT, Emerging Pandemic Threats Program; FAO, Food and Agricultural Organization; FELTP, Field Epidemiology and Laboratory Training Program; FETP, Field Epidemiology Training Program; FMD, Foot-and-Mouth Disease; GDD, Global Disease Detection Program; GEIS, Global Emerging Infections Surveillance and Response; GFRA, Global Foot-and-Mouth Disease Research Alliance; GOARN, Global Outbreak Alert Response Network; HHS, Department of Health and Human Services; HTLN, High Throughput Laboratory Network; IHR, International Health Regulations; LANL, Los Alamos National Laboratory; OIE, World Organization for Animal Health; USAID, United States Agency for International Development; USDA, United States Department of Agriculture.

**Competing interests**

No competing interests to declare.

**Authors' contributions**

All authors contributed equally to the text.

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