

December 2014 | Fact Sheet

# The U.S. Government & Global Emerging Infectious Disease Preparedness and Response

## Overview

Emerging infectious diseases represent an ongoing threat to the health and livelihoods of people everywhere, including those of Americans. Over the last few decades, there have been several EIDs that have taken the global community by surprise and drawn new attention to EIDs, including HIV, SARs, H1N1, and Ebola. Governments, multilateral institutions, and other organizations have increasingly recognized the threat such diseases pose and have augmented global efforts to prepare for and address them; the U.S. government has been a key supporter of these activities.<sup>1</sup>

**Emerging infectious disease (EID):** An infectious disease that is newly recognized as occurring in humans; one that has been recognized before but is newly appearing in a different population or geographic area than previously affected; one that is newly affecting many more individuals; and/or one that has developed new attributes (e.g., resistance or virulence).<sup>2</sup>

## Current Global Snapshot

After a period of optimism during the 1960s and 1970s about humankind’s ability to conquer infectious diseases, global concern about EIDs has grown. Since 1980, approximately one to three new human infectious diseases have been identified each year; others have “re-emerged,” causing greater numbers of cases than before and/or affecting different populations and regions than in the past (e.g., dengue fever or Ebola), and others have developed resistance to available treatments (e.g., multi-drug resistant tuberculosis). In particular, the discovery of HIV/AIDS in 1981 marked a turning point in global consciousness about global vulnerabilities to EIDs. There are a number of factors that contribute to disease emergence – including population growth and movement, changes in land use, greater contact between people and animals, international travel and trade, and poor public health infrastructure. Many of these factors are present simultaneously in certain geographic areas that have been identified as “hotspots” for emerging diseases, such as parts of Asia and sub-Saharan Africa.<sup>3,4</sup>

## IMPACT OF EIDs

While not every newly identified infectious disease has major public health implications, a few have resulted in global pandemics (like HIV/AIDS and H1N1 influenza, see Figure 1). Such outbreaks have also led to significant economic losses and interruptions in trade and travel. For example, it is estimated that SARS precipitated up to \$30 billion in economic losses (over \$3 million per case) in 2003.<sup>5</sup>

Figure 1: Selected Emerging Infectious Diseases Since 1975<sup>5</sup>

Emerging Disease	Year Identified	Estimated Global Impact	
		Cases	Deaths
Ebola Virus Disease	1976	19,568	7,653
Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS)	1981	78 million	39 million
Variant Creutzfeldt–Jakob disease (vCJD or “mad cow disease”)	1996	229	229
H5N1 Influenza (“bird flu”)	1997	668*	393*
Severe Acute Respiratory Syndrome (SARS)	2003	8096	774
H1N1 (2009) Influenza (“swine flu”)	2009	unknown	>284,500
Middle East Respiratory Syndrome (MERS)	2012	699	209
H7N9 Influenza (“bird flu”)	2013	453	175

NOTES: Cases and deaths reflect the cumulative number of cases and deaths (as of December 5, 2014). \* indicates cumulative cases and deaths from 2003 to present.

## STRATEGIES AND TOOLS

As new infectious diseases can emerge anywhere, governments, multilateral institutions, and other stakeholders have aimed to build and bolster a set of interconnected systems for outbreak prevention, preparedness, detection, and response. This complex web of global efforts – a “network of networks” – includes activities ranging from disease surveillance, drug and vaccine research and development, infectious disease research and training, preparedness and response planning and execution, and public education, behavior change and disease prevention campaigns.<sup>4</sup>

A guiding framework for global efforts is the revised *International Health Regulations* (IHR 2005), a legally-binding international agreement among member-states of the World Health Organization (WHO) that requires countries to develop a minimum level of capacity to “detect, assess, notify and report” potential outbreaks and other public health emergencies and that outlines the processes for reporting, investigating, and responding to these threats at the international level.<sup>7</sup> In addition to overseeing the IHR and supporting its implementation in countries worldwide, WHO often plays a central role during disease outbreaks, serving as a hub for communication and an organizer of the international response. Other organizations with important roles include the United Nations Food and Agriculture Organization (FAO) and the World Organization for Animal Health (OIE) - since many EIDs have origins in animals<sup>8</sup> - and the World Trade Organization (WTO) - since sound trade practices can help prevent and address outbreaks.

## CHALLENGES

Though technological and scientific advances have improved outbreak detection and response in recent decades, significant challenges remain in addressing EIDs, including: a lack of basic public health surveillance and response capabilities in many regions, which can delay and compromise the effectiveness of EID detection and response efforts;<sup>9</sup> ongoing scientific and technological challenges; as well as manufacturing capacity limitations and political, trade and intellectual property barriers, which can hinder information-sharing and timely research, development, and distribution of diagnostics, vaccines, drugs, and other prevention and response tools for newly emerging diseases.

## The U.S. Government Response

The U.S. government (USG) has taken a number of steps since 1990 to address the threat posed by EIDs. Key U.S. policy milestones include: a 1997 Presidential Directive on emerging diseases that called for greater interagency support for national and global EID efforts, strong U.S. engagement in and support for revising and strengthening the IHRs (especially following the 2003 SARS outbreak), and new U.S. national strategies on health security and countering biological threats, both released in 2009.<sup>10</sup> Most recently, in February 2014, the USG announced a new “Global Health Security Agenda,” a five-year (2014-2018) effort to accelerate progress toward a world “safe and secure from infectious disease threats,” undertaken in partnership with other governments, multilateral institutions, and public and private sector stakeholders.<sup>11</sup>

## STRUCTURE AND APPROACH

Multiple USG agencies support activities to prevent, prepare for, detect, and respond to EIDs, including: the Departments of State (global health diplomacy related to EIDs and technical assistance and capacity building for biosecurity), Agriculture (animal health and food safety capacity-building efforts as well as disease surveillance and research), and Energy (EID research and development) as well as the Departments of Health and Human Services (HHS), Defense (DoD), and the U.S. Agency for International Development (USAID), which are described below.

- **HHS:** Through the Centers for Disease Control and Prevention (CDC), the Food and Drug Administration (FDA), the National Institutes of Health (NIH), and other offices, HHS coordinates U.S. domestic health surveillance, preparedness, and response efforts with those of other countries. These agencies provide training and educational support to other countries, expert technical assistance during outbreak investigations and response efforts overseas (particularly through CDC’s Global Disease Detection (GDD) program), and support for the research and development of vaccines and drugs for EIDs (as well as their subsequent regulatory approval). HHS also serves as the official U.S. point of contact with WHO on IHR-related issues and is typically the primary U.S. representative at multilateral meetings on EID topics.
- **USAID:** USAID’s Emerging Pandemic Threats (EPT) program helps countries build their capacity to identify and respond to dangerous pathogens in animals and humans and to be prepared for outbreaks, including pandemics. In addition, many of USAID’s global health programs (like many CDC global health programs) support general health systems strengthening in developing countries, which can include activities to build surveillance and laboratory capacities that have applications for EIDs as well.
- **DoD:** The Army and Navy maintain a network of laboratories that support EID surveillance, research, and development, including a number that are located overseas. In addition, the DoD’s Global Emerging Infections Surveillance and Response

System (GEIS) provides technical and funding support for DoD and partner organizations' EID-focused surveillance, research and development, outbreak response, and local capacity-building efforts, and the Defense Threat Reduction Agency's Cooperative Biological Engagement Program (DTRA/CBEP) funds capacity-building efforts to strengthen partner countries' biosecurity, surveillance, and response capabilities.<sup>12</sup>

## U.S. GOVERNMENT FUNDING<sup>13</sup>

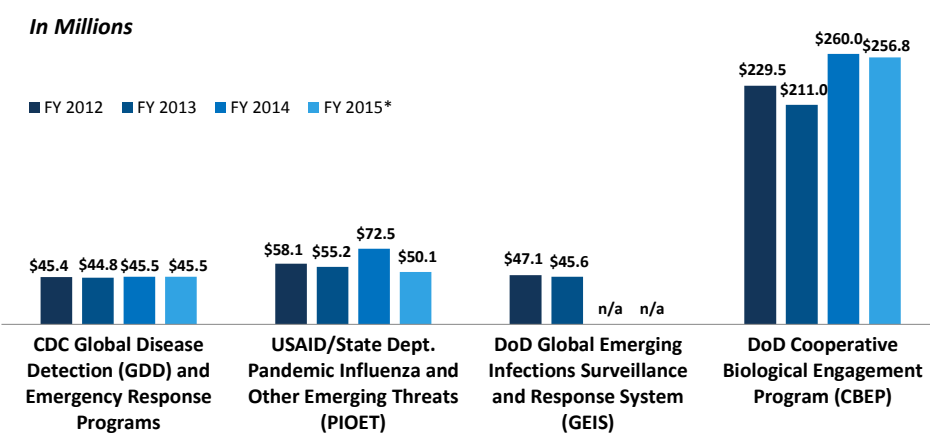
Congress provides international EID funding to several USG agencies including (but not limited to): CDC (primarily GDD), USAID (through Pandemic Influenza and Other Emerging Threats, which includes EPT), and DoD (for GEIS and CBEP); see Figure 2. Congress has also at times

provided additional funds through supplemental appropriations as needed to bolster response during important epidemic or pandemic events, as it did following the emergence of H1N1 influenza in 2009. Additionally, the USG funds other activities that support broader health systems capabilities in the U.S. and/or overseas that contribute to EID preparedness and response in emergencies (e.g., CDC's epidemiology and laboratory training activities that are supported by its International Public Health Capacity Training funding and some domestic and overseas outbreak-related activities of CDC's National Center for Emerging and Zoonotic Infectious Diseases).

## Looking Ahead

As reflected in the language of U.S. national and global health policy documents, continued U.S. engagement in efforts to reduce the threat and potential impacts of EIDs will be critical for global health and to protect the safety and well-being of Americans at home and abroad. Sustained, long-term U.S. investments in a range of EID efforts will be important to help build and strengthen the domestic and international systems needed to detect, report, and respond to emerging infectious disease threats, particularly given the potential for the emergence of fast-moving global pandemics in today's increasingly interconnected world. Additional opportunities for the U.S. to advance EID preparedness and response include: following through on the commitments laid out in the Global Health Security Agenda, leveraging existing U.S. global health investments to further strengthen health systems, reinforcing country ownership of EID efforts by helping countries to meet their IHR obligations, and improving mechanisms for scientific and technical cooperation across borders, particularly in light of barriers and difficulties that have hindered global outbreak detection and response in the past.

**Figure 2: U.S. Government Funding for Emerging Infectious Diseases, FY 2012 – FY 2015**



NOTES: Abbreviations mean Centers for Disease Control and Prevention (CDC), U.S. Agency for International Development (USAID), Department of Defense (DoD). "n/a" means the information is not publicly available currently. \* indicates President's Budget Request.

SOURCE: Kaiser Family Foundation analysis of data from congressional budget justifications, appropriations bills, the U.S. Foreign Assistance Dashboard ([www.foreignassistance.gov](http://www.foreignassistance.gov)), communication with GEIS staff, and AFHSC 2013/14 Annual Report.



<sup>1</sup> White House, "Global Health Security," fact sheet, 2011; WHO, *World Health Report: A Safer Future*, 2007.

<sup>2</sup> Definition draws on IOM, *Microbial Threats to Health: Emergence, Detection and Response*, 2003; and Fineberg and Wilson, "Emerging Infectious Diseases," IRGC, 2010.

<sup>3</sup> K.E. Jones, et al., "Global trends in emerging infectious diseases," *Nature*, 2008; Vol. 451.

<sup>4</sup> IOM, *Microbial Threats to Health: Emergence, Detection and Response*, 2003.

<sup>5</sup> UNAIDS, "Global Statistics," fact sheet, July 2014; F. Dawood, "Estimated global mortality associated with the first 12 months of 2009 pandemic influenza A H1N1 virus circulation: a modelling study," *Lancet Infectious Diseases*, 2012; Vol. 12, pp. 687-95; CDC, "Variant Creutzfeldt-Jakob Disease," fact sheet, June 3, 2014; CDC, "Outbreaks Chronology: Ebola Virus Disease," webpage, Oct. 13, 2014; and WHO: "WHO: Ebola Response Roadmap Situation Report," Oct. 17, 2014; "Ebola virus disease – Democratic Republic of Congo," Sept. 10, 2014; "Influenza at the human-animal interface: Summary and assessment as of 2 October 2014," 2014; "Summary of probable SARS cases," 2003; "Middle East respiratory syndrome coronavirus (MERS-CoV) summary and literature update—as of 11 June 2014," 2014; "WHO risk assessment of human infection with avian influenza A(H7N9) virus," June 27, 2014.

<sup>6</sup> X. Fan, "SARS: economic impacts and implications," *Policy Brief 15*, ADB, 2003.

<sup>7</sup> WHO, "About IHR," <http://www.who.int/ihr/about/en/>.

<sup>8</sup> D. Quammen, *Spillover: Animal Infections and the Next Human Pandemic*, 2013.

<sup>9</sup> UN Chronicle, "National Security and Pandemics", Aug. 2013, <http://unchronicle.un.org/article/national-security-and-pandemics/index.html>.

<sup>10</sup> White House: "Emerging Infectious Diseases," PDD/NSTC-7, 1996; *National Health Security Strategy*, 2009; *U.S. National Strategy on Countering Biological Threats*, 2009.

<sup>11</sup> HHS, "Global Health Security Agenda," 2014, <http://www.globalhealth.gov/global-health-topics/global-health-security/GHS%20Agenda.pdf>; CDC, "U.S. Commitment to the Global Health Security Agenda," 2014, [http://www.cdc.gov/globalhealth/security/pdf/ghs\\_us\\_commitment.pdf](http://www.cdc.gov/globalhealth/security/pdf/ghs_us_commitment.pdf).

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<sup>12</sup> KFF, *The U.S. Department of Defense and Global Health: Infectious Disease Efforts*, 2013.

<sup>13</sup> KFF analysis of data in congressional budget justifications, U.S. Foreign Assistance Dashboard ([www.foreignassistance.gov](http://www.foreignassistance.gov)), appropriations bills, communication with GEIS personnel, and GEIS 2013/14 Annual Report.