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# U.S. and International Health Responses to the Ebola Outbreak in West Africa

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## Summary

In March 2014, an Ebola Virus Disease (EVD) outbreak was reported in Guinea, West Africa. The outbreak is the first in West Africa and has caused an unprecedented number of cases and deaths. The outbreak is continuing to spread in Guinea, Sierra Leone, and Liberia (the “affected countries”); it has been contained in Nigeria and Senegal, and has been detected in Mali. As of October 22, 2014, more than 10,000 people have contracted EVD, more than half of whom have died.

Until October 2014, no secondary EVD cases had occurred outside of Africa. That month, health workers in Spain and the United States contracted EVD cases while providing care for Ebola patients. Other factors make this outbreak unique, including

- its introduction into West Africa;
- multi-country outbreaks occurring simultaneously;
- disease transmission within urban areas; and
- an unprecedented scale and pace of transmission.

In the aggregate, between 1976, when Ebola was first identified, through 2012, there were 2,387 cases, including 1,590 deaths, all in Central and East Africa. The number of Ebola cases in this outbreak is four times higher than the combined total of all prior outbreaks, and the number of cases is doubling monthly. The U.S. Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) have projected an exponential increase in cases. WHO estimated that by the end of November, some 20,000 people may contract Ebola; CDC estimated that “without additional interventions or changes in community behavior,” up to 1.4 million could contract EVD in Liberia and Sierra Leone by January 2015. CDC indicates, however, that the outbreak may not reach such proportions since responses are intensifying. In Liberia, for example, improvements in burial practices have resulted in roughly 85% of all bodies being collected within 24 hours of being reported to national officials.

In an August 2014 report, WHO estimated that it would cost roughly \$500 million to contain the outbreak by January. In September, international responses accelerated. The United Nations (U.N.) established the United Nations Mission for Ebola Emergency Response (UNMEER) “to utilize the assets of all relevant U.N. agencies” to address the health and broader social impacts of the outbreak. A proposed U.N. response would cost roughly \$1 billion, about half of which would be aimed at addressing health impacts.

The United States is the leading funder of the international Ebola response, and its financial support is growing. As of October 25, almost 900 U.S. government personnel had deployed to the region, and some 4,000 military personnel will be deployed to the region. The U.S. Agency for International Development (USAID) reports that as of October 22, U.S. funding for EVD responses totaled \$344.6 million. In addition, the Department of Defense (DOD) is planning to spend more than \$1 billion on EVD activities in West Africa. On October 17, President Obama established an Ebola Czar to coordinate U.S. domestic and global responses to the Ebola outbreak.

Some global health experts have criticized the U.S. and international response to the Ebola outbreak, decrying the pace and scale of assistance. The limited impact of U.S. and international

responses to the Ebola outbreak has raised several questions regarding global health governance structures, international commitment to bolstering pandemic preparedness and response capacity in poor countries, and global support for strengthening health systems. The international community lacks a rapid response team of health professionals prepared to address health emergencies like the ongoing West African Ebola outbreak. Debates about whether WHO should have such capacity have been at the heart of recent WHO reform debates.

While deliberating the appropriate response to ongoing Ebola outbreak, Congress is likely to discuss the breadth of health, social, economic, development, and security challenges that this outbreak is causing, as well as how U.S. global health aid is apportioned. This report focuses on the health impacts of the outbreak and discusses U.S. and international responses to those health challenges.

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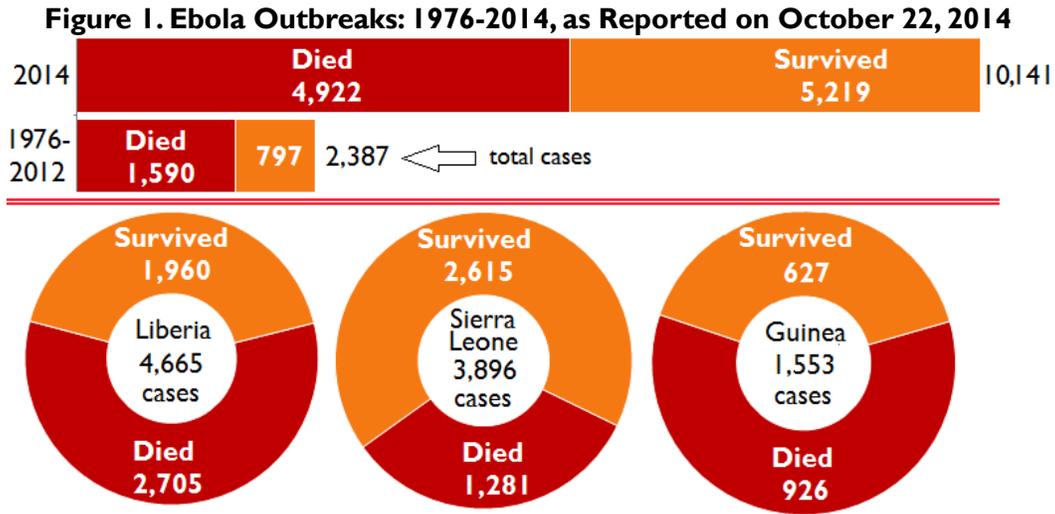
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## Background

Ebola virus disease (Ebola, or EVD) is a severe, often fatal disease that was first detected in the Democratic Republic of the Congo (DRC) in 1976.<sup>1</sup> Originating in animals, EVD is spread to and among humans through contact with the blood, other bodily fluids, organs, and corpses of those infected. It is not transmitted through the air, and the World Health Organization (WHO) maintains that there is minimal risk of contracting EVD on a plane,<sup>2</sup> though most airlines have suspended flights to and from the affected countries.<sup>3</sup>

In March 2014, an EVD outbreak was reported in Guinea, West Africa. The outbreak is the first in West Africa and has become the largest, most persistent ever documented. The outbreak is continuing to spread in Guinea, Sierra Leone, and Liberia (“affected countries”) and has ended in Nigeria and Senegal, after having infected 20 people in Nigeria and one in Senegal. As of late October, nearly 10,000 people have contracted EVD, of whom almost 5,000 have died (Figure 1). WHO regularly updates EVD cases at <http://www.who.int/ebola>.



Source: Created by CRS Global Health Specialist Tiaji Salaam-Blyther from WHO data.

Due to inadequate disease surveillance capacities in the region, WHO estimates that actual cases may be two to four times higher than reported.<sup>4</sup> Some health experts are concerned that the weak surveillance systems in neighboring countries may miss EVD cases. On October 23, Mali reported its first EVD case and some suspect that Cote d’Ivoire may have undetected cases.<sup>5</sup> WHO is reportedly sending a team to Mali to help with clinical management, epidemiology, contact tracing and social mobilization.

<sup>1</sup> This section was summarized from WHO, *Ebola*, fact sheet, number 103, April 2014.

<sup>2</sup> WHO, “WHO: Air travel is low-risk for Ebola transmission,” Note for the Media, August 14, 2014 and WHO, “Statement on travel and transport in relation to Ebola virus disease (EVD) outbreak, August 18, 2014.

<sup>3</sup> “WHO urges calm as Kenya bans contact with Ebola-affected countries,” *The Guardian*, August 17, 2014.

<sup>4</sup> WHO, *Situation Report Update*, September 8, 2014.

<sup>5</sup> Abby Ohlheiser, “WHO sending experts to Mali after first Ebola diagnosis in the West African country,” *Washington Post*, October 24, 2014.

## **Ebola Care and Treatment**

There are no drugs proven to prevent or treat EVD, though efforts are underway to develop them. In October, press reports indicated that WHO planned to begin testing two Ebola vaccines in January on some 20,000 health workers and other volunteers. The organization also indicated that a treatment might be available for use in Liberia by early November.<sup>6</sup> In the absence of specific treatments, health practitioners treat EVD symptoms with supportive care, which can reduce the fatality rate. Spread of the disease can be limited through the use of disease surveillance and containment measures. WHO has released manuals that outline appropriate patient care, management of contaminated objects, safe burial practices, and diagnostic protocol.<sup>7</sup> These measures successfully contained all the previous Ebola outbreaks.

## **Distinguishing Factors**

The Ebola virus that is circulating in West Africa is not new. Health experts are familiar with methods to treat and contain it. The disease is spreading quickly, however, because the health systems in the affected countries are ill-equipped to implement requisite disease containment and surveillance measures. Key factors that distinguish this outbreak from previous EVD outbreaks include the following:

**Emergence in West Africa.** Prior to the current outbreak in Guinea, Liberia, and Sierra Leone (affected countries), EVD outbreaks were concentrated in the DRC, Gabon, Sudan South Sudan, and Uganda (**Figure 3**).

**Simultaneous multi-country outbreaks.** Disease transmission along the shared borders of Guinea, Liberia, and Sierra Leone has been intense and despite efforts to detect the disease at the borders, people infected with Ebola have imported the disease into other countries. Contact tracing and disease containment have halted the spread in Senegal and Nigeria where the outbreak ended on October 17 and 19, respectively. In Nigeria, an imported case resulted in an outbreak that infected 20 people and killed eight. A single imported case in Senegal was contained to the index case. WHO is investigating a new EVD case in Mali.

Until October, no EVD cases outside of Africa resulted in secondary cases. In that month, health workers in the United States and Spain contracted EVD while caring for EVD patients. No additional cases have been reported from the health workers. No other reports have emerged of EVD spreading in other countries where EVD patients have been evacuated.

**Cases in urban areas.** Previous outbreaks were confined to rural and forested areas, whereas the current outbreak is spreading in rural and urban settings alike. Responders are struggling to isolate cases and contain the outbreak in densely populated urban areas that lack sufficient access to clean water and sanitation and face severe shortages of health workers and clinics.

**Scale and pace of transmission.** Ebola is spreading at an unprecedented rate in the affected countries. In Liberia, reported cases are doubling every 15-20 days and in Sierra Leone, reported

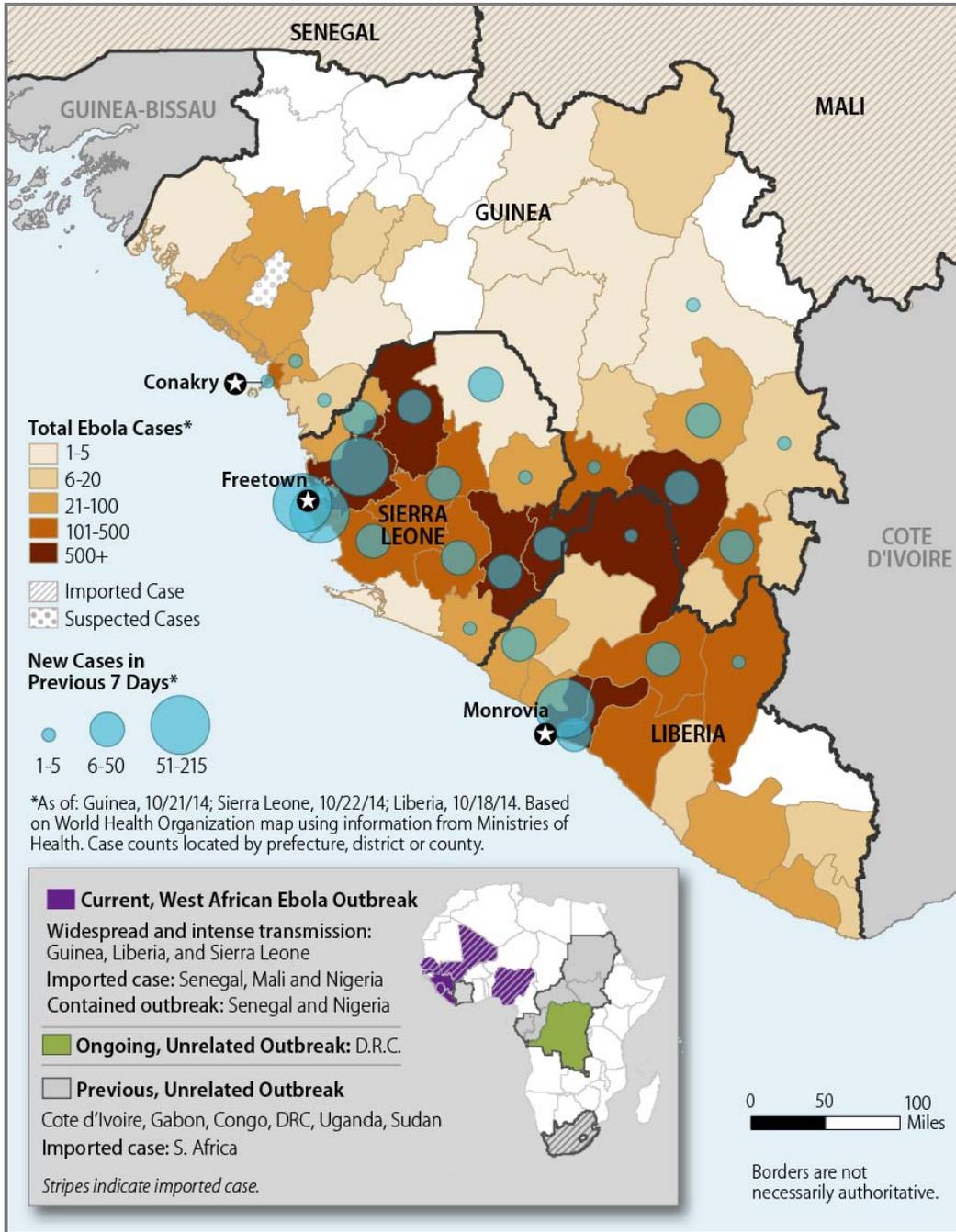
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<sup>6</sup> The Guardian, "WHO aims for Ebola serum in weeks and vaccine tests in Africa by January," September 22, 2014.

<sup>7</sup> WHO, *Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings, with Focus on Ebola*, August 2014.

cases are doubling every 30–40 days.<sup>8</sup> Health experts link the unabated spread of EVD in the affected countries to weak health systems.

**Figure 2. Map of Current and Past Ebola Outbreaks**



**Source:** Created by CRS Visual Information Specialist Amber Wilhelm from WHO data.

<sup>8</sup> Martin Meltzer et al., “Estimating the Future Number of Cases in the Ebola Epidemic—Liberia and Sierra Leone, 2014–2015,” *MMWR*, (September 23, 2014), volume 63.

## Unrelated, Ongoing Ebola Outbreak

A separate Ebola outbreak that is unrelated to the ongoing West Africa outbreak was detected in the DRC on August 24, 2014.<sup>9</sup> It reportedly began in late July or early August, when a woman contracted an EVD-like hemorrhagic fever after butchering a wild animal. She later died and infected several others. As of October 20, there have been 66 cases and 49 deaths in the DRC, including eight deaths among health workers. All but five of the 1,121 contacts have completed the 21-day follow-up period.<sup>10</sup> This is the seventh outbreak of EVD in the DRC since 1976.

## Congressional Actions

Congressional actions to address the outbreak have been accelerating. Several committees have convened hearings on the Ebola outbreak and in July and September 2014, U.S. Representative Karen Bass and Senator Christopher Coons introduced legislation recognizing the severe impacts and threats of the outbreak.<sup>11</sup> Also in September, Congress enacted legislation (P.L. 113-164, Continuing Appropriations Resolution, 2015) that provided \$88 million for the Ebola response: \$30 million for CDC Ebola response activities in West Africa and \$58 million for research and development of specific treatments and vaccines for Ebola. Congress has also permitted the Department of Defense (DOD) to reprogram roughly \$750 million of FY2014 Overseas Humanitarian Disaster and Civic Aid (OHDACA) funds to build 17 Ebola treatment units (ETUs) in Liberia and to support ongoing U.S. efforts in the region (see “Department of Defense”). For more information on DOD responses to the Ebola outbreak, see CRS Report IN10152, *Increased Department of Defense Role in U.S. Ebola Response*, by Don J. Jansen.

## Health System Constraints in Affected Countries

The health systems in the affected countries were already weak before the Ebola outbreak, and have become overwhelmed by the crisis. According to WHO, there are six components of a health system: (1) human resources; (2) governance and leadership; (3) financing; (4) commodities and supply chain networkers; (5) service delivery; and (6) information.<sup>12</sup> The affected countries face severe deficiencies in each of these areas and the outbreak is exacerbating these challenges. This section describes how constraints in each component of the affected countries’ health systems enable the virus to continue to spread. **Table 1** summarizes these issues.

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<sup>9</sup> This section was summarized by CRS from WHO, *Ebola virus disease – Democratic Republic of Congo*, Disease Outbreak News, August 27, 2014 and September 10, 2014.

<sup>10</sup> WHO, *Ebola Response Roadmap Situation Report*, October 22, 2014.

<sup>11</sup> H.Res. 701, Expressing the sense of the House of Representatives that the current outbreak of Ebola in Guinea, Sierra Leone, and Liberia is an international health crisis and is the largest and most widespread outbreak of the disease ever recorded and S.Res. 541, Recognizing the severe threat that the Ebola outbreak in West Africa poses to populations, governments, and economies across Africa and, if not properly contained, to regions across the globe, and expressing support for those affected by this epidemic.

<sup>12</sup> For more information on health systems, see [http://www.who.int/topics/health\\_systems/en/](http://www.who.int/topics/health_systems/en/).

**Table 1. Impact of Health System Deficiencies on Ebola Outbreak Containment**

	<b>Governance</b>	<b>Financing</b>	<b>Human Resources</b>	<b>Commodities</b>	<b>Service Delivery</b>	<b>Information</b>
Description	Policies, strategies, and plans that inform the course of action a country will take to meet the health needs of its people.	Mechanisms used to fund health efforts and allocate resources.	The people who provide healthcare and support health delivery.	Goods that are used to provide healthcare.	The management and delivery of healthcare.	The collection, analysis, and dissemination of health statistics for planning and allocating health resources.
Impact of Health System Component Deficiency in Ebola Context	Slow initial government response to the Ebola outbreak and incapacity to implement national Ebola plans has diminished public confidence in political authorities and limited efforts to dispel rumors and fears about Ebola.	Insufficient financial resources to fund local responses and pay health personnel contribute to human resource and commodity shortages.	Shortages of not only health personnel, but also support staff like grave diggers and statisticians limit the ability to detect, prevent, and treat EVD cases.	Insufficient supply of protective equipment threatens the safety of healthcare workers (including community volunteers) and is associated with hospital- and clinic-based infections.	Many health facilities in Liberia and Sierra Leone remain closed due to staff shortages and other factors.	Limited capacity to conduct contact tracing and diagnosis calls into question the actual EVD cases and impedes efforts to detect, treat, and control the virus.

**Source:** Created by CRS Global Health Specialist Tiaji Salaam-Blyther from WHO webpage on health systems, [http://www.who.int/topics/health\\_systems](http://www.who.int/topics/health_systems), and research on the Ebola outbreak.

## Governance and Leadership

The unabated spread of the outbreak in the affected countries has contributed to perceptions of government ineptitude. Mistrust of public officials has prompted many civilians to ignore or resist government responses. Reports of attacks on health workers and health facilities (run by non-governmental organization and national health ministries alike) persist. The affected governments have used armed forces to enforce disease control measures and to quarantine neighborhoods, further deepening public resentment. Some have questioned the effectiveness of quarantines and criticized the measures, citing concerns about human rights, food scarcity, and possible unrest. Following criticisms by health experts and protests, Liberia and Sierra Leone have stopped quarantining some neighborhoods, though some quarantine zones remain. Despite concerns about quarantine practices, Sierra Leonean officials had characterized a three-day “Stay Home House to House” sensitization campaign a success, noting during which 92 bodies had been recovered and 56 Ebola cases were detected.<sup>13</sup>

## Financing

Per capita health spending in Guinea, Liberia, and Sierra Leone has been relatively low (**Table 2**), contributing to poor conditions of publicly-funded health facilities. Health workers and other government personnel often experience delays in compensation and benefits, contributing to absenteeism and human worker shortages. As the Ebola outbreak intensified, some health workers abandoned their posts, citing not only safety concerns (from lack of protective equipment) but

<sup>13</sup> Naina Bajekal, “Ebola Lockdown in Sierra Leone Finds 150 New Cases,” *Time*, September 22, 2014 and Umaru Fofana, “Sierra Leone wraps up three-day Ebola lockdown,” *Reuters*, September 21, 2014.

also frustration over not receiving salaries. Several local staff at Ebola treatment units in Liberia had reportedly not been paid for three months.<sup>14</sup> Donors, including the United States, have since begun to offer financial aid to Liberia to support payment of health workers salaries and other financial incentives.

**Table 2. Selected Health System Financing Statistics, 2011**

	<b>% of Population Living on &lt; \$1 Daily</b>	<b>Health Personnel per 10,000 Pop.</b>	<b>Per Capita Gov. Health Spending</b>	<b>Gov. Health Budget as % of Total Gov. Spending</b>
Guinea	43.3%	not available	\$15	6.8%
Liberia	83.8%	2.8	\$27	19.1%
Sierra Leone	51.7%	1.9	\$31	12.3%
Nigeria	68.0%	20.2	\$49	6.7%
Africa	51.5%	14.6	\$76	9.7%
World	21.5%	43.3	\$619	15.2%

**Source:** Created by CRS Global Health Specialist Tiaji Salaam-Blyther from WHO, *World Health Statistics Report*, 2014.

**Notes:** Health personnel refers to doctors, nurses, and midwives.

All of the outbreak-affected countries lack sufficient financial resources to fund their national Ebola response plans and need financial support. Several donors have pledged to provide support to the affected countries, though gaps persist (see “International Health Responses”). To meet the health and secondary effects of the outbreak, the United Nations estimates that it will cost Guinea \$194 million, Liberia, \$473 million, and Sierra Leone \$220 million. Roughly half of these resources will be needed for addressing health needs.<sup>15</sup>

## Human Resources

Due to severe shortages of health workers and clinics, the majority of people infected with Ebola in Liberia are without access to medical care and treatment. Inadequate access to health personnel and facilities is also a problem in Sierra Leone and Guinea. Human resource constraints and concerns about conditions in health centers are prompting people to care for the ill on their own, facilitating the spread of the virus. The shortage of medics and health facilities also means that people needing care for non-EVD related issues have nowhere to go.

Observers are troubled not only by inadequate access to Ebola care but also to the impact that clinic closures are having on broader health issues, particularly maternal and child health. Before the outbreak, maternal and child mortality rates in the EVD-affected countries were among the highest in the world (**Figure 3**). In 2012, roughly 26% of all maternal deaths in sub-Saharan Africa occurred in the four countries, where more than 46,000 women died from pregnancy-related complications (an average of 126 daily deaths).<sup>16</sup> Also in 2012, nearly one million children died in the affected countries before reaching their fifth birthday, accounting for roughly

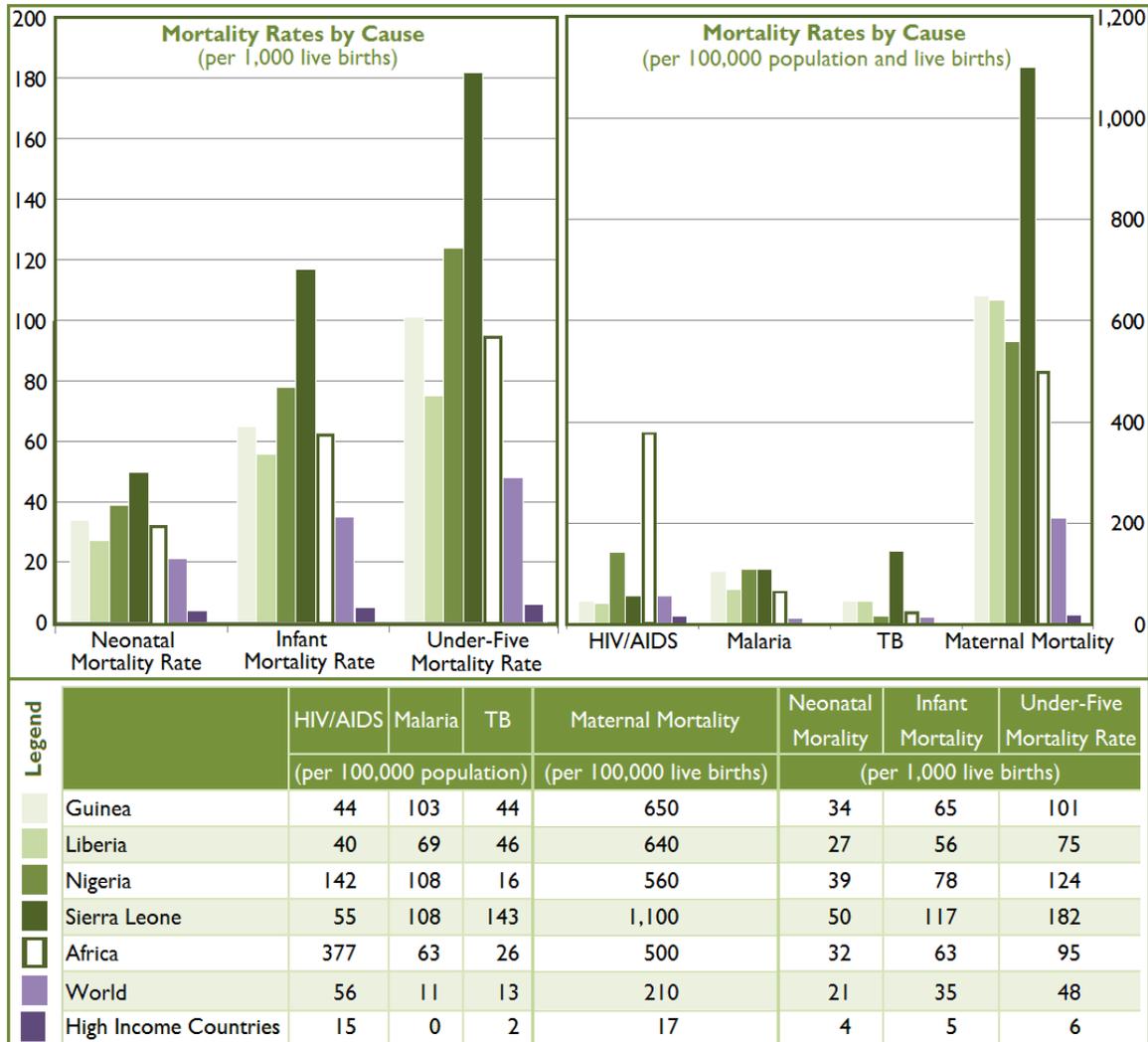
<sup>14</sup> USAID, *West Africa Ebola Outbreak—Update #2*, August 11, 2014.

<sup>15</sup> United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), *Ebola Virus Disease Outbreak: Overview of Needs and Requirements*, September 2014.

<sup>16</sup> UNICEF, *Trends in Maternal Mortality: 1990 to 2013*, 2014.

30% of all under-five deaths in sub-Saharan Africa.<sup>17</sup> Most of these deaths could have been prevented with adequate access to vaccines, clean water and sanitation, and nutrition.

**Figure 3. Health Statistics: Affected Countries, Africa, High-Income Countries, World**



**Source:** Created by CRS Global Health Specialist Tiaji Salaam-Blyther from WHO, *World Health Statistics Report*, 2014.

**Acronym:** Tuberculosis (TB)

**Notes:** *Maternal mortality* refers to the death of a woman while pregnant or within 42 days of a terminated pregnancy from any cause related to or aggravated by the pregnancy or its mismanagement, but not from accidental or incidental causes. *Neonatal mortality* refers to the probability of dying during the first 28 days of life. *Infant Mortality* refers to the probability of dying within the first year of life. *Under-Five Mortality* refers to the probability of dying between before five years of age. All statistics collected in 2012, except maternal mortality rate, collected in 2013. In 2012 and 2013, the World Bank classified high-income countries as those with gross national incomes of \$12,746 or more.

Press reports indicate that some pregnant women are avoiding health facilities out of fear of contracting EVD in health settings. At the same time, many needing assistance during labor and delivery are unable to receive medical attention due to clinic closures and human resource

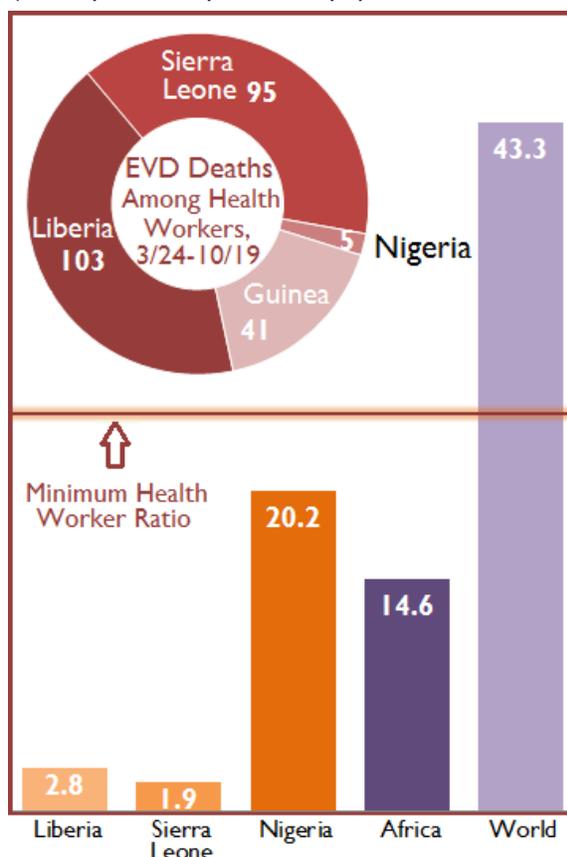
<sup>17</sup> WHO, *World Health Statistics Report*, 2014.

constraints. According to the United Nations, “[m]ore people are now dying in Liberia from treatable ailments and common medical conditions than from Ebola.”<sup>18</sup>

High maternal and child mortality rates in the affected countries are linked to the dearth of health workers in the affected countries. Between 2006 and 2013, Sierra Leone had only two doctors per 100,000 people, according to the WHO (Figure 4).<sup>19</sup> At an August 2014 congressional hearing, one witness testified that prior to the Ebola outbreak, Liberia had fewer than 200 doctors.<sup>20</sup> After the outbreak, he estimated that about 50 doctors remained to provide clinical care, due in part to the evacuation of several expatriate doctors. EVD deaths among health workers have further diminished these staffing levels. On October 22, WHO reported that 443 health workers had contracted EVD, of whom 244 died.<sup>21</sup> More than 40% of these deaths occurred in Liberia. Sierra Leone and Liberia face shortages that are much more severe than Nigeria and the rest of the world.

Ebola control is labor- and resource-intensive, due to requisite surveillance and containment measures. WHO estimates, for example, that a facility treating 70 Ebola patients needs at least 250 healthcare workers.<sup>22</sup> In order to stop the spread of EVD, WHO estimated at the end of August 2014 that the affected countries would need more than 13,000 health workers to provide health care, contact tracing, and safe burial.<sup>23</sup> The plan estimated that roughly 5% of the health personnel would come from foreign countries and the rest would be comprised of national health staff. The affected countries do not have enough health personnel and countries are beginning to deploy medics to the region.

**Figure 4. Health Personnel Ratios and EVD Deaths Among Health Workers**  
(health personnel per 10,000 population, 2006-2013)



**Source:** Created by CRS Global Health Specialist Tiaji Salaam-Blyther from WHO, *World Health Statistics Report, 2014* and WHO, *WHO: Ebola Response Roadmap Situation Report*, October 22, 2014.

**Notes:** Health personnel ratio data collected between 2006 and 2013.

<sup>18</sup> United Nations, “Secretary-General’s Remarks to the Security Council on Ebola,” Press Statement, September 18, 2014.

<sup>19</sup> WHO, *Unprecedented number of medical staff infected with Ebola*, August 25, 2014.

<sup>20</sup> U.S. Congress, House Committee on Foreign Affairs, Subcommittee on Africa, Global Health, Global Human Rights and International Organizations, *Combating the Ebola Threat*, Testimony by Dr. Frank Glover, August 7, 2014.

<sup>21</sup> WHO, *WHO: Ebola Response Roadmap Situation Report*, October 22, 2014.

<sup>22</sup> WHO, “WHO Director-General briefs Geneva UN missions on the Ebola outbreak,” Briefing to United Nations Member States, August 12, 2014.

<sup>23</sup> WHO, *Ebola Response Roadmap*, August 28, 2014, p. 24.

## Service Delivery

The Ebola outbreak has further diminished healthcare options in the affected countries. Many health facilities in Liberia and Sierra Leone are closed. Even before the outbreak, access to clinics was limited. The vast majority of health facilities are concentrated in urban areas and Ebola treatment centers are concentrated in high prevalence areas, leaving large swaths of the population without access to both general healthcare and Ebola-specific treatment. Due to limited access to clinics, the ill frequently travel great distances in search of healthcare, prompting most to wait until health complications are severe. Delayed health-seeking practices are reducing survival prospects among those sickened by Ebola and encumbering efforts to detect and contain the virus.

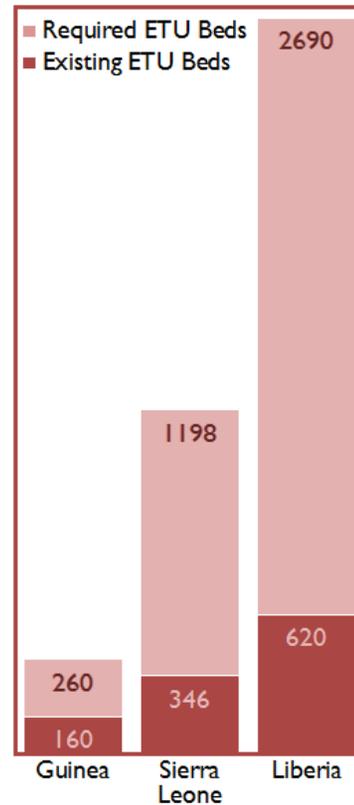
A variety of health services are needed to control the outbreak, including Ebola treatment centers, laboratories, contact tracing, and safe burial services. All of the affected countries face severe deficiencies in these areas. Most of the health services are unable to meet the demands and new ones are filled up as soon as they are opened. Patients turned away from treatment facilities typically return to their communities, often on public transportation, likely infecting several more people along the way. CDC estimates that fatality rates could be halved if people were able to access treatment and healthcare.<sup>24</sup>

Liberia faces the most severe treatment shortage. As of October 22, WHO estimated that it had only 23% of the beds it needed to treat those sickened by EVD (**Figure 5**). Treatment capacity is expected to improve with U.S. plans to support the construction of 27 ETUs in the country, 12 of which will be built by the Department of Defense (DOD).<sup>25</sup> Health experts are investigating a recent reduction in people seeking Ebola care in Liberia, reportedly leaving some beds vacant.<sup>26</sup>

Safe disposal of dead bodies is also improving in Liberia, where roughly 90% of dead bodies are being removed within 24 hours of being reported to the National Call Center.<sup>27</sup> EVD responders are also working with community leaders to adapt traditional funeral practices that can facilitate EVD transmission, such as kissing and touching corpses.

The poor quality of health care delivery is also a concern. Inconsistent adherence to infection control protocol, for example, is contributing to EVD cases among health workers. In July, CDC

**Figure 5. Bed Capacity in Ebola Treatment Units by Country**  
(as of October 18-19, 2014)



**Source:** Created by CRS Global Health Specialist Tiaji Salaam-Blyther from WHO, WHO: *Ebola Response Roadmap Situation Report*, October 22, 2014.

<sup>24</sup> Teleconference with CDC Director Tom Frieden, September 5, 2014.

<sup>25</sup> Communication with USAID, October 26, 2014.

<sup>26</sup> Sheri Fink, "In Liberia, a Good or Very Bad Sign: Empty Hospital Beds," *New York Times*, October 28, 2014.

<sup>27</sup> U.S. Government Inter-Agency Conference Call on Ebola, October 17, 2014.

investigated a cluster of Ebola cases among HCWs in Liberia and identified “multiple opportunities for transmission of Ebola virus to HCWs, including exposure to patients with undetected Ebola in the hospital, inadequate use of personal protective equipment during cleaning and disinfection of environmental surfaces in the hospital, and potential transmission from an ill HCW to another HCW.”<sup>28</sup> During a September tour of Liberia, CDC Director Tom Frieden noted inconsistent availability and use of gloves and hand washing.<sup>29</sup> Interruptions in water supply in health clinics further hamper efforts to ensure necessary sanitation. Dr. Frieden noted of 29 health centers surveyed during his tour to the affected region, only one had running water.<sup>30</sup>

The poor conditions of the health facilities also discourage attendance. Power outages and interruptions in potable water delivery are common.<sup>31</sup> In addition, ambulance services are virtually non-existent in rural areas and limited in urban areas. One district in Sierra Leone with a population of 465,000 people reportedly has only four ambulances, which are often overcrowded with ill people, irrespective of Ebola infection status.<sup>32</sup>

## **Commodities/Supply Chain Networks**

Shortages of protective gear are associated with EVD cases among health workers, and may allow EVD to be spread within health facilities. The affected countries have limited supplies of appropriate protective equipment and not all health and support personnel who interact with the public have access to such equipment. Due to resource constraints, the protective equipment is primarily provided to healthcare workers in Ebola treatment centers, leaving health workers who operate among the general population at risk of contracting and spreading the disease (and other infectious diseases) should they encounter an undiagnosed EVD case. WHO noted, however, shortages of PPE even in ETUs.<sup>33</sup> Health providers also lack sufficient supplies of antibiotics and safe blood to treat Ebola. The price of disinfectants and medicine has reportedly doubled, as people attempt to protect themselves and self-medicate in light of health system deficiencies.<sup>34</sup>

Transporting aid workers and commodities across and within the affected countries is complicated by poor road conditions and the suspension of air service by several commercial airlines. Efforts by the international community to develop alternative transportation routes have improved the situation, though limited air service remains a problem.

## **Information**

Awareness about preventing EVD infection has improved, but due to poverty, infrastructural deficiencies (e.g. clean water and sanitation), and health system constraints, many people lack

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<sup>28</sup> Joseph Forrester et al., “Cluster of Ebola Cases Among Liberian and U.S. Health Care Workers in an Ebola Treatment Unit and Adjacent Hospital – Liberia, 2014,” *Morbidity and Mortality Weekly Report*, (October 17, 2014), volume 63, number 41.

<sup>29</sup> Teleconference with CDC Director Tom Frieden, September 5, 2014.

<sup>30</sup> Ibid.

<sup>31</sup> Doctors Without Borders, “Flash Quote: WHO Declares Ebola an International Public Health Emergency,” *Field News*, August 8, 2014.

<sup>32</sup> The Star, “In Sierra Leone, an exhausting struggle to contain Ebola,” August 18, 2014.

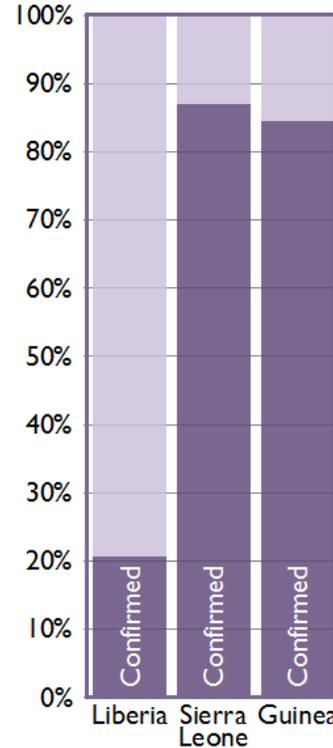
<sup>33</sup> WHO, “Unprecedented number of medical staff infected with Ebola,” *Situation Assessment*, August 25, 2014.

<sup>34</sup> Newsweek, “Ebola Frontline: Flooding in Sierra Leone Exacerbates Public Health Fears,” August 12, 2014.

means to avoid infection. Before Ebola hit, hunger was already a problem in the affected countries, particularly in rural areas. Consumption of wild animals is common practice, particularly in areas with high food insecurity. Health officials have been expanding efforts to inform the public about the risks associated with eating wild animals, including fruit bats and other animals that might carry EVD.<sup>35</sup> Without sufficient access to food, hunger often compels people to continue hunting and eating the animals despite the risks.

Efforts to contain the outbreak are encumbered by weak laboratory and surveillance systems. Health experts are uncertain about how many EVD cases exist and where they are occurring, particularly in Liberia where roughly 20% of EVD cases have been confirmed through laboratory diagnosis (**Figure 6**). Limited laboratory capacity has resulted in extensive diagnosis backlogs, further calling into question the number of EVD cases and hindering efforts to contain the outbreak. Uncertainty about EVD cases endangers health workers, other patients, and those living among people sickened by diseases of undetermined origins.

**Figure 6. Laboratory Confirmed EVD Cases by Country**  
(as of October 22, 2014)



**Source:** Created by CRS Global Health Specialist Tiaji Salaam-Blyther from WHO, WHO: *Ebola Response Roadmap Situation Report*, October 22, 2014.

## International Health Responses

International responses are accelerating, though it remains to be seen how much it will ultimately cost to contain the outbreak and when this will be achieved. The financial requirements for containing the outbreak are rising along with the spread of the outbreak (**Figure 7**). In March, WHO estimated that it would take \$4.8 million to contain the outbreak. At the end of April, more than 200 EVD cases had been discovered in Guinea, less than a dozen in Liberia, and none in Sierra Leone. In August, the organization revised its Ebola response plan, estimating it would cost roughly \$490 million to contain the outbreak.<sup>36</sup> By then, the outbreak had reached Sierra Leone and Nigeria and had caused 3,685 EVD cases, including 1,841 deaths. The outbreak is continuing to spread, is causing broader social and economic disruptions, and has infected more than 10,000 people.

**Figure 7. Timeline of International EVD Funding Requests**  
(U.S. millions)



**Source:** Created by CRS Global Health Specialist Tiaji Salaam-Blyther from WHO and UNOCHA funding requests.

<sup>35</sup> “Ebola risk unheeded as Guinea’s villagers keep on eating fruit bats,” *The Guardian*, August 4, 2014.

<sup>36</sup> WHO, *Ebola Response Roadmap*, August 28, 2014.

In September, the United Nations (U.N.) established the U.N. Mission for Ebola Emergency Response (UNMEER) to coordinate the international response to the outbreak. That month, the United Nations Security Council held a special meeting on Ebola, urging member states to expedite support for the affected countries and to contribute to a U.N. integrated Ebola response plan. The six-month, \$988 million plan calls for addressing the health and social impacts of the outbreak (**Table 3**).<sup>37</sup> Roughly half of the funds would be spent on health programs and the balance would be spent on addressing issues such as food insecurity, economic disruptions, and establishing and maintaining supply chain networks.

**Table 3. United Nations Ebola Response Plan**  
(U.S. \$ millions)

	Common Services	Guinea	Liberia	Sierra Leone	Total
<b>(1) Stop the Outbreak</b>					
Case identification and contact tracing	7.0	26.8	116.5	39.2	189.5
Safe and dignified burials	0.8	4.3	14.2	4.4	23.8
<b>(2) Treat the Infected</b>					
Ebola care and infection control	7.0	52.5	212.6	59.2	331.2
Medical care for responders	10.0	1.0	2.0	1.0	14.0
<b>(3) Ensure Essential Services</b>					
Food aid	2.5	28.4	36.3	40.4	107.7
Basic health care	1.0	47.1	12.9	36.1	97.1
Cash incentives for health workers	0.0	2.5	0.0	0.0	2.5
Recovery and economy	0.3	9.5	43.1	11.7	64.8
<b>(4) Preserve Stability</b>					
Supply chain management	3.9	3.1	20.7	14.8	42.6
Transport and fuel	22.9	0.0	0.5	0.0	23.4
Social mobilization	0.6	18.6	13.2	13.3	45.8
Messaging	1.5	0.3	1.1	0.3	3.2
Regional support for Points 1-4	11.9	0.0	0.0	0.0	0.0
<b>(5) Prevent Outbreaks in Unaffected Countries</b>					
Multi-faceted/preparedness (regional)	30.5	0.0	0.0	0.0	30.5
<b>Total</b>	<b>88.0</b>	<b>194.1</b>	<b>473.1</b>	<b>220.4</b>	<b>987.8</b>

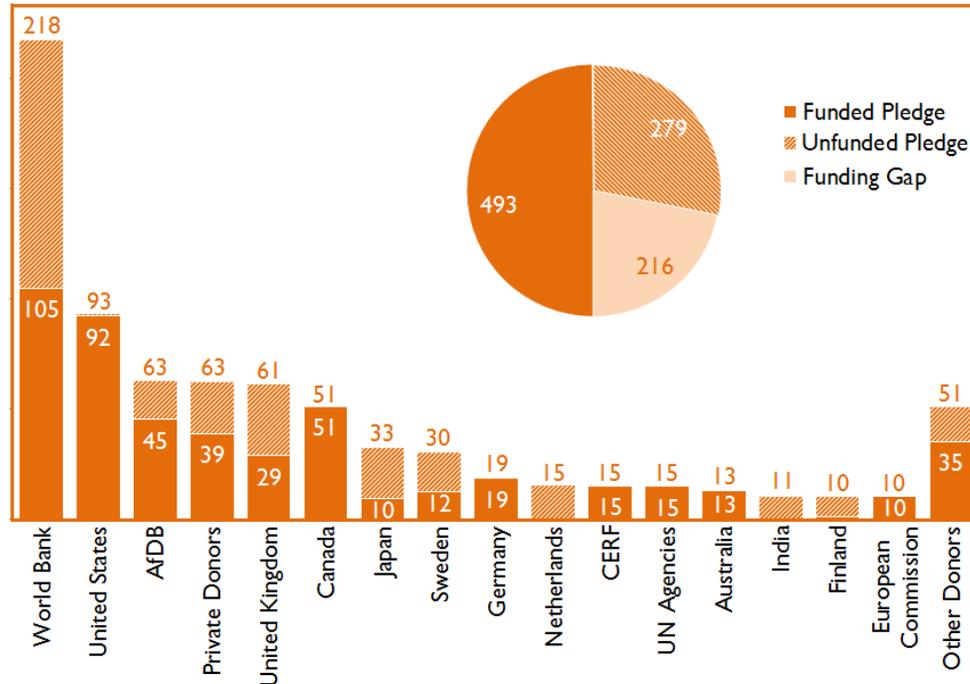
**Source:** United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), *Ebola Virus Disease Outbreak: Overview of Needs and Requirements*, September 2014.

**Notes:** The amounts in the table reflect the totals indicated in the U.N. plan. Due to rounding, the subtotals do not always equal the amount indicated in the Total column.

<sup>37</sup> United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), *Ebola Virus Disease Outbreak: Overview of Needs and Requirements*, September 2014.

As of October 29, 2014, donors have contributed \$493 million towards the UN plan and pledged to provide an additional \$279 million (**Figure 8**).<sup>38</sup> Donors are also providing resources for addressing the Ebola outbreak outside of the UN response. The United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) estimates that some \$894 million has been committed for addressing the outbreak and an additional \$938 million has been pledged for the immediate and long-term preparedness needs. WHO and UNOCHA will likely revise their requests for funding and material support as the outbreak continues to spread.

**Figure 8. Pledges, Commitments, and Disbursements for UN Ebola Plan**  
(as of October 27, 2014)



**Source:** Created by CRS from UNOCHA, Financial Tracking Service webpage on the Ebola outbreak at <http://fts.unocha.org/>, accessed on October 22, 2014.

## WHO Ebola Response Roadmap

As indicated above, roughly half of the U.N. request for tackling the outbreak is aimed at addressing direct health impacts. The World Health Organization is leading that component and has outlined measures the international community would need to take to contain the outbreak by January 2014. In the plan, entitled the Ebola Response Roadmap, WHO requested donors provide roughly \$490 million for:

- building 158 referring and isolation centers capable of holding over 1,500 beds;
- increasing diagnostic capacity to process 600 samples monthly; and
- attracting more than 13,000 health workers to provide health care, conduct contact tracing, and institute safe burial protocols.

<sup>38</sup> UNOCHA webpage on Ebola Outbreak Funding at <http://fts.unocha.org>, accessed on October 22, 2014.

## WHO Community Care Campaign

Since September, pledges to send health workers to the region have increased, though human resource constraints continue to inhibit containment efforts. Since September, several countries have pledged medical support to the region, including Cuba’s commitment to deploy 165 health professionals;<sup>39</sup> a U.S. commitment to deploy 65 U.S. Public Health Service Commissioned Corps officers for providing Ebola care in an DOD-established ETU;<sup>40</sup> Britain’s provision of 750 troops, including medical officers;<sup>41</sup> and China’s pledge to send more than 170 health workers.<sup>42</sup> The African Union and East African Community have respectively committed to send 100 and 600 health workers.<sup>43</sup>

In light of human resource constraints, the Liberian Government, WHO, CDC, and other partners developed the Community Care Campaign, which will initially be targeted at “the 400,000 most vulnerable households in Liberia” and will be subsequently expanded to cover the rest of the country and region.<sup>44</sup> The Community Care Campaign calls for the establishment of community care centers (CCCs), which will be managed and staffed by non-governmental organizations (NGOs), community health workers (CHWs, lay people with rudimentary health training) and family members of EVD patients. The CCCs are intended to “complement” Ebola Treatment Units that are staffed by trained health practitioners and are operating at maximum capacity. The Sierra Leonean government and implementing partners are also establishing CCCS in the country. **Table 4** summarizes similarities and differences between the two facilities.

**Table 4. Similarities and Differences Between ETUs and CCCs**

	<b>Ebola Treatment Units</b>	<b>Community Care Centers</b>
Bed Capacity	up to 100 beds	up to 15 beds
EVD Diagnosis	yes	depends on facility
Healthcare for EVD patients <sup>a</sup>	intravenous care, including hydration and blood transfusion; maintenance of oxygen and blood pressure levels; and treatment of other infections	oral rehydration, pain killers, fever reducers, and antimalarials
EVD Care	provided by trained medics	provided by NGOs, CHWs and family members
Oversight of Ebola Care Practices	on-site	off-site
Access to food and water	yes	yes

**Source:** Created by CRS from WHO, Key Considerations for the Implementation of an Ebola Care Unit at Community Level, September 2014.

a. For more on care and treatment of EVD symptoms, see <http://www.cdc.gov/vhf/ebola/treatment/>.

<sup>39</sup> WHO, “Cuban medical team heading for Sierra Leone,” Press Release, September 2014.

<sup>40</sup> HHS, “U.S. Public Health Service Commissioned Corps to help treat Ebola patients in Liberia,” September 16, 2014.

<sup>41</sup> USAID, “West Africa-Ebola Outbreak,” Fact Sheet #4, October 22, 2014.

<sup>42</sup> Ewan MacAskill and Rowena Mason, “British troops to be sent to help fight Ebola,” *The Guardian*, October 8, 2014.

<sup>43</sup> USAID, “West Africa-Ebola Outbreak,” Fact Sheet #4, October 22, 2014.

<sup>44</sup> White House, “Fact Sheet: U.S. Response to the Ebola Epidemic in West Africa,” September 16, 2014.

## **U.S. Responses to Pandemic Threats and Ebola**

The United States is the leading funder of the international Ebola response and its financial support is continuing to rise. The U.S. Agency for International Development (USAID) reports that as of October 22, U.S. humanitarian funding for EVD responses totaled \$344.6 million.<sup>45</sup> In addition, the Department of Defense (DOD) is planning to spend more than \$1 billion on containing the outbreak in support of U.S. EVD activities in West Africa, as described below.<sup>46</sup>

On October 17, President Obama established an Ebola Czar to coordinate U.S. domestic and global responses to the Ebola outbreak. The U.S. Global Ebola strategy has four key goals:

- 1) control the outbreak,
- 2) mitigate second order impacts,
- 3) establish coherent leadership and operations, and
- 4) advance global health security.

U.S. global efforts focus primarily on Liberia, where the outbreak is most widely spread, although the United States is engaged in all three affected countries. As of October 25, nearly 900 U.S. Government personnel are stationed in the region, more than 700 of which are among the 4,000 military personnel who will be deployed to the region.<sup>47</sup>

U.S. responses to the current Ebola outbreak are built on prior and ongoing efforts to build the capacity of foreign nations to prepare and respond to disease outbreaks—including Ebola. These activities are primarily implemented through USAID and CDC, though the U.S. Departments of Agriculture, Defense, and State also contribute to such efforts. Pandemic preparedness programs began in earnest after the 2005 avian flu outbreak and have experienced varying levels of congressional support. The section below briefly describes U.S. pandemic preparedness efforts, including Ebola outbreak responses, by agency.

### **USAID Pandemic Preparedness Efforts**

Since 2005, USAID has invested roughly \$1 billion on helping countries detect, prepare for, and respond to outbreaks that originate in animals, such as Ebola, and that have the potential to cause pandemics.<sup>48</sup> In FY2014, USAID spent \$72.5 million on such efforts through the Emerging and Pandemic Threats (EPT) program, which operates in 18 countries in Africa and Asia. The program grew out of USAID's initial response to H5N1 avian influenza in 2005.

Congress appropriates funds directly to USAID for EPT. These funds have fluctuated between FY2005-FY2014 (**Table 5**). Related activities in 18 countries in East and Central Africa and South and Southeast Asia focus on:

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<sup>45</sup> USAID, "West Africa-Ebola Outbreak," Fact Sheet #4, October 22, 2014.

<sup>46</sup> White House webpage on the U.S. Ebola response at <http://www.whitehouse.gov/ebola-response>, accessed on October 23, 2014.

<sup>47</sup> Communication with USAID, October 26, 2014.

<sup>48</sup> See the USAID webpage on pandemics at <http://www.usaid.gov/what-we-do/global-health/pandemic-influenza-and-other-emerging-threats>.

- **viral detection**—identification of viruses in wildlife, livestock, and human populations that may be public health threats;
- **risk determination**—characterization of the potential risk and method of transmission for specific viruses of animal origin;
- **institutionalization of a “one health” approach**—integration of a multi-sector approach to public health (including animal health and environment);
- **outbreak response capacity**—support for sustainable, country-level response to include preparedness and coordination; and
- **risk reduction**—promotion of actions that minimize or eliminate the potential for the emergence and spread of new viral threats.

**Table 5. USAID Pandemic Preparedness Funding**

(current U.S. \$ millions and percent)

	FY05 Actual	FY06 Actual	FY07 Actual	FY08 Actual	FY09 Actual	FY10 Actual	FY11 Actual	FY12 Actual	FY13 Actual	FY14 Estimate	FY15 Request	FY14- FY15
Avian Flu/ Pandemic Preparedness	16	162	161	115	190	106	93	58	55	73	50	-31.0%

**Source:** Created by CRS correspondence with USAID officials, August 6, 2014.

**Note:** Includes supplemental appropriations.

### USAID Ebola Responses<sup>49</sup>

USAID has deployed a Disaster Assistance Response Team (DART) to West Africa to coordinate the U.S. Government’s response to the Ebola outbreak. In coordination with other federal agencies, the team is overseeing the U.S. response. Between March and October 2014, USAID has committed to provide more than \$300 million for combating Ebola in West Africa.<sup>50</sup> This included the provision of resources for 1,000 treatment beds, 130,000 sets of protective equipment for healthcare staff and outbreak investigators, as well as 50,000 hygiene kits, which include soap, bleach, gloves, masks, and other supplies to help prevent the spread of disease.<sup>51</sup> USAID is also supporting the International Federation of Red Cross and Red Crescent Societies (IFRC) to raise public awareness of Ebola’s mode of transmission, teach disease prevention practices to communities, train volunteers to detect Ebola symptoms and identify contacts of confirmed or suspected cases for further monitoring, and support safe burial and body management activities. USAID has reprogrammed funds from the Global Health and International Disaster Assistance accounts to fund these efforts.

<sup>49</sup> Summarized from USAID, “USAID and CDC Announce Additional Assistance for West Africa Ebola Response,” press release, August 5, 2014.

<sup>50</sup> USAID, “West Africa-Ebola Outbreak,” Fact Sheet #4, October 22, 2014.

<sup>51</sup> U.S. Embassy, “U.S. to Help Mobilize More Health Workers for Ebola Outbreak,” September 9, 2014.

## CDC Pandemic Preparedness Efforts

CDC funds its global pandemic preparedness efforts through a variety of accounts, including the Global Disease Detection (GDD) program, Emerging and Zoonotic Infectious Diseases, Global Health, Immunization and Respiratory Diseases, and Public Health Preparedness and Response. The Centers leverage resources from these and other program accounts to respond to global disease outbreaks—including Ebola. Appropriations for GDD have grown since 2003 (**Table 6**).

**Table 6. CDC Global Disease Detection Funding**  
(current U.S. \$ millions)

	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Actual	FY08 Actual	FY09 Actual	FY10 Actual	FY11 Actual	FY12 Actual	FY13 Actual	FY14 Estimate	FY15 Estimate
GDD	12	21	32	32	31	34	44	42	42	45	45	45

**Source:** Created by CRS from correspondence with the Office of Management and Budget (OMB), appropriations legislation, and budget justification documents.

CDC has requested additional support (\$45 million) in FY2015 to fund activities in support of the Global Health Security Agenda, which will accelerate activities to detect, prevent, and respond to global infectious disease threats like Ebola.<sup>52</sup> CDC directly or indirectly supports pandemic influenza preparedness efforts in more than 50 countries. In some cases, CDC sends experts to work with WHO country offices or foreign health ministries, and at other times, CDC forms cooperative agreements with partners to support country efforts.

## CDC Ebola Responses<sup>53</sup>

At the end of March 2014, CDC teams traveled to Guinea and Liberia to help those Health Ministries characterize and control the outbreak, identify and manage EVD cases, conduct contact tracing, and improve data management. Following an initial response, new cases flared up after appearing to decelerate for some time. CDC returned to the region and began resumed technical assistance efforts. In addition to the activities discussed above, CDC is also training airport personnel and working with partners to display Ebola-specific travel messages for electronic monitors and posters at airports in the affected countries. CDC is not providing direct care of Ebola patients. As of October 22, 2014, CDC has committed more than \$16.7 million for its Ebola responses.<sup>54</sup>

## Department of Defense Ebola Responses

Until recently, DOD responses to the outbreak were focused on researching treatments and vaccines and providing laboratory diagnostic assistance to Sierra Leone and Liberia. On September 8, DOD announced that it would provide \$22 million to set up a 25-bed field hospital

<sup>52</sup> For more on the Global Health Security Agenda, see <http://www.cdc.gov/globalhealth/security/>.

<sup>53</sup> This section was summarized from correspondence with CDC. Also see, Meredith Dixon and Ilana Schafer, “Ebola Viral Disease Outbreak – West Africa, 2014,” *Morbidity and Mortality Weekly Report* (June 27, 2014), volume 63, issue 25, pp. 548-551; and <http://www.cdc.gov/vhf/ebola/outbreaks/guinea/>.

<sup>54</sup> USAID, “West Africa-Ebola Outbreak,” Fact Sheet #4, October 22, 2014.

in Liberia that would be used to treat EVD cases among healthcare workers. The Department of Health and Human Services (HHS) U.S. Public Health Service Commissioned Corps will deploy 65 officers “to Liberia to manage and staff the hospital.”<sup>55</sup> Military personnel will establish and supply the facility, but not provide direct medical care.<sup>56</sup>

On September 16, President Barack Obama announced the launch of “Operation United Assistance.”<sup>57</sup> The operation is to be based in Monrovia, Liberia, will entail the deployment of roughly 4,000 U.S. military forces, and be overseen and coordinated by the DOD U.S. Africa Command. The operation will support:

- the coordination of U.S. and international relief efforts;
- the provision of medical personnel to train up to 200 health workers weekly; and
- the establishment of 12 treatment centers in Liberia, each with 100-bed capacity.

Operation-related efforts are underway. The first 22-bed ETC is expected to be completed by the end of October and three others are to be completed in November.<sup>58</sup> More than 700 U.S. military personnel are in the region, including personnel from the U.S. Naval Medical Research Center who are operating three mobile medical labs for EVD testing.<sup>59</sup> Congress has approved several DOD reprogramming requests to fund Operation United Assistance as well as other related activities, including those that supply personal protective equipment, laboratory inputs, and technical advisors to the region. Total DOD funding for the global Ebola response is expected to exceed \$1 billion.<sup>60</sup>

## **Possible Issues for Congress**

The current Ebola outbreak has overwhelmed the governments of Guinea, Sierra Leone, and Liberia. Insufficient capacity to detect, treat, and prevent the spread of disease has enabled the virus to spread and has further weakened health systems that were already inundated and in dilapidated conditions. Congress has held several hearings on the outbreak and enacted legislation that urged expanding U.S. and international responses and that provided funds for U.S. responses. As the outbreak continues to spread, the Administration may request additional funds to contain the outbreak. This section describes issues Congress may consider as it assesses U.S. and international responses.

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<sup>55</sup> HHS, “U.S. Public Health Service Commissioned Corps to help treat Ebola patients in Liberia,” Press Release, September 16, 2014.

<sup>56</sup> Richard Sisk, “Pentagon to Set Up Ebola Field Hospital in Liberia,” *Military.com*, September 8, 2014; and AFP, “US to Send Field Hospital to Ebola-Hit Liberia,” September 8, 2014.

<sup>57</sup> White House, “Fact Sheet: U.S. Response to the Ebola Epidemic in West Africa,” September 16, 2014.

<sup>58</sup> White House, “Fact Sheet: The U.S. Government’s Response to Ebola at Home and Abroad,” October 22, 2014.

<sup>59</sup> *Ibid.*

<sup>60</sup> White House, “Fact Sheet: U.S. Response to the Ebola Epidemic in West Africa,” October 6, 2014.

## Human Resource Constraints

At the end of August, WHO estimated that it would take 13,000 health workers to contain the Ebola outbreak.<sup>61</sup> Although foreign governments and non-governmental organizations are beginning to deploy medics and other health workers, their numbers are not sufficient to meet the human resource demands. Human resource constraints are most acute in Liberia, where access to Ebola care is the most limited. The United States has partnered with the Liberian government, WHO, and other groups to develop a Community Care Campaign (see “WHO Community Care Campaign”). Doctors Without Borders (known by its French acronym, MSF) has expressed concern about the Community Care Campaign, asserting that the CCCs could turn into “contamination centers” without strict infection control, adequate supplies, trained staff, regular supervision, the ability to diagnose and refer patients, and proper burial methods.<sup>62</sup> WHO acknowledges that “any deficiencies in the quality of implementation could present major risk of virus transmission within the CCC thus exacerbating a situation it is set out to address.”<sup>63</sup> Key factors that may complicate safe implementation of the Community Care Campaign include:

- **Quality control.** Inconsistent adherence to infection control protocol is reportedly contributing to EVD cases among health workers. The inability to ensure disease infection, prevention, and control (IPC) protocols among trained health personnel calls into question whether non-governmental organizations, community health workers, and family members will adhere to IPC protocols. This concern is particularly acute for lay personnel (like family members) who may provide Ebola care in the CCCs.
- **Family care providers.** To avoid the possible spread of EVD from familial caretakers to other community members, WHO recommends that only one family member provide care for each patient for the duration of their stay in the CCCs. WHO specifies that the “family member providing supportive care to the patient must not go back and forth between the CCC and the community.”<sup>64</sup> However, collective familial care of and close community interaction with the ill is common in Liberia. It is unclear whether CCC supervisors will be able to curtail this custom and ensure that only one family member provides care. Other factors, including loss of income, separation of the caretaker from their uninfected family members, or emotional stress from being in a CCC, might also discourage compliance with WHO familial care guidelines.
- **Waste management and safe burial practices.** IPC protocol requires that those handling the soiled linen of EVD patients, cleaning the CCCs, or burying victims of EVD wear personal protective equipment (PPE). Further, in order to prevent the spread of EVD within CCCs, caretakers must follow strict protocol in using PPE and managing waste (using only designated areas for waste disposal and ensuring daily collection of human and PPE waste). The affected countries face deficiencies in waste management. In 2012, less than 20% of people living in the

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<sup>61</sup> WHO, *Ebola Response Roadmap*, August 28, 2014, p. 24.

<sup>62</sup> Lenny Bernstein and Lena Sun, “New effort to fight Ebola in Liberia would move infected patients out of their homes,” *Washington Post*, September 22, 2014.

<sup>63</sup> WHO, *Key Considerations for the Implementation of an Ebola Care Unit at Community Level*, September 2014.

<sup>64</sup> *Ibid.*

affected countries had access to improved sanitation facilities.<sup>65</sup> It may be a challenge ensuring strict adherence to IPC protocol among lay care takers without medical training, particularly if they lack access to sanitation themselves.

- **Oversight.** According to WHO, “monitoring and supervision is critical in ensuring the success of the approach.”<sup>66</sup> Most of the “low level community health workers and members of the community” who will be tasked with providing care in CCCs have never done so before. The Community Care Campaign calls for once daily supervisory visits by at least one health care worker trained in IPC. It remains to be seen whether once daily visits are enough to ensure compliance with the IPC protocols, as well as others, including proper and consistent use of PPE by care takers, launderers, burial team, and sanitation workers.
- **Supply chain management.** Due to poor supply chain management practices, many publicly funded health clinics in the affected countries face interruptions in medical supplies and often lack commodities such as gloves, masks, and gowns. A lack of protective equipment in ETUs and health clinics has been associated with EVD infection among health workers.<sup>67</sup> Lapses in protective gear in CCCs can lead to unsafe practices, such as recycling or reusing existing PPE. It remains to be seen whether WHO and its partners will be able to ensure the continuous supply of commodities to disparate CCCs.

WHO recognizes the inherent risks of this effort and advises that Ministries of Health in the affected countries “embark on this approach in an incremental manner starting with a few pilots that are well monitored before taking it up to scale.”<sup>68</sup>

U.S. implementation of the Community Care Campaign is already underway. USAID is issuing grants to non-governmental organizations to oversee the management of Community Care Centers. The White House reports that the United States Government has already provided 9,000 community care kits in Liberia for use by individuals in their homes.<sup>69</sup> NGOs generally have autonomy over the implementation of USAID grants, and USAID oversees implementation to ensure that program targets are met. Questions abound, however, about U.S. oversight and implementation of this campaign, particularly regarding U.S. government oversight of grantees managing CCCs and the standardization of quality control and IPC protocol.

## **Leadership of the International Outbreak Response**

Observers have criticized WHO leadership over the global Ebola response. Some critics have contended that budget cuts that began under WHO’s reform efforts have made the Organization less effective and have limited its capacity to contain the outbreak.<sup>70</sup> The 2014-2015 WHO program budget called for a 51% reduction in outbreak and crisis response activities from 2012-

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<sup>65</sup> World Bank database, accessed on October 1, 2014.

<sup>66</sup> WHO, *Key Considerations for the Implementation of an Ebola Care Unit at Community Level*, September 2014.

<sup>67</sup> For more on health infrastructure deficiencies, see Joseph Forrester et al., “Assessment of Ebola Virus Disease, Health Care Infrastructure, and Preparedness-Four Counties, Southeastern Liberia, August 2014,” *Morbidity and Mortality Weekly Report*, October 7, 2014, volume 1, issue 3.

<sup>68</sup> WHO, *Key Considerations for the Implementation of an Ebola Care Unit at Community Level*, September 2014.

<sup>69</sup> White House, “Fact Sheet: The U.S. Government’s Response to Ebola at Home and Abroad,” October 6, 2014.

<sup>70</sup> Sheri Pink, “Cuts at WHO Hurt Response to Ebola Crisis,” *New York Times*, September 3, 2014.

2013 levels.<sup>71</sup> Some observers maintain that earlier budget cuts have also crippled the agency by reducing critical staff, causing the closure of the viral hemorrhagic fever unit, and undermining operational capacity.<sup>72</sup> Beyond budgetary constraints, some critics contended that WHO's response has been stymied by bureaucratic bloat and undue influence of underqualified staff who attained their positions due to political relationships.<sup>73</sup>

Weak health systems in the affected countries, inadequate capacity of WHO to carry out its own Ebola plans, as well as insufficient international responses to the outbreak have reignited debates about whether WHO should function primarily as an advisory body or maintain some form of operational capacity. Some analysts advocate for the establishment of a WHO-administered "Health Systems Fund," that could be used to both build long-term health system capacity, as well as address short-term crises like the ongoing Ebola outbreak.<sup>74</sup> While supporting the need for a ready-to-deploy team of emergency health responders, others assert the "politics of sovereignty" would preclude WHO from leading such an effort.<sup>75</sup>

## **U.S. Support for Ebola Responses and Health Systems**

The speed at which EVD is spreading across West Africa is attributable, in large part, to weak health systems in those countries. Donors have long grappled with how to address health emergencies in light of dysfunctional health systems. In the early 2000s, donors turned to disease-based funding and channeled health aid through non-governmental groups. Opponents of this approach argued that disease-specific programs exacerbate human resource shortages in the public sector and further weaken health systems when parallel bureaucracies are established and government authorities are bypassed. Supporters assert that disease-based funding strengthens oversight capacity and facilitates the monitoring and evaluation of the investments.

This debate intensified following the introduction of the President's Emergency Plan for AIDS Relief (PEPFAR).<sup>76</sup> In an effort to curb the massive number of deaths that followed the introduction of HIV/AIDS, U.S. agencies provided funding to large non-governmental organizations and local partners who established care and treatment facilities outside of government networks. While the effort helped save millions of lives and averted millions more HIV infections, the United States became the sole supporter for millions of people worldwide whose lives would be at risk should U.S. funding be discontinued. In the second phase of PEPFAR (FY2009-FY2013), increasing portions of PEPFAR resources were used to support

<sup>71</sup> WHO, *Proposed Programme Budget 2014-2015*, April 19, 2013, Sixty-Sixth World Health Assembly, A66/7.

<sup>72</sup> Doctors Without Borders, "Ebola: the failures of the international outbreak response," September 2, 2014. Stephanie Nebehay and Barbara Lewis, "WHO slashes budget, jobs in new era of austerity," *Reuters*, May 19, 2011.

<sup>73</sup> Jason Gale and John Lauerman, "How the World's Top Health Body Allowed Ebola to Spiral Out of Control," *Bloomberg*, October 17, 2014; Lena Sun et al., "Out of Control: How the world's health organization failed to stop the Ebola disaster," *The Washington Post*, October 4, 2014; and Associated Press, "World Health Organization admits botching attempts to stop Ebola in West Africa," October 17, 2014.

<sup>74</sup> Lawrence Gostin, "West Africa's Ebola Epidemic is Out of Control, But Never Had to Happen," Briefing Paper Number 9, August 20, 2014. For more on the possible structure and functions of the Global Health Fund, see Lawrence Gostin and Eric Friedman, "Towards a Framework Convention on Global Health: A Transformative Agenda for Global Health Justice," *Yale Journal of Health Policy, Law, and Ethics*, (2013), volume 13, issue 1.

<sup>75</sup> Jack Chow, "The Ultimate Ebola-Fighting Force," *Foreign Policy*, September 10, 2014.

<sup>76</sup> For more on PEPFAR, see CRS Report IF00042, *The President's Emergency Plan for AIDS Relief (PEPFAR): Summary of Recent Developments (In Focus)* and CRS Report R42776, *The President's Emergency Plan for AIDS Relief (PEPFAR): Funding Issues After a Decade of Implementation, FY2004-FY2013*, by Tiaji Salaam-Blyther

health systems in hopes of bolstering country capacity to assume ownership over HIV/AIDS programs. Now in its third phase, debate on the use of PEPFAR funds for building health systems has resumed. A 2013 GAO report noted that roughly 21% of PEPFAR funds were spent on capacity building projects under the “other” budgetary category. At her confirmation hearing, PEPFAR Country Coordinator Deborah Birx asserted that under her leadership, 50% of all PEPFAR resources, including those funded through other accounts, would be spent on care and treatment activities, as mandated. Health system advocates fear that budgetary reforms aimed at adhering to the law may imperil efforts to bolster health systems.

The U.S. Congress faces a similar dilemma with the current Ebola outbreak. The affected countries need focused support to contain and end this outbreak. If and when the outbreak is arrested, however, the countries may not be in any better position to detect, prevent, or respond to other potential disease outbreaks unless donors begin the arduous task of supporting the development of strong health systems. Ken Isaacs, Vice President of International Programs and Government Relations at Samaritan’s Purse, described this dilemma at an August 2014 congressional hearing on Ebola, stating “While it should be the goal of the developed world to build capacity, the building of this capacity should not be the focus during times of an emergency crisis of a deadly disease that threatens the international community.”<sup>77</sup> USAID has reportedly established an Ebola Health Systems Strengthening working group to support the resumption of health care delivery and to bolster the health systems once the outbreak is contained.<sup>78</sup>

Though PEPFAR and other U.S.-funded health programs have attempted to respond to calls for greater investment in health systems, no appropriations specifically targeting such efforts are provided. Language in appropriations and accompanying conference reports direct the majority of health aid to particular diseases, leaving minimal resources for broader activities to strengthen health systems. The inability of the affected countries to respond to an unforeseen health event may prompt Congress to review how global health funds are appropriated.

## **Evaluating U.S. Responses**

A variety of U.S. agencies are responding to the ongoing Ebola outbreak. The Department of State is leading diplomatic engagements; USAID is coordinating U.S. responses, including the provision of financial and material support; CDC is heading public health and medical response activities; and DOD is handling support for foreign armed forces. With the exception of USAID, the budgetary structure of each of these agencies enables them to respond to this unanticipated event by drawing from accounts that have flexible authorities. The Department of State’s efforts to coordinate bilateral diplomatic engagements are conducted through existing channels (e.g., embassy contacts) and, as such, would not require additional, dedicated funding. Outbreak responses by the CDC can be financed through USAID disaster assistance accounts, as well as several CDC accounts that are used for domestic and international health efforts and for which there is not explicit congressional direction on their use. The DOD budget also supports an array of domestic and international health activities that do not receive detailed congressional direction.

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<sup>77</sup> U.S. Congress, House Committee on Foreign Affairs, Subcommittee on Africa, Global Health, Global Human Rights and International Organizations, *Combating the Ebola Threat*, Testimony by Ken Isaacs, Vice President of International Programs and Government Relations, Samaritan’s Purse, August 7, 2014

<sup>78</sup> USAID, *Investing in Health Systems to Address the Ebola Outbreak*, September 30, 2014.

Congress has established numerous directives over the years on how foreign aid funds are to be used. As the lead U.S. development agency, USAID often receives specific direction from Congress on how the bulk of its funds will be used through annual appropriations, leaving the agency with limited ability to address unanticipated events, like the current Ebola outbreak, without drawing from ongoing health efforts. According to USAID, it is currently reprogramming funds planned for preventing future outbreaks, as well as addressing ongoing outbreaks (including responses to H7N9 avian influenza in China and MERS-CoV in the Middle East), to address the current Ebola outbreak.<sup>79</sup>

Supporters of the current appropriation structure see it as a tool for overseeing health programs and ensuring that congressional priorities are met. Opponents argue that congressional directives encumber the agility that is needed in the field and create artificial segmentation of health and development issues, thereby limiting the impact and sustainability of such efforts.

By their nature, disease outbreaks are often unpredictable, though with appropriate disease surveillance, detection, and response mechanisms, their impact can be minimized. At present, USAID pandemic preparedness efforts are focused on East and Central Africa, where previous Ebola and influenza outbreaks have occurred, as well as South and Southeast Asia. Now that Ebola has emerged in West Africa, another EVD outbreak may occur in the region; a scenario the affected countries may be ill-prepared to handle. The FY2015 budget request (\$50 million) for pandemic preparedness is roughly 30% less than the FY2014 funding level (\$73 million). Even if Congress funds USAID pandemic preparedness programs at the FY2014 funding level, one USAID official contends that it will not be enough to meet current demands.<sup>80</sup>

## **Addressing the Long-Term and Broader Effects of the Outbreak**

Under the best of circumstances, experts predict that the outbreak can be contained by the end of January. In the meantime, the high death tolls are disrupting social structures and may cause broad, long-term effects in the region. MSF has reported that some affected villages in Sierra Leone have lost the majority of adult community members, leaving vulnerable populations—such as children and the elderly—without resources to cultivate agricultural land and procure food.<sup>81</sup> Observers are also concerned about a growing number of children who are being orphaned from Ebola. This group is particularly vulnerable to marginalization due to overwhelming fear of the virus. Countries in West and Central Africa already had large orphan populations due to a variety of causes including armed conflict and HIV/AIDS. In 2012, some 28 million children were orphaned in the region, of whom more than 4 million lost one or more parent to AIDS.<sup>82</sup> The outbreak is also hindering the capacity of these governments to address other health issues, such as obstetrical complications. Experts are concerned that child and maternal mortality rates, already high in the region, may further rise due to diminishing numbers of health personnel (caused both by Ebola deaths and abandonment of posts), diversion of limited resources to Ebola treatment centers, and public avoidance of health centers.

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<sup>79</sup> CRS correspondence with USAID, August 5, 2014.

<sup>80</sup> Ibid.

<sup>81</sup> USAID, *West Africa Ebola Outbreak—Update # 5*, August 18, 2014.

<sup>82</sup> UNICEF, *Towards an AIDS-Free Generation Children and AIDS: Sixth Stocktaking Report*, 2013.

The full health effects of the Ebola outbreak may not be known until it is contained. An accounting of broader health and development needs will likely ensue and may rekindle debate over how U.S. global health assistance funds are apportioned. Congress is likely to face arguments from advocates from a variety of actors attempting to garner support for a bevy of health and development issues that will have likely worsened in the wake of Ebola, including maternal and child mortality, child vulnerability and orphanhood, poverty, food scarcity, and water-borne infections.

## **Considering Research and Development Needs**

Since 1976, several Ebola outbreaks have erupted in sub-Saharan Africa, yet therapeutic options remain undeveloped. There is no specific cure, treatment, or vaccine for Ebola, nor is there any post-exposure prophylaxis for health workers who face regular exposure. Treatment of EVD symptoms increases the probability of survival. Several experimental specific treatments and vaccines are beginning clinical trials to determine their safety and efficacy. The appropriate use of experimental drugs that have not been tested for human safety and effectiveness has become a matter of debate, particularly around the issue of equity.

A global health lawyer described the ensuing debate. “Should [U.S.] workers receive a drug in extremely scarce supply when Africans are affected in far greater numbers? Balanced against this sense of injustice is the ethical concern of administering an experimental drug to African patients that has not undergone any safety testing in humans.”<sup>83</sup> In addition, if the experimental drugs are ineffectual or cause serious side effects, then their use may further exacerbate mistrust in healthcare workers and modern medical treatments. WHO held a special meeting in August on the topic and announced that under “the particular circumstances of th[e] outbreak, and provided certain conditions are met ... it is ethical to offer unproven interventions with as yet unknown efficacy and adverse effects, as potential treatment or prevention.”<sup>84</sup>

In October, press reports indicated that WHO planned to begin testing two Ebola vaccines in January on some 20,000 health workers and other volunteers. The organization also indicated that a limited amount of an experimental treatment might be available for use in Liberia by early November.<sup>85</sup> At the end of October, WHO convened a meeting “with high-ranking government representatives from Ebola-affected countries and development partners, civil society, regulatory agencies, vaccine manufacturers and funding agencies yesterday to discuss and agree on how to fast track testing and deployment of vaccines in sufficient numbers to impact the Ebola epidemic.”<sup>86</sup> Once the trials commence, debates about ethical practices will likely ensue, particularly if trial participants die or experience other adverse reactions.

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<sup>83</sup> Lawrence Gostin et al., “The Ebola Epidemic: A Global Health Emergency,” *JAMA*, (August 11, 2014).

<sup>84</sup> WHO, “Ethical considerations for use of unregistered interventions for Ebola viral disease (EVD),” WHO statement, August 12, 2014.

<sup>85</sup> The Guardian, “WHO aims for Ebola serum in weeks and vaccine tests in Africa by January,” September 22, 2014.

<sup>86</sup> WHO, “WHO convenes industry leaders and key partners to discuss trials and production of Ebola vaccine,” news release, October 24, 2014.

## Conclusion

In an August 29, 2014 report, WHO warned that bordering countries, namely Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, and Senegal, were “at risk” of seeing Ebola cases.<sup>87</sup> On October 23, 2014, Mali reported its first Ebola case and health officials suspect that cases may exist in other neighboring countries. WHO is reportedly helping neighboring countries to build EVD surveillance, preparedness and response plans. An Oxford University study concluded that some 22 million people across Central and West Africa live in forested areas where one of the suspected vectors (fruit bats) resides,<sup>88</sup> raising concerns among some that future Ebola outbreaks may occur in the region and other parts of sub-Saharan Africa. The article notes that “changes in human mobility and connectivity will likely have profound impacts on the dispersion of Ebola cases.” Prospects for future Ebola outbreaks in urban areas and in countries with limited pandemic preparedness capacity raise several questions, including:

- Is the U.S. response to the Ebola outbreak effective?
- Does the United States sufficiently support pandemic preparedness efforts?
- Does disease-specific funding encumber pandemic preparedness efforts?
- Will the reprogramming of USAID funds to address the Ebola outbreak impact ongoing global health and development programs?
- Are ongoing outbreak responses by the U.S. and international improving the capacity of the affected countries, as well as others in the region, to identify, detect, and respond to future outbreaks?

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<sup>87</sup> WHO, *WHO: Ebola Response Roadmap Situation Report 1*, August 29, 2014.

<sup>88</sup> David Pigott et al., “Mapping the zoonotic niche of Ebola virus disease in Africa,” *Elife*, (September 7, 2014).