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EVALUATION

EVALUATION OF THE USAID/OFDA EBOLA VIRUS DISEASE OUTBREAK RESPONSE IN WEST AFRICA 2014–2016

OBJECTIVE 4. COORDINATION OF THE RESPONSE

Photo courtesy of the United States Department of Defense

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Evaluation of the USAID/OFDA Ebola Virus Disease Outbreak Response in West Africa 2014–2016
Objective 4: Coordination of the Response

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ACRONYMS AND ABBREVIATIONS

ACF	Action against Hunger
AMEP	Activity Monitoring and Evaluation Plan
ANSS	*Agence Nationale de la Securité Sanitaire*
ASEOWA	African Union Support to the Ebola Outbreak in West Africa
AU	African Union
BCC	Behavior change communication
CEBS	Community event-based surveillance
CCC	Community Care Center
CDC	Centers for Disease Control and Prevention
CECI	Center for International Studies and Cooperation
CHW	Community Health Worker
CNLE	National Coordination Cell
COR	Contracting Officer's Representative
CRS	Catholic Relief Services
CT	Contact tracer
DART	Disaster Assistance Response Team
DASP	Disaster Assistance Support Program
DCHA	Democracy, Conflict and Humanitarian Assistance
DERC	District Ebola Response Centers
DFID	UK Department for International Development
DHMT	District Health Management Team
DHS	Department of Homeland Security
DOD	United States Department of Defense
DOS	United States Department of State
DRC	Danish Refugee Council
ECHO	European Community Humanitarian Office
EOC	Emergency Operations Center
ERC	Ebola Response Consortium
ETU	Ebola treatment unit
EU	European Union
EVD	Ebola virus disease
FEMA	Federal Emergency Management Agency
FETP	Field Epidemiology Training Program
FEWS NET	Famine Early Warning System Network
FFP	Food for Peace
FGD	Focus group discussion
FRC	French Red Cross
GC	Global Communities
GHSA	Global Health Security Agenda
GOARN	Global Outbreak Alert and Response Network
GOG	Government of Guinea
GOL	Government of Liberia
GoSL	Government of Sierra Leone
HC3	Health Communication Capacity Collaborative
HCW	Health care workers
HHBM	Health and Humanitarian Border Management
HHS	Health and Human Services
HIV	Human immunodeficiency virus
HKI	Helen Keller International
HTH	Heart to Heart
IBTCI	International Business & Technical Consultants, Inc.
ICS	Incident Command System
IFRC	International Federation of Red Cross and Red Crescent Societies
IHR	International Health Regulations
IMC	International Medical Corps
IMS	Incident Management System
INSS	*Instituto Nacional do Seguro Social*
IOM	International Organization for Migration
IP	Implementing partner
IPC	Infection prevention and control
IRC	International Rescue Committee
JSI	John Snow International
KAP	Knowledge, attitude and practices
KII	Key informant interview
ME&L	Monitoring, evaluation & learning
MHPSS	Mental health and psychological support service
MITAM	Mission Tasking Matrix
MMU	Monrovia Medical Unit
MMWR	Morbidity and Mortality Weekly Reports
MOH	Ministry of Health
MOHS	Ministry of Health and Sanitation
MOHSW	Ministry of Health and Social Welfare
MOU	Memorandum of understanding
MSF	*Médecins sans Frontières*
MTI	Medical Teams International
NERC	National Ebola Response Center
NGO	Nongovernmental organization
NIH	National Institutes of Health
NSC	National Security Council
OCHA	UN Office for the Coordination of Humanitarian Affairs

ODI	Overseas Development Institute
OFDA	Office of United States Foreign Disaster Assistance
OICC	Observational Interim Care Center
PAE	Pacific Architects and Engineers
PCI	Project Concern International
PHS	Public Health Service
PHU	Primary Health Unit
PIH	Partners in Health
PIO	Public International Organization
PMP	Performance management plan
PPE	Personal protective equipment
PSI	Population Services International
PU-AMI	*Premiere Urgence - Aide Medicale Internationale*
RI	Relief International
RITE	Rapid isolation and treatment of Ebola
RMT	Response Management Team
SDB	Safe and dignified burials
SRU	Screening and referral unit
SOP	Standard operating procedure
SOW	Scope of work
SP	Samaritan's Purse
STC	Save the Children
TDH	*Terre des Hommes*
TOC	Theory of change
TOT	Training of Trainers
UK	United Kingdom
UN	United Nations
UNICEF	United Nations Children's Emergency Fund
UNHAS	UN Humanitarian Air Service
UNMEER	UN Mission for Ebola Emergency Response
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
USG	United States Government
USPHS	United States Public Health Service Commissioned Corps
USUHS	DOD Uniformed Services University of the Health Sciences
VHF	Viral hemorrhagic fever
WAHA	Women and Health Alliance
WAHO	West African Health Organization
WASH	Water, sanitation and hygiene
WB	World Bank
WHO	World Health Organization
WHH	*Welthungerhilfe*
WFP	World Food Programme
WV	World Vision

GLOSSARY

Case-fatality rate (CFR): The proportion of people who die from a specified disease among all individuals diagnosed with the disease over a specified period of time. CFR is typically used as a measure of disease severity and is often used for prognosis (predicting disease course or outcome), where comparatively high rates are indicative of relatively poor outcomes. Often in disease outbreaks, and particularly with EVD, CFR is used to assess the effectiveness of disease treatment and/or intervention.

Community or Civic Engagement: Similar to and overlapping with "social mobilization" (see below), this set of activities includes working with community leaders, local civil society organizations, opinion leaders, and community health workers. In the EVD outbreak, this includes a wide array of grassroots groups, such as motorcycle drivers, as well as established relationships by some NGOs with their village-level contacts.

Contact tracing: The identification and in-person tracking of all people who may have come into contact with an infected person to identify, as soon as possible, any new cases of infection. It is an integral component of active surveillance, as well as epidemic investigation. In the case of EVD, contact tracing includes close observation of persons with even casual contact with a known case for 21 calendar days after that contact (21 days being the maximum incubation period of EVD).

Cumulative incidence: The cumulative incidence is a measure of disease frequency that addresses the question "How far has the disease spread during a specified period of time?" It is calculated using the following formula: (Number of new cases) / (Total population at risk).

Ebola virus disease (EVD): EVD is a severe illness transmitted through direct contact with the bodily fluids (including semen, blood, breast milk), and tissues of infected animals or people. Symptoms of EVD include fever, severe headache, muscle pain, weakness, diarrhea, vomiting, and unexplained hemorrhage. Diarrheal stools and saliva cause more transmission than anything else.

Emergency Operations Center (EOC): A central facility to command and control emergency activities at a strategic and, if necessary, political level. Its functions are to gather and analyze surveillance and operational data, make decisions about outbreak control, convene response agencies, and disseminate decisions.

Incident Command System (ICS): A structured approach to the way complex teams of responders to emergencies are managed in terms of the clarity of their roles, responsibilities, span of authority, and simple lines of reporting. ICS is commonly applied by OFDA, FEMA, and USDA and trained in around the world, including for OFDA-supported capacity building with other governments.

Incident Management System (IMS): A broader category that incorporates and uses ICS, often at the national level, and expressly for multi-agency cooperation. At the national level in the three countries discussed in this evaluation, the IMS included nationwide systems, authorities, central offices, and processes for tracking each activity by each actor. In turn, this included a coherent surveillance system and software for managing data.

Infection prevention and control (IPC): IPC includes measures to prevent transmission within health facilities through PPEs, training, ventilation, procedures, referral systems, and triage. IPC also includes systems within the health facility, roles and responsibilities, existence of guidelines and physical resources, outbreak investigation, hygiene, and waste management.

Isolation: A measure to physically separate infected individuals from non-infected persons. Isolation can occur at the household, community, or larger level, including admitting infected persons to hospitals (Ebola treatment units) or community care centers. The purpose of isolation is to reduce forward transmission of the infection. Isolation in health care facilities is a standard measure to implement infection control: the prevention of contagious diseases from being spread from a patient to other patients, health care workers, and visitors, or from outsiders to a particular patient. In the West African context, isolation also included community and household- based isolation.

P-value: The p-value is a measure of the probability that differences observed between groups occurred by chance. Frequently, differences between groups are considered statistically significant if the p-value is less than .05. This means that there is a 5% chance or less that the observed difference occurred by chance.

Personal protective equipment (PPE): PPE is used by individuals dealing with infected individuals or around infectious materials. Typically worn by health care workers, health facility staff, and burial workers, this includes gowns, shoes, gloves, masks, goggles, other garments, and accompanying materials that create a safe barrier between infectious materials and the worker in order to prevent infection. A PPE package may also include air-purifying respirators. The clothing varies in weight, permeability, and complexity for donning (putting on) and doffing (removal).

Quarantine: Measures taken to reduce the spread of a disease by limiting movement of peoples, including reducing

the mobility of non-infected groups with the goal of limiting the spread of disease. Typically, quarantine does not apply to emergency responders or health workers, but to families and communities. Most frequently, it is enforced by authorities, often in response to an epidemic. It can be applied to humans or animals, and includes border control. In Sierra Leone, for example, extensive nationwide quarantine was used to limit movement.

Reproduction Number: Designated by R nought or R_0, this number is the average number of onward new infections from each single infection, or the number of secondary cases that one case generates, on average, over the course of that case's infectious period. Mathematically, it is represented as R_0= (the ratio of number of new cases) / (the infectious period of time). An R_0 greater than one signifies increasing transmission, and R_0 below one signifies contraction of the outbreak.

Social Mobilization: A broad, generic category for a wide range of activities that involve a large population, both through in-person travel and meetings and through media. In the EVD response, this included public gatherings, convenings of village leaders, meetings among religious leaders, home visits, radio and television programming, use of billboards, SMS, and internet social media. For many implementing partners in this effort, this type of activity was executed via cadres of community health workers or volunteers who received training, financial support, transportation (such as motorcycles), and messages to disseminate. Social mobilization includes the activities undertaken by international and local aid agencies and national and local governments, but also includes those of local populations themselves. Much of the social mobilization effort of the EVD response was oriented toward affecting behavior change among as many persons as possible to change simple behaviors such as shaking hands, other physical contact, washing hands, and the handling of infected persons and dead bodies.

Surveillance: Surveillance is the ongoing systematic collection, recording, analysis, interpretation, and dissemination of data reflecting disease occurrence in a community or population.

ABSTRACT

Citation: Hansch, Steven, with Swati Sadaphal, Jennifer Leigh, Michael Toole, and Gayla Cook. "Evaluation of Ebola Virus Disease Response in West Africa 2014–2016: Objective 4, Coordination of the Response." Evaluation Report to USAID/OFDA, January 2018, International Business & Technical Consultants, Inc., Vienna, VA.

Background: The West Africa Ebola virus disease (EVD) outbreak began in December, 2013 in southeastern Guinea. As the United States Government (USG) lead for the response, the U.S. Office of Foreign Disaster Assistance (OFDA) deployed a Disaster Assistance Response Team on August 5, 2014, and established a corresponding Response Management Team, which operated until January 4, 2016. The team from International Business & Technical Consultants, Inc. (IBTCI) conducted an independent performance evaluation of OFDA's EVD outbreak response in West Africa. The performance evaluation was guided by four complementary objectives relating to the overall effectiveness of the response, the effectiveness of different programmatic components, the relevance, and the coordination of OFDA's response.

Methods: The evaluation focused on the OFDA EVD response in Liberia, Guinea, and Sierra Leone. Data collection methods included: a review of peer-reviewed and gray literature, Centers for Disease Control and Prevention (CDC) reports and surveillance data, and reports from OFDA implementing partners (IPs); semi-structured focus group discussions (n=196); semi-structured key informant interviews (n=285); an online self-assessment of OFDA staff (n=49); roundtable discussions with other responders; and three quantitative surveys. These included: a household survey (n=16,365); a community health workers survey (n=288); and a contact tracer survey (n=250). The primary data collection occurred from March to July, 2017. The portion of the evaluation presented in this report focuses on the coordination of OFDA's response to the EVD outbreak.

Findings: At the field level, OFDA coordinated extensively through an array of differing national command structures in each country where they met and engaged with responders, donors, and national agencies. Both OFDA and CDC brought critical support to the national emergency operations centers which took several months to become effective. OFDA's field- based DART and DC-based RMT teams integrated different USG agencies into a coherent response on the behalf of most of the USG. Of international entities, the four most important for coordination turned out to be with the World Health Organization (WHO) overall, with the United Kingdom's response in Sierra Leone, and with the World Food Programme (WFP) and the International Organization for Migration (IOM) for logistics and border control.

Conclusions: OFDA coordination was effective and contributed to interrupting the transmission of EVD, judged by the evaluation of the design and scope of major contributions of combined USG resources deployed successfully to the field. However, the USG, with OFDA as the lead, responded only after the EVD outbreak had spread widely. OFDA mobilized quickly, but could have been operational earlier in the regional outbreak. The differing styles, expertise, and procedures of OFDA and CDC took time to synchronize, a learning process that led to delays early in the response.

Though OFDA responded in the field to the evolving epidemiology of the outbreak, the joint USG strategy also was unclear and needed to be frequently updated. The outbreak response benefitted from the *ad hoc* leadership of the U.S., absent any formal multi- lateral frameworks where responsibilities matched capabilities.

Recommendations: OFDA should prepare to play the lead USG role in many overseas public health emergencies of humanitarian proportions, given its global scope and ongoing mandate to coordinate US disaster response. OFDA should anticipate that this role may increase in the future.

OFDA should continue to build its internal skills and external partnerships to address public health emergencies arising from fatal disease outbreaks. Internally, OFDA should address gaps in guidelines and operating procedures for these emergencies with staff training and enhanced collaboration with CDC.

OFDA should play a role in continuing to work with and support the WHO in shepherding the International Health Regulations into practice and in improving its capacity to be an operations-level humanitarian agency. Moreover, OFDA should engage in a more substantive way with relevant donors such as France, Germany, the European Union, China, and regional WHO entities in planning for future outbreak roles and strategies.

Photo courtesy of the U.S. Department of Defense

EXECUTIVE SUMMARY

Evaluation Purpose and Rationale

Under contract AID-OAA-I-15-00022/Order No. AID-OAA-TO-16-00034, International Business & Technical Consultants, Inc. (IBTCI) received a contract from the Office of United States Foreign Disaster Assistance (OFDA) in October, 2016 to conduct an independent performance evaluation of its support for the Ebola virus disease (EVD) outbreak response in West Africa. This performance evaluation focused on programs funded by the United States Government (USG)'s EVD outbreak response strategy: Controlling the Outbreak. This evaluation was guided by four complementary objectives relating to the overall effectiveness of the response, effectiveness of different programmatic components, the relevance, and the coordination of OFDA's response to the EVD outbreak.

Project Background

The West Africa EVD outbreak began with a single illness in December, 2013 in southeastern Guinea, before spreading to the neighboring countries of Mali, Nigeria, Liberia, Senegal, and Sierra Leone. With symptoms similar to some other endemic infectious diseases, EVD was not definitively diagnosed in the region until March, 2014. Misinformation and lack of awareness among the local public(s) regarding EVD transmission modes, combined with inadequate health care facilities and lack of health staff trained in surveillance or in EVD response, allowed EVD to rapidly spread. The severity of the outbreak was recognized by the international community in the summer of 2014, and soon after, national governments and international organizations began to take the actions to control EVD. The USG response to the EVD outbreak in West Africa was structured around four "Pillars:" 1) control the outbreak; 2) mitigate second-order impacts of the crisis; 3) coherent leadership and operations; and 4) global health security. The goal of the USG Pillar One response was to reduce the spread of EVD by preventing or limiting the exposure of susceptible persons to the virus. OFDA pursued this by: 1) funding isolation of EVD cases and safe burial of those who died (required to decrease transmission); and 2) simultaneous and comprehensive social education and outreach (necessary to increase population-wide understanding of the disease, how to recognize it, how to prevent its transmission, and the importance of modifying behaviors that increase risk).

As the USG lead for the response, OFDA deployed a Disaster Assistance Response Team (DART) on August 5, 2014, and established a corresponding Response Management Team (RMT) based in Washington, DC at the same time.

The DART—a team that over the course of the response included disaster response and public health experts from OFDA, the Department of Defense (DOD), and the Centers for Disease Control and Prevention (CDC)—coordinated with the National Institutes of Health (NIH), the Peace Corps, and the U.S. Public Health Service Commissioned Corps (USPHS) when deployed to assist host country governments in containing the EVD outbreak. Specific and separate DARTs were posted in Liberia, Sierra Leone, and Guinea.

EVALUATION QUESTIONS

This evaluation report presents the findings, conclusions, and recommendations of the evaluation team related to Objective Four of the overall evaluation: Coordination of the Response. This report -- Objective Four -- includes evaluation questions eight, nine, and ten[1] out of the ten evaluation questions presented in the evaluation statement of work (SOW) (see Annex B). Evaluation questions eight, nine and ten ask:

8. *How effectively did OFDA coordinate all USG efforts as the lead agency in this response?*
9. *To what extent were the activities supported by the USG well-coordinated with the broader international response, including national response structures in the affected countries, and well-coordinated operationally among those organizations that the USG funded?*
10. *How well did OFDA adjust to the changing epidemiology and priorities of the international response?*

Evaluation Design and Methods

This performance evaluation was designed to evaluate programs funded by OFDA between March 1, 2014 and January 4, 2016. The evaluation focused on the EVD response in Liberia, Guinea, and Sierra Leone. It was designed with a utilization-focused approach—to provide findings, conclusions, and recommendations that can be applied to future OFDA responses, are scalable, and are actionable. The design implied that each evaluation question finding is supported by two or more data collection methods, and that each conclusion is supported by data triangulation and interpretation of two or more findings. The data collection methods included a review of peer-reviewed and gray (unpublished) literature, reports from OFDA's implementing partners (IPs), and surveillance data; semi-structured focus group discussions (FGDs) (n=196); semi-structured key informant interviews (KIIs) (n=285); an online self-assessment of DART and RMT members (n=49); roundtable discussions with other responders; and three quantitative surveys: a household survey (n=16,365); a community health workers survey (n=288); and a contact tracer survey (n=250). The primary data collection occurred from March to July, 2017. Contribution analysis was used to mitigate the limited ability to attribute outcomes to individual interventions due to presence of multiple actors and programs.

Findings

FINDINGS BY QUESTION

EVALUATION QUESTION 8

How effectively did OFDA coordinate all USG efforts as the lead agency in this response?

OFDA very effectively led and coordinated with the U.S. Embassies in West Africa, DOD, CDC, the U.S. Department of Agriculture (USDA), the U.S. Public Health Service (USPHS), the offices of Health and Human Services (HHS), Food for Peace (FFP), and the rest of the U.S. Agency for International Development (USAID). This was supported from extensive interviews across USG agencies and a review of USG documents, reviews, and field-level experience. OFDA deployed over 350 personnel with the RMT and DARTs, which coordinated with most USG agencies.

Representing the USG, OFDA effectively managed U.S. funding to a wide array of complex programs, with design and review by CDC, some of which involved deployment of USPHS officers to Liberia. These programs, implemented largely through IPs, covered a wide array of critical EVD control interventions, including:

1. Create effective nationally-led incident management and coordination.
2. Create adequate isolation and treatment capacity in the countries affected by the outbreak.
3. Assist the public health response through safe human remains management.
4. Restore safety and functionality to the health care system
5. Support the delivery of concise, credible, and clear public outreach and communications.

OFDA's coordination with the DOD was effective in mobilizing DOD assets to the field in a timely manner. This reflected a close working relationship built between OFDA and DOD over the last 25 years, resulting in efficient processes and joint understanding that allowed smooth OFDA/DOD coordination. One of the most valuable and effective contributions early in the response was the allocation of military medical laboratories to Liberia, staffed by U.S. uniformed experts. Evidence of this comes from interviews across agencies, DOD's after-action report, and a roundtable meeting convened in early 2017.

OFDA and CDC worked extensively together throughout the outbreak; there were inefficiencies and a gradual learning curve that slowed inter-operability and communications. Coordination improved over the course of the outbreak, such that the model of combined teams (under the DARTs) proved to be a vital model for how to strategize and shepherd USG resources in a complex pandemic. Based on interviews within OFDA in Washington, DC and the ranks of the CDC, the working relationship started quickly in August, 2014 and unfolded in each country in a manner where both OFDA and CDC had inputs to OFDA's programming, ensuring technical, scientific, and practical aspects of funding decisions.

EVALUATION QUESTION 9

To what extent were the activities supported by the USG well-coordinated with the broader international response, national response structures and well-coordinated operationally between organizations that the USG funded?

The USG's international coordination was primarily with the UK government (in Sierra Leone), WHO, the UN Office for the Coordination of Humanitarian Affairs (OCHA), UNICEF, WFP, and IOM across the three countries. OFDA's coordination included sharing information and planning jointly with, and funding of, WHO, the World Food Program

(WFP), and International Organization for Migration (IOM). WFP provided UN Humanitarian Air Operations transport for aid officials within each country. As an overall umbrella coordinator, WHO was looked to, particularly for technical support to governments. OFDA promoted and facilitated an overall international coordination by WHO, although OFDA did not subordinate its own program decision making to WHO approval. OFDA gave substantial funding to and worked closely with WHO in Geneva and the field. In the field, CDC and OFDA listened to and supported WHO, which was most effective in Guinea. The long-term understanding and exchange of personnel between OFDA and the emergency offices of WHO were critical to a coherent response. But WHO, which is not traditionally a funding agency nor known for its emergency operations, has never been a strong lead program operations and implementation agency, even in the health sector. Thus, the lesson about the right model for responding to future infectious disease pandemic remains untested and unclear.

Both CDC and OFDA had long-standing critical programming relations with the IOM, which played an important role in screening and surveillance of suspected cases at country borders to attempt to mitigate the cross-border spread of the outbreak.

Besides the UK, there were no other major donors who demonstrated the willingness or capability to lead the control efforts. OFDA did not invest much in coordination with other bilateral donors or regional groups. The USG had minimal communication with the representatives of the European Community, Cuba, Russia, China, and Japan. The new UN agency specifically established to coordinate the EVD response, UNMEER, was not seen by OFDA as a valuable addition to the response and was largely disregarded. This was, in part, because UNMEER communicated their intention to facilitate rather than coordinate. OCHA frequently coordinates in large humanitarian crisis situations but was sidelined in the West Africa response as it entailed technical, epidemiological aspects; OCHA has historically been reluctant to bring health specialists on board. It is unclear whether OFDA had any communication or coordination with any of the private foundations, several of which played critical roles in funding the response.

OFDA funded Africa-to-Africa support, which contributed some value to controlling the outbreak. T he USG promoted support from within Africa to the three countries by mobilizing health providers with a grant to the African Union Support to the Ebola Outbreak in West Africa (ASEOWA) and by mobilizing trained, francophone epidemiologists from the Democratic Republic of Congo to Guinea, as detailed in award documents, by OFDA respondents, and in roundtables with IPs.

Within each country, OFDA provided funding support and legitimacy to the lead role of national governments and the critical roles played by district/county health offices. OFDA and CDC worked effectively with the national command structures of all three countries, as is evident from many interviews and CDC reports. OFDA gave valuable support to an array of local agencies in West Africa by supporting their role as sub-grantee partners working under prime IP holders. This was found in many award documents and field interviews with IPs. OFDA effectively encouraged and created consortia where IPs working in a country worked as part of a formal interagency program, as explicit in many multi-agency awards given. OFDA's coordination with partners exhibited a routine reevaluation of local needs, in large part informed by the information it received from WHO, CDC, local officials, and IPs. OFDA was able to redirect funds and issue new awards and modifications continuously throughout the epidemic.

EVALUATION QUESTION 10

How well did OFDA adjust to the changing epidemiology and priorities of the international response?

OFDA did very well in adapting its strategy by phase of the epidemic, as new information became available, per country and per region. At first, OFDA was forced into playing catch-up because it had not been tasked to lead the USG response when the outbreak first became apparent. OFDA is typically requested to respond only after events reach a large, "humanitarian" scale, for instance, when thousands or tens of thousands of persons are affected and facing harm.

OFDA's strategy was in its formulation phase during August and September, 2014, crafted with input from the CDC, the National Security Council (NSC), and the USAID administrator. OFDA adapted to the projections of the outbreak based on CDC's mathematical model, by expediting the erection of ETUs across Liberia, anticipating where the outbreak might spread. Planning was done in close coordination with WHO, which sought to get ahead of the expanding geographic scope of transmission by positioning ETUs along key access points covering most of Liberia.

During this period, OFDA effectively emphasized recruiting IPs, NGOs in particular, to build and operate ETUs. OFDA's strategy during this period of the epidemic curve's trajectory, along with other donors, was formally described as the 3 "B's" (for Behavior, Beds, and Burials), reflecting the USAID/CDC strategy. OFDA continued to adjust well to the international community's evolving understanding of the outbreak's epidemiology over time, for instance moving beyond a focus on health facility beds at ETUs, to more community-oriented approaches (Community Care Centers (CCCs)), and eventually to an emphasis on community outreach. This was ascertained from a review of programs implemented, IP literature, and FGDs at OFDA. Not just at the national level, but at the subnational level, OFDA's interventions shifted in response to epidemiological data received.

April, 2015 to September, 2015 was a major period of different transitions in epidemiology for both Sierra Leone and Guinea and saw a new form of transmission: sexual transmission via sperm in Liberia. OFDA recognized the possibility of recurrence; because most of the population had not been exposed to EVD, there was no herd immunity and the possibility of EVD growing in scale was a real possibility. OFDA read the epidemic curve well, maintained its presence, and continued to expand its efforts into lessons learned, surveillance, and work with survivors to extend outreach into communities. Through this period, OFDA and CDC supported the WHO strategy of "0+42," i.e., the goal of reaching 42 days without a new EVD case—the passing of two EVD incubation periods. OFDA followed WHO's lead role in Guinea, but after recognizing that other bilateral partners were not as involved in Guinea, shifted more of its attention and resources there. By this time, it had become apparent that the decline seen in Liberia was not clearly reflected by the epidemiology in Guinea, where the outbreak continued longer. Despite OFDA's relative flexibility to adjust its programs during a changing outbreak, there were still delays and lag times which prevented earlier control of epidemic.

With respect to data harmonization, OFDA accepted other agencies' data and did not impose tight case definitions or clear, harmonized reporting methods region-wide. In this outbreak, CDC had the mandate to manage surveillance. But as a result, the system of classifying cases as suspect, probable, and confirmed was not consistent across the three countries. Population-based surveys were not conducted, though, as they are in most other disasters OFDA responds to and as is good practice. As a result, OFDA was continuously reacting to data about the changing epidemiology that was biased toward health center reporting, with consequent underreporting of EVD cases, particularly in rural areas.

FINDINGS BY COUNTRY

GUINEA

In Guinea, OFDA coordination largely supported the national command structure, and supported WHO's stronger role there. CDC, before being part of the DART, was very active in Guinea dating from March, 2014. This included programming and USG visits to the Forest Region in the southeast, where the epidemic began, and from where it spread to other countries—and returned. OFDA funded WHO, IOM, WFP, and UNICEF at early stages to respond in Guinea.

SIERRA LEONE

In Sierra Leone, OFDA coordinated effectively with the UK Department for International Development (DFID) and allowed the UK government to be the lead strategist in working with the government. OFDA and CDC both provided incident command system and incident management system support to Sierra Leone's emergency coordinating body. OFDA contributed to reducing transmission in "hot spots" of the outbreak in Sierra Leone by providing important support to IP programs in the neglected eastern portions of the country, in consultation by other donors, starting largely in 2015. OFDA funded WHO, IOM, WFP, and UNICEF at early stages to respond in Sierra Leone.

LIBERIA

In Liberia, OFDA took a leadership role, working closely with the U.S. Embassy and the government of Liberia. The DART attended many of the technical working group meetings. Singularly among the three countries, in Liberia, OFDA gave daily tasks via the successful mission-tasking matrix—MITAM model—to DOD for their strong support in building ETUs, providing airlift to remote locations, and augmenting the EVD testing facilities with military mobile labs. OFDA also worked with DOD to set up the Monrovia Medical Unit (MMU), which helped to coordinate the overall international engagement by offering medical care for expatriates (both aid workers and airplane pilots), which boosted confidence among health workers and other agencies to return to work during the epidemic. OFDA and CDC both provided support to Liberia's national incident management system.

Conclusions

The EVD response demonstrated that when an outbreak of a lethal disease occurs in a resource-poor setting, OFDA's ability to rapidly mobilize and lead an intra-U.S. interagency effort was relevant, nimble, and critical. OFDA performed well, judged by the major contribution of combined USG resources deployed successfully to the field, and contributed to interrupting the transmission of EVD. OFDA's leadership role for the whole-of-government response involved an unprecedented degree of collaboration among OFDA, DOD, and HHS—particularly with CDC.

The DART model was extended for the first time to provide lead technical, strategic, and decision-making roles for CDC, and was successful. There was lack of clarity at times about respective roles of CDC and OFDA. Early communications between CDC and USAID were often stilted, confused, and required a learning curve. However, the agencies' ability to share understanding and game plans was enhanced by being part of a joint team and the coordination between CDC and OFDA became close, intensive, and extensive. The EVD outbreak proved how effective OFDA's coordination is with the DOD, having

been informed by numerous collaborative experiences in other prior interventions.

USG coordination efforts with the international response was both successful and unsuccessful. OFDA led the coordination of the USG response with the UN, including OCHA and WHO and other key UN agencies, such as UNICEF and WFP. UNMEER was not given significant attention by OFDA, indicating a deficiency in international coordination. Besides the UK, other inter-donor coordination was not evident.

OFDA, DOD (in Liberia), and CDC worked together effectively with the national command structures of all three countries. OFDA gave valuable support to an array of local agencies in West Africa by supporting their role as sub-grantee partners working under prime IP holders.

OFDA's responses to the changing epidemiology was informed by its ongoing collaboration with CDC and by local governments and IPs, who provided data and feedback about their progress. OFDA adapted its strategy, policy, geographic targeting, and types of activities funded. OFDA continued to adjust well to the international community's evolving understanding of the outbreak's epidemiology over time, for instance, moving beyond a focus on health facility beds at ETUs to a more community-oriented approach. However, OFDA was continuously reacting to data about the changing epidemiology that was based on health-center reporting only. The USG, with OFDA as the lead, responded only after the Ebola outbreak had spread widely. OFDA mobilized quickly but could have been operational earlier in the regional outbreak.

Recommendations

Recommendations emphasize greater inter-operability in the future between the OFDA and CDC and enhanced preparedness for future situations of this type.

1. *OFDA should develop or revise its memorandum of understanding (MOU) with CDC to include robust early detection and sharing of potentially important surveillance data in real time.* Develop regular opportunities to field and train OFDA staff with DOD, CDC, and other USG responders in order to establish institutional linkages and avert cultural, and other barriers. This relationship will be facilitated by having a full-time OFDA specialist based in CDC's Emergency Operations Center (EOC). Participation of CDC in DARTs should be continued.
2. *OFDA and its partners should adapt programs to better support mid-grant changes to tie with shifting disease priorities.* Even though OFDA has experienced success with its awards of a three-to-six-month duration, the mechanisms were insufficiently flexible to adapt to the needs in outbreaks like the one of 2014–2015. In future public health emergencies, OFDA will require innovative award mechanisms that allow rapid (within two weeks) design shifts to adapt to the changing understanding of the epidemiology and the evolving geographic spread of emerging diseases.
3. *The USG should, via its role within the UN, sustain its communication and work with the humanitarian response wing of WHO, to assist WHO in taking on the expanded role of directly managing field operations in large public health emergencies.* If this is supported, OCHA should then develop a framework for its engagement in future public health emergencies on behalf of the UN Secretariat, including coordination with WHO. This would, in turn, support WHO in shepherding the International Health Regulations into practice and improve its capacity to be an operations-level humanitarian agency.
4. *OFDA should fund, publish and share lessons learned by each IP* to promote a better understanding of distinct technical areas encountered in epidemic disease control.
5. *OFDA should edit its Field Operation Guide or generate stand-alone guidelines with guidance, metrics, and procedures for disease outbreaks with an emphasis on early recognition of the important characteristics of outbreaks in terms of strain of pathogen, transmissibility, case fatality patterns, observability, and cultural implications (such as burial practice behavior).* These guidelines should be prepared in collaboration with experienced staff from CDC and other agencies, and should be tested in the field. These cannot be crafted for each imaginable emerging infection, but can be organized according to key disease families or key characteristics of the infection, in terms of transmissibility; incubation period; lethality; and options for prevention.
6. *The USG should, via its role within the UN, promote discussion among other nations the ramifications of the West African EVD outbreak in terms of the realities of donor engagement* with the Global Health Security Agenda (GHSA).
7. *The USG should, via its role within the UN, engage in a more substantial way with relevant donors,* such as France, Germany, the remainder of the EU, China, and regional WHO entities in planning for future outbreak roles and strategies.
8. *OFDA should work more effectively with independent modelers and epidemic experts to play out scenarios at the beginning and in early stages of outbreaks* and not rely on any single model. OFDA should base its decision making about disease control activities on information that takes into account geographic containment, similar to how the USDA manages forest fires or how immunization programs are targeted.

Photo courtesy of the United States Department of Defense

INTRODUCTION

Evaluation Purpose

The United States Government (USG) support for the Ebola virus disease (EVD) outbreak response in West Africa was led by the United States Agency for International Development (USAID)/United States Bureau for Democracy, Conflict and Humanitarian Assistance (DCHA)/Office of United States Foreign Disaster Assistance (OFDA), in close coordination with a number of other U.S. Agencies, including the Department of State (DOS), Department of Defense (DOD), USAID Missions in Liberia and Guinea, and multiple arms of the Department of Health and Human Services (HHS) including the Centers for Disease Control and Prevention (CDC), the National Institutes of Health (NIH), and the U.S. Public Health Service Commissioned Corps (USPHS). Within USAID, OFDA worked closely with the Africa and Global Health Bureaus. In total, the USG provided $2.4 billion (combined across all U.S. Agencies funding (see Annex B, Scope of Work) for the EVD outbreak response in fiscal years 2014–2016.[57] The USG response to the EVD outbreak in West Africa was structured around four pillars, reflecting Congressional earmarks: 1) control the outbreak; 2) mitigate second-order impacts of the crisis; 3) coherent leadership and operations; and 4) global health security. OFDA's programming for the EVD outbreak response in West Africa in fiscal years 2014 and 2015 was focused on Pillar One of the response: Controlling the Outbreak. The purpose of this evaluation is to improve the USG's understanding of the performance of its response to the outbreak in Guinea, Liberia, and Sierra Leone. The evaluation focuses on the effectiveness of the response and relevance of the USG's response to the outbreak, as well as OFDA's role in coordinating the USG's international response.

Under contract AID-OAA-I-15-00022/Order No. AID-OAA-TO-16-00034, International Business & Technical Consultants, Inc. (IBTCI) was awarded an OFDA contract in October, 2016 to conduct an independent performance evaluation of OFDA's support to the EVD outbreak response in West Africa. The evaluation responds to the USAID's Evaluation Policy of January 2011 (updated in 2016) to ensure that USAID obtains systematic, meaningful feedback about the successes and shortcomings of its programming—and specifically that the lessons learned are documented and disseminated. This evaluation will inform future USG large-scale public health responses to infectious disease outbreaks.

INTENDED AUDIENCE

The primary audience for this evaluation is the OFDA Director and senior management team, senior managers, program managers, water, sanitation and health (WASH) and public health advisors. Other intended audiences include national and international implementing partners (IPs), governments in West Africa, as well as key stakeholders of the USG's response to large-scale infectious disease outbreaks within the CDC and USAID's Bureau for Global Health. OFDA intends to use the evaluation results to make evidence-based decisions on its role, and on the type and timing of its support within any future large-scale public health response of similar magnitude and complexity.

Evaluation Objectives and Questions

This performance evaluation focused on programs funded between March 1, 2014 and January 4, 2016 and actions taken under the EVD response objective: Controlling the Outbreak. This evaluation was guided by four complementary objectives relating to the overall effectiveness of the response, effectiveness of different programmatic components, the relevance, and the coordination of OFDA's response to the EVD outbreak. Each objective has multiple evaluation questions as described below. A complete description of this evaluation's statement of work (SOW) is provided in Annex B. The evaluation team is detailed in Annex K.

OBJECTIVE ONE: EFFECTIVENESS OF THE RESPONSE

1. *To what extent did the set of OFDA-supported activities and models of intervention achieve the outcomes and objectives, as defined by each IP and as part of OFDA's intentions?*
2. *Which USG-funded activities, alone or in combination, made the most significant contribution to controlling the EVD outbreak in West Africa?*
3. *Of the many activities designed to address specific aspects of the set of inter-related control measures, how well did each of the OFDA-funded activities fit within the overall response and efforts to control the outbreak?*

OBJECTIVE TWO: EFFECTIVENESS OF PROGRAMMATIC COMPONENTS

4. *What were the determining factors that contributed to success or failure of each of the different types of programs that OFDA supported?*

OBJECTIVE THREE: RELEVANCE

5. *Did OFDA correctly prioritize and weight the most relevant activities over the course of the response in relation to the outbreak's changing epidemiology?*
6. *Were OFDA's funding mechanisms and in-kind support appropriate to respond to the EVD outbreak in a timely and targeted manner in affected areas?*
7. *To what extent did attempting to adhere to technical 'gold standards' affect the timeliness and quality of the response by OFDA's supported IPs?*

OBJECTIVE FOUR: COORDINATION

8. *How effectively did OFDA coordinate all USG efforts as the lead agency in this response?*
9. *To what extent were the activities supported by the USG well-coordinated with the broader international response, including national response structures in the affected countries, and well-coordinated operationally among those organizations that the USG funded?*
10. *How well did OFDA adjust to the changing epidemiology and priorities of the international response?*

This evaluation report presents the results related to Objective Four: Coordination of the Response, i.e., questions eight, nine, and ten of the overall evaluation.[1]

BACKGROUND

Response Context

The West Africa EVD outbreak began with a single case in December, 2013 in southeastern Guinea, and then spread to the neighboring countries of Liberia and Sierra Leone. With symptoms similar to other endemic infectious diseases, EVD was not definitively identified as the cause of the outbreak until March, 2014. Misinformation and a lack of awareness among the public regarding EVD transmission modes, combined with inadequate health care facilities and a lack of health staff trained in EVD response techniques, allowed EVD to spread rapidly. By the end of March, 2014, there were 120 suspected, probable, and confirmed cases and 80 deaths in Liberia, Guinea, and Sierra Leone.[2]

The CDC activated its Emergency Operations Center (EOC) for EVD on July 9, 2014. By July 20, 2014, EVD cases surged in the region and the World Health Organization (WHO) reported the total number of EVD cases in Guinea, Liberia, and Sierra Leone as 1,093, with 660 deaths.[3] On July 24, 2014 WHO labeled the EVD outbreak a "Level 3" emergency, its highest level of health risk. As the lead USG entity for the response, OFDA deployed a Disaster Assistance Response Team (DART) to Liberia on August 5, 2014 and established a corresponding Response Management Team (RMT), based in Washington, DC. The DART, a team that over the course of the response included disaster response and public health experts from OFDA, DOD, and CDC—and was coordinated with NIH, and USPHS—was deployed to assist host country governments in containing the EVD outbreak.

OFDA instituted DARTs in Sierra Leone and Guinea as well, all under a nominal regional DART framework. The RMT based in Washington, DC supported the DARTs in coordination efforts. On August 28, 2014, WHO reported that the number of confirmed, probable, and suspected EVD cases and deaths had more than doubled from the previous month.[4] The number of new EVD cases per week in West Africa was about 700 in September 2014.[5]

On September 16, 2014, the United States President announced the USG's strategy for EVD outbreak response and preparedness.[6] The four pillars of the response and preparedness strategy were:

- Pillar One: Control the Outbreak
- Pillar Two: Mitigate Second-order Impacts of the Crisis
- Pillar Three: Coherent Leadership and Operations
- Pillar Four: Global Health Security

The goal of Pillar One was to control the outbreak by reducing the rate of transmission in the affected countries. This response had the following five distinct components:

1. Create effective nationally-led incident management and coordination. This component involved the creation of a National Incident Management System structured around sub- national EOCs to support technical leadership for all aspects of the response, as well as operational support for communications, call center coordination, and associated logistics.
2. Create adequate isolation and treatment capacity in the countries affected by the outbreak. This component involved the creation of Ebola treatment units (some agencies used an alternate name, Ebola treatment center or ETC; in this evaluation we use ETU to refer to both), and Community Care Centers (CCCs) alongside complementary interim measures to enable a community-based response to the outbreak.
3. Assist the public health response through safe human remains management, which goal was to collect human remains of suspected EVD cases within 24 hours to minimize disease transmission and inform surveillance.
4. Restore safety and functionality to the health care system by mainstreaming infection control practices in the health care systems of affected countries.
5. Support the delivery of concise, credible, and clear public outreach and communications to promote broad social mobilization around clear messages about the EVD outbreak.

Epidemiologic Aspects of EVD in West Africa

The most common method of monitoring progress against an outbreak of EVD or other disease is disease surveillance, i.e., counting numbers of cases that occur over time. In settings with weak health systems, those surveillance numbers may be inaccurate, because many cases are neither accurately identified nor reported to authorities.

From a perspective of reported new cases, Liberia had an apparent peak in September, 2014, whereas Sierra Leone and Guinea appeared to have multiple peaks, more spread out in time. Liberia saw 90% of its cases over 9 months, while Guinea and Sierra Leone both had 90% of cases over 12 months. The mode or peak in Liberia was the week of September 14–20, 2014, with 590 cases. Sierra Leone, which has a larger population and more cases overall, had its peak of 540 cases during the last week of October, 2014. In Guinea, there appeared to be multiple peaks—the highest being 292 cases during October 5–11, 2014—but experts believe that the curve charted for Guinea does not include a large number of undiagnosed and/or unreported EVD cases. Reported cases were heavily clustered in urban areas, along trade routes, and along borders. This clustering may also reflect better reporting in these areas.

Figure 1 depicts the known case counts as reported or reconstructed.[7] Sierra Leone and Liberia each demonstrated classic growth-peak-decline curves, though all three countries ought to be viewed as one collective outbreak, as there was re-transmission across borders during the 2014–2015 period. Guinea's curve is the most atypical, demonstrating a smoldering almost-endemic outbreak curve, reflecting micro-outbreaks in different parts of the country and most probably reflecting significant under-reporting. Across all three countries, the outbreak peaked within a few months of intervention programs being initiated. Thereafter, the orientation of response efforts was aimed toward rapidly locating new, primarily rural mini-outbreaks until zero cases were reached.

In this West African EVD outbreak, several less common epidemiologic indicators also provided important clues to the impact of ongoing outbreak control efforts.

First, there were several of assessments of R_0, a term that represents the average number of new EVD cases generated by each EVD-infected person. An R_0 of less than one means that the next generation of EVD cases will be smaller than the generation before and indicates that an outbreak is on the decline—success in outbreak control. In West Africa, careful analysis of EVD case surveillance data early in the outbreak indicated that, on average, each EVD case was infecting more than two other new people with Ebola virus ($R_0>2$) thus explaining why each subsequent EVD generation was much larger than the one before. However, as the use of isolation techniques and other EVD prevention measures became more widespread and more effective, the average number of new people infected by each EVD case began to decrease. Eventually, as that average number of new infections from each current EVD case fell below one ($R_0<1$), the size of subsequent generations of EVD cases became progressively smaller until the EVD outbreak died out.

When viewed from the perspective of specific small-area mini-outbreaks in districts, towns, or cities, the duration of individual outbreaks in Liberia varied from 20 to 100 days and declined over time at different times in each country.

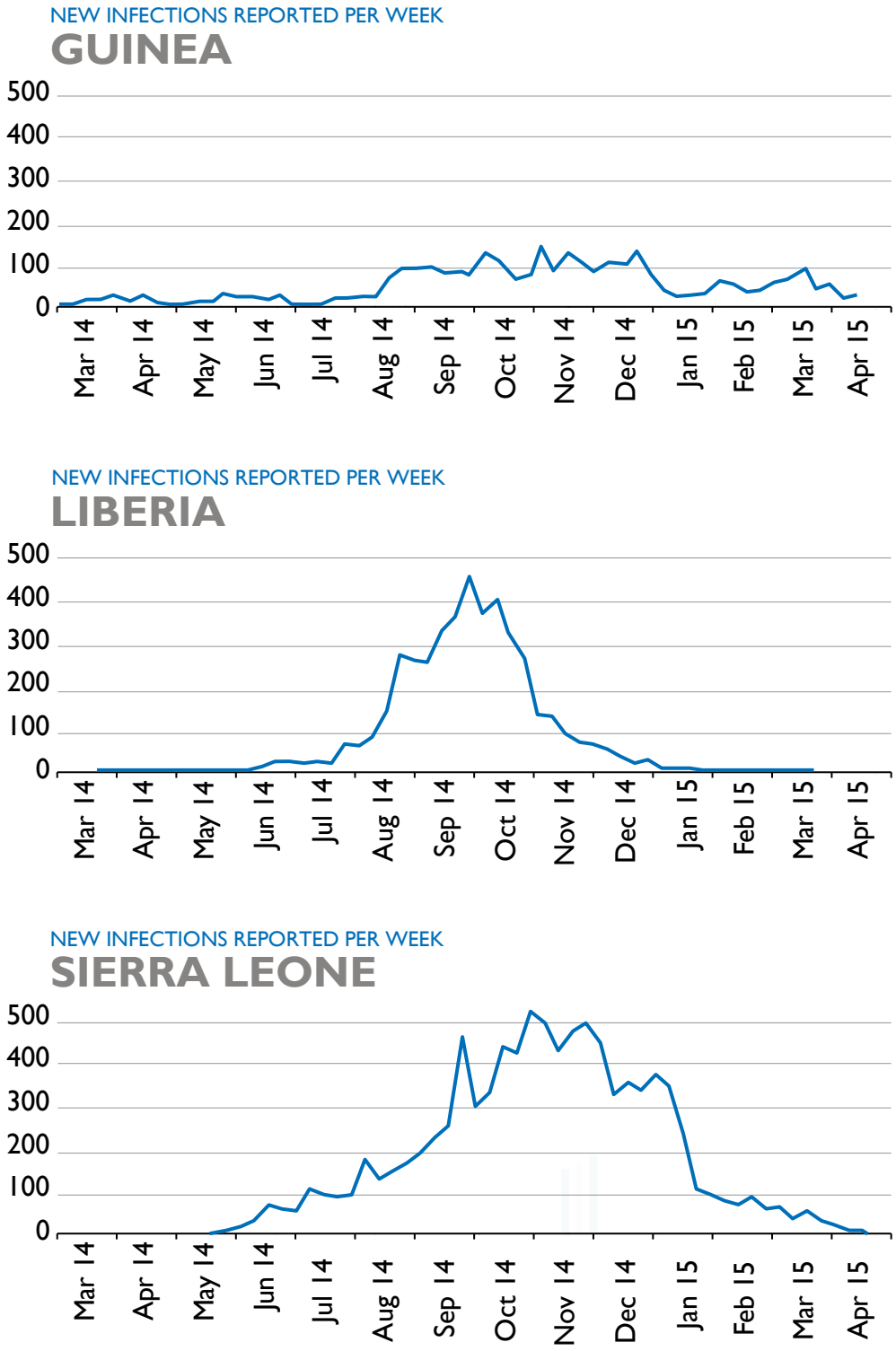
Another epidemiologic indicator is the average period between the onset of symptoms in persons with EVD and the time when those infected persons were admitted to appropriate EVD treatment facilities. This indicator is important, because it is a measure of the length of time that EVD-infected people were exposing others in their families and communities to the virus. It is also important because early access to supportive nursing and other care of EVD cases in appropriate facilities is associated with lower EVD mortality among those cases.

Incubation periods tended to be 8–20 days,[4] meaning that the timeline of EVD case identification represents one to three weeks later than actual EVD transmission.

Finally, a critical aspect of EVD epidemiology in the West African outbreak was the identification and monitoring of close contacts of EVD cases, i.e., those people who were most likely to have become infected by being in contact with current cases. The major goal of contact tracing for EVD is to ensure that any and all new EVD cases in the next generation occur only among those people who were known EVD contacts, who can then be quickly and safely referred for definitive diagnosis and clinical care. Conversely, EVD cases occurring among persons who were not known and monitored as contacts indicates that unknown EVD infection chains were continuing to spread EVD in families and communities.

Initially in all three countries, many newly occurring EVD cases had not previously been identified as contacts, indicating that the effectiveness of contact tracing was low. Over time, as these programs became more efficient, a larger and larger proportion of all EVD cases occurred among those people already being monitored by contact tracing programs.

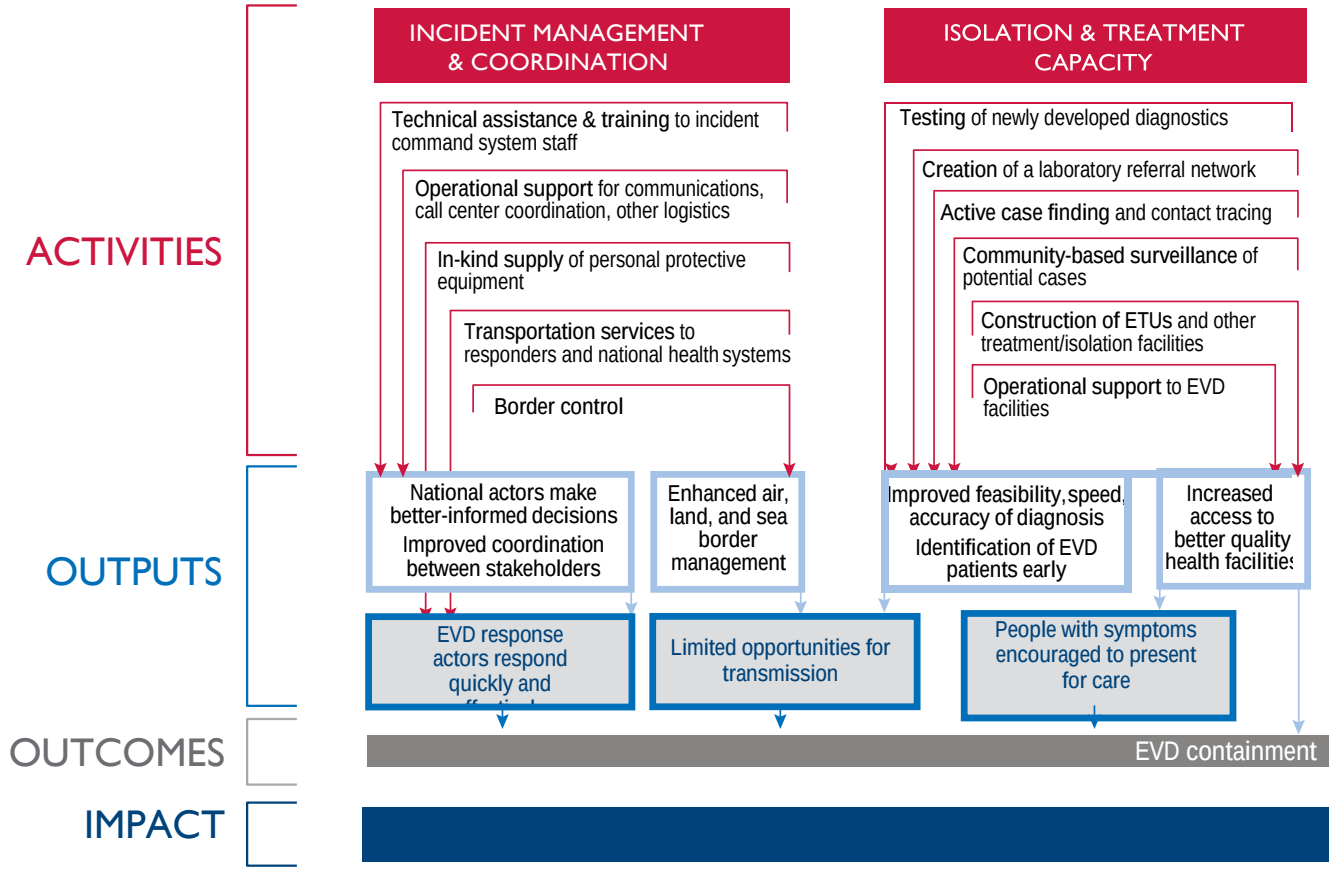
Figure 1. New EVD infections reported, by country
Source: CDC and WHO



Theory of Change

The underlying theory of change (TOC) for the response, as described in the SOW, was informed by two guiding principles of disease control: 1) effective isolation of EVD cases and safe burials of those who died were required to decrease transmission and bring the outbreak under control; and 2) simultaneous massive education and outreach was required to increase population-wide understanding of the disease, how to recognize it, how to prevent transmission, and the importance of modifying behaviors that increase risk. The structure of the response was modified and adjusted at several points during the course of the outbreak. The evaluation team constructed a TOC illustration to understand the logical structure of the response. The TOC explains the response components and activities grouped by response components, direct results (outputs), higher level outcomes (reduced disease transmission and number of EVD cases), and impact (reduced EVD mortality) (Figure 2). The TOC illustration helped the evaluation team to identify the most relevant respondents for each evaluation question, to formulate quantitative survey and qualitative interview questionnaire, and provided a structure for data analysis and reporting.

Figure 2. OFDA EVD response theory of change

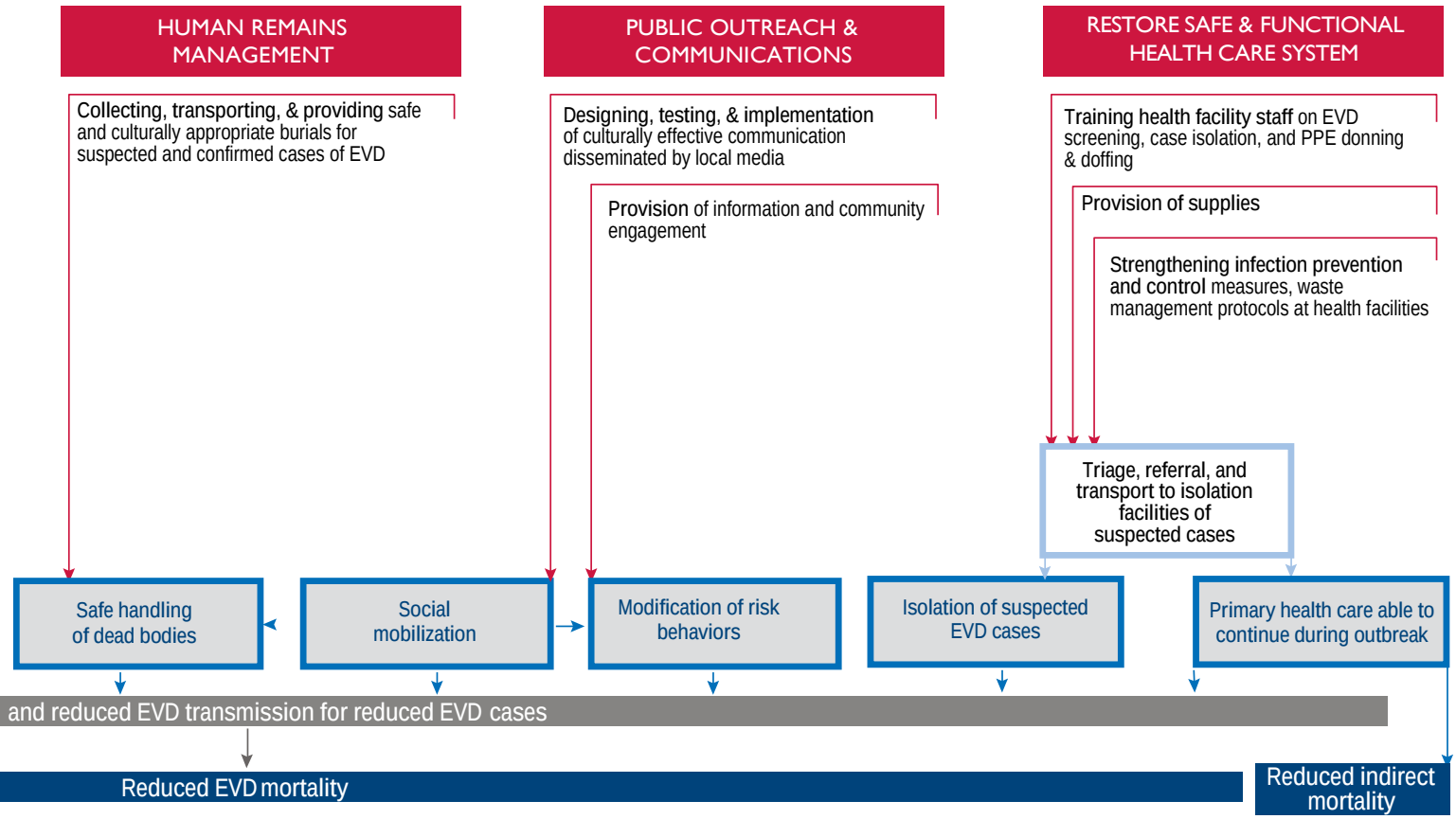


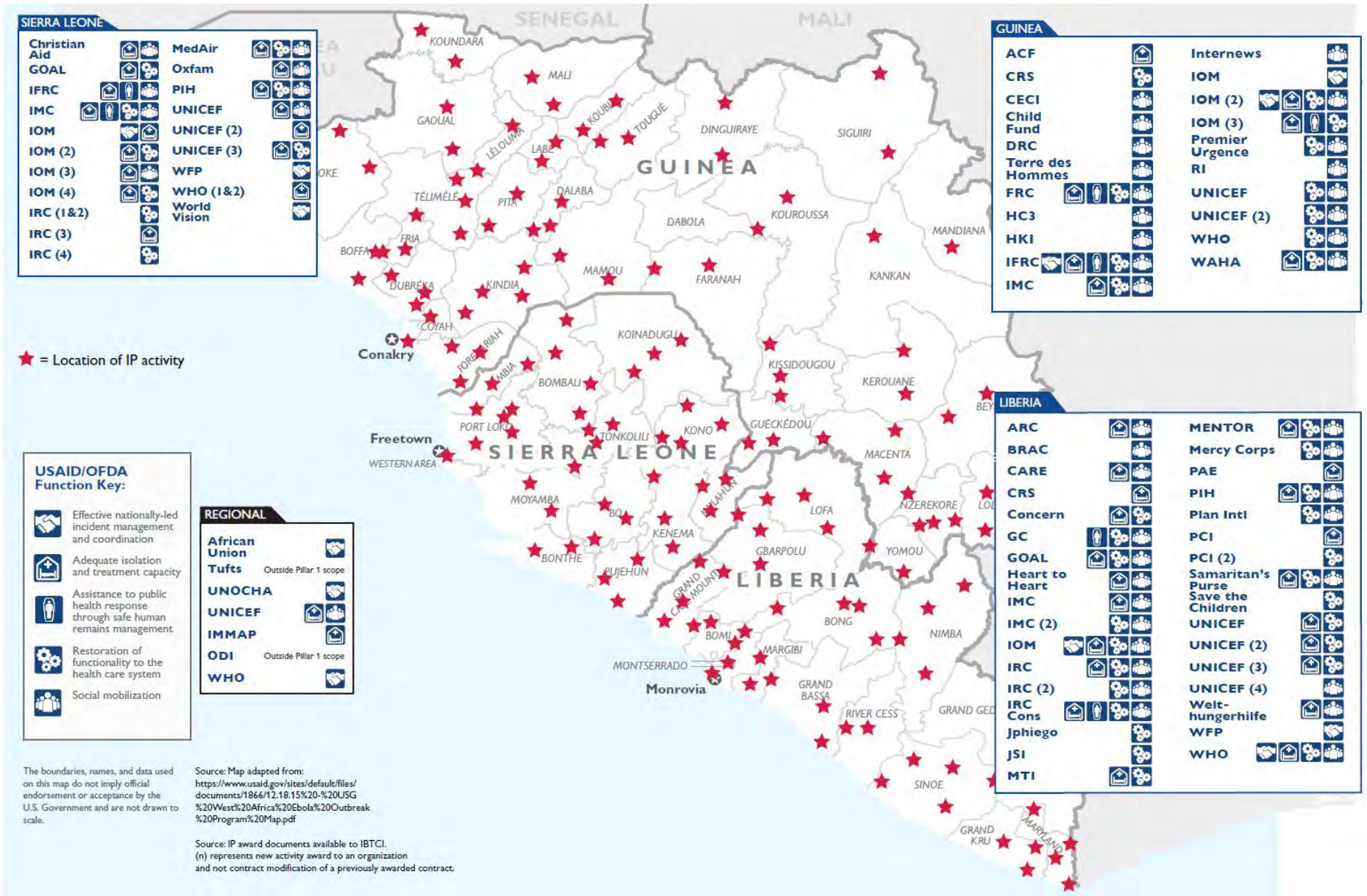
OFDA-supported IPs and Activities

OFDA funded over $772 million in country and regional activities under the response in Guinea, Liberia, and Sierra Leone and in the West Africa region (see Annex B, Evaluation SOW). The number of IPs supported included 26 in Liberia, 18 in Guinea, 14 in Sierra Leone, and five regional partners. Annex E includes a list of the OFDA-supported implementing partners, including location, funding amount received, and types of activities supported. Figure 3 on page 14 shows the physical locations of activities. During the 16 months from August 5, 2014 to January 4, 2016, the OFDA DARTs and RMT coordinated the response with OFDA-supported IPs, other USG agencies, non-USG donors, and national and international response partners in each country. Following the steady decrease in the EVD caseload in late 2015, the DARTs and RMT demobilized on January 4, 2016.

Response Funding

USG was a major donor in all three countries, its funding the highest among the major donors. Other major donors involved in the response at the same time were (and their respective funding contribution was) as follows: the World Bank (WB) $1.6 billion; United Kingdom (UK) $550 million; the European Union (EU) $720 million; the governments of Japan $185 million, Germany $134 million, China $125 million, and France $97 million; and the major philanthropic organizations Paul Allen Foundation and the Bill and Melinda Gates Foundation.[8] USG funding for individual countries was highest in Liberia, at around 83%; in Sierra Leone at 46%; and Guinea at 38% of total donor funding. The remainder was all other donors combined.[9] See Annex E for detail.





The boundaries, names, and data used on this map do not imply official endorsement or acceptance by the U.S. Government and are not drawn to scale.

Source: Map adapted from: https://www.usaid.gov/sites/default/files/documents/1866/12.18.15%20-%20USG%20West%20Africa%20Ebola%20Outbreak%20Program%20Map.pdf

Source: IP award documents available to IBTCI.
(n) represents new activity award to an organization and not contract modification of a previously awarded contract.

Figure 3. Map of IP activities, from USAID/DCHA through 2015.

METHODOLOGY

Evaluation Design

The performance evaluation was designed to evaluate actions taken and activities funded by OFDA between March 1, 2014 and January 4, 2016 of the EVD response: Controlling the Outbreak. Focusing on the EVD response in Liberia, Guinea, and Sierra Leone, it was designed with a utilization-focused approach—to provide findings, conclusions, and recommendations that can be applied, are scalable, actionable, and are meant to be of utility to the design and implementation of future OFDA interventions. The evaluation methodology considered real-world constraints, including time and funds available, and sought to minimize disruption and burden placed on individuals serving as data sources. The evaluation was designed to answer each of the 10 specified evaluation questions listed above in the Introduction.

The evaluation design team included experienced evaluators and methodological experts in qualitative and quantitative data collection. It included specialists in infectious disease epidemiology, medical anthropology, analysis of qualitative data, and data collection in humanitarian settings. A detailed description of the evaluation team is presented in Annex K. A local national working as an Evaluation Coordinator in each of the three target countries helped to refine the data collection questions and tools and ensure cultural relevance and sensitivity. Local response partners in each country were consulted to help compile lists of key informants. A more detailed description of evaluation design can be found in Annex D.

Data Collection Methods

The evaluation design incorporates six data collection methods: (1) a review of peer-reviewed and gray (unpublished) literature,[10] OFDA, CDC, and IP reports, and surveillance data; (2) semi-structured focus groups; (3) semi-structured key informant interviews (KIIs); (4) an online self-assessment survey conducted among DART and RMT members; (5) roundtable discussions with OFDA-supported IPs and other responders; and (6) quantitative surveys (see Table 1). The quantitative methods included national household surveys, with sub-national sampling proportionate to population size,[11] of several thousand households per country, as well as smaller purposively sampled surveys of individuals who worked as contact tracers, CHWs, or volunteers trained or supported by OFDA IPs.

The evaluation team interviewed the most relevant respondents for each of the evaluation questions. The choice of KII or FGD respondent group was determined based on the relevance to each evaluation question. An in-depth design matrix can be found in Annex D, which describes for each evaluation question the data collection methods, data sources, data collection locations and sampling, and data analysis methods. All of the data collection tools used can be found in Annex F. A full listing of persons interviewed can be found in Annex H, and a list of documents consulted can be found in Annex G with a literature review in Annex M. Desktop reviews and other research began in December, 2016

Field Implementation

Primary data collection within Liberia, Sierra Leone, and Guinea occurred from March to July, 2017. Training for the local supervisors and field survey teams occurred in each country from May 10–17, 2017. Survey trainings were led by ORB International in-country affiliates and overseen by the Public Health Advisor and local Evaluation Coordinators in each country. All surveyors were from the areas in which the data were collected, and field supervisors were country nationals. Training of field survey teams included instruction in survey methodology, operational guidelines including research ethics, a detailed review of the survey tools in each language, instruction in the electronic data collection devices, and practice interviews in the local community (under supervision). Data collection tools were pilot tested in each country the week prior to the survey training. Results from the pilot testing informed adjustments to the tools to ensure appropriate local understanding. Consistency was maintained in the tools across the three countries for comparability. The final tools were approved by OFDA.

Table 1. Data collection methods and sources of information		
Methods	Sources of information	Scope
Literature review	Peer-reviewed and gray literature; implementing partner records; published surveillance data	4,000 general literature plus 590 IP records from OFDA
Focus group discussions (FGDs)	▪ Burial team members ▪ EVD survivors and families affected by EVD ▪ Members of communities affected by EVD ▪ Members of communities near EVD-affected areas	196
Key informant interviews (KIIs)	• Community leaders • Ministry of Health (MOH) national response partners • National or regional hospital staff • Non-USG international response partners • OFDA supported implementing partners USG partners	285
OFDA Self-assessment online survey	DART members, RMT members	49
Roundtable discussions	USG and non-USG response partners	2
Quantitative surveys	General population	16,365
	Contact tracers	250
	Community health workers/social mobilizers	288

One household survey, representative of nationwide populations with 16,365 respondents (households), was conducted across all three countries.[12] Specific protocols were developed, both to comply with "do no harm" principles and to ensure the protection of respondents in this evaluation. Verbal informed consent was obtained from each household respondent. The respondents were informed in detail the purpose of evaluation and their right to refuse participation without any negative consequence. KII respondents' confidentiality was protected by not including their names and organization names in the report. The household survey teams were provided with instructions about how to make local referrals for counseling and other services, in case a respondent requested the information during or by the end of the survey. To protect respondent privacy, unique identifiers were used in place of names and the database and interview transcripts were password-protected. Local permissions were obtained for data collection in each country: from the Institute of Statistics and Geo-Information Services in Liberia; the Statistician General in Sierra Leone; and from the Ministry of Health, the National Health Security Agency, and the National Statistics Institute in the Ministry of Planning and Cooperation in Guinea.

Two representative but smaller sample-size surveys were conducted among contact tracers and community health workers.

Data Management and Analysis

Standardized procedures for interviewing, note taking, and data analysis ensured consistency and objectivity in interpretation of findings. Combining qualitative data with quantitative findings and findings from literature review enabled triangulation of information and ensured multiple sources of support for each finding. The quantitative survey data were collected on electronic tablets using SurveyToGo offline software, with built-in response validation. Data were uploaded from the tablets to a secure online server daily after data quality check by an ORB field supervisor. Data were downloaded from the online server weekly to perform an additional data quality check by the team leader. STATA statistical software, version 14 was used for quantitative analysis, which compared indicators across countries as well as by gender and urban/rural residence within each country. In this context, there were no appropriate baseline data for comparison. Interviewer notes were prepared immediately following each KII and FGD and uploaded to a secure shared online drive. Coding was applied according to a designated codebook based on the 10 evaluation questions.

The qualitative data were analyzed using Atlas-ti version 8, using a Grounded Theory approach.[13] Literature review data were analyzed with some use of *Tableau* version 10. Contribution analysis[14] was used to assess the influence of individual interventions on the outcomes in the presence of multiple actors and programs. Contribution analysis examines all evidence to discern the plausible links and impact pathways between activities and a common goal.

Summary data from quantitative surveys, KIIs, FGDs, document review, and secondary data analysis were distributed among team members. Multiple team meetings were held for data triangulation and interpretation of the results. Each evaluation question's findings were supported by two or more data collection methods; each conclusion was supported by data triangulation and interpretation of two or more findings.

Limitations

A number of potential limitations to the evaluation data and findings were identified during the design and implementation of the evaluation. Most were identified early, enabling IBTCI to take effective mitigating measures. Limitations are mentioned briefly below, and more detailed information on limitations, and the measures taken by IBTCI to mitigate their impact, is available in Annex D.

Interviews with key informants from OFDA, CDC, and each IP, and analysis of IP awards made, funding amounts, and public statements failed to fully mitigate the major limitation of IBTCI's inability to see the complete OFDA strategy documents and the lack of several IP awards documents. Key informants and household survey data were used to mitigate a restricted ability to evaluate achievement of program outcomes due to limited availability of IP performance measurement data. Key respondents were often identified and interviewed remotely to mitigate the limitation of many key personnel having left the focus countries. Survey questions were designed using anchor dates, and respondents were given time to reflect before answering to mitigate potential recall bias. Survey teams were trained extensively on interviewing skills and avoidance of leading questions to mitigate social desirability bias.

Data from numerous FGDs and KIIs in Sierra Leone and Guinea ensured the experiences of those countries were well-represented to mitigate the impact of numerous respondents focusing their recollections disproportionately on the response in Liberia. Quantitative survey data were disaggregated by gender to mitigate the limited availability of evidence on gender dimensions. Participation of men and women was ensured through conducting equal numbers of separate community FGDs by gender. Females were purposely selected for KIIs to compensate for bias from the natural under-sampling in non-professional groups. Data triangulation helped mitigate the tendency of stakeholders to feel they were successful and did a good or better than average job (optimism bias).

FINDINGS

This section consists of high-level findings associated with the evaluation questions. The overall results are presented here analyzing evaluation data across the three countries; country-specific findings and summary conclusions for each evaluation question are presented in the subsections.

Overall Findings

EVALUATION QUESTION 8

How effectively did OFDA coordinate all USG efforts as the lead agency in this response?

A. OFDA exercised its leadership role robustly, coordinating routinely with the U.S. Embassies in West Africa, DOD, CDC, the U.S. Public Health Service (USPHS), the offices of Health and Human Services (HHS), Food for Peace (FFP), and the rest of USAID. A key effectiveness factor was the OFDA's approach to forge a coherent USG team comprised of staff from different U.S. Agencies who worked in concert, sharing a strategy for containing the outbreak.

OFDA's guiding EVD strategy document was co-authored by CDC. This result is based on comparison and contrast across donors, field interviews with governmental officials, and extensive meetings with IPs.

USAID engaged over 350 specialists during the course of the response, most of who rotated in deployments to the field for two- to three-month assignments. Experienced DART managers rotated on and off and in multiple roles. A larger number of OFDA officers served on RMTs, where they supported their counterparts in the field. RMT officers generally backstop the entire West African region. KIIs and program

Photo courtesy of the United States Department of Defense

documents reported the extensive communications and coordination within the USG.

DOD, USPHS, and CDC each participated in RMT or DART structures. The DARTs worked closely with embassies, USAID's Global Health Bureau, its Africa Bureau, and the office of FFP, which had a seat on the DART team. This coordination took the form of posting OFDA staff in key locations, such as Atlanta, GA (within CDC) and Stuttgart, Germany (with DOD's AFRICOM). Moreover, OFDA included members of these agencies or liaison personnel within RMTs in Washington, DC or DARTs in West Africa.

The DART model was viewed as distinctively effective in an independent, international review in *Foreign Policy*:

> *"The Disaster Assistance Response Team (DART) mechanism used successfully by the U.S. coordinating its diverse array of civilian and military EVD responders, including the 101st Airborne of the U.S. Army and several NGOs, was also offered as a model."*[15]

As part of the DART, the Center for International Disaster Information helped to coordinate information shared with the broad U.S. community, including the public, which helped to engage the West African diaspora community.[16]

Of the major USG players, OFDA, CDC, and DOD were each involved in building or supporting local capacity for surveillance, case identification and, to some extent, contact tracing and clinical care. Because the scale of need was so great, there was no inefficiency from redundant efforts. Both OFDA and CDC deployed a considerable number of personnel to the three West African countries, often working on different aspects of the same issues or tasks. CDC personnel also served as a deputy DART lead and technical/scientific team lead within the DART. According to KII responses, some CDC deputy DART leaders were unaware that they bore that specific senior role on the DART teams, and gave the DART little attention. CDC medical personnel did not staff health facilities and were restricted from engaging in direct medical care. However, with OFDA funding, another HHS component—the Uniformed Public Health Corps of the USPHS—did deploy medical personnel specifically to staff EVD treatment units (ETUs) in Liberia, organized in late 2014 and mobilized in early 2015.

B. OFDA effectively exercised a lead agency role to implement a comprehensive set of field activities, primarily via an array of grant agreements to NGOs and international organizations as detailed in the allied Objective 1, 2 and 3 reports of the *Evaluation of the USAID/OFDA Ebola Outbreak Response in West Africa* (Ebola Response Evaluations). OFDA's coordination included taking the lead role, on behalf of the USG, to fund a wide range of implementing partners (IPs). Many IPs received multiple awards, which varied by country. A full listing of the total award amount per IP is attached in Annex E, based on a review of award documents provided by OFDA.[18] The awarded amount does not depict how all OFDA funds were spent, but focuses on how much was directed to independent non-USG partners and their primary areas of activity. Evidence for this was cross-sourced from USAID award documents, OCHA pledging data, data from NGOs, and provided raw data for technical analysis of the requisite inputs to the disease control effort.

From the time that OFDA was appointed to coordinate the USG effort, there was a steep learning curve and the need to mesh organizational cultures with other USG agencies. Most interviewees observed that the urgency of the situation forced everyone to cooperate. Most USG interviews found that coordination went well. Observers saw the DART, headed by OFDA, as providing coordination to rapidly engage partners providing services and support to response efforts; CDC staff served as technical leads for public health and medical issues. OFDA funding brought to bear not only established humanitarian response organizations but an array of scholars, engaging the problem-solving of experts from Tufts and the Overseas Development Institute, among others. Implementing partner, IMC, for instance, deployed not only medical practitioners but experts in EVD and epidemic research.[17]

OFDA was so effective at being the overall coordinator of USG program response due to its unique ability to rapidly fund and support a gamut of different partners; OFDA's annual budget clauses from Congress allow it to move significant amount of funds toward unexpected global contingencies quickly. OFDA successfully used this ability to access financial resources to respond to the EVD outbreak, where OFDA was able to start the process of procurements (funding multi-lateral IPs) almost immediately after it took over as lead agency in August, 2014. Delays occurred in the details of procurements, as some IPs needed to revise their proposals more than once before obtaining OFDA and CDC approval.

In this way, local DARTs shaped and harnessed the contacts, skills and capacities of existing State and USAID staff. Particularly in early stages of the outbreak, OFDA officers coordinated with Ambassadors and their teams to reach out to key U.S. NGOs about joining the EVD control efforts.[19] OFDA also maintains a regional sub-office in Senegal, which provided continuity, information sharing, and coordination across the region, including the possible outbreaks into Senegal, Mali, Guinea Bissau, Nigeria, and other neighbors.

> *"USAID Mission, in particular, was critical in providing context and critical contacts to which OFDA programs could be incorporated. In turn, some of these mission health programs were tweaked to help with EVD response activities."*
>
> — OFDA DART Member

> *"USAID Missions worked in coordination with the DART, clearly sharing USG investments, partners, and strategy with country officials, international actors, the UN and other donors to avoid duplication and highlight gaps."*
>
> — OFDA DART Team Leader

USG partners provided critical capabilities in Liberia for laboratory confirmation of cases, without which ETUs and other isolation facilities would become ineffective.

C. OFDA succeeded at overseeing large single awards and coordination of consortia of IPs. OFDA encouraged consortia of NGOs, which then coordinated on a tactical level among themselves to implement specific campaigns. The consortium approach was used to maximize the resources and reach of activities in targeted populations in a wider geographic area. The largest single implementation award from OFDA was to a contractor, Pacific Architects and Engineers (PAE), which uniquely brought a large number of health providers to Liberia to staff ETUs (through a partnership with ASPEN, an Australian health worker firm). PAE had been present in Liberia before the outbreak, supporting USG operations. As discussed in the allied Ebola Response Evaluation, Objective 3 (Relevance), this aspect was effective at achieving the output of mobilizing personnel, though ineffective in terms of the larger goal of containing the outbreak in a timely manner, as PAE's delivery occurred outside of the period of need. The next-largest awards were to public international organizations. Most other awards were cooperative agreements to non-profit agencies, who collectively comprised the largest portion of the overall expenditure.

D. OFDA included FFP in each DART, which was effective at integrating the use of in-kind food resources into an integrated response. Because the large-scale provision of food aid via WFP and NGOs allowed populations to agree to the isolation efforts necessary for reducing mobility and contact, and therefore reducing transmission, FFP's programming was an important adjunct to the other programs funded by OFDA. Though staffed with fewer headquarters personnel, FFP was effective at moving between the three countries within the DART structure. The FFP-funded famine early warning system (FEWS NET) was deployed in West Africa in an unprecedented manner to report on the extent and duration of market disruptions and consequent access to food in the three countries, published in the form of periodic field reports for donors and IPs. The FEWS NET system had been used extensively in conflicts, locust-infestation, drought, war, and El Nino, but never before to anticipate the repercussions of a disease emergency. The FEWS NET system tracked where market shut-downs led to gaps in the economic provision of food aid, and where WFP and FFP resources were targeted.

E. OFDA coordinated with other parts of USAID in necessary ways in developing the EVD control strategy. OFDA served as the planning and implementing lead office within USAID. In this capacity, OFDA worked with epidemic and communicable disease specialists within the Bureau for Global Health, as well as with more senior staff. The Administrator of USAID, who had a medical background, also played a substantial role early on in editing the OFDA EVD strategy and in organizing OFDA's role vis-à-vis the National Security Council (NSC) and CDC.

Key interventions undertaken with private money benefited from USAID's Bureau for Global Health's coordinating role on behalf of the USG. USAID recommended NGOs for the Paul G. Allen's Family Foundation (Vulcan) to fund, such as the BBC Media Action, which led extensive media outreach to inform the Liberian population. USAID's competition for innovative technical solutions might have contributed—for instance with improved personal protective equipment (PPE)—had the outbreak grown in scale and continued longer.[20]

Notably, OFDA did not coordinate or play a lead role in the development, testing, shepherding or deployment of vaccines, in which CDC and NIH were involved and which came too late to be relevant to bending the curve of that outbreak.

The UN coordinator of the response, Dr. David Nabarro reflected that:

> *"During any outbreak, it's imperative to move quickly and decisively at the beginning. In early 2014, a very small number of cases of Ebola were reported, mainly in Guinea. There was an uptick in June and July... and those cases were mainly in Liberia and Sierra Leone. If we'd been able to be more robust in our response in those early months, the giant outbreak we saw, particularly in urban areas, would not have happened."*[21]

F. OFDA's coordination with the DOD worked well within assignments given by the White House and OFDA, and effectively leveraged extensive efforts over the last 25 years to solidify the processes and joint understanding that allowed smooth OFDA/DOD coordination. Across KIIs, in DOD after-action reviews, in roundtable meeting at USPHS, and in correspondence with AFRICOM and other sources, the close working relationship between DOD and OFDA was universally attested to.

DOD's response was provided along four specific lines, all focused within Liberia: a) construction of ETUs; b) provision of airlift, i.e., helicopters to move USG personnel around the country; c) the provision of laboratory testing facilities, assays, and expertise; and d) the setting up and staffing of the MMU for expatriates and responders, including airplane pilots, should they fall ill. Collectively, these were dubbed "Operation United Assistance," and engaged a number of different components of the U.S. military, including the regional African Command (AFRICOM, headquartered in Stuttgart, Germany), TRANSOM[22] (in Illinois), and a range of medical units.

At the onset of Operation United Assistance, there were communications gaps. Joint Force Command-United Assistance (JFC-UA) and DART addressed this issue by holding daily meetings at the U.S. Embassy with the command group and Chief of Mission (U.S. Ambassador), semi-weekly interagency synchronizing meetings, and nightly operations-synchronizing meetings with the DART MITAM managers.

OFDA's tasking of DOD on a daily basis was effective in the well-honed use of MITAM spreadsheets, which were understood and acted upon by DOD. An "Ebola synch matrix" was collectively established between DOD personnel and the interagency community to assist in mapping the fast-paced construction of the ETUs, training health care workers, establishing Army medical test laboratories to verify EVD samples, and providing DART-directed logistical support via MITAMs to the international community. This Ebola synch matrix of time-to-task mapping put everyone on the same page and gave a greater shared understanding of impending requirements. Key engineering assessments, coordination, and repairs were critical to supporting Roberts International Airfield, Liberia's primary airport and lifeline, in order to support the increased flights for JFC-OUA.[24]

Laboratories: One of the most valuable and effective contributions early in the response was the allocation of military medical laboratories to Liberia, staffed by uniformed U.S. experts. Detailed collaboration and coordination efforts involved USAID, CDC, the U.S. Naval Medical Research Institute, Diagnostic Labs, U.S. Uniformed Services University of Health Sciences (USUHS), the Defense Threat Reduction Agency, and the Defense Logistics Agency.

In-Country Air Service: OFDA's tasking via MITAMs of DOD helicopters (rotary-wing aircraft) was substantial in Liberia for moving many NGO personnel within the country, including reaching difficult locations such as Grand Gedeh. DOD therefore provided valuable logistical support where needed. DOD also provided transport for CDC officers to areas of mini-outbreaks in Liberia was criticized by a number of respondents, in that DOD would only drop persons off, not pick them back up. This posed a burden on those staff to find their way back to base over land. DOD's prohibition against bringing them back, related to the risk of EVD contamination, seemed to be contradicted when DOD flew them back out again the next day.

Building ETUs: The early commitment of DOD to lead in the construction of seventeen ETUs was considered by many respondents to be a very poor early decision from the White House, OFDA, and the Joint Chiefs of Staff (detailed analysis and conclusions in Annex O). Some critics pointed to the fact that the early over-emphasis of spending USG funds on construction of ETUs was disproportionate to the needs of other sectors critical to controlling the outbreak. A separate complaint was that the ETUs were constructed, checked, and delivered at such a slow pace that most of them were irrelevant to the outbreak when they finally opened. The operation of building ETUs, once set in motion, was too cumbersome to be redirected. The emphasis on creating more health facilities and beds came out of the early apprehension from the CDC predictive model of the outbreak's EVD unfolding epidemiology (included a 2.5-fold correction factor for underreporting of EVD cases), which reported the possibility of 1.4 million cases if no behavior change occurred (though it also predicted a decline, if 70% of cases were isolated in health facilities). Hence, the DOD strategy, with OFDA, was forward-looking to accommodate for a worst-case scenario which, fortunately, never happened.

With partners like IOM, OFDA agreed to adjust or scale the work modality according to needs. ETUs were operated and staffed at 20, 30, and 45-bed capacities to respond in a cost-efficient manner. ETU resources were also utilized in community mobilization and active case finding when needed.

G. OFDA and CDC worked together often, formally and informally, throughout the outbreak; there were inefficiencies and a steep learning curve that slowed inter-operability and communications. Coordination improved over the course of the outbreak. Although OFDA had funded CDC in the past, and borrowed CDC staff for field- and Washington, DC-based technical support, the scale of collaboration between OFDA and CDC in the West African outbreak was a qualitatively different experience for both agencies. In the U.S., the relationship was slow to gel, in part because each agency perceived itself as "the lead" at different times. The disjuncture between disaster and health experts was reflected in the differing and inefficient efforts around the Incident Command System (ICS) versus Incident Management System (IMS), and also reflecting a larger gap among global disaster and health communities:

> As one senior USAID officer said: *"The global public health community and the global emergency community do not speak the same languages or know one anothers' worlds very well."*

This is evidenced by interviews with OFDA officers who worked with CDC and CDC officers who worked with OFDA, surveys of DART/RMT members, and a review of published literature by CDC. One key informant said:

> *"OFDA has it right that the response is field-driven. The DART priorities are facilitated by the RMT, while for CDC it was the reverse. Decisions in Atlanta that the country manager might not agree with. CDC people in the field can't move money around. Can't fund partners. We often had to rely on OFDA to facilitate funding."*
>
> As one USG informant recommended: *"Clearly define OFDA's role so there is strategic value-added. Maintain close and regular ties with the CDC and HHS in 'normal' times so they better understand how we work and complement potential of their value-added in the next crisis."*

Early on, OFDA had the most flexible financial resources, which it used to help capacitate CDC. During this early time, OFDA provided funding to CDC, and later, to the USPHS, according to KIIs. By December, 2014, Congress had authorized appropriations for its omnibus "Consolidated and Further Continuing Approbations Act, 2015," which obligated over US$2.4 billion, of which $1.2 billion was allocated for CDC. CDC's role in controlling the outbreak was extensive and out-weighed any other U.S. presence at the field level.

CDC assisted with a large share of the emergency response, particularly through the deployment of large numbers of personnel. The West Africa EVD outbreak was the largest emergency response in CDC's history. CDC activated its Emergency Operations Center on July 9, 2014. At the peak of the response, CDC maintained approximately 200 staff per day in West Africa and approximately 400 staff per day at its Atlanta headquarters dedicated to the response. Overall, approximately 1,897 CDC staff were deployed to international and U.S. locations, for approximately 110,000 total work days, and more than 4,000 CDC staff worked as part of the response.

Senior OFDA and CDC field staff interacted often. Serving in the field as members of DART teams, CDC had input into most of the decisions about OFDA awards to IPs, even as, separately, CDC also had its own procurement and allocation of resources not detailed in this report. Both OFDA and CDC staff shared in making decisions on what programs to pursue and which IP activities to fund.

In the end, the partnership between OFDA and CDC provided a critical and valuable marriage of technical know-how, science, and insight into emergency relief and outbreak control. CDC and OFDA each brought expertise to bear in how to respond to health crises in resource-poor environments. CDC brought greater expertise in the surveillance, modeling, isolation, case finding, technical guidelines, scientific knowledge of EVD, and in general the control of outbreaks; OFDA brought greater expertise in mobilizing local and NGO resources in addressing primary health care outreach, hygiene, community engagement, systems of referral of suspected cases, and tertiary health access. OFDA in particular brought a more extensive and nuanced understanding of varied implementing partners.

EVALUATION QUESTION 9

To what extent were the activities supported by the USG well-coordinated with the broader international response, national response structures and well-coordinated operationally between organizations that the USG funded?

BROADER INTERNATIONAL RESPONSE

A. USG efforts were well-coordinated with certain components of the international response, but not with many others. Greater attention was given by the USG to tracking, communicating with and planning with certain key international actors (WHO, DFID, IOM, WFP) but not with others. Few respondents or general information sources offered evidence that USAID or CDC were familiar with or in contact with the French Government, GIZ, the European Commission, the Wellcome Trust (a UK foundation), the Tony Blair Africa Governance Initiative, Japan, or Cuba, which provided the Cuban Medical Brigades through WHO in Guinea. Evidence is also absent about how extensively USAID communicated with the World Bank (besides weekly encounters at donor coordination meetings in Sierra Leone), which provided extensive financial support to governments. Despite OFDA maintaining a humanitarian liaison officer within the U.S. Mission to the UN, no information was found about the U.S. playing any notable role via the UN Security Council or General Assembly. OFDA was aware of the incapacity of the UN system to adequately gear up for effective response, a subject of much real-time criticism by health experts as well as MSF in the field.[23]

B. Coordination with other key donor countries was sometimes informal. For example, as in other outbreaks, OFDA liaised with the UK government in Sierra Leone. There, OFDA coordinated frequently and informally[25] with DFID, effectively carving the country into regions where each provided lead funding. CDC and OFDA each had *ad hoc* communications and coordination with DFID and other key responders shaping the response in Sierra Leone. This was evidenced over the course of FGDs with DART and RMT staff and in literature review.

USG teams may have been aware of other donor government efforts, but coordination appears to have been through WHO, not through OFDA. Other governments contributed significant resources that may have filled important gaps, such as Germany, Scandinavia, and China. Chinese assistance occurred early in the outbreak: *"In August 2014, [China] sent three teams of infectious disease experts…to assist local medical professionals … at a time when aid groups from the United States, Europe, and Japan were evacuating their own in droves. In mid-September [2014], a 59-member Chinese laboratory team departed for Sierra Leone."*[27] France maintained relations with the DOD in Washington DC and the French military staffed an ETU in Conakry in Guinea, but otherwise there was minimal communication or coordination with France, despite the appearance to many that France served as the lead in Guinea.

C. OFDA promoted and facilitated an overall international coordination primarily through WHO. OFDA funded WHO in its response; CDC lent staff to WHO and coordinated with WHO on technical issues such as the design of interventions and the software construct of national surveillance platforms. The efforts of many donors and UN agencies were coordinated in part by WHO, which received both in-kind and funding support from USAID. OFDA posted a senior staff person to Geneva to collaborate with WHO and other UN-based forums involved in coordinating the EVD response. This was clear from a range of KIIs with UN and USAID officials, and award documents.

The USG response was not well-coordinated within the UN Security Council-established mechanism UNMEER. To a large extent, the USG response ignored and side-lined UNMEER. USG respondents described UNMEER as being an ineffective model for UN coordination. It also seemed to U.S. officials as redundant to WHO's pre-existing role. The experiment

of creating UNMEER found that that model should not be replicated in the future and OFDA was correct in not devoting time to it.

According to DART members:

> *"Most of OFDA's previous emergency response coordination work with the UN system was OCHA/Cluster-focused. OCHA and the Cluster system were minimized (even marginalized) as part of the UN's Ebola response. From the outset, the DART was biased against the less conventional UNMEER structure approved by the UN Sec Gen and SC."*

> *"While UNMEER was slow to become operational, the DART could have worked more productively with UNMEER as its capabilities increased and capacity to coordinate aspects of the response grew. At times, it seemed that the DART actively resisted UNMEER (UN) coordination at any scale."*

Logistics across the three countries was promoted by the USG support to WFP. National and regional awards to WFP provided a much-needed airlift within the region of personnel via the United Nations Humanitarian Air Service. USG coordination with other salient UN humanitarian agencies, including the United Nations High Commissioner for Refugees (which coordinated extensive aid for West African refugees) and the United Nations Development Program was not shown by any evidence.

D. The USG promoted support from within Africa to the three countries with a grant to the African Union (ASEOWA) to mobilize trained health care workers and trained, francophone epidemiologists from the DRC to Guinea. USG respondents felt that the ASEOWA support had some benefits, but were unsure about its efficiency. Most felt that the Field Epidemiology Training Program epidemiologists from the Democratic Republic of Congo were invaluable as part of the CDC/ epidemiology response to track the outbreak in Guinea, because of their skills, ability to mesh with locals, and their ability to converse professionally in the French language.

The USG response was also not coordinated with the West African Health Organization (WAHO), or other regional entities such the Economic Community of West African States or Mano River intergovernmental group. This emerged from the review of award documents and field interviews from Liberia and Guinea, and lessons learned from CDC research.

IOM—supported by OFDA and CDC—did provide regional tracking via cross-border flow monitoring.

F. Coherent West Africa regional vision and coordination was a notable weakness in overall response among donors including USG. The international response was overly "silo'd" country by country, and there was too little joint planning across national boundaries. Because of the extensive involvement that the USG had in all three countries, OFDA had a unique opportunity to play a regional role in seeing the outbreak not by national boundary, but as a dynamic pandemic that moved back and forth across borders. The RMTs had more of a regional perspective than did any one DART, and similarly the incident command managers in Atlanta, GA provided a regional perspective of learning for CDC. The learning and planning that emerged from this regional perspective are not well documented. Nevertheless, most USG planning and programming was targeted to specific geographic areas and there was not a coherent strategy for anticipating forward spread of the disease—or ways to get ahead of it. OFDA's funding of iMMAP generated useful mapping of clusters of infection, which many agencies used in design and planning.

NATIONAL RESPONSE STRUCTURES

A. OFDA worked closely and effectively with the national command structures of all three countries, including providing critical guidance and training. CDC and OFDA teams each supported the setting up of local Emergency Operation Centers (EOCs). CDC trained these national coordinating bodies around its IMS, long used for health crises in the U.S. and in other countries. OFDA trained locals in the better-known ICS, which is mainstreamed across U.S. government agencies, including the Federal Emergency Management Agency (FEMA) and USDA, and promoted by OFDA internationally as part of its broader capacity building support to countries. The different approaches of support (CDC provided guidance, whereas OFDA provided processes and training) were manifest also in the differences between the two systems. Sources drawn for this included KIIs at MOH's, and KIIs and FGDs at USAID and CDC.

> *"CDC/USAID/others should work with governments on incident command center models (this is what was used in Guinea) to ensure government involvement in the response."*
>
> — DART Member

> *"The EOC was set up by OFDA and CDC but was purely medical and not a holistic approach on the problem. It stressed the epidemiology, but never food or non-food."*
>
> — DART member

The most important actors in bending the curve of the outbreak were the national governments of the three countries. Each government ultimately played an indispensable and extensive coordinating role for a wide range of responses. OFDA and other donors worked through each government and the pace of programs being approved and scaled depended largely on those governments and their decision making, including which ministries played lead roles. Had the outbreak occurred in a failed state, the look and character of the response may have been entirely different.

B. OFDA, CDC, and DOD attended the myriad technical working group meetings that brought together national authorities with IPs to track the epidemic and plan next steps.

OFDA effectively used its participation as a way to inform Washington, DC about the latest understanding of the outbreak and emerging gaps to be filled. Rather than creating competing working groups, OFDA and CDC lent legitimacy to the EOCs and lead decision makers in each country through their buy-in to the national and regional meetings. In Liberia, the relationship between the USG country team was particularly close and effective with the office of the President.

CDC and OFDA each interfaced extensively with local leaders, ministries of health, national leaders, and the U.S. Embassies. This included extensive involvement in setting up national surveillance systems and information-sharing mechanisms among implementers and responders. CDC in particular worked as technical advisors to district health officers and Zonal Surveillance Officers.[28]

When asked what the most important roles were that the U.S. Embassies and USAID missions played in West Africa during the response, DART respondents stated that they played a key diplomatic role in establishing relationships of trust with government and local leaders and coordinating with local agencies to enable a more effective response.

One dimension of coordination was the promotion of technical guidelines by OFDA, recognizing that this emergency was distinctive, and that OFDA's own field operations guidance and other common humanitarian guidelines failed to provide the level of technical details required for EVD,[26] as described more fully under Evaluation Question 5, in Ebola Response Evaluation, Objective 3. Surveillance of EVD generated estimates that had high confidence intervals, reflecting uncertainty in diagnosis and reporting.[31]

C. Support to national authorities was also provided indirectly through IP grants. Support to the three country governments occurred through grant awards and agreements to the international NGOs, as detailed in Annex E. Those prime award-holders for OFDA awards then sub-funded and coordinated sub-grantees and provided extensive training, vehicles (such as ambulances), and other support to a wide range of local civil society and governmental entities. In this regard, OFDA monitored a large network of implementers. OFDA's extensive support was similar to certain other donors, such as the German government or the World Bank, who supported the capacity of local responders through funding of governments.

BETWEEN USG-FUNDED ORGANIZATIONS

A. USG agencies promoted field operations through a sharing of information and resources. In Liberia, IMC, Project Concern, and Global Communities (GC) exchanged ideas and lessons.[29] In Liberia and Sierra Leone, key NGOs such as GC and World Vision shared vehicles and training with other entities under USG funding, such as the International Rescue Committee (IRC). CDC and OFDA each engaged extensively with the DOD in Liberia. OFDA, which had staff at the Pentagon and in Germany at the AFRICOM base, directly managed the assignments or tasks undertaken by soldiers and the deployment of their assets (e.g., helicopters). CDC personnel, often traveling within West African countries to remote outbreak sites, used DOD helicopters.

> *"We had regular OFDA coordination meetings. CDC was very active and supportive."*
>
> — IP respondent

B. OFDA effectively encouraged and created consortia where IPs working in a country worked as part of a formal inter-agency program. In Sierra Leone, for example, the IRC and other NGO partners formed the Ebola Response Consortium (ERC) in August, 2014. Made up of nine international NGOs, the ERC provided support to Sierra Leone's ministries of health to implement a comprehensive program to support IPC trainings and intensive supervision in 182 government hospitals. A designated ERC partner was responsible for supporting each targeted hospital, implementing trainings, and monitoring staff adherence to the IPC standard operating procedure. The consortium was able to provide IPC supervision at scale, which would not have been possible otherwise. This was evident via award documents and interviews with IPs. Surveillance of EVD generated estimates that had high confidence intervals, reflecting uncertainty in diagnosis and reporting.[31]

OFDA recognized the unique urban dimensions of the outbreak early on as well as the importance of reaching out to many rural areas. EVD had not previously hit any large urban areas.[32] OFDA's funding was balanced between the two, with balanced results, as explained on pages 25 and 31 of Ebola Response Evaluation, Objective 1.

C. Notably in Sierra Leone, OFDA funded IOM directly and facilitated border operations with IOM by encouraging CDC to use them for screening of cross-border movements. Both CDC and OFDA had long-standing critical programming relations with the IOM. While OFDA provided the funding for IOM's activities, CDC used a standing global framework agreement for its IOM/CDC coordination. Evidenced by OFDA respondents and roundtables with IPs, the IOM played an important role in screening and surveillance of suspected cases at country borders to attempt to mitigate the cross-border spread of the outbreak. OFDA had previously funded IOM in numerous emergencies where IOM functioned as a versatile implementing agency. At the same time, CDC has a global agreement to work with IOM on screening and monitoring of migration, particularly to and from Guinea along its southern borders.

EVALUATION QUESTION 10

How well did OFDA adjust to the changing epidemiology and priorities of the international response?

A. Overall, OFDA did very well in adapting its strategy by phase of the epidemic, as new information became available, per country and per region. OFDA's coordination with partners exhibited a recurring re-appraisal of local needs, in large part informed by the information it received from WHO, CDC, local officials and IPs, as revealed in FGDs at OFDA, field KIIs, the *Morbidity and Mortality Weekly Reports* (MMWRs), and award documents.

On reflection, among OFDA personnel surveyed, 58% percent of DART respondents (self-assessment survey results) rated OFDA's ability to prioritize the most relevant activities in response to changes in epidemiologic data as "good" or "very good."

Consistency of definitions, data reporting standards and analysis were a challenge early in the outbreak. OFDA accepted other agencies' data and did not impose tight case definitions or clear, harmonized reporting methods region-wide. As a result, the system of classifying cases as suspect, probable, and confirmed was not consistent across the three countries. Population-based surveys were not conducted, as they are in other disasters OFDA responds to. As a result, OFDA was continuously reacting to data about the outbreak waves and changing epidemiology that was biased toward health center reporting, with consequent significant under-reporting of EVD, particularly early on and in rural areas.

B. OFDA was forced into "playing catch-up," because it had not been asked to lead the USG response earlier. Evidence existed of widespread uncontrolled chains of transmission in both rural and urban areas in Guinea by May 15, 2014, and within rural areas of Sierra Leone by May 25, 2014, while the borders between these countries and Liberia were porous.

Although OFDA had been tracking the EVD outbreak since March, 2014, it had not established a strategy or made any plans (evidence in general literature, OFDA and CDC respondents, analysis of timing and epidemiology). During the July and August, 2014 period, OFDA realized that it needed to be more aggressively involved and began to dedicate more resources to consider how respond in a timely manner to the outbreak. Even as OFDA was preparing to gear up, its usual partner agencies were departing the region to avoid contact with EVD. There had been no clarity within the USG about which branches of the USG would give coherence to the response: USAID, State, HHS, DOD, or CDC. The Directors of OFDA and the CDC jointly traveled to Liberia to explore how to escalate a programmatic response to this emergency—already caught behind the curve and growing fast. Thus, during this period OFDA played catch up to an outbreak that was moving faster than anyone had seen before with any filovirus.

OFDA was also learning to determine how best to respond; based on a strategy largely proposed by CDC, the OFDA response at this time was oriented toward a goal of generating more hospital beds. It was during this period that both OFDA and CDC had communications with DOD about coordination, and OFDA was able to ascertain that DOD had unspent fiscal year funds that it could re-assign to EVD response for building ETUs. At this time, OFDA's approach was also heavily influenced by higher-level priorities that focused on infrastructure in Liberia. Attention was focused within the U.S. Almost entirely on Liberia, with less planning for Sierra Leone and Guinea. CDC teams were active in Guinea and Sierra Leone from this point onward, but significantly greater USG efforts were in Liberia until December of 2014. During this period, OFDA also was tracking the potential of the outbreak to increase its spread in Nigeria, Mali, and regionally. The Nigeria micro-outbreak also presented a frightening prospect of spread by airplane travel.[30]

C. Essential adjustments were extensive during the first few weeks of the outbreak as the availability of partners became known, funding for DOD operations were pinned down, and EOCs were formed in each country. OFDA's strategy was in a formulation phase during August and September, 2014,

crafted with input from CDC as well as the USAID Administrator. Even that strategy changed rapidly during the first two months of the response. In September, 2014, OFDA adapted to the projections of the outbreak—based on CDC's mathematical model—by expediting the erection of ETUs across Liberia, anticipating where the outbreak might spread. This was done in close coordination with WHO, which sought to get ahead of the expanding geographic scope of transmission by positioning ETUs along key access points covering most of Liberia. During this period, OFDA effectively emphasized recruiting IPs, NGOs in particular, to build and operate ETUs. OFDA's strategy during this period of the epidemic curve's trajectory, along with other donors, was formally described as the 3 "B's" for Behavior, Beds and Burials, reflecting the USAID/CDC strategy.

OFDA and other donors faced the challenge that many health workers, who had seen their co-workers die early in the outbreak, were afraid to show up for work. Therefore, as described in Evaluation Report 1, USG support for training, PPEs and other IPC elements as well as the commissioning of the MMU in Liberia, were essential to many of the other activities that were linked to health care. *"It was less about money and more about actors available,"* said one DART member. IPs experienced different timing of their award funding arriving, often based on whether they were flexible and understood OFDA and its strategy.

> *It was pretty quick, two weeks. To be honest, it felt like 'whatever we asked for, we would be given,' because we had agreed to take on an ETU. Normally, you go back and forth about costs, whereas here the attitude was here you go. They were having a lot of organizations wanting to do community-based work, and too few wanted to do clinical management of ETU"*
>
> — IP KII

OFDA carefully observed the outcomes of its early interventions with community mobilization and training of burial and dead body management teams in Liberia, which proved rapidly successful, as discussed in allied Ebola Response Evaluation reports for Objectives 1, 2, and 3. Early success in Liberia in promoting safe burials, a pivotal focus of OFDA's strategy, was not seen in the other two countries, although it is unclear why. OFDA and its partners recognized early that experience in Liberia confirmed the importance of citizen behavior change driving the decline in the basic reproduction number (R0)[33] that resulted in a cumulative case estimate of fewer than 25,000, rather than the 275,000–1,000,000 cases predicted by modelers by December, 2014.

OFDA also effectively and rapidly funded safe burial programs, which in Liberia involved funding multi-pronged efforts to identify safe burial teams across Liberia (for instance, with the IFRC and GC), to train them quickly, equip them with PPE and the vehicles required to manage and move dead bodies. All evidence suggests that this was arguably the single most effective reading of the epidemic curve made by OFDA, and was timely as a priority.

OFDA did not drive an early orientation toward isolation capacity at the local level. OFDA could have funded CCCs earlier, but rejected the CCC approach in favor of ETUs. This was controversial within OFDA, within CDC, within WHO and among IPs.

D. OFDA continued to adjust well to the international community's evolving understanding of the outbreak's epidemiology over time, for instance moving beyond a focus on health facility beds at ETUs, to more community-oriented approaches such as CCCs, and eventually to an emphasis on community outreach for community-based approaches supported by public health outreach. This was evident from a review of programs implemented, IP literature, and FGDs at OFDA. Not just at the national level, but also at the subnational level, OFDA's interventions shifted in response to epidemiological data received. All of these adjustments were based on multi-layered communication and interpretation of epidemiology between OFDA, CDC, local public health authorities, and WHO. As is common with OFDA funding in emergencies, a large share of awards received extensions or renewals.[34]

Tracking the temporal course of the outbreak, OFDA's sequence of awards and field-level collaboration supported, aligned with and tracked WHO's own adaptation from its August, 2014 Road Map for EVD response to its update in early 2015, "Getting to Zero" strategy.[35] Increasingly, OFDA adjusted its approach away from the 3 B's, toward what WHO called the "3 C's:" Community engagement, Case finding and Contact tracing, which oriented the response more deeply into communities, out into more rural areas, and allowed for more early-detection and isolation.

OFDA selectively funded research organizations such as Overseas Development Institute (ODI) and Tufts to explore key technical guidance. This addressed uncertainties about disinfection via different solutions for hand-sanitizing hygiene, disinfection of excreta, and liquid wastes at ETUs, for which OFDA funded Tufts University research.[36]

OFDA successfully funded the MENTOR Initiative (normally focused on malaria in crises) to engage the private health provider network, a dimension of the response neglected by others. This was a critical response early in the outbreak, when OFDA recognized that the high rate of deaths among health care workers had led to a collapse of the local health system.

E. Between November 2014 and March 2015, OFDA dramatically re-adjusted its allocation of resources among the three countries. Until December 2014, most of OFDA's resources and operations were allocated to Liberia rather than to the other two countries.

The greater attention to Liberia paid by the White House, OFDA, and DOD may have been due to the timing of when the early outbreak-generated international media attention. OFDA's and DOD's greater funding of the outbreak in Liberia, despite Liberia's smaller population, reflected not only a premise that the outbreak was worse in Liberia in, for example, 2014, but that efforts to control the spread of EVD in Guinea and Sierra Leone would be commensurately supported by the governments of France and the UK, respectively. The U.S. expected burden sharing by others. The UK did allocate extensive resources in Sierra Leone. In Guinea, an array of French, EC, Russian, Cuban, and other donors supported the response.

Beginning in October through December 2014, the number of new cases in Liberia started to decline. The reproduction rate of EVD began decreasing in the month of October in almost every district for which there is data in Liberia. By November, OFDA recognized the success of the combined programs with ETUs, safe management of dead bodies, community trainings, and government coordination. At this time there a new paradigm was adapted by OFDA with its partners: to use the improved surveillance system to rapidly identify new cases, rigorously implement contact tracing, and contain each micro-outbreak within the region it occurred. This was an effective measure for ensuring the de-escalation of the outbreak.

OFDA responded to the epidemic curve and then broadened its funding to include social mobilization to engage the larger population in necessary behavior change, both to prevent transmission and improve community acceptance of safe burial, isolation and treatment services. During this period, OFDA recognized that the ETUs rapidly put into construction would not all be needed and revised downward the total ETUs planned in Liberia—and even began the plans for the handover and decommissioning of the ETUs provided.

A notable turning point occurred late in 2014. By December, 2014, and until March, 2015, OFDA recognized the importance of shifting the focus of its efforts more toward Guinea and Sierra Leone. IPs encountered different types of bureaucratic and funding delays than in Liberia and confronted obstacles to speedy mobilization in these countries. Thus, a number of OFDA-supported efforts did not translate into active operations until March, 2015.

It became evident during this period that EVD was being re-transmitted across borders (for instance, back into Guinea) and border control measures were promoted. OFDA sought to coordinate use of CDC's relationship with IOM to engage border control measures earlier in Sierra Leone, but it took months—into 2015—to launch. CDC attempted to fund border control via CDC foundation funding, but discovered that the cooperative agreements would take six months to approve. At this point, OFDA stepped in to fund the cross-border operations, which were efficient at limiting further re-introduction of the virus. However, cross-land border transmission was not substantially more important to overall spread of the disease than any other transmission from village to village, or district to district. In both countries, OFDA's reading of the epidemic curve was effective in giving balanced attention to social mobilization to reach large population areas. It was also during this period that OFDA adjusted its estimate of the epidemic curve to support CCCs, which ensured isolation at a more decentralized, village level, to complement the ETU system and reach more of the population. There remains some controversy within WHO and expert communities whether these CCCs should have been supported earlier.

Evidence was not seen that OFDA took into account gender dimensions of the epidemic's evolution. Chains of transmission were examined in terms of movement of migrants and traders, those attending community events including funerals and between health workers. The gender dimensions of these spreaders (or super-spreaders) were not documented, though it is known that the transmission pathways of women were different from men. Men were subsequently understood to have had slightly fewer cases than women, and in Gueckedou, Guinea, much lower (2 to 1 ratio).38 Local adaptations included postponement of EVD-spreading female genital mutilation.[39] As well, the diminished quality of life of female survivors may also have influenced risk-related behavior among community members.[42]

F. Subsequently, OFDA adjusted extensively and in a timely manner to changes in the epidemic curve at each phase, reflecting the ongoing spread of the outbreak in Sierra Leone and Guinea. However, despite OFDA's effectiveness and relative nimbleness, the EVD outbreak continued to spread until mid-2015 in unpredictable ways that caught OFDA and other donors off-guard. As in most large humanitarian crises where OFDA is called in, OFDA's response was primarily reactive and adaptive to where the outbreak was—and not to where it was going. OFDA's ongoing learning might have benefited from more continuity from either longer postings or better handover between DART rotations. As one informant recommended:

> *"Have technical experts assigned to each team (this was done and should be a basic requirement); ensure that handover notes are prepared for those rotating in; prepare briefing notes on epidemiological issues - although everyone was learning by doing in Ebola."*

As cited in the Ebola Response Evaluation Objective 3, OFDA could have put earlier investment in more ground-level-up prevention through community-level IPC.

G. During the first 10 months of U.S. response to the outbreak, the USG recognized and took into account the poverty of quality data about the full scope of EVD transmission. Evidence at the time, and more recent research, indicates that possibly over 50% of EVD cases were not reported. Therefore, the published statistics were an incomplete picture of the epidemic

curve. This was evident to OFDA in Guinea, where most of the reported cases had no identified source of exposure, or contact who had EVD—which meant that for each case identified, there were certainly an equal or greater number of cases not reported or identified. Recent evidence suggests that there were more undocumented cases in rural areas, particularly during this middle period of the outbreak. Independent researchers of the outbreak believe that the total number of transmission events may have exceeded 65,000 persons.[37] Under-estimation and more precise and granular identification of cases improved as OFDA supported more and more community events-based surveillance, as described in the other Ebola Response Evaluation reports.

H. As soon as the transmission through semen was identified, the USG shifted its efforts. After the outbreak had been largely quelled in Liberia by May 2015, new disease evidence emerged that EVD could be transmitted through semen, which resided longer-term in individuals. Within 48 hours, the USG (the DART and CDC) and government of Liberia (led by the President) took this into account and shifted their strategy to educate about this.

I. As more areas were declared EVD-free, the OFDA shifted its orientation toward watchful waiting, surveillance, and responsible close-out. From April, 2015 until December, 2015, OFDA's efforts in all three countries had moved toward a more complex, varied system of extensive case identification, surveillance, contact tracing, community-based isolation, and rapid containment of small outbreaks. April, 2015 through September, 2015 was a major period of different transitions in epidemiology for both Sierra Leone and Guinea and shift to sexual transmission in Liberia. OFDA recognized the possibility of recurrence; because most of the population had not been exposed to EVD, there was no herd immunity and the possibility of EVD growing in scale was a possibility. OFDA read the epidemic curve well, and maintained its presence, and continued to expand its efforts into lessons learned, surveillance, and work with survivors to extend outreach into communities. Through this period, OFDA and CDC supported the WHO strategy of "0+42", i.e., the goal of reaching 42 days without a new EVD case—essentially, the passing of two EVD incubation periods. OFDA, CDC, and their partners were well prepared to respond to the mini-outbreaks that occurred in late 2015 (August/September in Sierra Leone; June/July in Liberia) and in Guinea in March 2016.[43]

Findings by Country

EVALUATION QUESTION 8

How effectively did OFDA coordinate all USG efforts as the lead agency in this response?

GUINEA

OFDA worked with CDC to ensure USAID and CDC were coordinated in Guinea. OFDA participated in and supported the government coordination mechanism (CNLE). OFDA did not coordinate much with non-USG donors. OFDA and CDC both were in almost all coordinating meetings in Conakry, and USG personnel deployed around the country providing awards, award monitoring, surveillance, and case identification National coordination activities began between May and June, 2014.

OFDA and CDC worked well together through a full-time liaison person. However, before the appointment of the liaison person, there had been some misunderstandings between OFDA and CDC. In the early months of the EVD outbreak, the U.S. Ambassador hosted weekly Friday morning meetings with OFDA and CDC representatives together. CDC/Guinea did not get enough administrative support from Atlanta, as evidenced by reported logistical problems that CDC staff faced in getting visas, booking flights and hotels, and gaining access to briefings and handover information.

Overall, the USG failed to contribute to the control of the outbreak early on, when it might have been contained. Experts reading the outbreak's progress observed case counts in Guinea, but failed to anticipate the geographic spread of the disease. CDC withdrew their team from Guinea in May, 2014, which allowed the outbreak to spread largely unobserved.

CDC was reported to be overwhelmed by the scale of the need and access to other non-USG experts, due to the scarcity of French-speaking health professionals, such as the Public Health Agency of Canada (via GOARN) and Field Epidemiology Training Program graduates from francophone African countries. These groups were particularly effective, according to numerous respondents.

SIERRA LEONE

CDC and OFDA worked with collaboration in the absence of any formal institutional agreements. KII with IPs, CDC, and government of Sierra Leone (GoSL) respondents reported that OFDA coordinated with CDC, USAID, and OFDA-supported IPs. The CDC provided technical assistance and OFDA provided management of partners, communication, and coordination. USAID, through OFDA, was able to work with partners in contracting and funding equipment and services. Respondents pointed out that the one notable challenge was that the DART leaders had no public health experience, while many CDC people had no disaster experience. DOD was not involved in Sierra Leone.

LIBERIA

OFDA worked daily with DOD and CDC to ensure USAID and CDC were coordinated. Liberia received the greatest intensity and share of response by the USG, including the White House, compared with other countries. Consequently, there were more IPs, partners, and branches of the USG in Liberia to be coordinated. The Liberian experience emphasized U.S. government commitment—USG funding amounted to 83% of the total funding by donors.

OFDA engaged extensively with the DOD in Liberia. OFDA, which had staff at the Pentagon and in Germany's AFRICOM base, directly managed the assignments or tasks undertaken by soldiers and the deployment of their assets (e.g., helicopters). DOD was mandated by the White House in general to help build, supply, and train staff for the numerous ETUs that were located in Liberia. It also employed construction experts and engineers to design the ETUs. DOD collaborated with local authorities and set up laboratory surveillance systems.[44] DOD health care personnel were deployed to provide backup support to the staffing of each. DOD's Operation United Assistance (OUA) officially began in September, 2014, when U.S. Army Africa established the JFC-OUA, located in Monrovia. The JFC-OUA then tasked the 101st Airborne Division headquarters and other units (a total of 2,692 soldiers at the peak of the outbreak in both Liberia and Senegal) to execute the actual formation of the JFC-UA, which supported the Liberian government and USAID/OFDA and, more specifically, a DART.

> *"With Ebola, there were so many new things that we'd never done before that all decisions needed to be kicked up to headquarters and their review by the Joint Chiefs of Staff."*
>
> — KII, USG

CDC worked regularly with OFDA in Liberia. One expert observed:

> *"The DART in Liberia was different from those in the other countries. Clearly a different experience."*

One respondent observed that OFDA staff did not know the meaning, for instance, of contact tracing.

> *"In an outbreak, our strategy shifted massively every two or three weeks based on what was happening with the epidemiology."*
>
> *"OFDA personnel in Liberia weren't resistant to shifting [strategy]… even if it was hard [for them] to understand, e.g., [increasing the] number of beds."*

The impression from IPs and other USG partners was that OFDA coordinated well. This was aided by OFDA's established relationships with many of the IPs assisting with the response. Respondents noted that *"CDC sociologists were effective as silent observers. They would talk with communities and identify gaps. They responded to CDC units, who reported it to the OFDA teams."*

OFDA funded more IPs in Liberia than in the other two countries. Award data show OFDA's greater orientation toward Liberia involved more use of NGOs and contractors, whereas its funding in Sierra Leone and Guinea took advantage of public international (intergovernmental) organizations, proportionally speaking.[40] OFDA also found that more partners were available in Liberia, where the U.S. Embassy was particularly forward- leaning and where the USG had strong relations with the Liberian President.

Another OFDA role entailed resolving operational problems among USG and host-country players in Liberia. For example, transport of teams that included CDC epidemiologists to field sites was often tasked via U.S. military aircraft. However, based on instructions from the Pentagon, military helicopters would only take people out to the field and drop them off, but would not bring them back.

CDC saw OFDA as an equal partner. The observations of IPs, including NGOs and MOH personnel, was that the two agencies complemented each other in their skills and strengths. A CDC respondent observed of OFDA:

> *"As equals, we were both clear about our lane. CDC was consulted every step of the way by OFDA. The U.S. Ambassador had meetings with CDC and OFDA every week, sometimes more often."*

An example of the role delegation was U.S. support for management of corpses. CDC staff trained GC in proper procedures for burial teams to swab cadavers to confirm EVD as the cause of death, an essential aspect of accurate surveillance. OFDA was the main funder of GC's safe and dignified burial (SDB) activities nationwide. This was one of the earliest OFDA awards, on August 13, 2014. CDC appreciated the ability of OFDA to move funds quickly, compared with their own. One respondent from USAID said: *"Every [CDC] funding decision took time. We had our own mechanism for funding partners... We had to set up contracts which can take months. We had to push at the Atlanta end to develop mechanisms."*

> *"In Liberia, CDC's role was focused on surveillance. It was difficult to see how the response was coordinated. There was a need to shift, and CDC was not able to take on that role as a humanitarian actor. CDC had a lot of technical deficiencies for case management, a gap filled by MSF. CDC and WHO roles were very unclear to me at the time."*
>
> — KII

> *"There were also dashboards that were put up with OFDA and CDC to track efforts. There are like 20 indicators, National Incident Management system, tracking activities that USAID, OFDA, DOD were doing, keeping track of who was doing what. They were updated with what was done each week. Lots of tracking of what's being done. This information was being gathered in real time."*
>
> — KII

EVALUATION QUESTION 9

To what extent were the activities supported by the USG well-coordinated with the broader international response, national response structures and well-coordinated operationally between organizations that the USG funded?

GUINEA

OFDA primarily used Guinea's national coordination mechanism (CNLE) to coordinate USG efforts. OFDA was perceived by lead authorities in Guinea to be very flexible in adapting to the changing epidemiology and national priorities. Government of Guinea (GOG) respondent explained:

> *"Maybe we were slow ... but all the partners were represented in the coordination. The USG through OFDA was involved in all decision-making by the CNLE and the advantage of bringing everybody together was that everyone always had a few things to say. They [OFDA] were flexible and listened very well."*

But for months before this, there was a vacuum of leadership to address the outbreak. MSF was credited with their earlier response and appeals for international engagement. MSF's international President said:

> *"What was lacking since the beginning is an entity or body that will somehow portray themselves as seeking the leadership and the coordination of the response to the Ebola epidemic."*[41]

Once established, the CNLE gave prioritization to social mobilization and IPC. ETUs were not as frequently requested, though the OFDA funding to the French Red Cross (FRC) and their ETU in Forécariah was very timely.

CDC gave strong support to the CNLE, which was critical to its success. There were different national and international NGOs—mostly independent of USG funding—that operated in Guinea, each with their own programs and strategies and did not coordinate well until CNLE was established. Informal clusters emerged and were active in Guinea for, e.g., child protection, WASH, and treatment. As reported in Ebola Response Evaluation, Objective 1, for Question 3, OFDA could have worked more with MOH, and not so exclusively with the CNLE.

There was less coordination with the French government than had been anticipated by the USG. It was not until around September, 2014 that coordination began to be truly effective.

At the international level, there appeared to be minimal communication between the U.S. Government and France, except through the French military liaison to the Pentagon.

The OFDA-supported IPs coordinated well with local community-based NGOs and general communities, using the best mechanisms available to address trust issues and promoting attention to the difficult southeastern Forest Region, where the operating environment was unusually austere. Significantly fewer OFDA-supported IPs (such as international NGOs) were capable of working in francophone settings. It is therefore unsurprising that half of OFDA resources in Guinea went to international entities such as WHO, UNICEF, and IOM.

SIERRA LEONE

OFDA successfully coordinated the USG response in Sierra Leone with the National Ebola Response Committee (NERC) and its subsidiary, District Ebola Response Committees (DERC).

OFDA participated in and supported the government coordination mechanisms, but did not serve directly in an advisory role to the government, which the OFDA left to DFID. In Sierra Leone, the UK government was the major or lead international donor supporting the international response. CDC and OFDA coordinated with DFID and the UK military. The UK sponsored more ETUs than the U.S. did; some respondents felt that early ETUs in Sierra Leone were up and running before other interventions. The USG co-funded many aspects of the ETUs in Sierra Leone.

> *"DFID was exceedingly important in the response. DFID worked more on the level of response logistics writ large, planning, movement of persons, coordination of response."*
>
> — USG respondent

OFDA did not coordinate much with donors other than the UK government, although WHO, the Wellcome Trust, and the Tony Blair Africa Governance Initiative were relevant. Interviews and other sources indicate little effort by OFDA to communicate or coordinate with other donors. The analogue to CDC from the UK, covering Sierra Leone, was Public Health England, which helped guide medical responses, strategy, and surveillance in the field; there is no evidence that DFID or other parts of the UK government coordinated their work with USG efforts, except *ad hoc* interactions at the field level.

Effective coordination by OFDA was reflected in its encouragement of IPs to work in consortia, which strategy DFID also followed in Sierra Leone. Although the OCHA "cluster system" did not exist in the response in Sierra Leone, there were local technical working groups. OFDA supported these IP-led groups, and thereby supported in-country coordination (for example, UNICEF led the Social Mobilization working group and IRC led the IPC group). CDC also attended the daily sector meetings and provided support for training, technical guidance, and vaccine trials. As in most disaster situations, these meetings were initially viewed as chaotic, but improved over time.

LIBERIA

OFDA helped to drive national coordination in Liberia and the DART was in direct communication with the President and her team.

In late July, 2014, supported by the CDC, WHO, and other partners, the Liberia Ministry of Health and Social Welfare (MOHSW) (renamed MOH in 2014) implemented an IMS with an incident manager devoted exclusively to EVD. The Incident Manager-in-Charge reported directly to President Ellen Sirleaf Johnson. The IMS ensured streamlined management, clear authority, structured working groups, and was accountable for operational follow-up. The IMS took over the lead from the Liberian government's former diverse Ebola Task Force, whose large size and organizational challenges handicapped its effectiveness.

Each USG agency (OFDA, CDC, USPHS, DOD) attended national and technical meetings under the Liberian-government led IMS, where they compared data daily with international colleagues such as MSF. There was a separate Liberian Presidential Advisory Committee on Ebola, a small group of senior officials and international partners, which provided advice about sensitive matters and policy. OFDA coordinated with the MOH to review IP proposals before approval by OFDA. OFDA facilitated technical reviews by CDC staff where appropriate. For the opening of any ETU, there were detailed discussions and site visits that included WHO, MOH, and OFDA.

A number of interviewees—international and national—supported the view of MOH and other Liberian government officials—that the government of Liberia exercised strong control of the EVD response with its international partners, among which OFDA and CDC played leading roles.

The partnership was comprehensive, including operations. According to an MOH official who was a decision maker during the response:

> *"Some donors tell you what they want done. But we sat and did an integrated work plan, so we tell them what we want done."*

National and international partners spoke of the constant presence of OFDA personnel at informational and decision making forums in Monrovia and in the field. MOH officials gave credit to CDC for a major role in helping to create the IMS in Liberia, reinforcing the Liberian response leadership and technical staff at national and field levels. CDC was seen as a highly valued technical partner, serving in several crucial roles, such as the training of contact tracers. OFDA was perceived as working in routine partnership with CDC and being a facilitator for rolling out, mobilizing, and funding partners for provision of supplies, logistics, PPE, and IPC materials.

OFDA helped to fill a vacuum in local decision making and mobilization to control EVD. Despite permissiveness and understanding by the President of Liberia, there was a notable lack of facilitation by the Liberian government to staff the response, i.e., to provide key support in practical measures. For instance, visa processing in the United States for U.S. staff planning travel to Liberia was not expedited. Agencies with extensive experience deploying staff overseas such as CDC debriefed returning personnel that resulted in new activities to better protect the health, safety, security, and resiliency of responding personnel. For example, enhanced screening of personnel to better match skill sets and experience with deployment needs was developed as a staffing strategy.

OFDA promoted consortia of NGOs to work together and learn from one another. There were many meetings in Monrovia, but some IPs also communicated among themselves. Despite OFDA's strong presence in Washington, DC, and the extensive membership-based coordination of most of the IPs through Inter*Action* (the NGO association), there was little relevant planning or technical information sharing among IPs in the U.S.

Coordination was slow with the African Union (funded by OFDA), Germany (GIZ), Cuban and Japanese support to ETUs, and other care centers the staff of which U.S. officers encountered in meetings. *"Coordinating requires funding,"* pointed out the USAID Mission Director at the time of the evaluation. Apart from providing funding for specific interventions, OFDA provided funding for coordination by groups including OCHA, the African Union, and WHO. This support often involved the work that these agencies were doing in all three heavily affected countries.

EVALUATION QUESTION 10

How well did OFDA adjust to the changing epidemiology and priorities of the international response?

GUINEA

The trajectory and patterns of the epidemic were less clear and less predictable in Guinea. The incidence rate was never high in Guinea, but cases were dispersed across most of the country. Response in Guinea was impaired by a lack of understanding of the epidemiologic trends of EVD and the reasons why the outbreak counts were so unpredictable. Indeed, no one has a clear understanding of what the real case load was in Guinea or whether there are mini-outbreaks still unaccounted for. OFDA allowed WHO to play more of a lead role in Guinea, but when recognizing that other bilateral partners were not as involved in Guinea, OFDA shifted more of its attention and resources there. It had become apparent that the decline seen in Liberia was not clearly reflected by the epidemiology in Guinea, where

the outbreak continued longer. Similarly, OFDA did not seem to have direct contact with some of the IPs staffing ETUs around the country and relied more on CDC's working relationship with the government. Feedback about what worked in Guinea was sparser and harder to interpret.

SIERRA LEONE

OFDA was flexible and responsive to governments and IPs, particularly heading into 2015, when the outbreak continued to appear uncontained. Response to the outbreak in Sierra Leone was difficult because of the large populations affected in different regions of the country, some of which received low priority at first.

OFDA's strongest adaption was perhaps in Sierra Leone, where it filled emerging gaps which were pinpointed during NERC coordination meetings where DFID, and WHO also participated. The allied Ebola Response Evaluation report for Objective 1 and 2 (Effectiveness of Programmatic Components) documents these projects in greater detail. OFDA benefited from CDC's engagement with the surveillance and command system.

LIBERIA

OFDA's intensive work in Liberia began with commitments for setting up health facilities along key roads and population centers in the country, promoting involvement of community leaders for community mobilization, supporting the government's ability to understand the epidemiology of the outbreak, and scaling up safe human remains management. Given knowledge of the epidemic in hindsight, these were appropriate emphases at the time. OFDA encouraged NGOs in the August to October 2014 time frame to bring health and medical expertise to bear in managing ETUs, which were needed to be effective for isolation purposes. At that time, no other isolation options existed. Soon thereafter, OFDA recognized that health facilities needed more than equipment and staff, they also needed extensive infection control measures such as cleaning, or removal of human blood and excreta, which OFDA quickly funded.

When new needs appeared, OFDA moved to fund IPs to meet them, including training and equipping burial teams, de-contamination of human waste in health facilities, and bringing together community leaders for social mobilization.

Noteworthy among the awards during this period was OFDA's effective use of the MENTOR Initiative to engage their network of private health providers in Liberia, who were able to play an important, yet neglected, role in the early response.[45]

The USG response played both a lead role and a gap-filling role, complementing multi-lateral efforts. The U.N. Multi-Partner Trust Fund, overseen by the U.N. Special Envoy, Dr. David Nabarro, provided $160 million largely to UN agencies for many of the same tasks discussed elsewhere in these Evaluation reports, epidemiologists logisticians, social mobilization officers, district monitors, etc.[46]

OFDA's taskings of DOD were efficient, given the purposes to which DOD was willing to commit, with the exception that OFDA could have intervened earlier to ascertain why DOD's ETUs were taking months to complete. Several of OFDA's programs, including those with USPHS, PAE, and the DOD construction of ETUs, fulfilled a precautionary goal of having facilities available in each area of Liberia in case EVD roared back.

Even as EVD was diminishing, however, OFDA and CDC nimbly shifted to a more nuanced and community-based approach of containing EVD in each small area where it occurred.

SUMMARY CONCLUSIONS

Evaluation Question 8

How effectively did OFDA coordinate all USG efforts as the lead agency in this response?

Once appointed as the USG's coordinating agency, OFDA played a key role in the EVD response. OFDA coordinated a complex set of agencies around a single strategy and included disparate branches of the U.S. government including CDC, DOD, USDA, State Department, Peace Corps, DHHS, USPHS, and the NSC. OFDA performed well, judged by the major contribution of combined USG resources deployed successfully to the field and contributing in interrupting the transmission of EVD.

The West Africa EVD response was perhaps the largest strictly humanitarian response in terms of numbers of USG personnel deployed to the field, cumulatively. Coordinating the safe and effective deployment of thousands of USG responders was an unprecedented challenge for the involved USG agencies. The challenge for OFDA was to identify the areas where coordination was needed to facilitate the success of this complex deployment response. OFDA's DART led effectively and the RMTs managed the communications in Washington, with the White House, HHS, FFP, USAID/GH, State Department, CDC, and DOD. OFDA has unusually well-honed coordination with DOD from extensive past experience. In the West Africa outbreak, CDC found it effective often to make requests to the DOD through OFDA.

In their individual reviews, UN agencies, IPs and USG personnel reported that EVD required a mind-shift in how disaster response was conceptualized. Among other things, routine project monitoring protocols and language were inadequate.

Early communication between CDC and USAID was often stilted, confused, and required a learning curve. Large numbers of staff were cross-posted, including CDC personnel to Washington, DC, and OFDA personnel to Atlanta, GA. Eventually, the coordination between CDC and OFDA became close, intensive, and extensive. OFDA and CDC learned about one another from the experience of working extensively together. It was a positive lesson: Separate agencies' ability to share understanding and game plans was enhanced by being part of a joint team. OFDA's relationship with CDC was critical, as CDC provided essential manpower in support of a range of technical interventions (e.g., command, surveillance, contact tracing, border screening). CDC's collaboration with OFDA was more relevant in disease outbreak response than OFDA's work with DOD, other USAID bureaus, the State Department, the Department of Agriculture, and others.

The USG failed to control the outbreak at this early point, when it might have been contained. Experts reading the outbreak's progress observed case counts in Guinea, but failed to anticipate the geographic spread of the disease. Early response which might have contained the outbreak before it spread widely failed. Whereas media coverage of the U.S. campaign refers to how it sprang into response, there was a critical period of four months where neither the USG nor the international community instigated case finding, surveillance, isolation, or public information—missing a window of opportunity to investigate the outbreak's epidemiology and control it before it killed many people. During April and May, 2014, donors relaxed their concern about EVD when 21 days passed without a case being reported. Indeed, almost all earlier outbreaks of EVD were self-limiting, contained within a short period of time in the rural areas where they occurred. As WHO reported in 2014 "Ebola has always remained a very localized event."

When these initial EVD cases were detected, local authorities did create surveillance systems—but the system was discontinued after no additional cases were found by health authorities between April and early June 2014. Then, the outbreak emerged in a small village in southern Guinea, situated near the Liberian and Sierra Leonean border. Guinea's porous borders and migration routes facilitated EVD's spread to neighboring countries, where it reached increasingly urban areas. Without better surveillance and responsive control measures, EVD spread faster than authorities could contain it. Starting in mid-June 2014, surveillance systems relying on aggregate case reports from each county were put in place.

The West African EVD outbreak was characterized by considerable chaos in how the disease spread, but retrospective modeling confirms that much of the spread was dependent on initial conditions, i.e. how well early cases were identified and contained, reinforcing the critical value of early response in future outbreaks.[47]

Evaluation Question 9

To what extent were the activities supported by the USG well-coordinated with the broader international response, national response structures and well-coordinated operationally between organizations that the USG funded?

OFDA led the coordination with other donors and the UN, including OCHA, WHO, other key UN agencies such as UNICEF, which had an extensive presence in each country, and the WFP, which successfully provided the UN Humanitarian Air Operations transport. Although OFDA was involved in interagency coordination, it worked less well with other government donors, including France, Germany, the EC, China, Cuba, and Japan. Except for the UK's DFID, OFDA's communications and joint planning with other donors or other international agencies was not found in the evidence.

OFDA and CDC coordination worked well with national governments in all three countries. CDC, OFDA, and OFDA-supported IPs, along with WHO, supported incident management and control systems. It is unclear whether OFDA had any communication or coordination with any donor foundations.

OFDA gave substantial funding to WHO and worked well with WHO on tracking the epidemiology of the disease. WHO, however, is not traditionally a funding agency nor known for its emergency operations and has never been a strong lead program operations and implementation agency, even in the health sector. Thus, the lesson about the right model for responding to future infectious disease pandemic remains untested and unclear.

The 2014–15 EVD outbreak was a case where the UN emergency cluster system of coordination was not invoked, OCHA took a back seat, the UN General Assembly and Security Council were not relevant, and SPHERE standards appeared to not apply. In part, this occurred because the central governments of each of the three governments were prepared to manage responses. But it also was due to the large, direct role played by key bilateral donors such as the USG and the UK governments.

The distinctive nature of this emergency was felt to call for a specialized UN agency; however, UNMEER, which had its headquarters in Accra, Ghana, was not given any significant attention by OFDA. This became a vicious circle. As key donors worked directly with IPs and local governments, UNMEER was sidelined in relevance. In turn, this led OFDA and others to view UNMEER as offering little, too slow, late-arriving, and unnecessary.

Unique among UN agencies for its early dissolution (August 31, 2015), UNMEER was also difficult to evaluate as former officers and staff could not be found, and no remnant of UNMEER exists for accountability purposes. In theory, UNMEER had little relevant value to add to existing humanitarian structures (for instance from OCHA) and national coordination mechanisms. In practice, UNMEER did not leverage the strengths or roles of UN or other agencies well, and was not effective in field-level coordination.[48] UNMEER did not play a relevant role among NGOs.[50] In the end, UNMEER did not generate performance information that permits its achievements to be learned from.

It does not appear to have made a difference that a UN specific humanitarian architecture was imposed in the EVD outbreak. The West African experience indicates that the national coordination system in each country was more effective than would have been an imposed set of external clusters.

Evaluation Question 10

How well did OFDA adjust to the changing epidemiology and priorities of the international response?

This evaluation looked at several factors: timeliness of OFDA response, adjustment to activities based on epidemiology, and adjustment to the control strategy based on priorities of the international response partner mainly WHO. Indeed, OFDA funded much of the epidemiology information through national surveillance systems. OFDA's sequence of awards and field-level collaboration supported, aligned with, and tracked WHO's own adaptation from its August, 2014 Road Map for EVD response to its update in early 2015, the "Getting to Zero" strategy.

OFDA responded relatively nimbly, though in a fast-moving outbreak, crossing international boundaries with built-in lag times for drawing biological samples/testing/distinguishing disease types, time matters crucially. Every measure to increase the speed and quality of OFDA's engagement (including DART rotation duration and handover procedures), data-gathering, decision making, and transfer of award funds had large implications for the outbreak's ongoing transmission a week or month later. As such, in communicable disease outbreaks, rapid adjustment was needed more than in OFDA's other disaster work.

As described in Ebola Response Evaluation, Objective 3, with regard to Evaluation Question 6, about the timing and targeting of OFDA's funding and its responsiveness to the outbreak, roughly one third of OFDA awards and funding occurred during this critical period (August to October, 2014), with an even more intense increase in funding in November and December 2014. Much of this funding was uncontroversial, such as provision of PPEs and training to protect local health care workers who faced high risk of death.[49]

A key finding of this evaluation is that there was emphasis by the White House on construction of ETUs, with the DOD serving in a lead role in building them in Liberia.[51] While DOD has the operational capability of rapidly constructing facilities, e.g., digging trenches or throwing up bridges and establishing temporary facilities necessary in wartime, in Liberia, the DOD took almost four months after arrival to produce functional ETUs—in large part because it did not build them directly, but pursued a complex process of research, design, and contracting to Liberian firms. They did so for reasons that are unclear. By the time these ETUs were ready for turnover to other IPs to run, they were still flawed, and the EVD caseload in need of ETUs had declined substantially. A key controversy at the time, and since, was about the decision to invest so many resources in the construction of ETUs as a priority over population-based public health outreach, behavior change communications, contact tracing, community care centers, village-based isolation, and other approaches that were ultimately perceived to be more relevant, less expensive, and more rapidly deployable.

This component of the EVD response represents an example of a USG, overall, not being sufficiently adaptive to the changing epidemiologic picture. The large expenditure of USG resources on ETU construction in Liberia proved to contribute little to the ultimate containment of EVD transmission.

While many humanitarian response mechanisms—such as grants and contracts—that focus on relatively fixed events such as responses to earthquakes or tsunamis, intrinsically take months to be worked out and implemented, the shifting needs during EVD outbreak required adequate response over the course of days and weeks. The machinery of the USG's usual humanitarian response (such as OFDA, FFP, CDC) is currently geared toward longer-term planning and is not well suited to adapt and change gears in the middle of a disease outbreak.

Overall, the USG's strategic adaptation during the West African EVD outbreak was late and during the early phases of the outbreak. The USG, with OFDA as the lead, responded only after the EVD outbreak had spread widely. OFDA was not forward-leaning enough to more proactively engage with the outbreak at a time when it could have been controlled.

RECOMMENDATIONS

Based on the data to support the findings and conclusions, the evaluation team offers the following recommendations to USAID/OFDA.

USG Coordination

1. *OFDA should develop an MOU with CDC that includes early detection and sharing of potentially important surveillance data in real time.* Develop regular opportunities to field train OFDA staff with DOD, CDC, and other USG responders in order to establish institutional linkages and avert institutional, cultural, and mission barriers. This relationship will be facilitated by having a full-time OFDA specialist based in the CDC Emergency Operations Center. Participation of CDC in DARTs should be sustained in the future.

   OFDA should not exclude itself from a lead role in future disease outbreaks of international public health significance. For future public health emergencies, OFDA should be prepared to deploy technical experts in the relevant health (or other) sectors at scale within DART teams.

   OFDA should research and discuss with CDC, including participation from FEMA, USDA, and relevant experts, the implications and options relative to any competing approaches of the Incident Command System, used by OFDA, USDA and FEMA, and the Incident Management System, used by CDC.

2. *For future public health emergencies, OFDA should be prepared to deploy technical experts in the relevant health (or other) sectors at scale within DART teams.* Vital to their roles is their understanding of the strengths, capabilities, and limitations of different parts of the USG from the USDA Forest Service or Peace Corps staff to the Council of State and territorial epidemiologists.[52]

3. *In anticipation of future pandemics, OFDA should pursue a stronger collaboration with the Laboratory Response Network, DOD's network of laboratories,* and other key laboratories at CDC, the Pasteur Institute, Israel, and other locations.

4. *OFDA and CDC should work together to plan for a range of scenarios in which infectious disease emergencies may occur in the future,* based on different pathogens and their spread, different settings (permissive, non-permissive, conflict, non-conflict, urban, rural), and on the feasibility of the participation of other U.S. departments, such as DOD.

   OFDA and CDC should jointly work toward solutions for the high-turnover and short-duration field deployments experienced during the 2014–2016 EVD outbreak and during other recent deployments. Increasingly, greater training and support for foreign nationals should be seen as the solution, particularly for scales of response that exceed the abilities of traditional NGOs.

   OFDA should coordinate with CDC to be more capable of managing international emergencies, including a dedicated unit in Atlanta of persons experienced in arranging international travel. This dovetails with the deployment of Field Epidemiology Training Program (FETP) residents and graduates, which was reported to be a positive experience. CDC and OFDA should work together to expedite greater collaboration with CDC offices in other francophone African countries and pre-arrange engagement of FETP graduates.

5. *Based on francophone translation difficulties faced by U.S. teams in West Africa, OFDA should plan for greater support for the translation of documents* and should develop an ongoing relationship with a professional translation agency.

International Coordination

1. *The USG should sustain its communication and work with the emergency wing of WHO to assist WHO to take on an expanded role in directly managing field operations* in large public health emergencies.

   Support the WHO to shepherd the International Health Regulations into practice and to improve its capacity to be an operations-level humanitarian agency.

2. *OFDA should assist OCHA to expand its own technical capabilities and that of the Inter-Agency Standing Committee mechanisms* to define and address different pandemic

scenarios. OCHA coordination with WHO should be supported by OFDA to develop a framework for how OCHA can be more relevant in future public health emergencies on behalf of the United Nations Secretariat, including support to WHO.

3. *In its planning with CDC, WHO, the IASC, OCHA and other bilateral donors, OFDA should be careful to try to avoid a country-specific orientation* to future public health emergencies, as future outbreaks may occur in differing circumstances affecting who can respond, how difficult the cultural dimensions, etc
4. *The USG should engage in a more substantial way with relevant donors, such as France, Germany, the remainder of the EU, China, and regional WHO entities in planning for future outbreak roles and strategies.* In larger pandemics, closer and more seamless collaboration will be valuable if not vital among these donors as well as the European Centers for Disease Control, the Pasteur Institute, Public Health England, Public Health Agency of Canada, the Burnet Institute of Australia, PAHO, Africa CDC.[53, 54]
5. *OFDA and CDC should enter into an agreement with Public Health Canada,* perhaps via GOARN, that can be useful in francophone settings or countries where the USG has limited access.
6. *The USG should promote a UN response to future pandemics that does not create new architectures, but involves new protocols and reinforces the Global Health Security Agenda.*

Improving Adaptation to Changing Outbreak Epidemiology

1. *OFDA should prepare and make available to its staff and its IPs a set of written guidelines* for scaling population-level control of pandemic infectious diseases of humanitarian concern. Central to these are SOPs for coordinating with HHS, DOD and other U.S. Agencies. These guidelines should be prepared in collaboration with experienced staff from CDC and other agencies, and should be field-tested. One option would be for OFDA to edit its Field Operation Guide, with guidance, metrics, and procedures for disease outbreaks, with an emphasis on early recognition of the important characteristics of outbreaks in terms of strain of pathogen, transmissibility, case fatality patterns, observability, and cultural implications (such as burial practice behavior).

   These expansions of internal guidance cannot be crafted for each imaginable emerging infection but can be organized according to key disease transmission modes (e.g., airborne, waterborne, mosquito borne) or key characteristics of the infection, in terms of a) transmissibility, b) incubation period, c) lethality and d) prevention options. EVD, Cholera, Dengue and Influenza, for instance, are so distinct as to require different approaches.

   In particular, OFDA needs to plan how an EVD-like response would play out in very different settings, such as within conflict zones, non-permissive environments, or concurrent with natural disasters. Just as OFDA stepped back in 1991 to reflect on its strategies in famine response, it similarly needs a process of reflection and interaction with IPs over strategies to contain and control epidemic emergencies. OFDA should own this process, as it cannot rely on CDC to be involved in every future scenario. In particular, OFDA should have procedures and training for an extreme case of pandemic flu, including the scenario of the pandemic in 1918. This should include some guidance for influenza viruses all from birds, such as H5N1 virus, which has high case fatality, H7N9, which has pandemic potential, and H1N1. OFDA should therefore prepare itself to learn the same basic epidemiology and surveillance language used by CDC and WHO, and add to its livelihoods and market specialization to produce new tools for tracking key routes of transmission (trade, migration, flight, cross-border) and risk factors of spread.
2. *At a more technical level, OFDA's disaster guidelines should be expanded to recognize the different types of outbreak threats that are potential continental crises,* with accompanying training about the current trends of 5-8 new emerging infectious diseases per year, as well as established pathogens such as monkeypox, plague (seen recently in Madagascar), the Middle Eastern Respiratory Virus, Severe Acute Respiratory Syndrome (SARS), Zika, Yellow Fever, and Dengue Fever—only a few examples of currently known emerging infections.[55]

   The challenge with any static set of guidelines is that the underlying science can evolve and change.[56] This would require OFDA to nimbly resource CDC guidance with real time revisions and replacements.
3. *OFDA and its partners should adapt programs to better support mid-grant changes to tie with shifting disease priorities.* Even though OFDA has experienced success with its awards of a 3–6 month duration, that short of a time frame is inadequate to meet the needs in outbreaks such as EVD in West Africa in 2014–2016. Current cooperative agreement and contractual mechanisms have been effective, but less than optimal for rapid adaptation during outbreaks where the disease becomes better understood with time and shifts its geographic spread from week to week.
4. *Along similar lines, OFDA should coordinate with WHO and CDC to create a new body of practice that melds together epidemiology and the logistics of response,* taking into account the dynamics of disease transmission and geography, including elevation contours, routes of spread by road, kinship networks, trade, and distances to clinics/ETUs.

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1. The results of Evaluation Questions 1 through 7 are presented as separate evaluation reports.

2. WHO. Ebola Situation Report, West Africa, April 1, 2014. Available from: http://www.who.int/csr/don/2014_04_02_ ebola/en/.

3. WHO. Ebola Situation Report, West Africa. July 20, 2014. Available from: http://www.who.int/csr/don/2014_07_24_ ebola/en/.

4. WHO. Ebola Situation Report. West Africa, October 1, 2014.Available from: http://www.who.int/csr/disease/ebola/situation-reports/archive/en/.

5. Ibid.

6. White House. Fact Sheet: U.S. Response to the Ebola Epidemic in West Africa. https://obamawhitehouse.archives.gov/the-press-office/2014/09/16/fact-sheet-us-response-ebola-epidemic-west-africa. Published September 16,2014. Accessed October 18, 2017.

7. During the early weeks and months of the outbreak infections were misdiagnosed, unconfirmed, or double-counted—as a person might be "reported" when identified, and then re-reported at a health facility, and then re-reported again for various reasons. Data was also lost at different steps. Thus, one of the surveillance tasks during the fall of 2014 was to sort through and consolidate the array of records to hone the most accurate estimates of the cumulative cases. This, however did not rectify the extensive under-reporting which occurred because people were reticent to come forward when they suspected infection.

8. Sources of donor funding:
— Source of U.S. government funding total: USAID/OFDA Fact Sheet #12 FY2016, September 30, 2016
— Source of UK government funding total: The end of the Ebola epidemic. UK.gov website. https://www.gov. uk/government/news/the-end-of-the-ebola-outbreak
(converted from GBP to USD at a rate of 1.29 U.S. dollars to 1 pound). Published January 14, 2016. Updated January 15, 2016.Accessed October 18, 2017.
— Source of World Bank Group funding total: World Bank Group Ebola Response Fact Sheet. World Bank website. http://www.worldbank.org/en/topic/health/brief/world-bank-group-ebola-fact-sheet. Published April 6, 2016. Accessed October 18, 2017.
—Source of data for all other donors: Office of the UN Special Envoy on Ebola. Resources for Results V. 1 September 2014 to 31 October 2015. Available from: https://ebolaresponse.un.org/sites/default/files/resources_for_results_v.pdf.

9. UN data and U.S. OFDA fact sheet data.

10. The IBTCI team culled over 4,000 published and grey literature documents through online search, communications, and requests from aid agencies and in conversations with NGOs. The team actively wrote to CDC, USPHS, the Pasteur Institute, Ministries of Health in West Africa, USAID offices, UN offices, Public Health England, and the European Centers for Disease Control to solicit data and analysis. Critical documents included the CDC's *Morbidity and Mortality Weekly Reports* (MMWRs). This complemented the over 860 documents made available by OFDA from its own files about grants, contracts, and reporting by IPs. The team reviewed all documents for their salience to the key analytic questions about mapping the time frame of the epidemic against tangible field interventions, and for scientific or biological basis measuring how interventions may have affected the epidemic curve. There were limitations in the data collected, as European agencies and the World Bank were unwilling to share documents.

11. "Subnational levels" refers to districts or regions within a country and its communities. With a subnational proportionate-to-size sampling method, communities with larger populations have a proportionately greater chance of being selected in a survey sample than do smaller communities.

12. The survey was designed to exceed 15,000 to allow for meaningful coverage of each part of the three-country region and offset limitations in recall specificity. 3,500 respondents were selected across 8 regions of Guinea; 5,500 from 14 districts in Sierra Leone; and 6,000 from 15 counties of Liberia. These samples by country were determined by calculating the population necessary to be representative at the largest sub-national organizational level, which varies by country. These samples achieve a balance of the statistical power of different evaluation hypotheses and purposes of the different indicators and questions pursued through the survey, and recognizing that there were believed to be fewer cases overall in Guinea, despite its larger population, and more OFDA-funded activities in Liberia, of interest.

13. Grounded theory is an approach for looking systematically at largely qualitative data, such as transcripts of interviews or protocols of observations, with the aim of generating theories. Grounded theory categorizes empirically collected data to build a general theory that will fit the data.

14. Contribution analysis is an analytic approach used for determining a complex, multifaceted program's effectiveness in a complex setting (*i.e.,* one with multiple intervention components, multiple levels of funders (from global to local), a wide array of actors and providers, and varying socio-political contextual factors). *See* Bressler, S, 2009. Presentation on assessing contribution: Paper read at First Committee Meeting on Planning Assessment/Evaluation of HIV/AIDS Programs Implemented under the U.S. Leadership Against HIV/AIDS, Tuberculosis, and Malaria Reauthorization Act of 2008, Washington, DC.

15. Garrett L. The Ebola Review Part II. *Foreign Policy,* June 5, 2015. Available from: http://foreignpolicy.com/2015/06/06/ebola-review-part-ii-g-7-merkel-world-health-organization/.

16. See website: USAID Center for International Disaster Information, www.cidi.org.

17. This included a number of physicians from different universities. One example of a researcher/practitioner who worked for IMC was Steven Hatch whose analysis informed this evaluation: Inferno: A Doctor's Ebola Story, March 2017, St. Martin's Press.

18. These figures drew from both confidential individual cooperative agreement and contract documents and cross-checked against USAID/CDC periodic Fact Sheets which summarized contributions to the outbreak.

19. KIIs with U.S. officials in each West African country, as well as the OFDA director.

20. IP and USAID KIIs.

21. Van Der Veken L. Interview with David Nabarro, McKinsey and Company September 2016. Available from: https://www.mckinsey.com/industries/social-sector/our-insights/the-ebola-crisis-then-and-now-an-interview-with-the-uns-david-nabarro.

22. TRANSCOM is U.S. DOD Transportation Command, the functional command for all surface/air/sealift, which is headquartered at Scott Air Force Base, Illinois. Among other things, they designed and equipped emergency medical evacuation aircraft to handle active Ebola cases.

23. For example, see MSF public letter of September 2, 2014 calling the UN and donor response a failure. Available from: http://www.doctorswithoutborders.org/news-stories/press-release/global-bio-disaster-response-urgently-needed-ebola-fight.

24. An Air Forces Africa (AFAF) pavements team provided an initial report on the airfield during early operations, allowing the U.S. Transportation Command (USTRANSCOM) to make accurate decisions on the maximum weight of aircraft to be deployed. Pavement experts from the Air Force Civil Engineer Center (AFCEC) and the United States Army Corps of Engineers (USACE) provided reach-back expert analyses to help JFC-OUA engineers develop a simple maintenance and minor repair strategy, using a Logistics Civil Augmentation Program with local contractors to keep the airfield open.

25. For example, OFDA and DFID saw one another almost daily at inter-agency meetings at the EOCs, in technical working groups and at weekly donor coordination meetings. Some meetings were formally about donor coordination, but the majority of the meetings were opportunistic.

26. Numerous versions of the FOG, three versions of SPHERE, "Communicable disease control in emergencies, field manual" that are the go-to references for most humanitarian workers all failed to even mention EVD, let alone lay out operational tasks and how to fulfill them.

27. Huang Y. China's Response to the 2014 Ebola Outbreak in West Africa. *Global Challenges*, 2017. Available from: http://onlinelibrary.wiley.com/doi/10.1002/gch2.201600001/full.

28. From MMWRs, KIIs and FGDs.

29. KIIs, Roundtable meetings, FGDs.

30. See: Bogoch II, Creatore MI, Cetron MS, et al. Assessment of the potential for international dissemination of Ebola virus via commercial air travel during the 2014 West African outbreak. 2015 Oct 21. *The Lancet*, 385:229–35.

31. Hsieh Y-H. Temporal Course of 2014 Ebola Virus Disease Outbreak in West Africa Elucidated through Morbidly and Mortality Data: A Tale of Three Countries. 2015. *PLOS One* 10(11): e0140810.

32. To understand why, see Quammen, D. *Spillover: Animal Infections and the Next Human Pandemic.* 2012. New York, NY: WW Norton and Company, Inc.. Because OFDA is mandated to fund emergency relief, it has traditionally funded awards for 3-6 month time frames only.

33. Brown GD, Oleson JJ and Porter AT. An empirically adjusted approach to reproductive number estimation for stochastic compartmental models: A case study of two Ebola outbreaks. 2015. *Biometrics, 72*(2), 335-343.

34. Because OFDA is mandated to fund emergency relief, it has traditionally funded awards for 3-6 month time frames only.

35. See WHO Executive Board. Ebola at End-2014: Getting to Zero, Special Session of the Executive Board on the Ebola Emergency. Special Session of the Executive Board on the Ebola Emergency, January 20, 2015.
See also: WHO. *2015 WHO Strategic Response Plan.* Available from: http://apps.who.int/iris/bitstream/10665/163360/1/9789241508698_eng.pdf.

36. USAID. (2015, June 5). Agreement No. AID-OFDA-A-15-00026 [Award Agreement with Tufts University]. June 5, 2015.

37. KII, Dr. Eugene Richardson, Harvard Medical School.

38. WHO Ebola Response Team. Ebola Virus Disease Among Male and Female Persons in West Africa. January 7, 2016 *N Engl J Med,* 374:96–98.

39. Bjälkander O, et al. FGM in the Time of Ebola – carpe opportunitatem. 2016 *The Lancet* Jul 4 :e447. doi: 10.1016/S2214-109X(16)30081-X.

40. DOD's expenditures were entirely in Liberia, with no operations in Guinea or Sierra Leone. CDC deployed large numbers of personnel to each country, though breakdowns of how CDC allocated its resources are not available.

41. "A conversation with Dr. Joanne Liu, President of Doctors without Borders" *Washington Post,* August 25, 2014.

42. Hanson J, Decosimo AC, Quinn MA. Diminished Quality of Life Among Women Affected by Ebola. 2016. *J of Soc Behav and Health Sci* Vol. 10(1):112–113.

43. A summary of these new phases is provided in Boisen ML, Hartnett JN, Goba A, et al. Epidemiology and Management of the 2013-16 West African Ebola Outbreak. 2016. *Annual Review of Virology* 3:147-171.

44. The Army Corps of Engineers, who have their own budget and experts, were never asked to be involved with the ETUs.

45. The unique MENTOR Initiative, which focuses year-round on communicable diseases in emergencies, scaled up to support 400 facilities, including helping private facilities screen patients, safety for health workers and procedures, training and remove waste.

46. See: Nabarro D. UN Ebola Response Multi-Partner Trust Fund Third Interim Report. UNDP 2015. Available from: http://mptf.undp.org/factsheet/fund/EBO00

47. Mangiarotti S, Peyre M and Huc M. A chaotic model for the epidemic of Ebola virus disease in West Africa, 2013-2016. 2016. *Chaos 26,* 113112 doi: 10.1063/1.4967730.

48. UN General Assembly. Lessons Learned Exercise on the Coordination Activities of the United Nations Mission for Ebola Emergency Response. February 2017, New York, A/71/810. Available from: https://reliefweb.int/report/sierra-leone/lessons-learned-exercise-coordination-activities-united-nations-mission-ebola-0.

49. Evans D, Goldstein M, Popova A. Health-care worker mortality and the legacy of the Ebola epidemic. 2015. *The Lancet* August. http://dx.doi.org/10.1016/S2214-109X(15)00065-0

50. Letter from Inter*Action* and ICVA to Anthony Banbury at UNMEER. Recommendations from the IASC NGO Consortia for UNMEER. October 8, 2017.

51. Among the reasons why ETUs received early priority included:
    a) Health facility-based responses had been the primary objective of CDC, MSF, and WHO in past EVD responses;
    b) The well-publicized CDC MMWR predictive model of the ongoing characterized one worst-case scenario with almost 1.5 million EVD cases. This one selected scenario report received front-page headlines. The model included facilities and beds as the main interventions. As a result, "more beds" was a policy; conclusion taken by the USG at senior levels, and promoted by CDC. Consequently, the White House in August; 2014 focused on an EVD-control strategy that gave prime attention to generating more beds, hence more ETUs.
    c) The U.S. EVD response, primarily aimed at Liberia in August and September, 2014, occurred toward the end of the USG's fiscal year when OFDA and CDC had limited funds but DOD had almost $1 billion available to apply to the outbreak, but primarily for ETU construction, as DOD was averse to other implementation.

52. See website: Council of State and Territorial Epidemiologists *http://www.cste.org.*

53. See website: Africa CDC. *https://au.int/en/pressreleases/20170331/africa-centres-diseases-control-and-prevention-launches-new-networks-fight* (page 35).

54. Peters D, Keusch G et al. In Search of Global Governance for Research in Epidemics. 2017. *The Lancet* October 7, vol. 390.

55. Synthesis of EVD treatment guidelines were only pulled together in late 2017. See Lamontange F, Fowler R et al. Evidence-Based Guidelines for Supportive Care of Patients with Ebola Virus Disease. 2017 *The Lancet* October http://dx.doi.org/10.1016/S0140-6736(17)31795-6.

56. In other words, OFDA should be routinely connected to the unfolding understanding of zoonotic threats and diseases of pandemic potential, for instance, through the *Emerg Infect Dis* website at https://wwwnc.cdc.gov/eid/; See also: Nelson K. *Infectious Disease Epidemiology, Theory and Practice.* 2014. Burlington, MA: Jones and Barlett.

57. The OFDA evaluation scope of work to IBTCI stated the total USG finding amount was $2.4 Billion. The USAID West Africa- Ebola Outbreak Fact Sheet #12, September 30, 2016 notes the funding amount by 30 Sept 2016 was $2.7 Billion. The evaluation covered the USG's outbreak response activities from March 2014 up to Jan 2016.

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January 2018

EVALUATION

EVALUATION OF THE USAID/OFDA EBOLA VIRUS DISEASE OUTBREAK RESPONSE IN WEST AFRICA 2014–2016

OBJECTIVE 2. EFFECTIVENESS OF PROGRAMMATIC COMPONENTS

Photo courtesy of the U.S. Department of Defense

At the request of the United States Agency for International Development (USAID), this publication was prepared independently by International Business and Technical Consultants, Inc. (IBTCI).

Evaluation of the USAID/OFDA Ebola Virus Disease Outbreak Response in West Africa 2014–2016
Objective 2: Effectiveness of Programmatic Components

USAID/DCHA/OFDA
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EVALUATION OF THE USAID/OFDA EBOLA VIRUS DISEASE RESPONSE IN WEST AFRICA 2014–2016

January 2018

OBJECTIVE 2. EFFECTIVENESS OF PROGRAMMATIC COMPONENTS

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ACRONYMS AND ABBREVIATIONS

ACF	Action against Hunger
AMEP	Activity Monitoring and Evaluation Plan
ANSS	*Agence Nationale de la Securité Sanitaire*
ASEOWA	African Union Support to the Ebola Outbreak in West Africa
AU	African Union
BCC	Behavior change communication
CEBS	Community event-based surveillance
CCC	Community Care Center
CDC	Centers for Disease Control and Prevention
CECI	Center for International Studies and Cooperation
CHW	Community Health Worker
CNLE	National Coordination Cell
COR	Contracting Officer's Representative
CRS	Catholic Relief Services
CT	Contact tracer
DART	Disaster Assistance Response Team
DASP	Disaster Assistance Support Program
DCHA	Democracy, Conflict and Humanitarian Assistance
DERC	District Ebola Response Centers
DFID	UK Department for International Development
DHMT	District Health Management Team
DHS	Department of Homeland Security
DOD	United States Department of Defense
DOS	United States Department of State
DRC	Danish Refugee Council
ECHO	European Community Humanitarian Office
EOC	Emergency Operations Center
ERC	Ebola Response Consortium
ETU	Ebola treatment unit
EU	European Union
EVD	Ebola virus disease
FEMA	Federal Emergency Management Agency
FETP	Field Epidemiology Training Program
FEWS NET	Famine Early Warning System Network
FFP	Food for Peace
FGD	Focus group discussion
FRC	French Red Cross
GC	Global Communities
GHSA	Global Health Security Agenda
GOARN	Global Outbreak Alert and Response Network
GOG	Government of Guinea
GOL	Government of Liberia
GoSL	Government of Sierra Leone
HC3	Health Communication Capacity Collaborative
HCW	Health care workers
HHBM	Health and Humanitarian Border Management
HHS	Health and Human Services
HIV	Human immunodeficiency virus
HKI	Helen Keller International
HTH	Heart to Heart
IBTCI	International Business & Technical Consultants, Inc.
ICS	Incident Command System
IFRC	International Federation of Red Cross and Red Crescent Societies
IHR	International Health Regulations
IMC	International Medical Corps
IMS	Incident Management System
INSS	*Instituto Nacional do Seguro Social*
IOM	International Organization for Migration
IP	Implementing partner
IPC	Infection prevention and control
IRC	International Rescue Committee
JSI	John Snow International
KAP	Knowledge, attitude and practices
KII	Key informant interview
ME&L	Monitoring, evaluation & learning
MHPSS	Mental health and psychological support service
MITAM	Mission Tasking Matrix
MMU	Monrovia Medical Unit
MMWR	Morbidity and Mortality Weekly Reports
MOH	Ministry of Health
MOHS	Ministry of Health and Sanitation
MOHSW	Ministry of Health and Social Welfare
MOU	Memorandum of understanding
MSF	*Médecins sans Frontières*
MTI	Medical Teams International
NERC	National Ebola Response Center
NGO	Nongovernmental organization
NIH	National Institutes of Health
NSC	National Security Council
OCHA	UN Office for the Coordination of Humanitarian Affairs
ODI	Overseas Development Institute

OFDA	Office of United States Foreign Disaster Assistance
OICC	Observational Interim Care Center
PAE	Pacific Architects and Engineers
PCI	Project Concern International
PHS	Public Health Service
PHU	Primary Health Unit
PIH	Partners in Health
PIO	Public International Organization
PMP	Performance management plan
PPE	Personal protective equipment
PSI	Population Services International
PU-AMI	*Premiere Urgence - Aide Medicale Internationale*
RI	Relief International
RITE	Rapid isolation and treatment of Ebola
RMT	Response Management Team
SDB	Safe and dignified burials
SRU	Screening and referral unit
SOP	Standard operating procedure
SOW	Scope of work
SP	Samaritan's Purse
STC	Save the Children
TDH	*Terre des Hommes*
TOC	Theory of change
TOT	Training of Trainers
UK	United Kingdom
UN	United Nations
UNICEF	United Nations Children's Emergency Fund
UNHAS	UN Humanitarian Air Service
UNMEER	UN Mission for Ebola Emergency Response
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
USG	United States Government
USPHS	United States Public Health Service Commissioned Corps
USUHS	DOD Uniformed Services University of the Health Sciences
VHF	Viral hemorrhagic fever
WAHA	Women and Health Alliance
WAHO	West African Health Organization
WASH	Water, sanitation and hygiene
WB	World Bank
WHO	World Health Organization
WHH	*Welthungerhilfe*
WFP	World Food Programme
WV	World Vision

GLOSSARY

Case-fatality rate (CFR): The proportion of people who die from a specified disease among all individuals diagnosed with the disease over a specified period of time. CFR is typically used as a measure of disease severity and is often used for prognosis (predicting disease course or outcome), where comparatively high rates are indicative of relatively poor outcomes. Often in disease outbreaks, and particularly with EVD, CFR is used to assess the effectiveness of disease treatment and/or intervention.

Community or Civic Engagement: Similar to and overlapping with "social mobilization" (see below), this set of activities includes working with community leaders, local civil society organizations, opinion leaders, and community health workers. In the EVD outbreak, this includes a wide array of grassroots groups, such as motorcycle drivers, as well as established relationships by some NGOs with their village-level contacts.

Contact tracing: The identification and in-person tracking of all people who may have come into contact with an infected person to identify, as soon as possible, any new cases of infection. It is an integral component of active surveillance, as well as epidemic investigation. In the case of EVD, contact tracing includes close observation of persons with even casual contact with a known case for 21 calendar days after that contact (21 days being the maximum incubation period of EVD).

Cumulative incidence: The cumulative incidence is a measure of disease frequency that addresses the question "How far has the disease spread during a specified period of time?" It is calculated using the following formula: (Number of new cases) / (Total population at risk).

Ebola virus disease (EVD): EVD is a severe illness transmitted through direct contact with the bodily fluids (including semen, blood, breast milk), and tissues of infected animals or people. Symptoms of EVD include fever, severe headache, muscle pain, weakness, diarrhea, vomiting, and unexplained hemorrhage. Diarrheal stools and saliva cause more transmission than anything else.

Emergency Operations Center (EOC): A central facility to command and control emergency activities at a strategic and, if necessary, political level. Its functions are to gather and analyze surveillance and operational data, make decisions about outbreak control, convene response agencies, and disseminate decisions.

Incident Command System (ICS): A structured approach to the way complex teams of responders to emergencies are managed in terms of the clarity of their roles, responsibilities, span of authority, and simple lines of reporting. ICS is commonly applied by OFDA, FEMA, and USDA and trained in around the world, including for OFDA-supported capacity building with other governments.

Incident Management System (IMS): A broader category that incorporates and uses ICS, often at the national level, and expressly for multi-agency cooperation. At the national level in the three countries discussed in this evaluation, the IMS included nationwide systems, authorities, central offices, and processes for tracking each activity by each actor. In turn, this included a coherent surveillance system and software for managing data.

Infection prevention and control (IPC): IPC includes measures to prevent transmission within health facilities through personal protective equipment, training, ventilation, procedures, referral systems, and triage. IPC also includes systems within the health facility, roles and responsibilities, existence of guidelines and physical resources, outbreak investigation, hygiene, and waste management.

Isolation: A measure to physically separate infected individuals from non-infected persons. Isolation can occur at the household, community, or larger level, including admitting infected persons to hospitals (Ebola treatment units) or community care centers. The purpose of isolation is to reduce forward transmission of the infection. Isolation in health care facilities is a standard measure to implement infection control: the prevention of contagious diseases from being spread from a patient to other patients, health care workers, and visitors, or from outsiders to a particular patient. In the West African context, isolation also included community and household- based isolation.

P-value: The p-value is a measure of the probability that differences observed between groups occurred by chance. Frequently, differences between groups are considered statistically significant if the p-value is less than 05. This means that there is a 5% chance or less that the observed difference occurred by chance.

Personal protective equipment (PPE): PPE is used by individuals dealing with infected individuals or around infectious materials. Typically worn by health care workers, health facility staff, and burial workers, this includes gowns, shoes, gloves, masks, goggles, other garments, and accompanying materials that create a safe barrier between infectious materials and the worker in order to prevent infection. A PPE package may also include air-purifying respirators. The clothing varies in weight, permeability, and complexity for donning (putting on) and doffing (removal).

Quarantine: Measures taken to reduce the spread of a disease by limiting movement of peoples, including reducing the mobility of non-infected groups with the goal of limiting the spread of disease. Typically, quarantine does not apply to emergency responders or health workers, but to families and communities. Most frequently, it is enforced by authorities, often in response to an epidemic. It can be applied to humans or animals, and includes border control. In Sierra Leone, for example, extensive nationwide quarantine was used to limit movement.

Reproduction Number: Designated by R nought or R_0, this number is the average number of onward new infections from each single infection, or the number of secondary cases that one case generates, on average, over the course of that case's infectious period. Mathematically, it is represented as R_0 = (the ratio of number of new cases) / (the infectious period of time). An R_0 greater than one signifies increasing transmission, and R_0 below one signifies contraction of the outbreak.

Social Mobilization: A broad, generic category for a wide range of activities that involve a large population, both through in-person travel and meetings and through media. In the EVD response, this included public gatherings, convenings of village leaders, meetings among religious leaders, home visits, radio and television programming, use of billboards, SMS, and internet social media. For many implementing partners in this effort, this type of activity was executed via cadres of community health workers or volunteers who received training, financial support, transportation (such as motorcycles), and messages to disseminate. Social mobilization includes the activities undertaken by international and local aid agencies and national and local governments, but also includes those of local populations themselves. Much of the social mobilization effort of the EVD response was oriented toward affecting behavior change among as many persons as possible to change simple behaviors such as shaking hands, other physical contact, washing hands, and the handling of infected persons and dead bodies.

Surveillance: Surveillance is the ongoing systematic collection, recording, analysis, interpretation, and dissemination of data reflecting disease occurrence in a community or population.

ABSTRACT

Citation: Cook, Gayla, with Jennifer Leigh, Michael Toole, Steven Hansch, and Swati Sadaphal. "Evaluation of Ebola Virus Disease Response in West Africa 2014–2016: Objective 2, Effectiveness of Programmatic Components." Evaluation Report to USAID/OFDA, January 2018, International Business & Technical Consultants, Inc., Vienna, VA.

Background: The West Africa Ebola virus disease (EVD) outbreak began in December, 2013 in southeastern Guinea. As the United States Government (USG) lead for the response, the U.S. Office of Foreign Disaster Assistance (OFDA) deployed a Disaster Assistance Response Team on August 5, 2014, and established a corresponding Response Management Team, which operated until January 4, 2016. International Business & Technical Consultants, Inc. (IBTCI) conducted an independent performance evaluation of OFDA's EVD outbreak response in West Africa. The performance evaluation was guided by four complementary objectives relating to the overall effectiveness of the response, the effectiveness of different programmatic components, the relevance, and the coordination of OFDA's response.

Methods: The evaluation focused on the OFDA EVD response in Liberia, Guinea, and Sierra Leone. Data collection methods included: a review of peer-reviewed and gray literature, Centers for Disease Control and Prevention (CDC) reports and surveillance data, and reports from OFDA implementing partners (IPs); semi-structured focus group discussions (n=196); semi-structured key informant interviews (n=285); an online self-assessment of OFDA staff (n=49); roundtable discussions with other responders; and three quantitative surveys. These included: a household survey (n=16,365); a community health workers survey (n=288); and a contact tracer survey (n=250). The primary data collection occurred from March to July, 2017. The portion of the evaluation presented in this report focuses on the effectiveness of the program components of OFDA's response and the determining factors for success or failure.

Findings: OFDA was a significant contributor to enhancing national incidence management and coordination in all three countries, including high emergency funding levels to the World Food Programme (WFP) to provide logistics and air services for all responders. In Liberia, OFDA was a lead donor in providing staff, supplies, and funding for triage, isolation, and palliative care through establishing Ebola Treatment Units (ETUs) with reporting, referral, and transportation capabilities, and food support (via Food for Peace) for community-based isolation. In all three countries, OFDA funded strategically located isolation and treatment facility support in locations of high infection rates. OFDA learned from and worked closely with IPs, notably the International Federation of Red Cross and Red Crescent Societies and Global Communities, to identify shortcomings of early community engagement efforts. OFDA eventually supported effective social mobilization to build public understanding of EVD and cultural acceptance of interconnected responses. OFDA was a leading donor for safe dignified burials, personal protective equipment, transportation, and training of burial workers. OFDA aided introduction of mainstreamed infection control practices at health care facilities to restore safety and functionality to the health care system by interrupting public EVD transmission and mortality and among hard-hit national health care workers.

Conclusions: The overarching determining factor for OFDA's measurable success was its organizational prowess in mobilizing massive resources and contracting capable international nongovernmental organizations (INGOs) and Public International Organizations (PIOs), once the USG declared the emergency response, to implement simultaneous, complementary intervention components. Failures impeding optimal program component results resulted from delays in:

1) perceiving the need to integrate community engagement with population outreach,
2) recognizing the need for program interventions for traumatized and stigmatized survivors and frontline burial and community health workers: and
3) establishing data and monitoring, evaluation, and learning systems to assist planning and decision-making.

Recommendations: OFDA should institute a monitoring, evaluation, and learning system to collect real-time evidence, to monitor IP performance, establish feedback and accountability, and enable proactive planning and decision-making. OFDA should seek to be a watchdog for key issues such as grassroots engagement, community representation, transparency, and gender-sensitive programming. OFDA and IPs should engage early in a response in consultations with religious and traditional leaders to identify local sensitivities. OFDA should stockpile safe burial resources for emergency deployment, and assemble population and health system data at the outset and strategize for epidemic and non-epidemic complementarity. OFDA should prepare now for future similar outbreaks by commissioning construction of a data infrastructure (including indicators, data collection modules, and research protocols) that will collect relevant data, integrate findings into broader response data analysis and decision making, and inform mid-term operational adaptations, as needed, e.g., program interventions for epidemic survivors and frontline epidemic workers.

Photo courtesy of the U.S. Department of Defense

EXECUTIVE SUMMARY

Evaluation Purpose and Rationale

Under contract AID-OAA-I-15-00022/Order No. AID-OAA- TO-16-00034, International Business & Technical Consultants, Inc. (IBTCI) received a contract from the Office of United States Foreign Disaster Assistance (OFDA) in October, 2016 to conduct an independent performance evaluation of its support for the Ebola virus disease (EVD) outbreak response in West Africa. This performance evaluation focused on programs funded by the United States Government (USG)'s EVD outbreak response strategy: Controlling the Outbreak. This evaluation was guided by four complementary objectives relating to the overall effectiveness of the response, effectiveness of different programmatic components, the relevance, and the coordination of OFDA's response to the EVD outbreak.

Project Background

The West Africa EVD outbreak began with a single illness in December, 2013 in southeastern Guinea, before spreading to the neighboring countries of Mali, Nigeria, Liberia, Senegal, and Sierra Leone. With symptoms similar to some other endemic infectious diseases, EVD was not definitively diagnosed in the region until March, 2014. Misinformation and lack of awareness among the local public regarding EVD transmission modes, combined with inadequate health care facilities and lack of health staff trained in surveillance or in EVD response, allowed EVD to rapidly spread. The severity of the outbreak was recognized by the international community in the summer of 2014, and soon after, national governments and international organizations began to take the actions to control EVD. The USG response to the EVD outbreak in West Africa was structured around four "Pillars:" 1) control the outbreak; 2) mitigate second-order impacts of the crisis; 3) coherent leadership and operations; and 4) global health security.

The goal of the USG Pillar One response was to reduce the spread of EVD by preventing or limiting the exposure of susceptible persons to the virus. OFDA pursued this by: 1) funding isolation of EVD cases and safe burial of those who died (required to decrease transmission); and 2) simultaneous and comprehensive social education and outreach (necessary to increase population-wide understanding of the disease, how to recognize it, how to prevent its transmission, and the importance of modifying behaviors that increase risk).

As the USG lead for the response, OFDA deployed a Disaster Assistance Response Team (DART) on August 5, 2014, and established a corresponding Response Management Team (RMT) based in Washington, DC at the same time. The DART—a team that over the course of the response included disaster response and public health experts from OFDA, the Department of Defense (DOD), and the Centers for Disease Control and Prevention (CDC)—coordinated with the National Institutes of Health (NIH), the Peace Corps, and the U.S. Public Health Service Commissioned Corps (USPHS) when deployed to assist host country governments in containing the EVD outbreak. Specific and separate DARTs were posted in Liberia, Sierra Leone, and Guinea.

EVALUATION QUESTIONS

This evaluation report presents the findings, conclusions, and recommendations of the evaluation team related to Objective Two of the overall evaluation: Effectiveness of Programmatic Components. Objective Two includes evaluation question four[1] out of the ten evaluation questions presented in the evaluation statement of work (SOW) (see Annex B). Evaluation question four posits:

4. *What were the determining factors that contributed to success or failure of each of the different types of programs that OFDA supported?*

Evaluation Design and Methods

This performance evaluation was designed to evaluate programs funded by OFDA between March 1, 2014 and January 4, 2016. The evaluation focused on the EVD response in Liberia, Guinea, and Sierra Leone. It was designed with a utilization-focused approach—to provide findings, conclusions, and recommendations that can be applied to future OFDA responses, are scalable, and are actionable. The design implied that each evaluation question finding is supported by two or more data collection methods, and that each conclusion is supported by data triangulation and interpretation of two or more findings. The data collection methods included a review of peer-reviewed and gray (unpublished) literature, reports from OFDA's implementing partners (IPs), and surveillance data; semi-structured focus group discussions (FGDs) (n=196); semi-structured key informant interviews (KIIs) (n=285); an online self-assessment of DART and RMT members (n=49); roundtable discussions with other responders; and three quantitative surveys: a household survey (n=16,365); a community health workers survey (n=288); and a contact tracer survey (n=250). The primary data collection occurred from March to July, 2017. Contribution analysis was used to mitigate the limited ability to attribute outcomes to individual interventions due to presence of multiple actors and programs.

Findings

This section consists of high-level findings associated with the evaluation question for the five programmatic components. The overall findings are presented analyzing evaluation data across the three countries. Country-specific findings are presented in the body of the report.

PROGRAM COMPONENT 1: INCIDENT MANAGEMENT AND COORDINATION

OFDA provided significant funding levels for supporting activities to enhance national incidence management as well as coordination across all three countries. An example of coordination and leveraging resources was OFDA funding in Sierra Leone to a consortium of international and national NGOs, following a request from the National Surveillance Pillar, to nationally scale up a proven effective community-based approach for surveillance. There were other very effective models of consortia of international and local civil society organizations implementing national EVD strategies at the local level across prefectures, chiefdoms, and counties to reach affected communities. Such efforts were in addition to very high emergency funding levels to the World Food Programme (WFP) to provide logistics and air services across all three countries in support of all responders. WFP services were crucial for the limited response capacity context of low-resource governments.

PROGRAM COMPONENT 2: CREATE ADEQUATE TREATMENT AND ISOLATION CAPACITY

OFDA succeeded in providing staff, supplies, and funding for triage, isolation, and palliative care through the establishment of an ETU system with reporting, referral, and transportation capabilities, and food support (from Food for Peace (FFP)) for community-based isolation in Liberia. These resources would not have otherwise existed without OFDA support. OFDA evolved from an emphasis on ETUs to support of CCCs. In all three countries OFDA funded isolation and treatment facility support in locations of high infection rates, or key strategic importance due to high mobility across borders and between rural and urban areas; these were key factors in rapid EVD transmission in West Africa. After IP feedback on livelihood disruption due to isolation, DART teams mobilized food provision from FFP for affected communities, which in turn made isolation for long periods and treatment activities more acceptable. Initially OFDA and IPs failed to consider how survivors and burial and community workers suffered from trauma and stigma in their communities.

PROGRAM COMPONENT 3: ASSIST SAFE HUMAN REMAINS MANAGEMENT

EVD infections and deaths increased exponentially and the three countries struggled to manage the volume and dangers of highly contagious human remains. Early on, OFDA-funded safe and dignified burial (SDB) programs did not integrate a culturally sensitive approach. OFDA and IPs failed to consider local traditions, religion, social values, and the normal human psychology of grief and mourning in intervention implementation design. This oversight undermined the effectiveness of nearly all initial SDB activities. The harm caused by this initial oversight likely resulted from the absence of effective mechanisms for either including the affected communities' perspectives when planning interventions or for gathering valid and reliable feedback on a continuous basis. It also may have contributed briefly to the prolonging of the outbreak. OFDA learned from and worked closely with IPs, notably the International Federation of Red Cross and Red Crescent Societies (IFRC) and Global Communities (GC),

each of which had prior local experience and trusted relationships, to identify shortcomings of early community engagement efforts and conduct social mobilization to build public understanding of EVD and cultural acceptance of SDB. OFDA was a leading SDB donor in Liberia, and was among many donors in Guinea and Sierra Leone. Personal protective equipment (PPE), transportation, and training of burial workers were major inputs sponsored by OFDA.

PROGRAM COMPONENT 4: RESTORE HEALTH CARE SYSTEM SAFETY AND FUNCTIONALITY

After health care facilities became major sites of infection at the outset of the outbreak, the health sector in all three countries effectively collapsed. OFDA funded activities to improve infection control practices (IPC) at health care facilities and restore safety and functionality to the health care system by mainstreaming IPC in all three countries, with large mobilizations of skilled personnel, training, supplies, and protocols. This was critical to interrupting EVD transmission. Most significantly, it effectively disrupted rapidly escalating EVD transmission and EVD mortality among national health care workers, thereby securing the workforce in already fragile health care sectors. Additionally, securing the health care sector effectively increased health care workers' access to patients for case identification and reporting and took steps to reverse outbreak- related increases in non-EVD mortality. This effectively restored trust in health services and protected health care workers. Insufficient epidemiological data exists to provide firm evidence of such findings, but anecdotal reports suggest that mortality rates associated with non-EVD health issues such as injuries, malaria, diabetes, and problematic labor and delivery increased in the early months of the outbreak due to reduced access to health care.

PROGRAM COMPONENT 5: SUPPORT SOCIAL MOBILIZATION

OFDA-supported social mobilization activities are represented in the public health approach to prevention and reduction in spread, which was at least as important as the more clinical approach that took precedence earlier in the response. Social mobilization depended on and in turn took advantage of the natural program skills and instincts of the international NGOs and Red Cross, who routinely mount primary care outreach with local participation, community health workers (CHWs), and community engagement. Social mobilization was gradually ramped up over time to become better integrated with other EVD response strategic priorities (e.g. case identification, contact tracing), and intrinsically tailored to local contexts.

Conclusions

PROGRAM COMPONENT 1: INCIDENT MANAGEMENT AND COORDINATION

OFDA demonstrated that it could be effective as a lead incident command partner as in Liberia, or in a secondary role, as in Sierra Leone and Guinea, both supporting the national government's authority and filling gaps where necessary. Each country had a different variation of the Incident Management System (IMS), or pillar approach; all worked eventually. The determining factors for national command and control effectiveness were the speed with which national structures began operating and were able to mobilize specialized human and financial resources, coordinate with response partners, and establish the essential response support systems—social mobilization, isolation and treatment, and surveillance—which all required simultaneous activation. *The determining factors of OFDA's success in supporting the national EVD command and control structures included the USG's historical political relationship, the extent to which OFDA was invited to play a partner role, the existence of some health system infrastructure upon which to build decentralized coordination with added resources,* and the availability of quality data and analysis to guide planning and decision making. OFDA's main failures or challenges in enhancing effective incident command and coordination were delays in OFDA implementation related to clarifying IP applications and communications as DART teams handed-over between rotations, unevenness in training for contact tracers, and absence of a monitoring, evaluation & learning (ME&L) system to monitor partner performance and provide a feedback loop for affected communities receiving services.

PROGRAM COMPONENT 2: CREATE ADEQUATE TREATMENT AND ISOLATION CAPACITY

OFDA's organizational prowess in mobilizing massive resources and contracting capable INGOs and Public International Organizations (PIOs), once the USG declared the emergency response, as well as capacity to implement health and complementary intervention components, were the determining factors for OFDA's success in rapidly increasing treatment and isolation capacity in Liberia. This effort was on a lesser scale, and started later, in Guinea and Sierra Leone, but nonetheless contributed significantly to expansion of isolation and patient care facilities that were put to good use. OFDA successfully supported the evolution of funding priorities in consultation

with IPs. This resulted in the expansion of isolation services to include needed resources identified on the ground, including psychosocial services, child protection, community engagement around issues of stigma, and food and financial support to address isolation restrictions and livelihood disruptions. OFDA succeeded in quickly injecting massive inputs—technical personnel, training, supplies and logistics—into the existing, inadequate health facilities. The ETU model for new construction was not fast enough, which was a challenge. Factors that reduced the effectiveness of this program area include uneven contact tracing and IP funding delays; low community acceptance of quarantine and isolation; late provision of services for psychosocial needs, child protection, and needs of vulnerable populations due to lack of feedback; inefficiency of coordination of ambulances; inadequate ME&L regarding training effectiveness; delayed funding despite OFDA's flexibility and speed in reviewing proposals; and the absence of a social accountability system. A very serious challenge was the inability of data systems to produce better forecasting analyses for planning and decision making—responders were generally behind the epidemic's spread rather than ahead of it, especially in Guinea and Sierra Leone.

PROGRAM COMPONENT 3: ASSIST SAFE HUMAN REMAINS MANAGEMENT

After encountering substantial community resistance and community non-compliance with EVD response guidance regarding the safe disposal of human remains, OFDA's IPs and external actors heeded country-based feedback. Improving the timeliness and responsiveness of SDB teams, changing practices to make SDBs more culturally sensitive, and integrating psychosocial and social mobilization components into SDB practices all contributed to the ultimate success of this programmatic component, as did OFDA's strong working relationships with IFRC, FRC, and GC, which had the technical and local capacity to implement SDBs. OFDA sponsorship of SDB activities were ultimately effective at contributing to the response, playing a leading role in Liberia, and a supportive role in Guinea and Sierra Leone.

PROGRAM COMPONENT 4: RESTORE HEALTH CARE SYSTEM SAFETY AND FUNCTIONALITY

OFDA saw this component as a way to mitigate the poor health system infrastructure that could impede the response, and result in increased non-EVD mortality. The poor resource context motivated this program component, which was not, for example, a component of the UNMEER response strategy. *Widespread introduction of IPC measures in the health care system was a determining factor in OFDA's effectiveness in containing the spread of EVD, stopping the deaths of health care workers and reversing people's aversion to seeking treatment in public health care facilities.* Major factors for OFDA success were its ability to assess the needs of the health system and coordinate delivery of multiple inputs rapidly, including supplies, training, advisers, protocols, communications messages through IPs with local experience or implementation capabilities. Challenges to the effectiveness of this program areas include a scarcity of trained human resources. In addition, IPs on the ground had to take rapid precautions for workforce protection, changing administrative procedures from standard activities to hazard conditions.

PROGRAM COMPONENT 5: SUPPORT SOCIAL MOBILIZATION

OFDA successfully adjusted to the importance of social mobilization to all program components, and shifted support to make this a major program intervention area. As the leading funder of social mobilization activities during the EVD response, OFDA was the main funder of social mobilization activities in Liberia and joined other donors funding this program area in Guinea and Sierra Leone. Nevertheless, there were numerous limitations, including social mobilization poorly integrated into other EVD response strategic priorities (e.g., case identification, contact tracing) and there was little real-time data collected through social mobilization.

Recommendations

This section consists of high-level recommendations, based on the conclusions and findings. The evaluation team suggests that USAID/OFDA consider the following, in order of priority:

IMPROVING INCIDENT MANAGEMENT AND COORDINATION IN OFDA RESPONSES

1. *Institute an ME&L system at the beginning of emergency* for ongoing learning and to collect real-time evidence, monitor IP performance, and establish feedback and accountability with affected communities.
2. *Convene other likely USG interagency responders* to brainstorm how to prepare for data needs, decision making, and planning in future disease outbreaks.

3. *Review operational procedures to ensure greater continuity* in the field of its personnel when responding to similar situations, principally to achieve overlap or longer durations of DART team deployments
4. *Review operational procedures to optimize award implementation.* Minimize funding delays after proposal review. Other items are expanded upon in the allied Evaluation of the USAID/OFDA Ebola Outbreak Response in West Africa (Ebola Response Evaluation), Objective 3.

IMPROVING ADEQUATE TREATMENT AND ISOLATION CAPACITY IN OFDA RESPONSES

1. *Strengthen adequate treatment and isolation capacity by using a disease-appropriate "IPC continuum" model* that creates consistent context-appropriate barriers to transmission (e.g., PPE, sterilization materials, hygiene equipment, and training) at household, community, health care unit, and treatment facility levels.
2. *Provide guidelines for IPs to coordinate about duty of care concerns for frontline health emergency staff and volunteers,* and for the psychosocial and clinical consequences of a medical emergency for survivors.
3. *OFDA should seek, at a minimum, to be a watchdog for key issues* like grassroots engagement, community representation, transparency, and gender-sensitive programming.

IMPROVING SAFE HUMAN REMAINS MANAGEMENT IN OFDA RESPONSES

1. *Stockpile safe burial resources* for emergency deployment.
2. *Engage early in a response in high-level consultations with religious and traditional leaders* to identify local sensitivities
3. *Work with national private networks of funerary/mortuary professionals* to integrate into an overall response system,
4. *Encourage IPs to explore ways for psychosocial support* and community outreach to be available to burial workers

IMPROVING RESTORATION OF HEALTH CARE SYSTEM SAFETY AND FUNCTIONALITY IN OFDA RESPONSES

1. *Ensure that in future outbreaks, this program component mobilizes from the outset* to assemble population and health system data to strategize for epidemic and non-epidemic complementarity.

IMPROVING THE INTEGRATION OF SOCIAL MOBILIZATION IN OFDA RESPONSES

1. *OFDA should allocate resources to commission external consultants to coordinate with OFDA to build a data infrastructure* that will include four key components: 1) data collection; 2) data analysis; 3) integration of findings into broader response data analysis and decision making; and 4) the incorporation of lessons and insights into short- to mid-term operational adaptations, as needed. Such activities would benefit from parallel investments in developing and refining indicators, data collection modules, and research protocols that can be rapidly adapted "off the shelf."
2. *OFDA should engage experts propose and test measurable, timely, sensitive, and useful indicators* that will enable the integration of local cultural, contextual, and socioeconomic factors into policy-making and resource prioritization.

   For instance, a KAP "score" framework drawn from a pre-positioned index of cultural and epidemiological variables, including those targeting risk for gender, age, and location. Also, a response "effectiveness" score which could be collected using simple text-based survey mechanisms on mobile phones.

3. *Revise OFDA's theory of change about social mobilization and emergency response by adding a critical assumption that social mobilization begins at the start of the response, not later.* This is to better recognize and account for the inherent roll-out and scale-up challenges and time frames associated with engagement with community leaders, training of outreach agents, and integration of program strategies.
4. *Social mobilization capabilities need to better anticipate and respond to counter-messages in social media.* Research more ways to integrate community engagement in the earliest phases of any response. Support efforts to systematically develop measurable, sensitive, timely, and useful indicators of locally-appropriate sociocultural factors.
5. *OFDA should better support the creation of qualitatively-informed situation report (SitRep) indicators* or composite qualitative indices. Ensure this kind of data can be integrated into with standard epidemiological models.

Photo courtesy of the U.S. Department of Defense

INTRODUCTION

Evaluation Purpose

The United States Government (USG) support for the Ebola virus disease (EVD) outbreak response in West Africa was led by the United States Agency for International Development (USAID)/United States Bureau for Democracy, Conflict and Humanitarian Assistance (DCHA)/Office of United States Foreign Disaster Assistance (OFDA), in close coordination with a number of other U.S. Agencies, including the Department of State (DOS), Department of Defense (DOD), USAID Missions in Liberia and Guinea, and multiple arms of the Department of Health and Human Services (HHS) including the Centers for Disease Control and Prevention (CDC), the National Institutes of Health (NIH), and the U.S. Public Health Service Commissioned Corps (USPHS). Within USAID, OFDA worked closely with the Africa and Global Health Bureaus. In total, the USG provided $2.4 billion (combined across all U.S. Agencies funding (see Annex B, Scope of Work) for the EVD outbreak response in fiscal years 2014–2016.[32] The USG response to the EVD outbreak in West Africa was structured around four pillars, reflecting Congressional earmarks: 1) control the outbreak; 2) mitigate second-order impacts of the crisis; 3) coherent leadership and operations; and 4) global health security. OFDA's programming for the EVD outbreak response in West Africa in fiscal years 2014 and 2015 was focused on Pillar One of the response: Controlling the Outbreak. The purpose of this evaluation is to improve the USG's understanding of the performance of its response to the outbreak in Guinea, Liberia, and Sierra Leone. The evaluation focuses on the effectiveness of the response and relevance of the USG's response to the outbreak, as well as OFDA's role in coordinating the USG's international response.

Under contract AID-OAA-I-15-00022/Order No. AID-OAA-TO-16-00034, International Business & Technical Consultants, Inc. (IBTCI) was awarded an OFDA contract in October, 2016 to conduct an independent performance evaluation of OFDA's support to the EVD outbreak response in West Africa. The evaluation responds to the USAID's Evaluation Policy of January 2011 (updated in 2016) to ensure that USAID obtains systematic, meaningful feedback about the successes and shortcomings of its programming—and specifically that the lessons learned are documented and disseminated. This evaluation will inform future USG large-scale public health responses to infectious disease outbreaks.

INTENDED AUDIENCE

The primary audience for this evaluation is the OFDA Director and senior management team, senior managers, program managers, water, sanitation and health (WASH) and public health advisors. Other intended audiences include national and international implementing partners (IPs), governments in West Africa, as well as key stakeholders of the USG's response to large-scale infectious disease outbreaks within CDC and USAID's Bureau for Global Health. OFDA intends to use the evaluation results to make evidence-based decisions on its role, and on the type and timing of its support within any future large-scale public health response of similar magnitude and complexity.

Evaluation Objectives and Questions

This performance evaluation focused on programs funded between March 1, 2014 and January 4, 2016 and actions taken under the EVD response objective: Controlling the Outbreak. This evaluation was guided by four complementary objectives relating to the overall effectiveness of the response, effectiveness of different programmatic components, the relevance, and the coordination of OFDA's response to the EVD outbreak. Each objective has multiple evaluation questions as described below. A complete description of this evaluation's statement of work (SOW) is provided in Annex B. The evaluation team is detailed in Annex K.

OBJECTIVE ONE: EFFECTIVENESS OF THE RESPONSE

1. *To what extent did the set of OFDA-supported activities and models of intervention achieve the outcomes and objectives, as defined by each IP and as part of OFDA's intentions?*
2. *Which USG-funded activities, alone or in combination, made the most significant contribution to controlling the EVD outbreak in West Africa?*
3. *Of the many activities designed to address specific aspects of the set of inter-related control measures, how well did each of the OFDA-funded activities fit within the overall response and efforts to control the outbreak?*

OBJECTIVE TWO: EFFECTIVENESS OF PROGRAMMATIC COMPONENTS

4. *What were the determining factors that contributed to success or failure of each of the different types of programs that OFDA supported?*

OBJECTIVE THREE: RELEVANCE

5. *Did OFDA correctly prioritize and weight the most relevant activities over the course of the response in relation to the outbreak's changing epidemiology?*
6. *Were OFDA's funding mechanisms and in-kind support appropriate to respond to the EVD outbreak in a timely and targeted manner in affected areas?*
7. *To what extent did attempting to adhere to technical 'gold standards' affect the timeliness and quality of the response by OFDA's supported IPs?*

OBJECTIVE FOUR: COORDINATION

8. *How effectively did OFDA coordinate all USG efforts as the lead agency in this response?*
9. *To what extent were the activities supported by the USG well-coordinated with the broader international response, including national response structures in the affected countries, and well-coordinated operationally among those organizations that the USG funded?*
10. *How well did OFDA adjust to the changing epidemiology and priorities of the international response?*

This evaluation report presents the results related to Objective Two: the Effectiveness of Programmatic Components, i.e., question four.[1]

BACKGROUND

Response Context

The West Africa EVD outbreak began with a single case in December, 2013 in southeastern Guinea, and then spread to the neighboring countries of Liberia and Sierra Leone. With symptoms similar to other endemic infectious diseases, EVD was not definitively identified as the cause of the outbreak until March, 2014. Misinformation and a lack of awareness among the public regarding EVD transmission modes, combined with inadequate health care facilities and a lack of health staff trained in EVD response techniques, allowed EVD to spread rapidly. By the end of March, 2014, there were 120 suspected, probable, and confirmed cases and 80 deaths in Liberia, Guinea, and Sierra Leone.[2]

The CDC activated its Emergency Operations Center (EOC) for EVD on July 9, 2014. By July 20, 2014, EVD cases surged in the region and the World Health Organization (WHO) reported the total number of EVD cases in Guinea, Liberia, and Sierra Leone as 1,093, with 660 deaths.[3] On July 24, 2014 WHO labeled the EVD outbreak a "Level 3" emergency, its highest level of health risk. As the lead USG entity for the response, OFDA deployed a Disaster Assistance Response Team (DART) to Liberia on August 5, 2014 and established a corresponding Response Management Team (RMT), based in Washington, DC. The DART, a team that over the course of the response included disaster response and public health experts from OFDA, DOD, and CDC—and was coordinated with NIH, and USPHS—was deployed to assist host country governments in containing the EVD outbreak.

OFDA instituted DARTs in Sierra Leone and Guinea as well, all under a nominal regional DART framework. The RMT based in Washington, DC supported the DARTs in coordination efforts. On August 28, 2014, WHO reported that the number of confirmed, probable, and suspected EVD cases and deaths had more than doubled from the previous month.[4] The number of new EVD cases per week in West Africa was about 700 in September 2014.[5]

On September 16, 2014, the United States President announced the USG's strategy for EVD outbreak response and preparedness.[6] The four pillars of the response and preparedness strategy were:

- Pillar One: Control the Outbreak
- Pillar Two: Mitigate Second-order Impacts of the Crisis
- Pillar Three: Coherent Leadership and Operations
- Pillar Four: Global Health Security

The goal of Pillar One was to control the outbreak by reducing the rate of transmission in the affected countries. This response had the following five distinct components:

1. Create effective nationally-led incident management and coordination. This component involved the creation of a National Incident Management System structured around sub- national EOCs to support technical leadership for all aspects of the response, as well as operational support for communications, call center coordination, and associated logistics.
2. Create adequate isolation and treatment capacity in the countries affected by the outbreak. This component involved the creation of Ebola treatment units (some agencies used an alternate name, Ebola treatment center or ETC; in this evaluation we use ETU to refer to both) and Community Care Centers (CCCs) alongside complementary interim measures to enable a community-based response to the outbreak.
3. Assist the public health response through safe human remains management, which goal was to collect human remains of suspected EVD cases within 24 hours to minimize disease transmission and inform surveillance.
4. Restore safety and functionality to the health care system by mainstreaming infection control practices in the health care systems of affected countries.
5. Support the delivery of concise, credible, and clear public outreach and communications to promote broad social mobilization around clear messages about the EVD outbreak.

Epidemiologic Aspects of EVD in West Africa

The most common method of monitoring progress against an outbreak of EVD or other disease is disease surveillance, i.e., counting numbers of cases that occur over time. In settings with weak health systems, those surveillance numbers may be inaccurate, because many cases are neither accurately identified nor reported to authorities.

From a perspective of reported new cases, Liberia had an apparent peak in September, 2014, whereas Sierra Leone and Guinea appeared to have multiple peaks, more spread out in time. Liberia saw 90% of its cases over 9 months, while Guinea and Sierra Leone both had 90% of cases over 12 months. The mode or peak in Liberia was the week of September 14–20, 2014, with 590 cases. Sierra Leone, which had a larger population and more cases overall, had its peak of 540 cases during the last week of October, 2014. In Guinea, there appeared to be multiple peaks—the highest being 292 cases during October 5–11, 2014—but experts believe that the curve charted for Guinea does not include a large number of undiagnosed and/or unreported EVD cases. Reported cases were heavily clustered in urban areas, along trade routes, and along borders. This clustering may also reflect better reporting in these areas.

Figure 1 depicts the known case counts as reported or reconstructed.[7] Sierra Leone and Liberia each demonstrated classic growth-peak-decline curves, though all three countries ought to be viewed as one collective outbreak, as there was re-transmission across borders during the 2014–2015 period.

Guinea's curve is the most atypical, demonstrating a smoldering almost-endemic outbreak curve, reflecting micro-outbreaks in different parts of the country and most probably reflecting significant under-reporting . Across all three countries, the outbreak peaked within a few months of intervention programs being initiated. Thereafter, the orientation of response efforts was aimed toward rapidly locating new, primarily rural mini-outbreaks until zero cases were reached.

In this West African EVD outbreak, several less common epidemiologic indicators also provided important clues to the impact of ongoing outbreak control efforts.

First, there were several of assessments of R_0, a term that represents the average number of new EVD cases generated by each EVD-infected person. An R_0 of less than one means that the next generation of EVD cases will be smaller than the generation before and indicates that an outbreak is on the decline—success in outbreak control. In West Africa, careful analysis of EVD case surveillance data early in the outbreak indicated that, on average, each EVD case was infecting more than two other new people with Ebola virus (R_0>2) thus explaining why each subsequent EVD generation was much larger than the one before. However, as the use of isolation techniques and other EVD prevention measures became more widespread and more effective, the average number of new people infected by each EVD case began to decrease. Eventually, as that average number of new infections from each current EVD case fell below one (R_0<1), the size of subsequent generations of EVD cases became progressively smaller until the EVD outbreak died out.

When viewed from the perspective of specific small-area mini-outbreaks in districts, towns, or cities, the duration of individual outbreaks in Liberia varied from 20 to 100 days and declined over time at different times in each country.

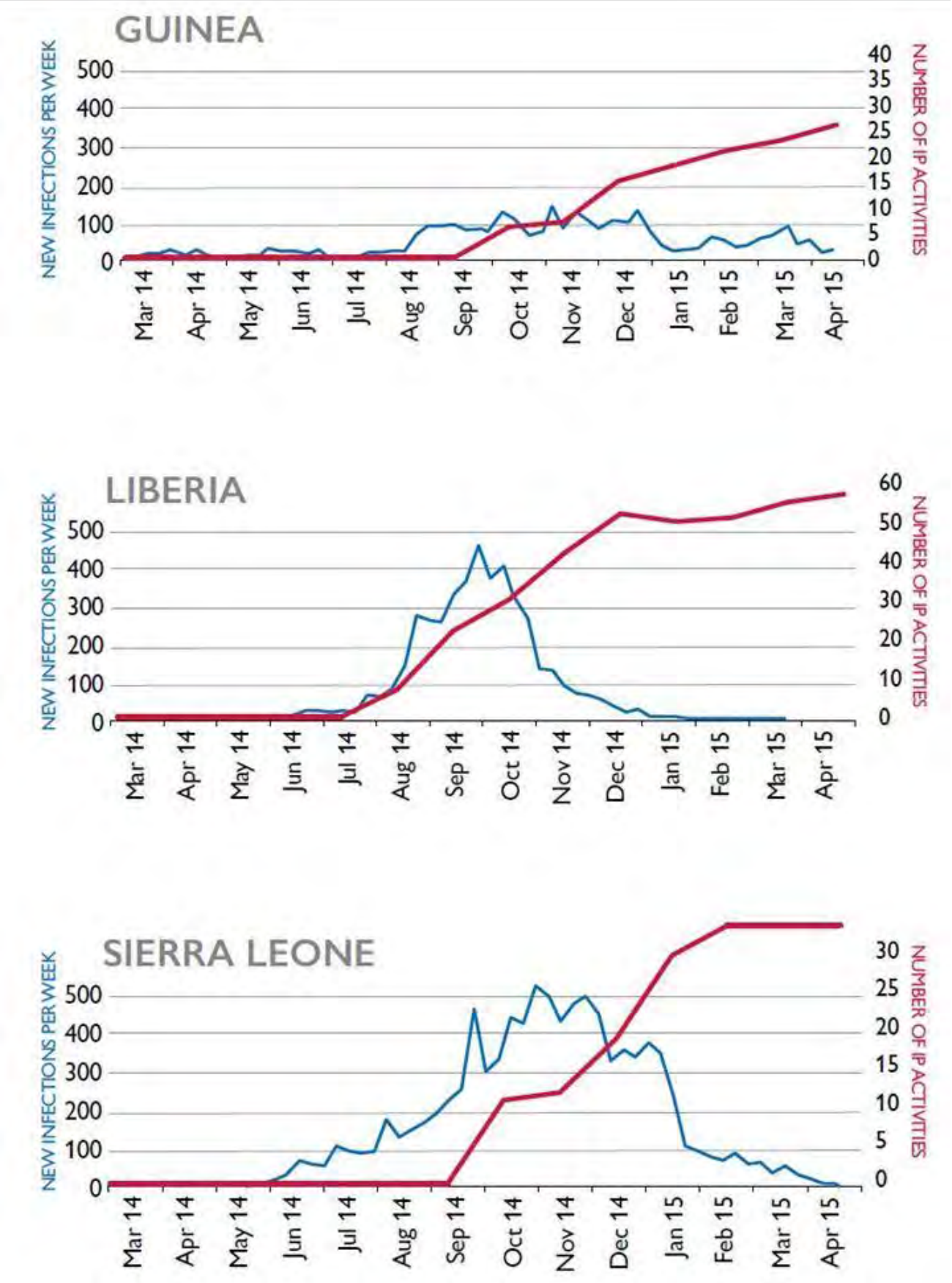
Another epidemiologic indicator is the average period between the onset of symptoms in persons with EVD and the time when those infected persons were admitted to appropriate EVD treatment facilities. This indicator is important, because it is a measure of the length of time that EVD-infected people were exposing others in their families and communities to the virus. It is also important because early access to supportive nursing and other care of EVD cases in appropriate facilities is associated with lower EVD mortality among those cases.

Incubation periods tended to be 8–20 days,[4] meaning that the timeline of EVD case identification represents one to three weeks later than actual EVD transmission.

Finally, a critical aspect of EVD epidemiology in the West African outbreak was the identification and monitoring of close contacts of EVD cases, i.e., those people who were most likely to have become infected by being in contact with current cases. The major goal of contact tracing for EVD is to ensure that any and all new EVD cases in the next generation occur only among those people who were known EVD contacts, who can then be quickly and safely referred for definitive diagnosis and clinical care. Conversely, EVD cases occurring among persons who were not known and monitored as contacts indicates that unknown EVD infection chains were continuing to spread EVD in families and communities.

Initially in all three countries, many newly occurring EVD cases had not previously been identified as contacts, indicating that the effectiveness of contact tracing was low. Over time, as these programs became more efficient, a larger and larger proportion of all EVD cases occurred among those people already being monitored by contact tracing programs.

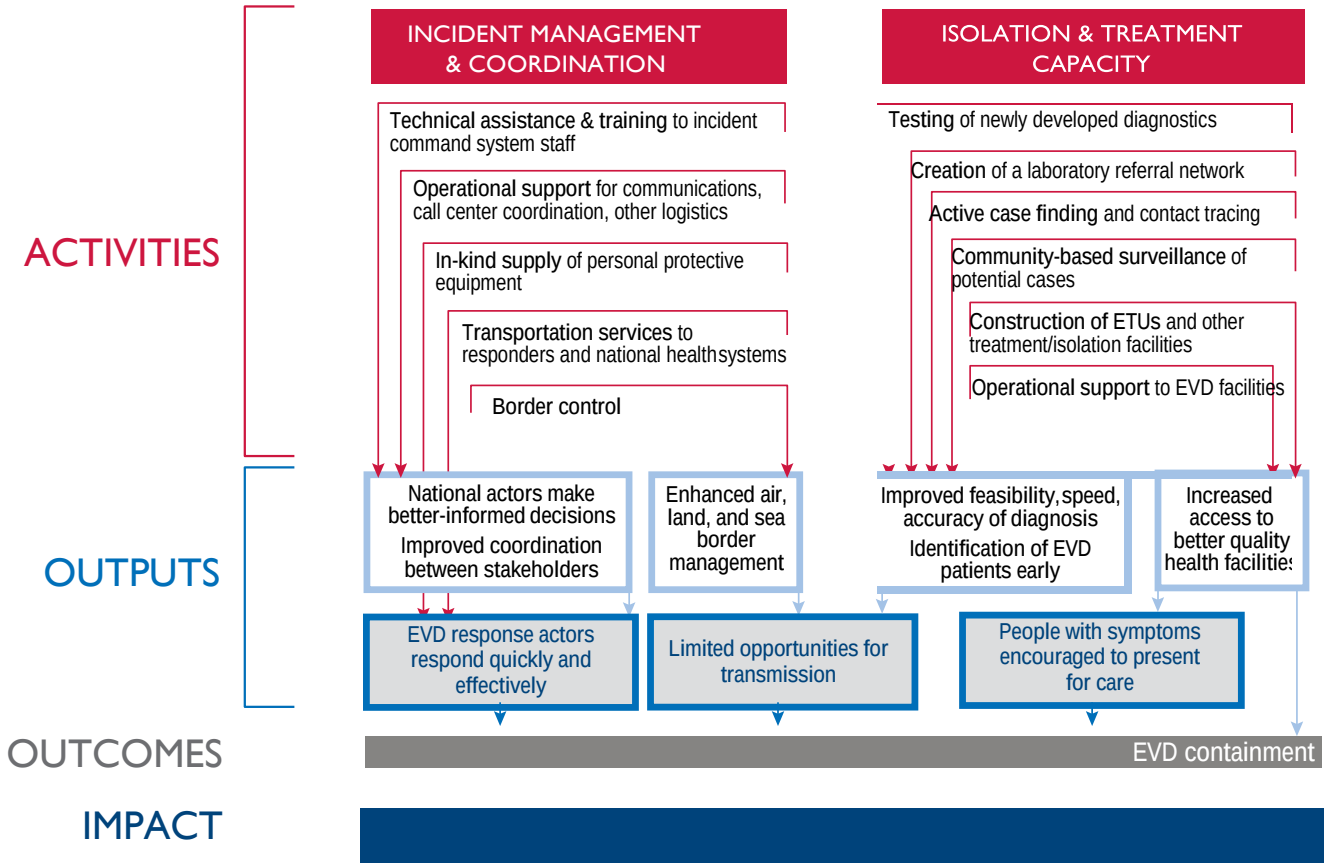
Figure 1. New EVD infections reported vs. Timeline of OFDA-supported IP grant agreements, by country
Source: CDC and WHO. Source of IP grant agreements, see Annex E



Theory of Change

The underlying theory of change (TOC) for the response, as described in the SOW, was informed by two guiding principles of disease control: 1) effective isolation of EVD cases and safe burials of those who died were required to decrease transmission and bring the outbreak under control; and 2) simultaneous massive education and outreach was required to increase population-wide understanding of the disease, how to recognize it, how to prevent transmission, and the importance of modifying behaviors that increase risk. The structure of the response was modified and adjusted at several points during the course of the outbreak. The evaluation team constructed a TOC illustration to understand the logical structure of the response. The TOC explains the response components and activities grouped by response components, direct results (outputs), higher level outcomes (reduced disease transmission and number of EVD cases), and impact (reduced EVD mortality) (Figure 2). The TOC illustration helped the evaluation team to identify the most relevant respondents for each evaluation question, to formulate quantitative survey and qualitative interview questionnaire, and provided a structure for data analysis and reporting.

Figure 2. OFDA EVD response theory of change



OFDA-supported IPs and Activities

OFDA funded over $772 million in country and regional activities under the response in Guinea, Liberia, and Sierra Leone and in the West Africa region (see Annex B, Evaluation SOW). The number of IPs supported included 26 in Liberia, 18 in Guinea, 14 in Sierra Leone, and five regional partners. Annex E includes a list of the OFDA-supported implementing partners, including location, funding amount received, and types of activities supported. Figure 3 on page 14 shows the physical locations of activities. During the 16 months from August 5, 2014 to January 4, 2016, the OFDA DARTs and RMT coordinated the response with OFDA-supported IPs, other USG agencies, non-USG donors, and national and international response partners in each country. Following the steady decrease in the EVD caseload in late 2015, the DARTs and RMT demobilized on January 4, 2016.

Response Funding

USG was a major donor in all three countries, its funding the highest among the major donors. Other major donors involved in the response at the same time were (and their respective funding contribution was) as follows: the World Bank (WB) $1.6 billion; United Kingdom (UK) $550 million; the European Union (EU) $720 million; the governments of Japan $185 million, Germany $134 million, China $125 million, and France $97 million; and the major philanthropic organizations Paul Allen Foundation and the Bill and Melinda Gates Foundation.[8] USG funding for individual countries was highest in Liberia, at around 83%; in Sierra Leone at 46%; and Guinea at 38% of total donor funding. The remainder was all other donors combined.[9] See Annex E for detail.

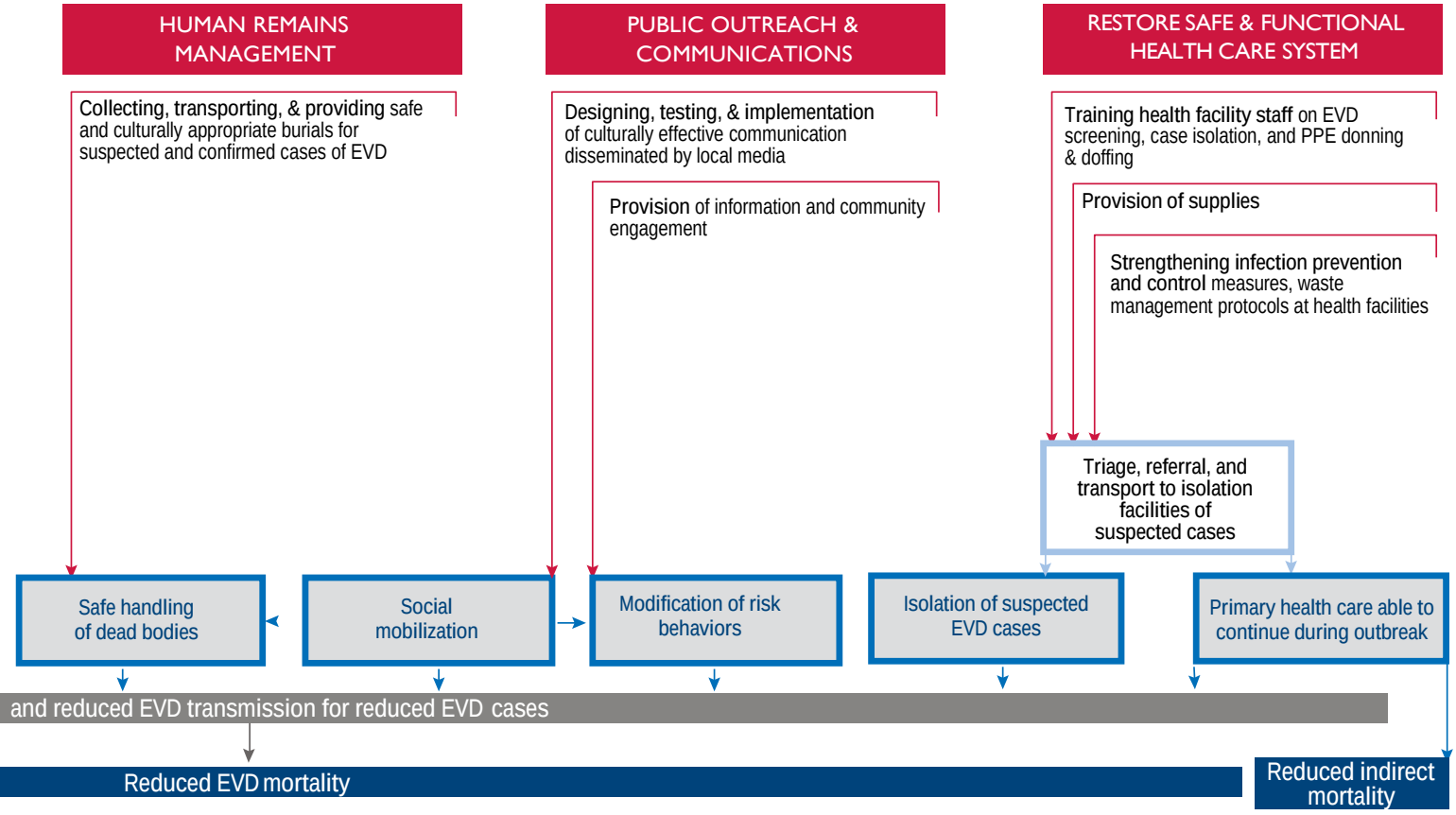
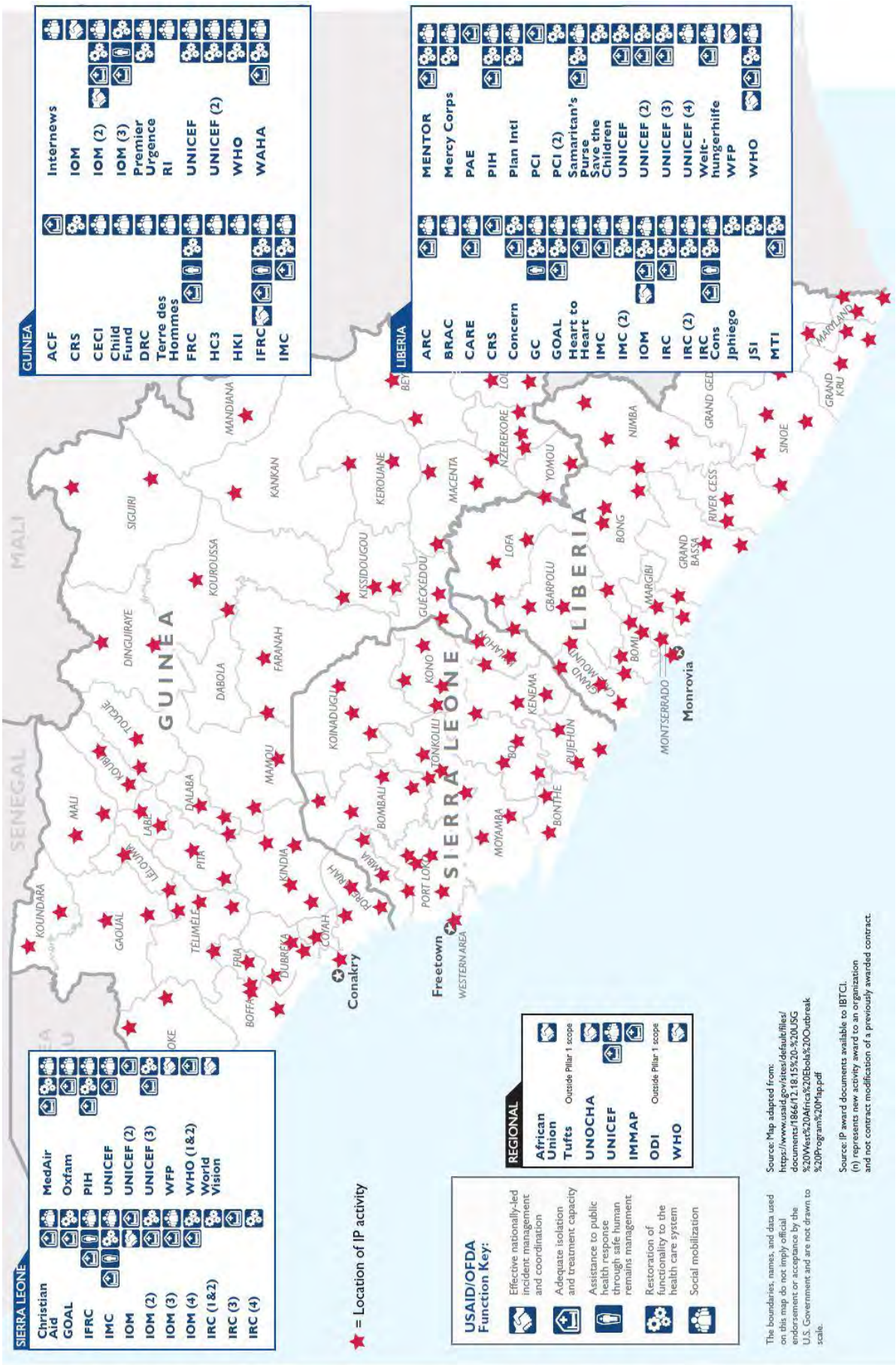


Figure 3. Map of project locations (detail in Annex



METHODOLOGY

Evaluation Design

The performance evaluation was designed to evaluate actions taken and activities funded by OFDA between March 1, 2014 and January 4, 2016 of the EVD response: Controlling the Outbreak. Focusing on the EVD response in Liberia, Guinea, and Sierra Leone, it was designed with a utilization-focused approach—to provide findings, conclusions, and recommendations that can be applied, are scalable, actionable, and are meant to be of utility to the design and implementation of future OFDA interventions. The evaluation methodology considered real-world constraints, including time and funds available, and sought to minimize disruption and burden placed on individuals serving as data sources. The evaluation was designed to answer each of the 10 specified evaluation questions listed above in the Introduction.

The evaluation design team included experienced evaluators and methodological experts in qualitative and quantitative data collection. It included specialists in evaluation, infectious disease epidemiology, humanitarian aid, medical anthropology, analysis of qualitative data, and data collection in humanitarian settings. A detailed description of the evaluation team is presented in Annex K.

A local national working as an Evaluation Coordinator in each of the three target countries helped to refine the data collection questions and tools and ensure cultural relevance and sensitivity. Local response partners in each country were consulted to help compile lists of key informants. A more detailed description of evaluation design can be found in Annex D.

Data Collection Methods

The evaluation design incorporates six data collection methods: (1) a review of peer-reviewed and gray (unpublished) literature,[10] OFDA, CDC, and IP reports, and surveillance data; (2) semi-structured focus groups; (3) semi-structured key informant interviews (KIIs); (4) an online self-assessment survey conducted among DART and RMT members; (5) roundtable discussions with OFDA-supported IPs and other responders; and (6) quantitative surveys (see Table 1). The quantitative methods included national household surveys, with sub-national sampling proportionate to population size,[10] of several thousand households per country, as well as smaller purposively sampled surveys of individuals who worked as contact tracers, CHWs, or volunteers trained or supported by OFDA IPs. The evaluation team interviewed the most relevant respondents for each of the evaluation questions. The choice of KII or FGD respondent group was determined based on the relevance to each evaluation question. An in-depth design matrix can be found in Annex D, which describes for each evaluation question the data collection methods, data sources, data collection locations and sampling, and data analysis methods. All of the data collection tools used can be found in Annex F. A full listing of persons interviewed can be found in Annex H, and a list of documents consulted can be found in Annex G with a literature review in Annex M. Desktop reviews and other research began in December, 2016.

Field Implementation

Primary data collection within Liberia, Sierra Leone and Guinea occurred from March to July, 2017. Training for the local supervisors and field survey teams occurred in each country from May 10–17, 2017. Survey trainings were led by ORB International in-country affiliates and overseen by the Public Health Advisor and local Evaluation Coordinators in each country. All surveyors were from the areas in which the data were collected, and field supervisors were country nationals. Training of field survey teams included instruction in survey methodology, operational guidelines including research ethics, a detailed review of the survey tools in each language, instruction in the electronic data collection devices, and practice interviews in the local community (under supervision). Data collection tools were pilot tested in each country the week prior to the survey training. Results from the pilot testing informed adjustments to the tools to ensure appropriate local understanding. Consistency was maintained in the tools across the three countries for comparability. The final tools were approved by OFDA.

Table 1. Data collection methods and sources of information		
Methods	Sources of information	Scope
Literature review	Peer-reviewed and gray literature; implementing partner records; published surveillance data	4,000 general literature plus 590 IP records from OFDA
Focus group discussions (FGDs)	▪ Burial team members ▪ EVD survivors and families affected by EVD ▪ Members of communities affected by EVD ▪ Members of communities near EVD-affected areas	196
Key informant interviews (KIIs)	• Community leaders • Ministry of Health (MOH) national response partners • National or regional hospital staff • Non-USG international response partners • OFDA supported implementing partners USG partners	285
OFDA Self-assessment online survey	DART members, RMT members	49
Roundtable discussions	USG and non-USG response partners	2
Quantitative surveys	General population	16,365
	Contact tracers	250
	Community health workers/social mobilizers	288

One household survey, representative of nationwide populations with 16,365 respondents (households), was conducted across all three countries.[11] Specific protocols were developed, both to comply with "do no harm" principles and to ensure the protection of respondents in this evaluation. Verbal informed consent was obtained from each household respondent. The respondents were informed in detail the purpose of evaluation and their right to refuse participation without any negative consequence. KII respondents' confidentiality was protected by not including their names and organization names in the report. The household survey teams were provided with instructions about how to make local referrals for counseling and other services, in case a respondent requested the information during or by the end of the survey. To protect respondent privacy, unique identifiers were used in place of names and the database and interview transcripts were password-protected. Local permissions were obtained for data collection in each country: from the Institute of Statistics and Geo-Information Services in Liberia; the Statistician General in Sierra Leone; and from the Ministry of Health, the National Health Security Agency, and the National Statistics Institute in the Ministry of Planning and Cooperation in Guinea.

Two representative but smaller sample-size surveys were conducted among contact tracers and community health workers.

Data Management And Analysis

Standardized procedures for interviewing, note taking, and data analysis ensured consistency and objectivity in interpretation of findings. Combining qualitative data with quantitative findings and findings from literature review enabled triangulation of information and ensured multiple sources of support for each finding. The quantitative survey data were collected on electronic tablets using *SurveyToGo* offline software, with built-in response validation. Data were uploaded from the tablets to a secure online server daily after data quality check by an ORB field supervisor.

Data were downloaded from the online server weekly to perform an additional data quality check by the team leader. STATA software version 14 was used for quantitative analysis, which compared indicators across countries as well as by gender and urban/rural residence within each country. In this context, there were no appropriate baseline data for comparison. Interviewer notes were prepared immediately following each KII and FGD and uploaded to a secure shared online drive. Coding was applied according to a designated codebook based on the 10 evaluation questions.

The qualitative data were analyzed using *Atlas-ti* version 8, using a Grounded Theory approach.[12] Literature review data were analyzed using Tableau version 10. Contribution analysis[13] was used to assess the influence of individual interventions on the outcomes in the presence of multiple actors and programs. Contribution analysis examines all evidence to discern the plausible links and impact pathways between activities and a common goal.

Summary data from quantitative surveys, KIIs, FGDs, document review, and secondary data analysis were distributed among team members. Multiple team meetings were held for data triangulation and interpretation of the results. Each evaluation question's findings were supported by two or more data collection methods; each conclusion was supported by data triangulation and interpretation of two or more findings.

Limitations

A number of potential limitations to the evaluation data and findings were identified during the design and implementation of the evaluation. Most were identified early, enabling IBTCI to take effective mitigating measures. Limitations are mentioned briefly below, and more detailed information on limitations, and the measures taken by IBTCI to mitigate their impact, is available in Annex D.

Interviews with key informants from OFDA, CDC, and each IP, and analysis of IP awards made, funding amounts, and public statements failed to fully mitigate the major limitation of IBTCI's inability to see the complete OFDA strategy documents and the lack of several IP awards documents. Key informants and household survey data were used to mitigate a restricted ability to evaluate achievement of program outcomes due to limited availability of IP performance measurement data. Key respondents were often identified and interviewed remotely to mitigate the limitation of many key personnel having left the focus countries. Survey questions were designed using anchor dates, and respondents were given time to reflect before answering to mitigate potential recall bias. Survey teams were trained extensively on interviewing skills and avoidance of leading questions to mitigate social desirability bias.

Data from numerous FGDs and KIIs in Sierra Leone and Guinea ensured the experiences of those countries were well-represented to mitigate the impact of numerous respondents focusing their recollections disproportionately on the response in Liberia. Quantitative survey data were disaggregated by gender to mitigate the limited availability of evidence on gender dimensions. Participation of men and women was ensured through conducting equal numbers of separate community FGDs by gender. Females were purposely selected for KIIs to compensate for bias from the natural under-sampling in non-professional groups. Data triangulation helped mitigate the tendency of stakeholders to feel they were successful and did a good or better than average job (optimism bias).

FINDINGS

This section consists of high-level findings associated with the evaluation questions. The overall results are presented here analyzing evaluation data across the three countries; country-specific findings and summary conclusions for each evaluation question are presented in the subsections. They expand and build on findings found in the allied *Evaluation of the USAID/OFDA Ebola Outbreak Response in West Africa* (Ebola Response Evaluation), Objective 1 (Effectiveness).

Overall Findings

Measuring the effectiveness of vast program components in a country-by-country analysis is a complex process, requiring the careful triangulation of data. Effectiveness of any program component in each country was determined by the skills, capabilities, efforts, and capacities of a wide array of actors, differing political, social, geographic, demographic, and cultural contexts and epidemiological variables.

For the purpose of this report, we defined the presence of effectiveness, or "success," and the absence of effectiveness, or "failure," based upon a minimum of two of the following three sources of data. First, we asked different stakeholder groups about their experiences and their subjective evaluations of the successes and failures that they had noted of the programmatic components (see Annex F, Data Collection Tools). Secondly, we systematically reviewed and analyzed IP, OFDA, and USG internal reports, evaluations, and assessments. Thirdly, we compared those findings with literature from researchers and journalists who had studied and published about the programmatic components which were generic to all EVD outbreak responses.

Outputs of OFDA-funded activities were the basis for reviewing the theory of change implementation (activities, outputs, and outcomes), rather than impacts. Many responders contributed to reducing direct and indirect EVD mortality (impacts). This measurement focused rather on the outputs and outcomes for which OFDA IPs were accountable, to see their contribution to containment, and reduced EVD transmission and cases, therefore establishing a causal link showing effectiveness.

The evaluation identified determining factors common to a public health emergency response, that spanned the five program components: funding, timing and speed in implementing programs, providing logistics and supplies for very poor or non-existent infrastructure (electricity, communications, roads, water), mitigating very weak health care systems with budget and skills shortages. These are determining factors that OFDA must often mitigate against in emergency response.

There were these and more uncommon determinants as follows for each program component.

1. INCIDENT MANAGEMENT AND COORDINATION

OFDA demonstrated that it could be effective as a lead incident command partner as in Liberia, or in a secondary role, as in Sierra Leone and Guinea, both supporting the national government's authority and filling gaps where necessary. Each had a different variation of the Incident Management System (IMS) and all three worked effectively, eventually. OFDA helped to make incident management and coordination more effective in all three countries by strengthening sub-national coordination—to make national plans operational at the household level—through the regional response structures in each country. The determining factors for national command and control effectiveness were the speed with which they began operating and were able to mobilize specialized human and financial resources, coordinate with response partners, and establish the essential response support systems—social mobilization, isolation and treatment, and surveillance—which all required simultaneous activation.

Ebola Response Evaluation, Objective 1 concluded that *"The most effective USG-funded activities were nationally-led incident management and coordination, social mobilization, and safe human remains management."* Alongside CDC, OFDA supported national-level Emergency Operations Centers (EOCs) to oversee Incident Management (or Command) Systems that provided a unified authority for coordinating roles and responsibilities. The determining factors of OFDA's success in supporting the national EVD command and control structures included the USG's historical political relationship with that country, the extent to which OFDA was invited to play a partner role, the existence of some health system infrastructure upon which to build decentralized coordination with added resources, and the availability of quality data and analysis to guide planning and decision making. Others were

OFDA's ability to rapidly establish trusted relationships with host-country governments; source technical advisors and training support; provide large-scale financing, logistics, supply, transportation, and organizational skills; localize programs through IP subcontractors; and leverage bi-lateral relationships of the countries with relevant UN agencies. Another factor was the strong cooperation between OFDA and CDC. *"CDC is brains and OFDA is the brawn"* was how a senior Liberian MOH interviewee saw it. OFDA was flexible in approach, able at finding correct partners and mobilizing the ones most relevant for the activities, and the skills of CDC and OFDA were complementary. OFDA's main challenges in enhancing effective incident command and coordination included delays in OFDA implementation related to clarifying IP applications and the communications as DART teams handed-over between rotations; unevenness in training for contact tracers; and absence of a monitoring, evaluation & learning (ME&L) system to monitor partner performance and provide a feedback loop for affected communities receiving services.

Theory of Change: An incident management system establishes a command and control structure, manages border control, aggregates, distills, and examines surveillance data from each part of the country, oversees warehousing and logistics, and promotes coordination of all aspects of the response. Incident management and coordination provides a common hierarchy and framework within which responders from multiple agencies can be effective. Surveillance, including contact tracing, is a fundamental function of this program component, although in the OFDA response, contact tracing activities took place in other program components as well. As in many disasters where OFDA responds, it pursued extensive informal coordination in all three countries, including convening IPs, mapping donor-funded activities, fostering IP coordination, and referring IPs to work together.

Findings: OFDA worked closely with CDC in each country to identify needs and optimize resources. OFDA provided significant funding for supportive activities to enhance national and sub-national incident management and coordination in all three countries. For example, OFDA supported the case reporting phone system hotline at local and regional levels in Guinea that was more user-friendly for the public, augmenting the national hotline. Another example of coordination and leveraging resources was OFDA funding in Sierra Leone to a consortium of international and national NGOs, following a request from the National Surveillance Pillar, to nationally scale up a proven effective community-based approach for surveillance. The model brought together the District Health Management Team (DHMT) and had a high level of buy-in among local leaders, community members, and Ebola response workers. There were other very effective models of consortia of international and local civil society organizations implementing national EVD strategies at the local level across prefectures (in Guinea), chiefdoms (in Sierra Leone), and counties (in Liberia) to reach affected communities.

Other examples are Mercy Corps' successful national social mobilization campaign in Liberia, which incorporated a dozen Liberian civil society organizations across the country, representing women's, youth, and faith-based groups. An IRC consortium in Sierra Leone succeeded in bringing 182 public health units to IPC compliance levels. However, in Liberia, both a women's group KI and a national level government KI reported a lack of responsiveness to locally driven suggestions for improving programs.

In addition, there were very high emergency funding levels to the WFP to provide logistics and air services across all three countries in support of all international responders. WFP services were crucial for the limited response capacity context of low-resource governments.

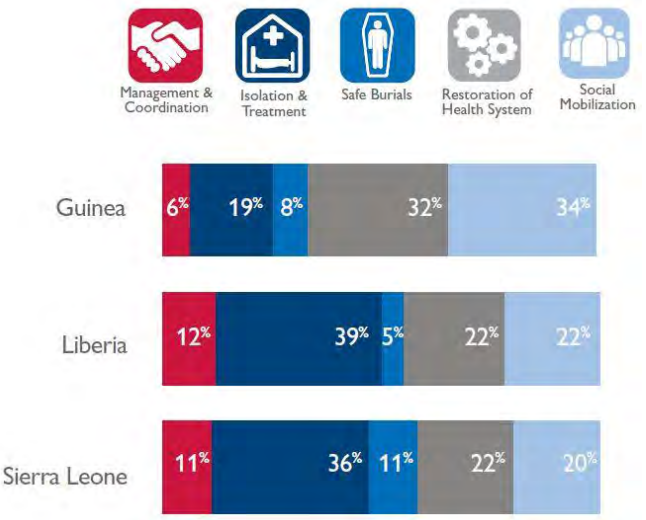
2. CREATE ADEQUATE TREATMENT AND ISOLATION CAPACITY

Adequate isolation and treatment capacity requires the establishment of an "IPC continuum" that reaches from the household and community level—at which an individual's initial point of contact with an undiagnosed infected individual beginning to show symptoms of infection—and extends all the way through triage, testing, isolation, and treatment. IPC gaps throughout the IPC continuum can create entry points for the spread of EVD infection; widespread utilization of precautionary tools, techniques, and sanitary practices can close those entry points and prevent further transmission. To study the effectiveness of OFDA's efforts to create adequate isolation and treatment capacity, this evaluation analyzed isolation and treatment capacity across the IPC continuum, emphasizing: 1) the distribution of hygiene kits to households and community facilities like mosques, churches, and schools; 2) the provision of community-based trainings on IPC practices; 3) the expansion of IPC practices across health care facilities; 4) the establishment of community care centers (CCCs); and 5) the construction and operation of ETUs.

Qualitative data disaggregated by country suggests that OFDA was moderately effective at supporting the establishment of IPC capacity in Guinea and Liberia, but was much less effective at doing so in Sierra Leone.

OFDA's organizational prowess in mobilizing large-scale response resources and contracting capable international nongovernmental organizations (INGOs) and funding Public International Organizations (PIOs) once the USG declared the emergency response, as well as the capacity to implement health and complementary technical interventions, were the determining factors for OFDA's success in rapidly increasing treatment and isolation capacity in Liberia. This effort was on a somewhat lesser scale, and started later, in Guinea and Sierra Leone, but nonetheless contributed significantly to expansion of isolation and patient care facilities that were put to good use. This program category—treatment and isolation capacity, taken with the overlapping restoration of

Figure 4. OFDA Funding by program component



health care programs—were where OFDA expended the most funds (see Figure 4). OFDA contributions included funding to renovate buildings into new ETUs and CCCs and staff, supplies, and equipment; technical expertise in epidemic control and humanitarian crises. The network of health facilities promoted by OFDA engaged with enhanced laboratories set up by DOD and CDC to increase capacity and speed of diagnosis. The challenge to planning isolation and treatment facilities, bed numbers needed, and their locations was the lack of available data and analytical tools that integrated relevant demographic and epidemiologic variables. The determining factors of OFDA's ability to rapidly create adequate treatment and isolation capacity were financial and technical resources. OFDA successfully supported the evolution of funding priorities in consultation with IPs. This resulted in the expansion of isolation services to include needed resources identified on the ground, including psychosocial services, child protection, community engagement around issues of stigma, and food and financial support to address isolation restrictions and livelihood disruptions. OFDA succeeded in quickly injecting massive inputs—technical personnel, laboratories, training, supplies and logistics—into the existing, inadequate health facilities. The ETU model for DOD-led construction was not fast enough. The CCC model was faster to bring to fruition—a success—in a context where the number of days (not weeks or months) it took to create isolation facilities equated with lives lost. Factors that reduced the effectiveness of this program area include poor contact tracing and IP funding delays; low community acceptance of quarantine and isolation; late inclusion of provisions for psychosocial care, child protection, and the needs of vulnerable populations, due to lack of feedback; inefficiency of coordination of ambulances; inadequate ME&L regarding training effectiveness; long OFDA grant process timing; and the absence of a social accountability system. A very serious challenge was the inability of data systems to produce better forecasting analyses for planning and decision making: responders were generally behind the epidemic's spread rather than ahead of it, especially in Guinea and Sierra Leone.

Theory of Change: Central to the containment of infectious diseases like EVD is the isolation of those exhibiting symptoms and awaiting diagnosis, to stop onward transmission of the virus. OFDA funded ETUs and CCCs alongside complementary interim measures to enable a community-based response with the best types of structures. The evidence from the EVD outbreak is that it is both possible and necessary to have different models for achieving isolation.

Findings: OFDA succeeded in providing staff, supplies, food, and funding for triage, isolation, quarantine, and palliative care through the establishment of an ETU system with reporting, referral, and transportation capabilities; it also facilitated food support through FFP for community-based quarantines in Liberia. These resources would not have otherwise existed without OFDA support. OFDA explored the CCC system through some pilot initiatives, but did not make large-scale investments in Liberia, suggesting that OFDA may have struggled initially to understand the role of community-based triage, testing, and isolation as a necessary intermediary step between household and community isolation and ETU isolation. Later, OFDA increased support of CCCs. OFDA received strong recommendations against the use of CCCs from WHO and CDC as early as August 2014, when the CCC model was proposed.

OFDA funded isolation and treatment facility support in locations of high infection rates, or key strategic importance because of high mobility across borders and between rural and urban areas, as these are a key factor in rapid EVD transmission in West Africa. After IP feedback about livelihood disruption within households due to isolation of infected family members, DART teams mobilized food provision for affected communities, which in turn made isolation for long periods and treatment activities more acceptable.

Initially, OFDA and IPs failed to consider how survivors and burial and community workers suffered from trauma and stigma in their communities. Issues of differences in stipends and compensation for the mortal risks that local response workers faced dampened worker morale at times.

Contact tracing: OFDA's Program Component 2 infrastructure was based on a "hub and spoke model," with ETUs and affiliated laboratories functioning as the "hub," and contact tracing efforts functioning as dynamic "spokes" that brought suspected EVD cases to ETUs and laboratories for testing and triage. Contact tracing, as a programmatic component, required the mass mobilization of tens of thousands of community-based health workers, social mobilizers, contact tracers, community

leaders, and volunteers across each of the three countries. In contrast to the intensely centralized infrastructure of ETU facilities, contact tracing activities required massive investments of four types of resources designed to push responders out into local communities: 1) cell phones (and cell phone towers) to facilitate communication between surveillance centers and tracers; 2) vehicular transportation (motorcycles and other vehicles that were appropriate for West Africa's climactic and infrastructure limitations); 3) data collection instruments and training in how to use them; and 4) salaries and human resource supports (management, training, and psychosocial support) for contact tracers. Some of our findings suggest that these primary requirements required additional supports—such as technical support, motorcycle and bicycle repair, salary disbursements, psychosocial counseling for workers, and staff supervision.

Evidence suggests that in all three countries, OFDA's initial support for contact tracing activities underestimated the communications, transportation, salary, training, and human resource requirements of these activities, and correspondingly under-invested resources. This indicates that OFDA and its IPs did not fully grasp the mechanism that contact tracing played in the EVD containment strategy model. An interview with *Médecins sans Frontières (*MSF) suggests that as a result, at one point in Sierra Leone, contact tracing activities were missing as many as 75% of suspected cases in a confirmed patient's chain of transmission; first-person accounts, media evidence, and some epidemiological models support the trend (but not the count) of MSF's conclusions.[15]

Gender. This evaluation found that an under-collection of gender-variable epidemiological data prevented OFDA and its partner agencies from having a clear understanding of gender effects on the virology and epidemiology of EVD. This was a systemic finding applicable to all USG and IP approaches. As a result, actions that were specifically targeted toward prevention, case management, contact tracing, and isolation and treatment did not integrate gender concerns into planning or operations. Although CDC was in charge of disease surveillance including collation and analysis of epidemiological data, OFDA is accountable for gender sensitive programming under all emergency contexts. Therefore, OFDA should not have stepped so far back from all surveillance activities that they were unaware or unable to fill a gap in gender-sensitive surveillance, when it was evident that the gap existed. OFDA has, as part of its mission, a primary responsibility to be accountable for grassroots engagement, community representation, transparency, and gender-sensitive programming that it retains—even when it is partnered with a technical advisement entity that does not prioritize OFDA's core strengths. It should seek, at a minimum, to be a watchdog for key issues like gender in future outbreaks.

While some believed that women were more vulnerable to infection by EVD, our analysis of the secondary literature found that epidemiological studies of EVD infections which integrated gender as a variable found no quantitative difference between rates of cases among men versus women.[16] However, the pathways of transmission experienced by women were qualitatively different than those of men. Men were more likely to come into contact with the virus through community-based activities such as burials, surveillance, or market or labor activities; women—as primary health care, physical care, and social support providers—were more likely to come into contact with the virus within the household or through gender-specific support networks. This played out in several ways.

This evaluation finds that public health communication pathways tended to biased against women, compared with men (women were more likely to have lower levels of literacy, less access to mobile phones and media devices, and less access to EVD health promotion campaigns in urban areas).

Lastly, our findings demonstrated that women were disproportionately affected by health systems closures; health systems failures, when combined with inadequate IPC training, resulted in women being turned away for pre-partum, labor and delivery, and postpartum treatment. There is additional evidence to suggest that these barriers extended to neonatal care and to women who were breastfeeding.

3. ASSIST SAFE HUMAN REMAINS MANAGEMENT

Initially, OFDA-funded **safe and dignified burial** (SDB) programs did not integrate a culturally sensitive approach. OFDA and IPs failed to consider local traditions, religion, social values, and the normal human psychology of grief and mourning in intervention implementation design. This oversight undermined the effectiveness of nearly all initial SDB activities. This failure may be at odds with the "do no harm" principles shared by OFDA and its partners and poses an ethical challenge. The harm caused by this initial oversight likely resulted from the absence of effective mechanisms for including affected communities' perspectives when planning interventions and for gathering valid and reliable feedback on a continuous basis. It also may have contributed briefly to the prolonging of the outbreak.

Theory of change: Supporting safe human remains management is a core task for interrupting EVD transmission. The lesson learned in West Africa is to integrate a culturally appreciative approach from the outset, either as a critical assumption, or intrinsic to the TOC.

Findings: The worst-affected countries all faced crises in disposing of highly infectious human remains. When authorities introduced safe burial practices, there was low community acceptance of change in burial practices and, therefore, low effectiveness of safe burials efforts—thus affecting community-

based transmission associated with burial events. After encountering substantial community resistance and community non-compliance with EVD response guidance regarding the safe disposal of human remains, OFDA's IPs and external actors advised OFDA to prioritize culturally sensitive safe human remains management in OFDA-funded SDB activities. A crucial component of culturally sensitive SDB strategies was the close integration of robust social mobilization and psychosocial counseling. Country-based feedback also emphasized the need to expand SDB response capacity through hot lines and vehicles, so that burial teams would be able to be more timely and responsive during a crucial period of post-mortem virus transmission risk. Improving the timeliness and responsiveness of SDB teams, changing practices to make SDBs more culturally sensitive, and integrating psychosocial and social mobilization components into SDB practices all contributed to the ultimate success of this programmatic component, as did OFDA's strong working relationships with IFRC, FRC, and GC, which had the technical and local capacity to implement SDBs.

4. RESTORE HEALTH CARE SYSTEM SAFETY AND FUNCTIONALITY

OFDA saw this component as the way to mitigate the poor health system infrastructure that could impede the response, and result in increased non-EVD mortality. The poor resource context motivated this program component, which was not, for example, a component of the UNMEER response strategy. Widespread introduction of IPC measures in the health care system was a determining factor in OFDA's effectiveness in containing the spread of EVD, stopping the deaths of health care workers, and reversing people's aversion to seeking treatment in public health care facilities. Major factors for OFDA success were its ability to assess the needs of the health system and coordinate delivery of multiple inputs rapidly, including supplies, training, advisers, protocols, and communications messages through IPs with local experience or implementation capabilities. Challenges to the effectiveness of this program area include a scarcity of trained human resources. In addition, IPs on the ground had to take rapid precautions for workforce protection, changing administrative procedures from standard activities to hazard conditions.

Theory of change: Restoration of safety and functionality to the health care system by mainstreaming IPC in the health care systems of affected countries is a core element to interrupting EVD transmission—and preventing an increase in non-EVD mortality. A critical assumption needs to be added—that there is basic infrastructure such as water, electricity, structures, and staff, in order to implement this component.

Findings: After health care facilities became major sources of new infections at the outset of the outbreak, the health sector in all three countries effectively collapsed. OFDA funded activities to improve IPC at health care facilities to restore safety and functionality to the health care system by mainstreaming IPC in all three countries, with large upticks of skilled personnel, training, supplies, and protocols. This was critical to interrupting EVD transmission. Most significantly, it effectively disrupted rapidly escalating EVD transmission and EVD-related deaths among national health care workers, thereby securing the workforce of already fragile health care sectors. Additionally, securing the health care sector effectively increased health care workers' access to patients for case identification and reporting, and took steps to reverse epidemic-related increases in non-EVD mortality, restoring trust in health services, and protecting health care workers. Insufficient epidemiological data exists to provide firm evidence of such findings, but reports suggest that mortality rates associated with non-EVD health issues such as injuries, malaria, diabetes, and problematic labor and delivery increased in the early months of the outbreak because of reduced access to health care. Estimates of excess malaria mortality alone, caused by the collapse of treatment options, exceed estimates of deaths due to EVD.

Several studies demonstrated that the emphasis on expanding standalone ETU facilities, rather than co-prioritizing the rapid strengthening of existing primary health care facilities, had detrimental impacts on maternal/child health[14] (e.g. facility-based deliveries),15 as well as all other causes of morbidity and mortality,[16] including HIV/AIDS.[17]

Critical gaps in patient care were identified in all three countries. There was concern about IPC precautions among local health care workers resulted in all non-EVD patients, including elderly, pregnant women, lactating mothers, and children under five, and reports of them being turned away from health facilities. This increased the risk of death because critical health care measures were left to be managed at the community level by family, friends, or community-based health providers (e.g., midwives), who lacked access to IPC training and materials available in facilities.

5. SUPPORT SOCIAL MOBILIZATION

OFDA-supported social mobilization activities are a vital part of public health approaches to preventing transmission and reducing the number of new cases during epidemics. Social mobilization plays a central role in facilitating community cooperation, behavior change communication, and conveying information about risk factors. Just as importantly, social mobilization is embedded in social and linguistic systems that support case reporting, case management, contact tracing, and rapid symptom identification. For these reasons, social mobilization is as important as are medical and clinical activities.

Theory of change: The delivery of concise, credible, and clear public outreach and communications promotes understanding about EVD to effect prevention, positive behavior change, and health-seeking practices in all three countries. There was qualitative evidence that community engagement led to the

support of other strategy components that required public acceptance such as contact tracing, isolation and treatment, and safe burials. Tables 3, 4, and 5 below compare OFDA's implementation of social mobilization in the three countries, underlining major deficits.

Findings: At the outset of the USG's engagement with the EVD outbreak in August 2014, both OFDA-supported and non-supported social mobilization efforts were widespread and robust and have been credited with facilitating a rapid turn in the epidemic trajectory in Liberia's capital, Monrovia. However, such activities were initially ineffective, because they were poorly integrated into all other aspects of the response. Confronted with continued gaps in surveillance, contact tracing, and community resistance, OFDA-supported IPs with long-standing community engagement experience were able to massively expand social mobilization capacities as OFDA resources increased in November 2014 in Liberia and in December 2014 and January 2015 in Sierra Leone and Guinea.

Results by Country

OVERVIEW

This assessment used a contribution approach (see the Data Management and Analysis section of the Introduction), that examined the value that OFDA added to the activities of multiple donors and implementing agencies, to review the effectiveness of each of the five programmatic components of the overall USG response. In the section Summary Conclusions, there is a cross-country analysis.

GUINEA

1. Create Effective Incident Management and Coordination

OFDA primarily used Guinea's national coordination mechanism (CNLE) to coordinate USG efforts. One Guinean respondent explained:

> *"The USG through OFDA was involved in all decision-making by the CNLE...They [OFDA] were flexible and listened very well."*

Qualitative data suggests that the frequent turnover of OFDA staff affected program implementation and timeliness. OFDA records show that 25% of DART members were deployed to Guinea, compared with 55% posed in Liberia.

OFDA support in this program component was mainly through OFDA's funding to WHO, the recipient of its largest award in Guinea, for $19.6 million. WHO was able to recruit more francophone speakers to the field than the USG, and WHO was able to provide effective coordination with response partners, such as the Public Health Agency of Canada. The African Union, funded by OFDA, also provided technical advisers for command and control activities and restoring health systems. WHO capabilities were stronger in Guinea than OFDA and its partners.

Apart from WHO, effective support for this program component came via OFDA awards to IFRC and IOM. Both trained contact tracers and assisted with cross-border surveillance activities. IOM technical support for coordination and training are credited with playing a leading role in keeping borders open.

WHO reports to OFDA did not provide feedback about Government of Guinea (GOG) satisfaction with WHO and African Union services. However, WHO's public reports by WHO and KIIs with other actors informed evaluators that WHO was strongly involved in providing technical assistance and training to the GOG. OFDA's support to IOM also assisted local authorities in scaling and fine-tuning border screening of migrants for EVD spread.

An important aspect of effectiveness in coordination is the ability to include a wide range of stakeholders. Evidence from key informant interviews suggests that in Guinea, OFDA-supported coordination efforts did not include the private health care sector, at least in Conakry and Forécariah. This would likely have had downstream impacts on the effectiveness of other response areas, like restoring health systems capacity through IPC training and human remains management (through private providers of funerary services).

The USG was less involved in attempting to coordinate the response in Guinea, when compared to Liberia, in significant part because the GOG was not as welcoming to USAID. The evaluation team about coordination found that: 1) OFDA worked closely with CDC to ensure USAID and CDC were coordinated; 2) OFDA did not coordinate much with non-USG donors; 3) OFDA was flexible and responsive to governments and IPs; and 4) the USG response to Guinea was impaired by a lack of understanding of the epidemiologic trends of EVD and the reasons why the outbreak counts were so erratic. This program component received the smallest proportion of OFDA funding, 6%. (KIIs, document reviews, see allied Ebola Response Evaluation report for Objective 4 (Coordination of Response).

Based on document review and KIIs, apart from CDC and OFDA direct staff involvement with the government's national coordinating body, CNLE, incident management support was overwhelmingly through the WHO. OFDA's largest award in Guinea, nearly $20 million, was to WHO, for both command and control and health system restoration interventions. WHO was especially capable in Guinea and harnessed more

Table 2. Evaluation findings on incident management and coordination, Guinea		
Evidence About Reducing Transmission	Failures	Factors
>Strengthened incident management system (operations, strategy, surveillance) (WHO, IOM, IFRC, AU) >Supplied infrastructure nationally & sub-nationally (IOM) >Enabled critical training nationally & sub-nationally (WHO, IOM, IFRC) >Supported open borders & surveillance (IOM)	>OFDA assistance was slow to reach full deployment until after the EVD incidence peak >Delays in processing IP applications >Absence of feedback from beneficiaries	Positives: >PIO capability >Technical advisors >Conduct training >Coordination/collaboration >Funding >Timing (quick) Negatives: >OFDA staff turnover >Data inadequacy (availability & analysis) >Contact tracing incompetency >Lack of private sector coordination >Absence of monitoring, evaluation & learning (ME&L) system

francophone speakers to the field than the USG was able to, providing effective coordination with groups like Public Health Canada. The African Union also provided technical advisers for command and control activities. Reports provided by OFDA from the IP did not provide feedback about GOG satisfaction with WHO and African Union services. Public reports by WHO and feedback from KIIs and FGDs provided evaluators with information about WHO's robust involvement in providing technical assistance and training to the GOG. KIs mentioned *"improved surveillance data guided the response and CNLE was instrumental in coordinating the response post-June 2014."*

A shortcoming mentioned by interviews with private clinic directors in Conakry and Forécariah was that the private sector was not involved by the national coordination bodies.

> *"There was no coordination between the clinic and the health authorities including the regional coordination. The clinic was not invited and involved in any decision from the prefectural health office that even banned them from coming around the office's premises."*
>
> —Private clinic director, Forécariah

IP KIs noted that there was frequent turnover of OFDA staff, which affected program implementation and timeliness. However, IP KIs also perceived that the slow implementation pace might be because *"the government did not want to publicize either the epidemic or problems in responding."*

Data for incident management decision making was a challenge throughout West Africa, but particularly in Guinea.[20]

> *"The country experienced a complicated spatio-temporal disease pattern, with several waves of increasing and decreasing weekly incidence. Although Guinea has suffered considerably fewer cases than Liberia and Sierra Leone, it has struggled the most to eliminate the epidemic as evidenced by the noticeable increase in the number of cases observed several times during the second quarter of 2015 and continued flare-ups ongoing as of April 2016."*

2. Create Adequate Isolation and Treatment Capacity

In Guinea, OFDA made seven IP awards (see Annex E) to support the creation of adequate isolation and treatment capacities, which is pivotal to the EVD response theory of change. By funding percentage, this was OFDA's largest intervention area, accounting for 34% of activities. OFDA-supported IPs distributed isolation and treatment resources across ETUs, smaller Screening and Referral Units (SRUs), and holding or transit centers, converting transit centers into full ETUs as needed. OFDA funded the International Medical Corps (IMC) to construct 10 SRUs at hospitals. A total of 35,128 persons— 21,649 females and 13,479 males —were screened for EVD at OFDA-funded SRUs. Other IPs delivering isolation and treatment interventions with OFDA funding included ACF, FRC, IFRC, IMC, IOM and WAHA.

Numerous IP respondents mentioned delays seen in funding due to slow processing of grant awards after proposal review and approval. Other informants indicated that this was associated with the co-approvals between CDC and OFDA, USAID CO compliance requirements, and a lack of contract staff bandwidth in Washington, DC. OFDA funded the French Red Cross (FRC) to run an ETU in Forécariah prefecture, where many of the last EVD cases occurred. Between April and June 2015, the case fatality rate (CFR) in the FRC ETU dropped from 62% to 50% and the CFR in children under five years fell from 100% to 60%. OFDA funded IOM to create EOCs at the prefectural level, where they coordinated through weekly meetings chaired

by the DPS (prefectural health department). OFDA funding provided ambulances to reduce the time to travel from the transit centers to the ETU and avoided the need to travel to Conakry for treatment; this was consistent with the national strategy as coordinated by CNLE. Ambulances that arrived after long delays, or not at all, was an issued frequently noted by KIs and FGDs; this dampened community acceptance of the response.

An important measure of effectiveness in this program component contributed to the national strategy in locating isolation and treatment facilities at strategic locations. Forty percent of the activities were implemented across all eight regions. Kindia region, including Coyah, Dubréka, Kindia, Forécariah, and Télimélé prefectures had the greatest number of activities (30), which corresponded to the "hot spots" of EVD cases.

The inability of responders to use available data to get ahead of, rather than react to, the outbreak spread may indicate inadequacies in planning for isolation and treatment. *"Rapid knowledge production and dissemination are essential for outbreak prevention and response, but reliable systems for sharing epidemiological, genomic, and clinical data were not established during the Ebola outbreak,"* according to the Independent Panel on the Global Response to Ebola, launched by the Harvard Global Health Institute and the London School of Hygiene & Tropical Medicine.[21]

Qualitative data indicated that food distributions to isolation and treatment units, facilitated by FFP (a member of the DART) either in-kind or through vouchers, improved the effectiveness of isolation, quarantine, and ETU response actions. However, in the household survey conducted in Guinea for this evaluation, families with EVD cases who were quarantined were more likely to have received food support in urban areas (89%) than in rural areas (53%).

IP distribution of household and community hygiene kits were identified by respondents as having supported the process of isolation and quarantine at the household and community level. Despite OFDA's overall delays in integrating hygiene kit (also called sanitary kit) distributions into overall response strategies (see Ebola Response Evaluation, Objective 3 (Relevance)), evidence from focus group respondents suggests that the distribution of hygiene kits in Guinea was timely, widespread, and seen as effective by the time that OFDA engaged intensively in activities in Guinea.

Of 26 focus groups conducted in Guinea, almost all acknowledged receiving kits, 60% identified hygiene kits as having prevented further infection, and a third recommended the early and widespread distribution of hygiene kits in future epidemic outbreaks. Over half of Guinea focus groups identified hand washing as a key prevention method for preventing infection. This data demonstrates that respondents in focus groups believed that hygiene kit distributions prevented additional cases and recognized the kits as an important component of community-based isolation and treatment response capacities at community-based sites of transmission.

Progressive increases in intensive support by IPs for IPC training, staff training, and IPC supplies in isolation and treatment facilities improved the effectiveness of such facilities in slowing down EVD transmission. Training was noted by several KIIs as one of the most successful factors for prevention of spread at health facilities. KIs reported that trainers and participants were highly

Table 3. Evaluation findings on isolation and treatment capacity, Guinea

Evidence About Reducing ransmission	Failures	Factors
> OFDA provided isolation & treatment facility support in locations of highest need (ACF, FRC, IFRC, HKI, IMC, IOM, WAHA) > Food provision for affected communities supported isolation & treatment activities (UNICEF, local partners) > Hygiene kits helped households to interrupt transmission	> Contact tracing effectiveness > IP funding delays > No or slow ambulance response > Lack of clarity among IPs about OFDA's willingness to support ETU renovations vs. ETU construction	Positives: > Hygiene kit availability > IPs with prior local experience > Funding > Technical advisers > Training capability > Supplies/logistics > Food support Negatives: > Low community acceptance > Training capability (ineffective) > ME&L inadequacy for training > OFDA grant process timing (slow) > Human resource risk management

motivated, and training materials and manuals were helpful. IPs observed that there were delays by OFDA in processing of funding proposals by OFDA and CDC both. Several IPs raised the challenge of attracting skilled staff due to the high health risk.

OFDA funding for contact tracer training suggests that contact tracers did receive some training, but it also identified gaps in training or a lack of long-term retention of training principles. In our 2017 contact tracer survey, nearly all contact tracers surveyed could report at least one symptom of EVD (100%), and 63% were able to completely detail how to identify EVD case contacts. A high proportion of contact tracers (88%) understood most modes of EVD transmission, but less than a quarter understood sexual transmission (23%), and just 5% correctly characterized risks associated with preparing bodies for burial. In available IP-written reports, data were not found that measured effectiveness of the training.

3. Assist Safe Human Remains Management

The eventual effectiveness of safe human remains management activities is attributed to proper training of CHWs and improved social mobilization. In the household survey for this evaluation in Guinea, a majority of EVD-affected households reported receiving safe burial services: 69% in rural areas and 57% in rural areas. KIs explained that CHWs were trained to change behaviors in target communities and distribute hygiene kits at the same time as they delivered information about EVD. However, KIs noted, *"Many mistakes were made by safe burial teams, ignoring community beliefs and leaving out families' role in the burial of their loved ones."* In the beginning stages of the crisis, there was a lack of experience and hostility toward burials. *"We didn't have an appreciation of the 'dignified' aspect of safe burials."*

OFDA provided funding to the IFRC and Guinea Red Cross, who learned from early resistance and from IFRC experience in Liberia to solve problems connected with SDBs. The Guinea Red Cross was the target of frequent acts of community resistance for its burial activities, including reported and under- reported violence reprisals. IFRC reports indicate that morale was low, volunteers were exhausted, and there was a lack of meaningful psychosocial support provided to burial teams. This evidence suggests that despite substantial OFDA investments, IFRC and the German Red Cross were likely under-supported and under-capacitated to conduct SDBs.

The critical assumption in this theory of change component is that bodies are disposed of in culturally acceptable ways.

4. Restore Health Care System Safety and Functionality

Most of the KIs interviewed said they believe successful restoration of health care facilities was due to IPC training. *"There were zero cases of EVD"* after reaching the target for training health workers, according to one KI. According to KIs, 2,000 CHWs were trained in IPC. KIs explained: *"IPC training coordinated with JHPIEGO, used the same training materials and coordinate with the national certification team lead by WHO."* IPC training was conducted in every referral center. They were trained in screening, triage, rapid response, and promotion of hygiene and hand washing. IPs reported near 100% IPC coverage in targeted facilities. *"Active follow-up was critical to success as well as good coordination with other agencies."*

Table 4. Evaluation findings on human remains management, Guinea

Evidence About Reducing ransmission	Failures	Factors
>Substantial support to IFRC and German Red Cross's SDB work >Training CHWs in widely dispersed communities (ACF, CECI, Child Fund, FTDH, HKI, IFRC, RI) contributed to SDB acceptance	>Slow SDB success	Positives: >IPs with prior local experience >Community acceptance >Supplies/logistics >Technicaladvisers >Training Capability >Coordination/collaboration >Funding Negatives: >Low community acceptance >Cultural barriers to trust >Dearth of experts i>local customs >Life-threatening risk and conditions of service of local responders

Table 5. Evaluation findings related to the restoration of health care system, Guinea		
Evidence About Reducing ransmission	Failures	Factors
>OFDA helped restore health facilities, especially in hotspots, through intensive IPC support >Drastic reductions in EVD following IPC training >IPs integrated community education into health care settings	>Failure to invest sufficiently early in intensive IPC training in public and private health care facilities during 2014 in Guinea	Positives: >Funding >Training capability >Technical advisers >Supplies/logistics >Food support >Community acceptance >Infrastructure (roads) Negatives: >Scarce trained human resources >Lack of detailed population health data >Coordination across donors > Skilled staff turnover > Weak MoH

WASH improvements in health centers and schools were also effective. Along with social mobilization, this program component received the largest share of OFDA funding, at 32%. The screening and referral units (described above in the isolation and treatment section) supported the general effort to control the outbreak, as well as Guinea's health system, by building confidence of both health care workers and the larger community in the safety of public health facilities. Programs to restore functionality to the health care system included logistics for local health centers and IPC. IPs improved the design and infrastructure of water supply, latrines, and medical waste disposal.

Field-level professional KIs reported that there was inadequate funding for effective screening, laboratory confirmation, or triage structures in health centers and inconsistency with staff quality and capabilities. The only area where some claimed duplication by donors and IPs was IPC training; however, informants did not believe that redundancy was harmful.

KIs noted, as in the words of one KII: *"Staff turnover was frequent and led to repetition by new staff members."* Another mentioned *"lots of expats focused on the number of health workers trained, but with little monitoring and follow-up."* KIs noted a three-month delay in receiving OFDA funds. Although IPC training was a factor of success for restoring functionality to the health care system, KIs noted that at times IPC training was *"late in starting due to lack of resources, such as incinerators."* They said the health care system was *"too weak to provide adequate care"* and basic needs (e.g., water) were often not met. This critical assumption was not explicit in the theory of change for this program component.

5. Support Social Mobilization with Clear Messages about EVD

Localized community mobilization activities conducted by OFDA-funded IPs were most effective, through networks of organizations including NGOs, associations, youth leaders, women leaders, community leaders, and social mobilizers who worked closely with district officers in each prefecture to ensure coordination. Social mobilization through young people was deemed effective. KIs reported Child Fund worked with 200 youth associations. It was important to keep schools open and encourage WASH in schools and HCs. Most KIs responded that *"community engagement was the turning point in the response to Ebola."* Social mobilization was a program component for 17 IPs. (see Annex E). For about half of those IPs, social mobilization was combined with other interventions, most frequently with restoring health care systems. This was effective in increasing the opportunities to reach people.

OFDA supported mass media and communications campaigns that disseminated effective, positive messages, as well materials distribution campaigns that distributed more than 5,000 solar radios to "local radio posts," and mobile FM radio station broadcasting in local languages. Radio programming helped reduce the stigma and resistance. Communities were exposed to effective, positive messages. Mobilization occurred through networks of organizations, including NGOs, associations, and community leaders. Communications in phase one of outbreak (Apr–Sep 2014) were overwhelmingly negative ("Ebola = Death") and contributed to social resistance. Key respondents mentioned that social resistance was an inhibiting factor for uptake of EVD prevention and treatment activities. OFDA funded many agencies to implement social mobilization and communication activities, including ACH, CECI, ChildFund,

DRC, HKI, IFRC, IMC, InterNews, RI, and UNICEF. However, a number of these IPs did not begin implementation until case numbers had fallen, in mid-2015. Another challenge was implementing mental health interventions in a scenario without baseline data about the mental health sequelae and a lack of local psychosocial expertise. UNICEF, an OFDA grantee, noted that it failed to institute a social accountability system from the outset, to ensure feedback from those affected, and to ensure a voice for marginalized groups.

> *"Within 1-2 months of accelerated social mobilization, the number of prefectures reporting social resistance dropped from 27 to 4."*
>
> — GOG KI

> *"The interventions were not effective because despite all the supports including vehicles, funding did not stop the epidemic. It was just a way to throw money through the windows. But when institutions thought of involving the community through the approach of Socio Anthropology, the violence stopped and Ebola was gone."*
>
> — KII Researcher

The positive effects of these social mobilization activities can be seen in the household survey in Guinea (n=4,134). This survey found that more than 70% of households had accurate knowledge of EVD prevention, based on the composite score from four questions (household survey questions 18 to 21) and 84% of households had positive attitudes scores (household survey questions 26 to 41). Men and urban households had better knowledge and attitude scores than did women and rural households (p-value<0.05).

OFDA-funded IPs used different theories of change for social mobilization—some through mass media, others through person-to-person relationships, others through authority figures. While there is clear evidence that behavior change, driven by community engagement and IP-led social mobilization, was one of the single most important determinants of the epidemic's decline in Guinea, there is little material available to explain these dynamics in detail. This conclusion is supported by the literature review (see Annex M) that found community engagement and social mobilization was not researched, modeled, or assessed.

The qualitative evidence clearly demonstrates that in all three countries, the mode by which the message was delivered mattered as much, if not more, than the messaging itself. Some anthropologists identified primary conflicts between local populations and EVD response actors, but the changes in messages that they proposed could not and would not have substituted for the massive rollout of tens of thousands of social mobilizers, CHWs, traditional and religious leaders, and formal and informal health workers, hygienists, activists, and advocates who campaigned at a grassroots level for individuals to accede to response dictates under profoundly difficult conditions—the death of a family member; or the quarantine of a spouse or sister. Respondents indicated that through being talked to, in person, community mobilization or door-to-door campaigns were particularly important in encouraging behavior change. The trustworthiness of the source of the messaging also mattered greatly; religious leaders, for example, were more trusted than radio messages. Linguistic and technological barriers were also salient. Some evidence has suggested that men and women, urban and rural populations, and elderly and youth populations had different access to different kinds of messages due to varied sociodemographic language and technological "tracks."

Table 6. Evaluation findings on social mobilization, Guinea

Evidence About Reducing Transmission	Failures	Factors
> Eventually a social mobilization component was integrated into almost every activity – 17 out of 23 IPs > Reduced social resistance led to success in all other program components	> Delayed community behavior change	Positives: > Community acceptance (poor) > Poor messaging > Technical advisers > Funding > Technical advisers > Funding > Community acceptance (good) Negatives: > Little reporting data from IPs about the outputs or outcomes of their social mobilization > Inadequate research about local attitudes, behaviors and practice

Table 7. Evaluation findings about the incident management system and coordination, Sierra Leone		
Evidence About Reducing Transmission	Failures	Factors
> OFDA-funded IPs worked effectively with national response partners NERC and DERC >IP consortium worked well	> OFDA assistance began after the EVD incidence peak >Proactive planning and decision-making	Positives: >Coordination/collaboration >Funding Negatives: >Data inadequacy >Lack of KM system >Timing (slow) >Inadequate ME&L system for feedback >OFDA staff turnover & communication

SIERRA LEONE

1. Create Effective Incident Management and Coordination

OFDA was effective in an overall but indirect support role in Sierra Leone by channeling its largest single award in Sierra Leone, nearly $20 million, to the WFP for Humanitarian Air Service transportation support in its lead role in UNHAS for the aid system. Although the OCHA "cluster system" did not exist in the response in Sierra Leone, there were local technical pillars. OFDA supported the agencies engaged in the numerous inter-agency technical working groups. For example, UNICEF chaired the Social Mobilization Pillar, and IRC led the local IPC Pillar. CDC also attended the daily sector "pillar" meetings and provided support for training, technical guidance, and vaccine trials. There was also support through OFDA regional funding to WHO.

Feedback about Government of Sierra Leone (GoSL) satisfaction with services provided are not part of project records. Donor KIs raised the question of accountability by large UN agencies. These data may have allowed trend analysis when processed against epidemiologic indicators, such as the average number of new EVD cases generated by each EVD-infected person.

The accompanying report, Ebola Response Evaluation, Objective 4 (Coordination) further explains that the outbreak response in Sierra Leone was difficult because of the large populations affected in different regions of the country, some of which received low priority at first. There appeared to be a lack of data and utilization of knowledge in order to get ahead of the outbreak, instead of reacting to it. USG priorities were to a significant extent set in August, 2014 when the scale of the outbreak in Sierra Leone was not as evident as it was in Liberia. USAID and embassies were in contact with UK's DFID during this period, as the U.S. Watched the UK military also respond and support the Sierra Leone military as they imposed quarantines. Notwithstanding data challenges, data were available from case management records about clustering of cases, migration and cross-border movement, which could have been analyzed with other surveillance data, and epidemiologic indicators such as the R_0 (the average number of new EVD cases generated by each EVD-infected person), and differences between onset times and presentation for treatment.

KIIs with IPs and other donor staff reported that there was an ongoing concern about government accountability and transparency. Nevertheless, OFDA successfully coordinated the USG response in Sierra Leone with National Ebola Response Committee (NERC) and its subsidiary District Ebola Response Committees (DERC).

> *"We worked together, since MOH was taking the lead – the priorities were communicated to partners, and they all followed and provided necessary support needed at that time, mainly technical back-stop, logistics."*
>
> — MOH

> *"Coordination with Ministry of Health, Social Welfare and implementing partners was good. The medium was through 'DERC' meetings, pillars report, issues were discussed and decisions made."*
>
> — DHMT

The findings of the evaluation team about OFDA support of EVD response coordination in Sierra Leone found that OFDA's role evolved. Specifically, OFDA participated in and supported the government coordination mechanisms, but did so informally, and less so than did DFID, which had a much stronger preexisting relationship with the government. OFDA worked closely with CDC to ensure USAID and CDC were coordinated, though in Sierra Leone, CDC had more reach than did OFDA. OFDA did not coordinate globally with other donors besides the UK, the major or lead international donor supporting the international response. Most coordination was in DART team immediate meetings at the routine EOC

meetings in each capital city. OFDA also coordinated with ECHO, Japan International Cooperation Agency, WHO, the Wellcome Trust and the Tony Blair Africa Governance Initiative as active responders. OFDA was flexible and responsive to governments and IPs, particularly heading into 2015, when the outbreak continued to appear uncontained.

2. Create Adequate Isolation and Treatment Capacity

Making human resources available was a major factor for OFDA's effective support in this program area, including training local health care workers and deployment of expatriate clinical staff to work in treatment facilities.

> *"We never received training before the outbreak. Became prepared after receiving training and support from IMC and other partners such as Red Cross and MSF."*
>
> — Former ETU staff

Nearly every OFDA-funded IP worked in this program area (see Annex E). They provided a range of isolation and treatment capabilities, from ETU support, to transportation, to in-kind assistance with chlorine, food, and PPE supplies. The context of isolation and treatment differed in Sierra Leone from Guinea and Liberia. In Sierra Leone, at the national level, mass quarantines were repeatedly imposed, with mandatory stay-at-home periods for case identification and community sensitization. At the district and chiefdom level, local leaders took extraordinary measures to set up a complex system of borders, pass systems, curfews, and by-laws to ensure local adherence to IPC and case reporting mechanisms. It is within this context that a system of more than 50 UNICEF-supported CCCs were constructed, funded by DFID but with PPE and other IPC support from OFDA.

One study[19] found that despite an initial period of fear and distrust, the CCCs were popular due to the free provision of drugs used to treat common illnesses with symptoms similar to EVD, such as malaria and respiratory infections.

In accordance with direction from the GoSL, IMC established Lunsar and Kambia ETUs and provided case management training to local health workers. The Lunsar ETU specialized in pediatric EVD cases and the Kambia ETU admitted cases along the porous Guinea border. IOM provided cross-border screening and training of CHWs in border areas. IOM with Oxfam provided interim care packages (including oral rehydration salts and PPE) to families waiting for transfer to ETUs or CCCs.

It was effective to fund the IRC-led Ebola Response Consortium (ERC). Made up of nine international NGOs, the ERC provided support to Sierra Leone's MOHs to implement a comprehensive program of IPC trainings and intensive supervision in 182 government hospitals. The designated ERC partner was responsible for supporting each targeted hospital to implement trainings and to monitor staff adherence to the IPC standard operating procedure (SOP). This service delivery mode was a factor in overcoming the constraints of limited country capacity in terms of human resources, logistics, supplies, infrastructure, and finances.

In contrast to Guinea, however, qualitative data suggests that household and community-based IPC distributions in Sierra Leone may have been less effective. Of 23 focus groups conducted in Sierra Leone, 43% acknowledged receiving hygiene kits; none reported that hygiene kits were instrumental in preventing further infections; and just 8% recommended the distribution of hygiene supplies in future epidemic outbreaks. Twenty-six percent (26%) of Sierra Leone focus groups identified hand washing as a key prevention method for preventing infection. Anecdotal evidence from these focus groups also suggests that distributed hygiene supplies were rapidly depleted and not resupplied after first or second distributions. These findings suggest that IPC distributions to households and communities may have been less widespread than in Guinea—and therefore, less effective.

Table 8. Evaluation findings on isolation and treatment, Sierra Leone

Evidence About Reducing Transmission	Failures	Factors
>OFDA funding and in-kind support brought relief to health care facilities in remote locations in implementing isolation activities, through provision of supplies and training staff. >Eventual community acceptance of CCCs		Positives: >IPs with local capacity >Coordination/Collaboration >Funding >Technical advisers >Training capacity >Standards/procedures >Supplies/logistics
		Negatives: >Infrastructure >Community acceptance

Table 9. Evaluation findings on human remains management, Sierra Leone		
Evidence About Reducing Transmission	Failures	Factors
>Improvement in acceptance of SDBs >Rapid swab testing for immediate determination of SDB or not	>Continued community resistance	Positives: >Communications strategies (right ones) >Cultural sensitivity (white body bags, not black) >Training of youth volunteers and religious leaders as burial team members
		Negatives: >Cultural acceptance (lack of) >Communications strategies (wrong ones) >Community distrust of burial teams

3. Assist Safe Human Remains Management

OFDA-funded partners in Sierra Leone were effective in advancing the following safe burial programs and objectives:

>Coordinated with WHO and the CDC to ensure that agreed-upon safe burial standards and systems were being deployed

>Adapted safe burial tools (appropriately colored body bags) to accommodate local cultural concerns

>Trained youth volunteers and religious leaders for burial teams

>Prevented EVD infection among all burial team members through the duration of the epidemic

>Provided sufficient supplies, staff support, transportation, and training to burial teams

>Transitioned to a rapid-swab testing protocol on human remains when the technology became available

>Worked with social mobilization campaigns to sensitize local communities to the need to accept safe burials

>Integrated survivors into safe burial teams in order to improve community acceptance of safe burial procedures

Safe burials were supported by IFRC, which received funding from multiple sources, including OFDA. In Sierra Leone, cultural practices associated with traditional funerary practices played a prominent role in the early acceleration of the EVD epidemic in that country. As a result, the rapid, widespread use of safe burial practices conducted by trained safe burial teams was a core priority for OFDA intervention. The IFRC conducted a study to estimate the effectiveness of their OFDA-funded safe burial activities, which found that the SDB program potentially averted between 1,411 and 10,452 secondary EVD cases, reducing the epidemic by 4.9% to 36.5%.[22]

Some quotes from respondents highlight these successes:

"Family members of survivors and survivors themselves were incorporated into the work units and the community seeing their fellow members responded positively to them."

— FGD Burial team member, Kenema

Impairing effectiveness of control efforts, some burial team members were ostracized, derided for the incentives they received for very stressful work. Some feel that safe burials never achieved full acceptance in Sierra Leone, and that they are regarded as a terrible emergency measure that was needed for public health purposes—but one that had lasting social and cultural harm.

"Burial processes not considered dignified or appropriate. There were so many rumors on the inappropriate treatment of corpse of victims hence community members preferring to bury their dead rather than give them to the burial team."

— DHMT, Makeni District

But a USG KI remarked:

"Safe burial is a success story in SL, no infection among any burial team members, they had the most danger- infectious materials handling and dealing with family members- sometimes violent, they were dedicated teams."

4. Restore Health Care System Safety and Functionality by Mainstreaming IPC

As noted under Isolation and Treatment, above, through the IRC, OFDA funded the ERC. The ERC provided support to Sierra Leone's ministries of health to implement a comprehensive program to support IPC trainings and intensive supervision in 182 government hospitals. A designated ERC partner was responsible for supporting each targeted hospital,

to implement trainings, set up labs and to monitor staff adherence to the IPC standard operating procedure.

"It could have taken 10 years to get where we are today. We have IPC trainings, surveillance, community based surveillance program, labs, and technical experts."

— MOH KI

In collaboration with the MOH, the College of Medicine and Allied Health Sciences, CDC and WHO, and IOM managed the largest Training Academy in Sierra Leone, conducting clinical and basic WHO/CDC IPC training for over 7,000 doctors, nurses, hygienists, and other medical functionaries deploying to both EVD and non-EVD facilities beginning in December, 2014. As an extension of the Training Academy and with OFDA support, IOM trained over 1,000 clinicians and non-clinicians through district-level mobile training in Kambia, Port Loko, Bo, Pujehun, Kenema, Kono, Kailahun, Tonkolili, and Bombali. IOM mobile training was reported to be in high demand and highly rated by trainees, district health management teams, and WHO, among others. The IOM training cadre included international and national clinicians and had the ability to quickly ramp up capacity on a demand-driven basis.

For a period, there were no antenatal and postnatal services, because both the nurses and patients were scared of contracting the virus from each other: *"No trust…just fear"* (FGD, women's group). FGDs found that this changed as trust in facilities improved, and there was messaging directed at pregnant women.

The OFDA interventions addressed the lack of guidelines and supplies for IPC and waste management, but according to KIIs, could not overcome the infrastructure deficits: water, electricity, and waste management were lacking.

"The challenge is how to maintain the health system in terms of quality of services, especially in rural settings, how to incentivize HWs to stay in rural areas."

— MOH staff

5. Support Social Mobilization with Clear Messages on EVD

Through the coordination with NERC and DERCs, IP efforts were targeted at areas with the highest incidence and strongest social resistance to EVD interventions. There were no stand-alone interventions—they were all integrated with other interventions, either isolation-and-treatment (Christian Aid, IOM, UNICEF), or both isolation-and-treatment and SDB (IFRC). Other IPs combined isolation and treatment, restoring health facilities, and social mobilization (MedAir, PIH).

"We sent a wrong message initially: Ebola has no treatment – led to fear, people did not show up for care – better to die at home if no treatment is available. We learned from our mistake – we changed the message to – bring [them] early, take early treatment within 1 to 3 days of treatment – you will be better and survive."

— Staff of the Office of the President

"Earlier messages stated that 'when you get Ebola you will die.' This was later modified to 'if you get Ebola and you seek early treatment, you are likely to survive.'"

— FGD Community

Traditions and customs of West Africa culture such as shaking hands, hugging, and caring of the sick, were barriers in the implementation of isolation of suspected cases and treatment of EVD confirmed cases in treatment facilities.

Table 10. Evaluation findings on restoring health care systems, Sierra Leone

Evidence About Reducing Transmission	Failures	Factors
> Extensive IPC training and systems building directly in public health facilities		Positives: > Technical advisers > Training capability > Funding > Supplies/logistics
		Negatives: > Poor infrastructure (water, electricity, facilities) > No guidelines or supplies for IPC and waste management > Lack of funding for staff > Limited country capacity

"People had traditions for shaking hands, hugging, washing bodies – had to be intervened by traditional leaders, people were worried that traditions were being abandoned, neglected, destroyed by strangers."

— FGD Community

The efficacy of social mobilization efforts comes from the household survey, showing that 68% of households had accurate knowledge about how to prevent EVD based on the composite score from four questions. Men and urban households had a better knowledge and attitude score than did women and rural households. Among those households with accurate knowledge of EVD prevention, the top three sources of information had been radio (96%), families, friends and community members (94%), and churches or mosques (92%). Eighty-two percent reported that health workers provided information. There were no urban or rural differences, except that churches and mosques were a more common source of information in urban than rural areas. Seventy-six percent of households considered government or ministry sources as providing the most accurate information on EVD. Correct knowledge about the type of contact of the EVD case was high among surveyed contact tracers and more than 50% of surveyed CHWs correctly identified various modes of EVD transmission.

From the peer-reviewed literature, the team found studies about the effectiveness of isolation, patient care, safe burial, contact tracing, and community-based surveillance, and IPC in Sierra Leone. Studies measuring the effectiveness of different forms of social mobilization and command and control still remain lacking.

Table 11. Evaluation findings on social mobilization, Sierra Leone

Evidence About Reducing Transmission	Failures	Factors
>Training community volunteers, community leaders, traditional leaders, youth groups to deliver accurate messages about Ebola and encouraging early treatment	>Sustained social resistance	Positives: >Technical advisers >Training capability >Funding >Supplies/logistics
		Negatives: >Poor infrastructure (water, electricity, facilities) >No guidelines or supplies for IPC and waste management >Lack of funding for staff >Limited country capacity

LIBERIA

1. Create Effective Incident Management and Coordination

Regarding coordination, the evaluation team concluded that OFDA helped to drive national coordination in Liberia, and the DART was in direct communications with the President and her team. OFDA worked closely with DOD and CDC to ensure USAID and CDC were coordinated. OFDA promoted consortia of NGOs to work together and learn from one another. OFDA was flexible and responsive to governments and IPs. (See Objective 4: Coordination report for detailed findings.)

"Creation of the Incident Management System was a game changer, it created order out of chaos," declared a leading MOH official during the Ebola Response. The IMS was proposed as early as August 2014 by OFDA and the CDC, with the support of WHO and other partners.

OFDA provided important IMS support by an EOC technical advisor (one per country), who brought to bear OFDA's global experience in training about ICS principles.

Collaboration became very effective, though initially it was not (KII, MOH official). According to an MOH official who was a decision maker during the response, *"Some donors tell you what they want done. But we sat and did an integrated work plan, so we tell them what we want done."* National and international partners spoke of the constant presence of OFDA personnel at informational and decision-making forums in Monrovia and in the field. MOH officials give credit to CDC for a major role in helping to create the IMS in Liberia, reinforcing the Liberian response leadership and technical staff at national and field levels. CDC was seen as a highly-valued technical partner, serving in several crucial

roles, such as the training of contact tracers. OFDA was perceived as working consistently with CDC and being the facilitator for the rollout of activities, mobilizing, and funding partners for provision of supplies, logistics, PPE, and IPC materials.

OFDA worked through and provided support to the subnational response levels. *"Strong national mobilization in a decentralized but harmonized system at the community level has been of great value in controlling the epidemic in Liberia,"* said a KI. DART staff were frequently present in the counties where IPs operated.

A national coordination official in Liberia commented, *"...the technical or training provided was sufficient, appropriate and timely."* However, he said *"the funding agencies were unwilling to take advice from the local partners or counterparts, and they failed miserably to acclimate to the local context."*[23] There was a similar view by a woman leader in Grand Bassa who felt that *"the aid agencies were not willing to accept suggestions from the local counterparts or adjust the planned activities,"* and strongly advised that *"...the international organizations supported by OFDA/ USAID should be a bit flexible to accept our suggestions wherever necessary, since we are the end-users."*

Successes:

- Some determining success factors were that 1) OFDA recognized the Government of Liberia (GOL)'s leadership of the IMS; 2) OFDA provided training and support to the IMS; and 3) OFDA deployed their IPs following the lead of the IMS.
- In addition to coordinated consultation, WHO, MOH, and OFDA conducted ETU site visits together. FGDs noted examples of MOH and NGO collaboration for the provision of supplies and services.
- CDC played a major role in expanding the capacity of Liberians to utilize the data that was the basis of policy and coordination decisions. Such data drove OFDA's funding decisions regarding geographic and intervention foci.

Failures/Barriers:

- Although some KIs reported instances of nationally-led coordination and collaboration, others claim there was a "disjointed" approach and that counties that were not affected by EVD were disproportionately involved in discussions, while *"people really affected did not have the chance to speak."* This improved over time, but speaks
- to absence of social accountability, as other marginal stakeholders could be left out.
- >An evaluation of Save the Children CCCs in Margibi County, Liberia, found that command and control issues like consolidation of experts in Liberia's capital, Monrovia, extended negotiations with the Liberian government over the construction of CCCs, and prolonged deliberations outside of the region over CCC deployment, prevented CCCs from being deployed in a timely manner.
- Some KIs reported that the use of information collected in the course of programs and from surveillance was not being fully utilized. They stated that there could have been better decisions about the number and placement of ETUs and CCCs. They indicated it was not only a mechanical matter of processing data, but also important to analyze and make decisions with stakeholders with experience outside of the capital.

2. Isolation and Treatment Capacity

OFDA-supported programs provided adequate isolation and treatment capacity through ETUs, CCCs, staffing, contact tracing/surveillance, and case management. ETUs were noted as one of the most significant contributions. Local key informants explained how 20 ETUs were built during the response, though only 9 ETUs were used. KIs claimed, *"The ETU was the safest place because it had all the preventable measures,"* including protective gear, spray team with apparatus, hand washing facility that reduced transmission and spread. Unused ETUs were used for training and mock drills of case management. A

Table 12. Evaluation findings on incident management and cooperation, Liberia

Evidence About Reducing Transmission	Failures	Factors
>Strong GOL IMS leadership >Strong collaboration with IMS >Whole-of-government and whole-of-response approaches	>OFDA assistance began after the EVD had begun to grow and spread	Positives: >Logistics/supplies >Funding >Coordination/collaboration >IPs with local capacity
		Negatives: >Poor infrastructure (water, electricity, facilities) >Lack of funding for staff >Limited country capacity

EVIDENCE ABOUT RAPID ISOLATION CAMPAIGN

Empirical evidence of the effect of rapid patient isolation and hospitalization comes from investigations of a series of small outbreaks in Liberia. Twelve outbreaks were included in a study of the Rapid Isolation and Treatment of Ebola (RITE) strategy, applied between July and November 2014. RITE encouraged active case finding and contact tracing and the use of practices that prevent infection when caring for the ill and burying the dead. In a comparison of the trends seen in six mini-outbreaks that occurred before the introduction of RITE and six that occurred afterward, the time between the first new case in remote areas and the notification of health authorities was reduced by nearly half, the proportion of patients isolated increased from 28% to 81%, survival improved from 13% to 50%, the case reproduction number fell below unity (the replacement rate), outbreaks became shorter (median duration declined from 53 to 25 days), and the number of generations of cases dropped from a median of four to two. On their own, these observations made before and after the introduction of RITE do not provide the level of evidence afforded by a randomized trial, but they are consistent with the larger body of evidence about Ebola interventions.

Table 13. Evaluation findings on isolation and treatment, Liberia

Evidence About Reducing Transmission	Failures	Factors
> Wide availability of ETUs & CCCs, especially in hot spots	> Surveillance system not fit for purpose, with differing software systems, incomplete data, redundant data, and too many variables > OFDA reliance on CDC modeling data that omitted socio-cultural variables	Positives: > Supplies/logistics > Funding > Transport Negatives: > Community acceptance (low initially) > Donor lack of local context and culture awareness > Affected community not involved in driving project design > OFDA restrictions about building required extra drafts of IP proposals

major achievement was transporting medication and supplies to health facilities, especially remote areas in the Southeast that were difficult to access.

KIs attribute the success of surveillance and contact tracing to community health teams, explaining they needed *"people who were already in the community."* According to FGDs, some people would hide sick relatives and bodies; however, since the CHWs were from the local communities, they were able to provide Liberian Red Cross with covert information (e.g. identify hidden sick people and secret burials). LRC would follow-up to quarantine and disinfect the area.

Focus group data suggests that household and community-based IPC distributions in Liberia were partially effective. Of 81 focus groups conducted in Liberia, 51% of them acknowledged receiving components of hygiene kits, ranging from bleach to buckets to PPE, but the contents of such distributions and the frequency of supply was highly variable. Sixty-three percent (63%) of Liberia focus groups identified hand washing as a key prevention method for preventing infection, which is comparable with Guinea, but more than double the rate of focus groups in Sierra Leone. Some communities reported that IPC supplies were distributed to one sole location (a school, mosque, or workplace) but not to households. Others indicated that they only received IPC distributions after the infection of a household member or a community member.

Successes:

> Effective contact tracing in hot spots to eradicate "hidden cases." The evidence of this is the way that Liberia outperformed Guinea and Sierra Leone, with the lowest incidence of hidden cases among the three countries.

> OFDA funding complemented funding from the African private sector and funding from traditional funders of the African Union to mobilize 855 health workers in two months from Africa, including nurses, doctors, laboratory technologists, medical epidemiologists, and burial teams, among others.

- OFDA and CDC facilitated innovations that had major impacts on effectively diagnosing and treating suspected EVD cases. As of July 2014, only one laboratory at the Liberia Institute for Biomedical Research outside Monrovia was able to conduct Ebola testing, albeit with support from the U.S. National Institutes of Health (NIH) and the U.S. Army Medical Research Institute of Infectious Diseases.
- CDC collaborated with private industry to promote development of a point-of-care test to detect EVD within 30 minutes after a finger stick or oral swab—this was a game-changer. This provided valuable access to knowledge of whether an inpatient really had EVD and replaced waiting for days for a test result, which affected treatment decisions as well as how a corpse was buried.
- Several IPs supported by OFDA worked in remote areas. These hard-to-reach areas were important in containing the spread of EVD, by rapidly responding to isolated outbreaks.
- Whether funded directly by OFDA or by CDC, these USG-funded activities were mutually supportive in combatting the virus. For example, the many IPs supported by OFDA to bolster isolation and treatment relied on a laboratory network that had been nonexistent before the outbreak.
- FFP food distribution played a critical role in supporting isolation and restrictions on mobility for recipients in a number of communities affected by the epidemic. OFDA coordinated with FFP, responding to warnings from IPs about food shortages among quarantined communities and population movements caused by the EVD outbreak.

Failures/Barriers:

- Many clinics and health facilities were closed or were not built in time. One FGD reported that *"many people died before they could go."* For example, a KI reported Clara Town Community lacked medical facilities, WASH facilities, and ambulance services to transport ill and injured patients. Multiple discussants recalled their relatives died due to delayed transportation to an ETU. Training CHWs was a significant contributor to community mobilization and they were supplied with cell phones, but in remote areas affected people didn't have phones. Some KIs noted a lack of new permanent health care infrastructure and resources, explaining *"OFDA could only support emergency related response by creating temporary or semi-permanent structures."* In some cases, this took the form of tents. More often, OFDA funds were spent to rehabilitate existing structures to retrofit them for EVD management. OFDA by its mandate is not—unlike other bureaus of USAID—mandated to fund long-term activities, systems, or facilities, which it then explains to its IPs during the back-and-forth proposal negotiations.
- UNICEF was one of the larger recipients of OFDA funding. An evaluation of its response to EVD found that while largely positive, initially activities were inadequate in addressing children's needs.
- IPs said that clarification that ETUs could not be permanent structures sometimes delayed funding decisions. IPs and GOL contended that the same funds could be spent in some instances for permanent structures, which would be more cost-effective and serve a sustained purpose.
- Some KIs thought that the overbuilding of ETUs was based on the data available at the time, while others felt the U.S. could have used data better to inform decisions. They also felt that apart from modeling data, the USG should have listened more closely to health NGOs with experience with EVD and conditions in Liberia and West Africa (KI, INGO in Liberia). This view is corroborated by the fact that the epidemic curve did bend before application of major donor-driven interventions. A different view from the USG treatment model was that the lack of medical and public health infrastructure in Liberia created a challenge, but that communities could mitigate the challenges themselves and the approach of donors should have been different. One author noted: *"Working with community leaders to understand the culture of communities and ethnic groups, as well as utilizing the human resources available could create a flow of surveillance information, increase the number of treated patients, and reduce the transmission of infectious disease through education of the public in future infectious disease outbreak."*[24]

3. Safe Human Remains Management

In early August 2014, as the death toll mounted and some bodies were abandoned on the streets of Monrovia, the capital, Liberian health authorities ordered that all EVD victims must be cremated. While there was strong public resistance to the order, there was also community opposition to burials of EVD victims, for fear of contamination.

OFDA funded most safe burial services in Liberia, including those by the Liberian Red Cross in Montserrado County, and GC in the rest of the country. (In Sierra Leone, OFDA supported safe burials through Christian Aid, the IFRC, and IMC.) Reflecting on priorities, a CDC key informant recalled *"It seemed that the curves were shifting as the safe burial activities improved. It seemed that the smaller outbreaks were coming under control more quickly."*

Successes:

- By mid-2015, international forensics teams regarded SDB teams as highly skilled and lessons learned in the epidemic offered insights for the management of infectious human remains.[25] This was based on a multi-country qualitative study on the impact of SDB for stopping EVD transmission in West Africa commissioned by UNICEF. In Liberia, it was conducted in the area with the highest concentration of EVD in Liberia, Monrovia and in Montserrado.

> Guidelines: Many KIs believed that safe human remains management can be attributed to WHO training about proper burial procedures. Based on training protocols developed and refined through experience by WHO, MSF, GC, and IFRC with the Liberian Red Cross, OFDA provided the financial resources for IP logistics and supplies to rapidly roll out this critical intervention. This funding was among the first awards made by OFDA, i.e., to GC in August 2014.

Failures/Barriers:

> In Liberia, models predict that there would have been more significant reductions in cases, if SDB had been introduced earlier.[26]

> Until policies, procedures, and support were put into place, the GOL resorted to mass cremations, despite efforts by OFDA-funded IPs to establish safe alternatives (land for safe burials), reflecting bureaucratic inertia. As wealthy Liberians were able to continue to have dignified burials during this period, resentment and distrust grew among many Liberians. This may also have created bias against safe burial teams when they became available. FGDs claimed burial teams were *"very wicked because they burned the hearts of dead people."* Others said they kept deceased relatives in their homes for weeks, because there was no proper way to bury them. One FGD said burial workers sometimes burned people's belongings without permission.

> The role of the oral swab diagnostics confused community members. It was unclear if it was meant to be a rapid test that would grant permission to families to move forward with burials if negative, or not. The role of contact tracers supporting SDB isolations prior to burial during periods of burial delays also confused matters.

4. Restore Functionality to Health Care System

More than 4,000 health care workers from 350 facilities received training in basic IPC protocols between September and the end of December 2014 through OFDA-supported IPs. This was a joint exercise that brought together OFDA, CDC, DOD, and IPs. They were supported by best practices including IPC focal persons who were selected and trained at major hospitals. Other training was for surveillance and investigative skills for health care workers, and improved supervision. Through logistics and supply IPs supported by OFDA, PPE was delivered to major facilities nationwide (gloves and bleach were made as widely available as possible).

OFDA-funded IPs focused on restoring traditional health care services after recognizing that routine health services management should not be neglected during the outbreak.

In Liberia, an IPC Task Force was formed to coordinate IPC activities during the epidemic. Cooper *et al.* wrote, *"In September 2014, at the height of the outbreak, the national IPC Task Force was established with a Ministry of Health (MoH) mandate to coordinate IPC response activities. A steering group of the Task Force, including representatives of the World Health Organization (WHO) and the United States Centers for Disease Control and Prevention (CDC), supported MoH leadership in implementing standardized messaging and IPC training for the health workforce. This structure, and the activities implemented under this structure, played a crucial role in the implementation of IPC practices and successful containment of the outbreak."*[27] OFDA supported the effort with IPC supplies for facilities.

Successes:

> KIs suggested that community engagement and ownership were essential to IPC. *"Community care centers did a good job in changing the course of the disease"* through public

Table 14. Evaluation findings about human remains management, Liberia

Evidence About Reducing Transmission	Failures	Factors
> Reversal of previous social resistance	> Cremation Policy	Positives: > Funding > SDB training > Guidelines > The end of cremation (so burials were no longer done in secret) > Expansion of social mobilization > Reduced financial burden of funerals
		Negatives: > Initially social accountability was missing > Timing (late) > Social accountability initially missing > ME&L inadequate from IPs

awareness and acceptance. Discussants said that infection prevention was made possible through *"carefulness, self-care, washing of hands, avoiding touching others, etc."* Literature corroborates this: An effective IPC strategy requires substantial community engagement that integrates community information and feedback into all aspects of IPC training and implementation.[28]

- Communities were enabled to develop latrines and their own health management sites and WASH facilities to prevent disease. According to feedback received by one OFDA-funded IP from county health team members, many communities are still using these facilities in 2017.
- When the downward curve of the epidemic was confirmed, there was a major re-programming of resources to build capability and transfer a massive amount of supplies to the Liberian health care system.

Failures/Barriers:

KIs and FGDs reported that a lack of resources and inconsistent supplies contributed to failure of health care system restoration and IPC. One KI said, *"I threatened at the onset since my facility lacked protective gear, laboratory testing facilities and equipment."* Although many FGDs did say they received adequate supplies, such as hand sanitizers, buckets, chlorine, and food, the provision of supplies was inconsistent.

5. Support Social Mobilization with Clear Messages on EVD

Community engagement and understanding of each local community's beliefs and traditional practices was critical to success of the overall response, and particularly important to ensure rapid isolation of infected patients, monitoring of contacts, and safe burials. Emergency risk communication was a dynamic process, which changed as the outbreak evolved to promote understanding of messages about risk, even as the outbreak seemed to be waning.

According to many respondents—internal and external to Liberia—behavior change, driven by community engagement and social mobilization, was one of the single most important determinants of the outbreak's decline. Roughly 20% of OFDA awards (in number and value) included a social mobilization dimension.

Primarily funded by OFDA, IPs trained thousands of general community health volunteers to share health messages locally. In October 2014, traditional leaders convened and resolved to support government interventions, opening another trusted channel of health information. During November, 2014, traditional and community leaders supported training in all of Liberia's 88 districts. IP activities included providing traditional chiefs with mobile phones to report suspected cases, reinforcing the importance of involving trusted messengers.

A key informant from a multilateral response partner summarized the problem, saying that the response *"missed the real problem, i.e., that behavior change in the population was the core element needed for success in controlling the epidemic. That we didn't need such a singular focus on building treatment centers, which were used by only 28 people in the end. What we needed was to focus on changing the behavior in the population and empowering and engaging them."*

OFDA should find instructive the experience of Mercy Corps/ECAP's experience in Liberia on collecting real-time data on social mobilization (see box next page). ECAP built a well-functioning, mass population-distributed real-time network for collecting information on community engagement and social mobilization that could be shared through an open source data "dashboard." However, ECAP's data were not analyzed, used, or integrated into the broader response structure.

Future OFDA efforts to improve social mobilization should prioritize resource allocations for real-time data analysis, interpretation, and coordination with other evidence bases in order for real-time data collection to have value and use.

Table 15. Evaluation findings on restoring health systems, Liberia

Evidence About Reducing Transmission	Failures	Factors
- Transferring unused Ebola response supplies to traditional health care system - Improved IPC compliance in health care facilities	- Emphasis on EVD control in specialized centers neglected other health centers open for other health conditions	Positives: - OFDA flexibility in modifying agreements - Training - Supplies and logistics
		Negatives: - Poor infrastructure: roads, electricity, health facilities)

LESSONS FROM THE LIBERIA EBOLA COMMUNITY ACTION PLATFORM (ECAP)

In 2014, Mercy Corps, with USAID/OFDA support, initiated the Ebola Community Action Platform (ECAP) to coordinate EVD social mobilization and behavior change campaigns in Liberia's 15 counties. ECAP facilitated sub-grants to 77 local NGOs, with support from Population Service International's "Listen, Learn, Act" methods and IREX's local media training capacities.

ECAP 1 (Sept 2014-Jul 2015) built a rapid-response social mobilization platform that reached 2 to 3 million Liberians in 3,300 communities with messages about Ebola. ECAP 1 used digital and analog strategies to support national mobilizers conducting face-to-face outreach. This created a "total environment" of EVD messaging that reinforced informal social learning. ECAP 1 challenges included poor IT infrastructure and troubleshooting support.

ECAP 2 (Jul 2015-Jul 2016) was an early recovery program designed to build grassroots preparedness for future outbreaks. ECAP 2 sought to improve health practices for preventable illnesses, strengthen connections between local populations and health care facilities, re-establish vaccination campaigns, and rebuild trust in the health care system. ECAP Phase 2 strengthened the national health system by empowering local communities to take control over local health conditions. Today, ECAP networks can be repurposed for various national objectives (e.g. elections).

ECAP'S CHALLENGES: LESSONS FOR SOCIAL MOBILIZATION

Behavior Change: Responders were late to recognize the importance of social mobilization. But once implemented, ECAP 1 was successful in strengthening grassroots support for all EVD response activities, including "no-touch" and community IPC strategies. ECAP 2 empowered local communities to take responsibility for local public health surveillance and resources, but confronted continued issues with misalignments between community needs and approved message campaigns.

Data Utilization: Mercy Corps made impressive investments in the open-access MELS dashboard and built a sophisticated smartphone-based KAP data collection system. However, the Ministry of Health was not prepared to handle the level of data provided. Clear end-user data analysis, data visualization, and knowledge utilization plans that are integrated with response data collection needs should be built into data collection infrastructure early on.

Notes: Analysis is based on key informant interviews, Mercy Corps documents, literature made available by OFDA.

KIs and FGDs believe interventions that funded community members to help themselves had the most impact. For example, hand washing efforts and resources were very effective because it became a habit for community members. Radio was the most effective mode of communication, due to poor transportation and communication infrastructure, although messages also spread via videos, posters, newspapers, and hospital announcements. KIs also emphasized the power of word-of-mouth communication. CHWs would go from house to house, advocating infection control and prevention measures. Community members, especially village leaders, played an instrumental role in distributing sanitation.

Successes:

- A senior MOH official overseeing behavior change programs said, *"The radio distance learning program covered the entire country, a 26-part series that covered many topics – supported by USAID through HC3. It gave information about maternal child health and Ebola warning signs. It prepared the way for volunteers to do community entry."* Community engagement also played a vital role in reducing the stigma and discrimination against victims and health care workers.
- Mercy Corps, an IP supported by OFDA to conduct a major social mobilization activity with PSI, tested their theory of change that changes in practices, and of transmission rates, were the evidence of the success of its inputs—principally training Community Health Volunteers through local partners (77 in all), equipping them with clear messages. The objective was to enhance the awareness and uptake of behaviors that reduced EVD transmission across all 15 counties of Liberia.

  The innovation of the Mercy Corps program was a built-in data collection system, made to measure behavior uptake. The result was that 1.5 million community members adopted health practices which had been promoted by IP messaging.

Failure/Barrier:

- Interviews revealed that poor communication between treatment centers and patients' families was an obstacle to further trust and referral by communities.
- KIs and FGDs noted there was a huge trust issue among people, the government, and NGOs that prevented community mobilization. *"Sometimes an NGO had their plan, regardless of the situation in the community."* One KI noted that the CDC was *"not adept at decoding complex social situations"* and *"did not understand the social divide that played a big part of fueling Ebola."* The lack of advocacy strategy and

trust meant a "majority of residents were ignorant about the disease and there was a lack of capacity to fight it."

- *"Room for improvement"* was the finding of IFRC's evaluation report analyzing its social mobilization strategies. Communications around social mobilization was problematic, reported the Liberian Red Cross, along with a lack of clear goals and job descriptions for volunteers.
- There was an absence of knowledge management and learning mechanisms apart from those used for limited operational purposes in the field, during the outbreak. However, some OFDA-funded IPs achieved such mechanisms in the form of workshops with a learning purpose, publications, and evaluations—many of which were made public.

Table 16. Evaluation findings on social mobilization, Liberia

Evidence About Reducing Transmission	Failures	Factors
> Eventual success of social mobilization programming	> Importance of the social mobilization component was not recognized at the outset	Positives: > Communications messaging > Peer to peer communication > Funding > Technical advisers > Training capacity
		Negatives: > Community acceptance (low) > Lack of ME&L to capture learnings from OFDA's social mobilization investment

SUMMARY CONCLUSIONS

This section summarizes the conclusions for each program component, looking at the findings across the three countries.

1. Incident Management and Coordination

OFDA demonstrated that it could be effective as a lead incident command partner as in Liberia, or in a second line role, as in Sierra Leone and Guinea, both supporting the national government's authority and filling gaps where necessary. Each had a different variation of the IMS, or pillar approach, and all worked eventually. The determining factors for national command and control effectiveness was the speed with which they began operating and ability to mobilize specialized human and financial resources, coordinate with response partners, and establish the essential response support systems—social mobilization, isolation and treatment, and surveillance — which all required simultaneous activation.

The determining factors of OFDA's success in supporting the national EVD command and control structures included the USG's historical political relationship, the extent to which OFDA was invited to play a partner role, the existence of some health system infrastructure upon which to build decentralized coordination with added resources, and the availability of quality data and analysis to guide planning and decision-making. Others were OFDA's ability to rapidly establish trusted relationships with host-country governments; source technical advisors and training support; provide large-scale financing, logistics, supply, transportation, and organizational skills; localize programs through IPs' subcontractors; and leverage bi-lateral relationships of the countries with relevant UN agencies. Another factor was the cooperation between OFDA and CDC: "CDC is brains and OFDA is Brawn=muscle." OFDA was flexible in approach, able to mobilize the correct partners relevant for the activities, and the skills between CDC and OFDA were complementary. OFDA's main failures or challenges in enhancing effective incident command and coordination were delays in OFDA implementation related to clarifying IP applications and the process of handing over from one DART team to the next; unevenness in training for contact tracers, and absence of a ME&L system to monitor partner performance and provide a feedback loop for affected communities receiving services.

2. Create Adequate Treatment and Isolation Capacity

Adequate isolation and treatment capacity requires the establishment of an "IPC continuum" that reaches from the household and community level—where an individual's initial point of contact with undiagnosed infected individuals beginning to show symptoms infection—and extends all the way through triage, testing, isolation, and treatment. IPC gaps throughout the IPC continuum can create entry points for the spread of EVD infection; but the widespread utilization of precautionary tools, techniques, and sanitary practices can close those entry points and prevent further transmission. Qualitative data disaggregated by country suggests that OFDA was moderately effective at supporting the establishment of IPC capacity in Guinea and Liberia, but was much less effective at doing so in Sierra Leone.

Contact tracing, when effectively done, was widely regarded by IPs as having played a vital role in slowing down the epidemic by interrupting chains of transmission. Initially, contact tracing was "silo'ed" as a response program and was not well-integrated into activities such as social mobilization or SDB—both of which were closely associated with community-based reports of first-person contacts with EVD-infected individuals. Contact tracing activities became more effective as the socio-cultural context for contact tracing became more conducive to effective case-finding. This was accomplished through the expansion of social mobilization activities, which included outreach to community, religious, political, and economic leaders in all three countries. OFDA was a strong supporter of social mobilization, which complemented contact tracing support that was mainly by WHO and CDC, with OFDA to a lesser extent.

By comparison to other programmatic components, contact tracing supported by social mobilization was a cost-effective means for interrupting virus transmission. Relatively small investments in contact tracing activities went a long way toward slowing the spread of infection. For example, in November 2014, a UNICEF allocation of USD $6 million to Liberia's MOH to support social mobilization activities resulted in 10,000 social mobilizers launched across the country, in rural and urban areas.

OFDA's organizational prowess in mobilizing massive resources and contracting capable INGOs and PIOs, as well as capacity to

implement health and complementary interventions components, were the determining factors for OFDA's success in rapidly increasing treatment and isolation capacity in Liberia. This effort was on a lesser scale and started later in Guinea and Sierra Leone, but nonetheless contributed significantly to expansion of isolation and patient care facilities that were put to good use. This program category, taken with the overlapping restoration of health care program area, were where OFDA expended the most funds. OFDA contributions included funding to renovate buildings into new ETUs and CCCs and staff, supplies and equipment; technical expertise in epidemic control and humanitarian crises; and laboratories to increase capacity and speed of diagnosis.

The challenge to planning isolation and treatment, bed numbers needed, and their locations was availability of data and analytical tools that integrated relevant demographic and epidemiologic variables. The determining factors for OFDA's success to rapidly create adequate treatment and isolation capacity were financial and technical resources, limited by the availability of partners, the inherent challenges of working in remote low-resource areas, and the technical requirements of ETU construction. OFDA successfully supported the evolution of funding priorities in consultation with IPs. This resulted in the expansion of isolation services to include needed resources identified on the ground, including psychosocial services, child protection, community engagement around issues of stigma, and food and financial support to address quarantine restrictions and livelihood disruptions. OFDA succeeded in quickly injecting massive inputs—technical personnel, training, supplies and logistics—into the existing inadequate health facilities. The ETU model for new construction was not fast enough, a challenge. The CCC model was faster to make operational — a success —in a context where the number of days (not weeks or months) it took to create isolation facilities equated with lives that were lost. Factors that reduced the effectiveness of this program area include poor contact tracing and IP funding delays; low community acceptance of quarantine and isolation; late inclusion of provisions for psychosocial needs, child protection, the needs of vulnerable populations due to lack of feedback; inefficiency of coordination of ambulances; inadequate ME&L regarding training effectiveness; long OFDA grant process timing; and absence of a social accountability system.

A very serious challenge was the inability of data systems to produce better forecasting analyses for planning and decision making; responders were generally behind the outbreak's spread rather than ahead of it, especially in Guinea and Sierra Leone. The inability of responders to use available data to get ahead of, rather than react to, the outbreak spread may indicate inadequacies in planning for isolation and treatment. Moreover, one might assert that OFDA has, as part of its mission, a primary responsibility to be accountable for grassroots engagement, community representation, transparency, and gender-sensitive programming that it retains even when partnered with a technical advisement entity like CDC which does not prioritize OFDA's core strengths. It should seek, at a minimum, to be a watchdog for key issues like gender in future outbreaks.

3. Assist Safe Human Remains Management

OFDA made a strategic decision to play a leading role in the three countries to prioritize culturally sensitive safe human remains management, in partnership with robust social mobilization strategies. This was a determining factor in the success of this programmatic component, along with the existence of the IFRC and GC, who had the technical and local capacity to implement. The failure was associated with governmental inertia (decrees) and cultural insensitivity in ignoring traditions, religion, and values during intervention implementation design. This failure may be at odds with the "do no harm" principles shared by OFDA and its partners and poses an ethical challenge. Challenges included a lack of public education about how EVD spread, and the absence of mechanisms for including affected communities' perspectives when planning interventions and for ongoing feedback. Many initial efforts failed to incorporate local traditions, religion and values in intervention design. These factors resulted initially in low community acceptance of change in burial practices and, therefore, low effectiveness of safe burials efforts to reduce community-based transmission associated with burial events.

4. Restore Health Care System Safety and Functionality

OFDA saw this component as the way to mitigate the poor health system infrastructure that could impede the response, and result in increased non-EVD mortality. The context of poor resources motivated this program component—which was not, for example, a component of the UNMEER response strategy. Widespread introduction of IPC measures in the health care system was a determining factor in OFDA's effectiveness in containing the spread of EVD, stopping the deaths of health care workers and reversing people's aversion to seeking treatment in health care facilities. *Major factors for OFDA success were its ability to assess the needs of the health system and coordinate delivery of multiple inputs rapidly, including supplies, training, advisers, protocols, communications messages through IPs with local experience or implementation capabilities. Challenges to the effectiveness of this program area include a scarcity of trained human resources.* In addition, IPs had to take rapid precautions for workforce protection, changing administrative procedures from standard activities to hazard conditions.

5. Support Social Mobilization

OFDA successfully adjusted to the importance of social mobilization to all program components, and shifted support to make this a major program intervention area. However, as the leading funder of social mobilization activities during the EVD response, OFDA was the main funder of social mobilization activities in Liberia, and joined other donors funding this program area in Guinea and Sierra Leone. *Nevertheless, there were numerous limitations including a failure to integrate social mobilization into other EVD response strategic priorities (e.g. case identification and contact tracing) and there was no real-time data collected through social mobilization.*

Table 17 below depicts the conclusion that over the course of the outbreak, OFDA-supported social mobilization activities became better integrated with other strategic program strategies such as case management and contact tracing, but still did not completely adapt to the local contexts.

Table 17. Evaluation findings on EVD social mobilization, by country

	Guinea	Liberia	Sierra Leone
Cross Response			
Was social mobilization adequately defined and modeled to have timely epidemiological impacts?	No	No	No
Was real-time data collected through social mobilization activities integrated into overall response planning?	No	No	No
Were other prominent donors leading social mobilization support?	Yes	No	Yes
Phase 0			
Did OFDA Fund social mobilization?	No	No	No
Did OFDA understand the function of social mobilization in an epidemic context?	No	No	No
Were social mobilization campaigns (1) using consistent and effective messaging; and (2) reaching wide audiences?	(1) No (2) No	(1) No (2) No	(1) No (2) No
Was social mobilization integrated into other EVD response strategic priorities (e.g. case identification, contact tracing)?	No	No	No
Was social mobilization adapted to the local context?	No	No	No
Phase 1			
Did OFDA Fund social mobilization?	No	Yes	No
Did OFDA prioritize the function of social mobilization in an epidemic context?	No	Yes	No
Were social mobilization campaigns (1) using consistent and effective messaging; and (2) reaching wide audiences?	(1) No (2) No	(1) Mixed (2) Mixed	(1) No (2) Mixed
Was social mobilization integrated into other EVD response strategic priorities (e.g. case identification, contact tracing)?	No	No	No
Was social mobilization adapted to the local context?	No	No	No
Phase 2			
Was social mobilization integrated into the overall response?	Yes	Yes	Yes
Did OFDA fund social mobilization?	Yes	Yes	Yes
Did OFDA fund social mobilization at adequately?	Yes	Yes	No
Was social mobilization integrated into other EVD response strategic priorities (e.g. case identification, contact tracing)?	Yes	Yes	Yes
Did OFDA understand the function of social mobilization in an epidemic context?	Yes	Yes	Yes
Were social mobilization campaigns (1) using consistent and effective messaging; and (2) reaching wide audiences?	(1) Yes (2) Yes	(1) Yes (2) Yes	(1) Yes (2) Yes
Were social mobilization activities adapted to local context?	No	No	No

Source: Analysis of OFDA's IP award documents

RECOMMENDATIONS

The evaluation team suggests that USAID/OFDA consider the following, in order of priority:

Improving Incident Management and Coordination

1. *Institute an ME&L system at the beginning of emergency operations for ongoing learning and to collect real-time evidence,* and to monitor IP performance, and validate strategies through a feedback loop with affected communities. Require IPs to more uniformly and rigorously capture monitoring data about the effectiveness of all activities, such as training and Contact Tracing, and share. OFDA should allocate sufficient resources to review, revise, and expand current ME&L procedures in order to align ME&L activities with the data requirements for epidemic outbreaks. This may take the form of support to independent, third-party epidemiologic organizations. New ME&L frameworks, reporting templates and indicators should be developed for OFDA involvement in public health emergencies that accomplish the following key objectives:
   - they are adaptable and relevant for epidemic outbreak scenarios;
   - they can be readily integrated with epidemiological models that use geospatial, longitudinal, and biological data;
   - they sustain OFDA's commitment to gender equality through gender-sensitive ME&L data collection among outbreak indicators
2. *Convene other likely USG interagency responders to brainstorm about how to prepare for data needs,* decision making, and planning in future disease outbreaks.
3. *Review operational procedures to ensure greater continuity in the field* for personnel when responding to similar situations, principally to achieve overlap or longer durations of DART team deployments.
4. *Review operational procedures* to optimize award implementation. This is expanded upon in the allied Ebola Response Evaluation, Objective 3 (Relevance) report.

Improving Adequate Treatment and Isolation Capacity

1. *Strengthen adequate treatment and isolation capacity by using a disease-appropriate "IPC continuum" model* that creates consistent context-appropriate barriers to transmission (e.g. PPE, sterilization materials, hygiene equipment, and training) at each of household, community, health care unit, and treatment facility levels.
2. *Provide guidelines for IPs to coordinate about duty of care concerns for frontline health emergency staff and volunteers,* and for the psychosocial and clinical consequences of a medical emergency for survivors.
3. *OFDA should seek, at a minimum, to be a watchdog for vulnerabilities among sub-populations, including gender in future outbreaks.* OFDA should address grassroots engagement, community representation, transparency, and gender-sensitive programming that it retains even when it is partnered with a technical advisement entity such as CDC that does not prioritize OFDA's core strengths.

Improving Safe Human Remains Management

1. *Stockpile safe burial resources* for emergency deployment.
2. *Engage early in a response in high-level consultations* with religious and traditional leaders to identify local sensitivities.
3. *Work with national private networks of funerary/mortuary professionals* to integrate into an overall response system.
4. *Encourage IPs to explore ways for psychosocial support and community outreach* to be available to burial workers.

Improving Restoration of Health Care System Safety and Functionality

Ensure that in future outbreaks, this program component mobilizes from the outset to assemble population and health system data to strategize for epidemic and non-epidemic complementarity.

Improving the Integration of Social Mobilization

1. *OFDA should allocate resources to commission external consultants to coordinate with OFDA to build a data infrastructure* that will include four key components: 1) data collection; 2) data analysis; 3) integration of findings into broader response data analysis and decision-making; and 4) the incorporation of lessons and insights into short- to mid- term operational adaptations, as needed. Such activities would benefit from parallel investments in developing and refining indicators, data collection modules, and research protocols that can be rapidly adapted "off the shelf."
2. *OFDA should engage experts to propose and test measurable, timely, sensitive, and useful indicators that will enable the integration of local cultural, contextual, and socioeconomic factors into policy-making and resource prioritization.*

   For instance:

- A KAP "score" framework: This would use continuously collected KAP data drawn from a pre-positioned index of variables that have been rapidly validated for local cultural and epidemiological contexts. Data gathered using mobile technology would be used to inform a continuously changing composite indicator of community knowledge, attitudes, and practices. The resulting KAP "score" could be used as a measure of overall emergency response effectiveness, and could be disaggregated by time, location, and sub-population to identify gaps in social mobilization, community engagement, and communications strategies. Such a "score" would give early indications of localized and culturally-based reluctance to adapt behavior changes or to resist public health campaigns.
- A response "effectiveness" score: Similar to the KAP "score," the development of a response "effectiveness" score might entail the pre-selection of several dozen variables that are associated with response effectiveness; and could be collected using simple text-based survey mechanisms on mobile phones. Examples from the EVD experience would include - frequency of supply of IPC materials in local communities; frequency of points of contact with community educators; perceived fairness (or unfairness) of distributions; local perceptions of emergency responders' responsiveness and accountability: and targeted risk variables like gender, age, and location.

  Such an initiative is consistent with emerging efforts in international institutions (WHO, UNICEF) to rapidly anticipate, understand, and respond to shifting sociocultural factors in emergency scenarios.

3. *Revise OFDA's theory of change about social mobilization and emergency response by adding a critical assumption that social mobilization begin at the outset of the response, not later.* This is to better recognize and account for the inherent roll-out and scale-up challenges and time frames associated with engagement with community leaders, training of outreach agents, and integration of program strategies from the response outset.
4. *Social mobilization capabilities need to better anticipate and respond to counter-messages in social media.* Research more ways to integrate community engagement in the earliest phases of any future response. Support efforts to systematically develop measurable, sensitive, timely and useful indicators of locally-appropriate sociocultural factors.
5. *OFDA can better support the creation of qualitatively-informed SitRep indicators* or composite qualitative indices. Ensure this kind of data can be integrated into standard epidemiological models.

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6. White House. Fact Sheet: U.S. Response to the Ebola Epidemic in West Africa. https://obamawhitehouse.archives.gov/the-press-office/2014/09/16/fact-sheet-us-response-ebola-epidemic-west-africa. Published September 16, 2014. Accessed October 18, 2017.

7. During the early weeks and months of the outbreak infections were misdiagnosed, unconfirmed, or double-counted—as a person might be "reported" when identified, and then re-reported at a health facility, and then re-reported again for various reasons. Data was also lost at different steps. Thus, one of the surveillance tasks during the fall of 2014 was to sort through and consolidate the array of records to hone the most accurate estimates of the cumulative cases. This, however did not rectify the extensive under-reporting which occurred because people were reticent to come forward when they suspected infection.

8. Sources of donor funding:
   — Source of U.S. government funding total: USAID/OFDA Fact Sheet #12 FY2016, September 30, 2016
   — Source of UK government funding total: The end of the Ebola epidemic. UK.gov website. https://www.gov.uk/government/news/the-end-of-the-ebola-outbreak (converted from GBP to USD at a rate of 1.29 U.S. dollars to 1 pound). Published January 14, 2016.

   — Source of World Bank Group funding total: World Bank Group Ebola Response Fact Sheet. World Bank website. http://www.worldbank.org/en/topic/health/brief/world-bank-group-ebola-fact-sheet. Published April 6, 2016.

   —Source of data for all other donors: Office of the UN Special Envoy on Ebola. Resources for Results V. 1 September 2014 to 31 October 2015. Available from: https://ebolaresponse.un.org/sites/default/files/resources_for_results_v.pdf.

9. UN data and U.S. OFDA fact sheet data.

10. The IBTCI team culled over 4,000 published and grey literature documents through online search, communications, and requests from aid agencies and in conversations with NGOs. Evaluators actively wrote to CDC, USPHS, the Pasteur Institute, Ministries of Health in West Africa, USAID offices, UN offices, Public Health England, and the European Centers for Disease Control to solicit data and analysis. Critical documents included the CDC's *Morbidity and Mortality Weekly Reports* (MMWRs). This complemented the over 860 documents made available by OFDA from its own files about grants, contracts, and reporting by IPs. The evaluation team reviewed all documents for their salience to the key analytic questions about mapping the time frame of the epidemic against tangible field interventions, and for scientific or biological basis measuring how interventions may have affected
    the epidemic curve. There were limitations in the data collected, as European agencies and the World Bank were unwilling to share documents.

11. "Subnational levels" refers to districts or regions within a country and its communities. With a subnational proportionate-to-size sampling method, communities with larger populations have a proportionately greater chance of being selected in a survey sample than do smaller communities.

12. The survey was designed to exceed 15,000 to allow for meaningful coverage of each part of the three-country region and offset limitations in recall specificity. 3,500 respondents were selected across 8 regions of Guinea; 5,500 from 14 districts in Sierra Leone; and 6,000 from 15 counties of Liberia. These samples by country were determined by calculating the population necessary to be representative at the largest sub-national organizational level, which varies by country. These samples achieve a balance of the statistical power of different evaluation hypotheses and purposes of the different indicators and questions pursued through the survey, and recognizing that there were believed to be fewer cases overall in Guinea, despite its larger population, and more OFDA-funded activities in Liberia, of interest.

13. Grounded theory is an approach for looking systematically at largely qualitative data, such as transcripts of interviews or protocols of observations, with the aim of generating theories. Grounded theory categorizes empirically collected data to build a general theory that will fit the data.

14. Contribution analysis is an analytic approach used for determining a complex, multifaceted program's effectiveness in a complex setting (*i.e.,* one with multiple intervention components, multiple levels of funders (from global to local), a wide array of actors and providers, and varying socio-political contextual factors). *See* Bressler, S, 2009. Presentation on assessing contribution: Paper read at First

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USAID
FROM THE AMERICAN PEOPLE

January 2018

EVALUATION

EVALUATION OF EBOLA RESPONSE IN WEST AFRICA 2014–2016
ANNEXES

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At the request of the United States Agency for International Development (USAID), this publication was prepared independently by International Business and Technical Consultants, Inc. (IBTCI).

Evaluation of Ebola Response in West Africa 2014–2016, ANNEXES

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The view into the confirmed patient ward of an Ebola Treatment Unit in Monrovia, Liberia

ANNEXES

January 2018

EVALUATION OF EBOLA RESPONSE IN WEST AFRICA 2014–2016

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ANNEX A. TIMELINE ANALYSIS

TIMELINE ANALYSIS OF WEST AFRICAN EBOLA EPIDEMIOLOGICAL TRENDS, INTERNATIONAL RESPONSE ACTIVITIES, AND USAID/OFDA ACTIONS

Timeline Tables

The timelines that follow draw from:

- US government/OFDA timeline (includes CDC, DOD, and other key events)
- United Nations/international assistance timeline
- General epidemic key events timeline
- Guinea key events timeline
- Liberia key events timeline
- Sierra Leone key events timeline
- Guinea: DART/CDC/IP timeline
- Liberia: DART/CDC/IP timeline
- Sierra Leone: DART/CDC/IP timeline
- USG expenditures to date (from USAID fact sheets)
- OFDA expenditures to date (from USAID fact sheets)

These timelines were indexed against WHO statistics about the number of EVD-related cases and the number of EVD-related fatalities. EVD epidemiological data integrated into our analysis included the following statistics:

- # reported EVD rates for the entire response
- # reported EVD fatalities for the entire response
- # reported EVD cases in Guinea
- # reported EVD fatalities in Guinea
- # reported EVD cases in Liberia
- # reported EVD fatalities in Liberia
- # reported EVD cases in Sierra Leone
- # reported EVD fatalities in Sierra Leone

Data was analyzed using Tableau version 10.3.0, a data visualization software program allowing for comparative analysis of quantitative and qualitative data.

Table A–1. Key events in USG response to EVD outbreak

Year	Month	Date	Activity
2013	Dec	Early	Index case of Ebola virus disease (EVD) occurred in child in Gueckedou, Guinea; that child and multiple family members died over next month
2014	Mar	21	Guinea's Ministry of Health notified WHO about an expanding and high-fatality EVD outbreak
2014	Mar	Late	Liberia's Ministry of Health and Social Welfare reports initial EVD cases in Liberia; Sierra Leone reports suspected case of EVD
2014	Mar	27	Senegal closes border with Guinea to reduce EVD spread
2014	Mar	31	CDC sends five-person team to Guinea to support MOH and WHO in controlling the outbreak
2014	April	mid	DOD lab team travels from Guinea to Liberia to set up country's first EVD laboratory
2014	Apr–May		Sporadic EVD cases reported in Guinea and Liberia; CDC increases assigned staff
2014	May	24	Sierra Leone reports first confirmed EVD case; 38 EVD cases reported the following week
2014	May	29	Liberia reports new EVD case that originated in Sierra Leone
2014	July	9	CDC Emergency Operations Center activated, CDC deployments surge
2014	July		First airlines cancel flights to Liberia and Sierra Leone (Nigerian airlines Asky and Arik Air)
2014	July	mid	OFDA assessments covering the region
2014	July	20	Ebola infected traveler arrives in Nigeria from Liberia, introduces EVD to Lagos
2014	July	24	WHO classifies west African EVD outbreak as Level 3, its highest classification
2014	July	32	Government of Sierra Leone declares a national State of Emergency
2014	Aug		More airlines suspend flights to the region, including African and European airlines Brusses Airlines limits flights. (Royal Morocco Airlines continues flights throughout the outbreak.)
2014	Aug	1	OFDA stands up (activates) a Response Management Team (RMT) for EVD outbreak
2014	Aug	4	Spread to Senegal, CDC teams help stop the outbreak
2014	Aug	4	US Ambassador in Liberia issues Disaster Declaration
2014	Aug	13	DOD creates EVD Task Force, USAID DART arrives in Liberia
2014	Aug	14	CDC laboratory established in Sierra Leone. US Chargé d'Affaires declares a disaster due to the effects of the EVD outbreak in Sierra Leone.
2014	Aug	15	CDC Director visits Liberia
2014	Aug	22	US Chargé d'Affaires declares a disaster due to the magnitude of the EVD outbreak in Guinea
2014	Aug	25	CDC expands EVD testing among US labs
2014	Aug	28	CDC Director and USAID/OFDA Director meet with Liberian President, other key GoL officials, and international partners regarding challenges and overall EVD response strategy
2014	Aug	8	Dr. Frieden travels to Guinea, Liberia, and Sierra Leone
2014	Sept	15	USAID/OFDA airlifts five shipments of relief commodities into EVD-affected countries, valued at more than $393,000. Humanitarian partners use USG relief commodities—including PPE, plastic sheeting, water treatment supplies, and body bags—to conduct EVD screenings, protect health care workers, and construct ETUs.
2014	Sept	16	USARAF CG In Liberia
2014	Sept	18	The US President announces the establishment of a 3,000-strong US military command center in Liberia and intent to build treatment centers
2014	Sept	23	US military engineers and airfield specialists arrive in Monrovia to begin conducting assessments
2014	Sept	24	Microplanning workshops with county leaders held in Liberia. USAID/OFDA-supported U.N. Humanitarian Air Service (UNHAS) transports more than 380 humanitarian responders to EVD-affected areas. UNHAS also transports more than 510 cubic meters of medical cargo in support of the EVD response (1.4 million cases by Jan 20, 2015).
2014	Sept	26	USAID/FFP provides a total of $6.6 million in food commodities—including 5,629 MT of lentils, rice, soy-fortified bulgur, vegetable oil, and yellow split peas—to support the WFP EMOP. CDC works with UNICEF and Focus 1000 to develop a KAP study in Sierra Leone.

Year	Month	Date	Activity
2014	Sept	1	USAID and US Department of State provide a $10 million grant to support the AU medical mission responding to the EVD outbreak
2014	Oct	6	CDC implements enhanced screening at airports, new tracking program for people coming from countries with EVD outbreak
2014	Oct	9	CDC organizes health care worker safety course in Anniston, Alabama for West Africa volunteers. By now, USG has sent more than 130 civilian medical health care and disaster response experts and nearly 350 military personnel to West Africa.
2014	Oct	13	DOD sends 100 US Marines to help bolster US response in Liberia. Marines arrive on Oct 9. DOD sends four tilt-rotor aircraft and two C-130 cargo planes to Liberia. The Marine contingent serves to temporarily assist US supply efforts and air transport until the US Army 101st Airborne arrives in mid-Oct.
2014	Oct	14	US President spoke with UN Secretary-General on Oct 13 to stress the importance of member state support to the UN's EVD outbreak appeal and the need to provide more support to EVD-affected areas
2014	Oct	15	100 additional US military are sent to Liberia, then totaling 565. USAID Administrator announced nearly $142 million in USAID humanitarian activities to support the EVD response in acutely affected countries of West Africa, including in Guinea, Liberia, and Sierra Leone.
2014	Oct	25	Rapid Isolation and Treatment of Ebola (RITE) teams help rapidly control new outbreaks in Liberia. More than 430 DOD personnel are in Liberia to support the EVD response.
2014	Oct	26	101st Airborne Division Relief in Place/Transfer of Authority
2014	Oct	31	CDC works with states to improve hospital readiness
2014	Oct	5	EVD spreads to Mali, CDC teams help stop the outbreak
2014	Nov	7	White House requests just over $6 billion in funding from Congress to address EVD epidemic. Between Nov 5 and 19, the USG provided nearly $185 million in additional funding to support the humanitarian response to the EVD outbreak in West Africa, including emergency medical services, community education and outreach, food, and water, sanitation, and hygiene (WASH) interventions, as well as logistical support and relief commodities
2014	Nov	17	MMU and the first DOD-built ETU completed
2014	Nov	11	USG declares a EVD outbreak a disaster
2014	Dec	23	Congress passes President Obama's Ebola supplemental appropriations request, funding the Global Health Security Agenda (launched in Feb, 2014)
2015	Jan	13	DOD mobile laboratory began operation in Sierra Leone
2015	Feb	11	White House announced via fact sheet that the three countires had sufficient emergency operations centers, rapid response capacities and Ebola-capable laboratories
2015	Mar	1	USG Interagency Meeting on Social Mobilization, Communication and Preparedness in DC
2015	April	22	USAID-funded Rebuilding Basic Health services project with HC3 responds to EVD in Liberia
2015	Apr	17	CDC deploys 1000th staff member to West Africa
2015	May		Kenya Airways resumes flights to Liberia
2015	Jun	27	CDC recommends reduced screening for passengers from Liberia
2015	Jun	30	DOD's Operation United Assistance concluded its onsite operations in West African.
2015	Aug		OFDA states it will give an additional $5 million in USAID/OFDA funding to support EVD response efforts.
2015	Sep		Most major airlines resum flight services to EVD-effected regions.
2016	Jan	4	OFDA terminates the West African EVD DART.
2016	Early		Sporadic EVD cases are reported in Guinea, Liberia, and Sierra Leone; spread within each country was limited.
2016	Mar	31	CDC's Emergency Operations Center (Atlanta) closes out its EVD activities.

Table A–2. Key events in international coordination of the response to EVD outbreak

Year	Month	Date	Activity
2014	March	27	Senegal closes its border with Guinea in an effort to halt EVD from spreading
2014	March	31	MSF warns of an "epidemic of a magnitude never seen before"
2014	July	1	Uganda sends a team of 20 Ebola experts to Sierra Leone and Liberia
2014	July	25	WHO opens a regional Ebola response center
2014	July	31	WHO appeals for US$71 million
2014	Aug	4	The World Bank announces up to $200 million in emergency assistance for Guinea, Liberia, and Sierra Leone
2014	Aug	13	WFP declares EVD outbreak a Level 3 emergency, announces that it needs $70 million to feed 1.3 million people in quarantine areas
2014	Aug	19	The International Federation of Red Cross and Red Crescent Societies (IFRC) announces a regional emergency appeal
2014	Aug	21	The World Bank says it is expecting GDP growth in Guinea to fall from 4.5% to 3.5%.
2014	Aug	28	WHO announces that $490 million shall be needed over the next six months
2014	Sept	1	The Global Ebola Response Coalition (GERC) is established.
2014	Sept	2	MSF briefs the U.N about EVD, warns that treatment centers are overwhelmed and transmission rates are at unprecedented levels.
2014	Sept	5	UN appeals for $600 million. European Union commits €140 million.
2014	Sept	8	UK announces plan to build Ebola treatment center in Sierra Leone, and states plan to send 750 troops to Sierra Leone.
2014	Sept	12	Government of the People's Republic of China (GoPRC) states plan to deploy an additional 59 medical personnel and a mobile laboratory to Sierra Leone. The GoPRC announces plan to provide approximately $32.5 million in humanitarian assistance—including food commodities, relief supplies for disease control, emergency treatment facilities, and financial support—to help control the EVD outbreak.
2014	Sept	15	UNDP economic projections for Liberia are revised downwards
2014	Sept	16	UN appeals for $988 million. World Bank approves a $105 million grant for EVD-containment efforts in Guinea, Liberia, and Sierra Leone. The grant—which includes $52 million for Liberia, $28 million for Sierra Leone, and $25 million for Guinea—is to help communities cope with the economic impact of the crisis and support the rebuilding of essential public health systems.
2014	Sept	18	United Nations Mission for Ebola Emergency Response (UNMEER) is established. An emergency session of the UN Security Council adopts UNSC Resolution 2177, declaring EVD a threat to international peace and security and calling on UN member states to provide resources and assistance, lift travel bans, and refrain from isolating EVD-affected countries. UN Disasters Assessment and Coordination (UNDAC) team deployed to Liberia to support to the National Ebola Command Center and humanitarian partners in operational coordination, information management, mapping the outbreak and response, and the launch of multi-sector humanitarian clusters.
2014	Sept	19	The governments of France and Germany announce plans to establish an air hub in Dakar, Senegal, to help move supplies and personnel into affected countries,
2014	Sept	22	UNMEER advance team arrives Accra
2014	Sept	23	Distribution of MSF hygiene kits begins. WFP has delivered approximately 3,345 metric tons of food commodities to more than 180,000 people affected by the EVD outbreak in Guinea, Liberia, and Sierra Leone.
2014	Sept	26	WHO announces that the Ebola epidemic ravaging parts of West Africa is the most severe acute public health emergency seen in modern times.
2014	Oct	2	UK Secretary of State for International Development J announces that the UK DFID will provide an additional £20million—$32.4 million—to support public health staff and procurement of supplies for the ongoing response in Sierra Leone. The DFID funding will also allow for additional international disease control experts to assist the GoSL. The £20million announcement comes in addition to the previously announced £100 million—$162 million—commitment from the government of the UK to control the EVD outbreak in Sierra Leone.

Year	Month	Date	Activity
2014	Oct	6	Government of Norway announces an additional NOK 89 million—$13.8 million—to support the EVD response in West Africa, bringing Norway's total commitments to NOK 184 million—$28.5 million.
2014	Oct	10	The EU announced €3 million—approximately $3.8 million—in funding to support medical evacuation for humanitarian workers who contract EVD while working in West Africa.
2014	Oct	13	Margaret Chan reports in a speech that the EVD outbreak in West Africa is the most severe public health emergency in modern times, noting that it has progressed from a public health crisis to a crisis of international peace and security.
2014	Oct	14	WHO Assistant Director-General reports that up to 10,000 people per week could contract EVD by early December. MSF reports that 16 staff members contracted EVD, and nine had died as a result of the disease.
2014	Oct	15	UNMEER EVD preparedness, prevention, and response planning conference in Accra, Ghana.
2014	Oct	20	WHO declares Nigeria to be Ebola-free; Ghanaian president announces that aid is beginning to arrive.
2014	Oct	2930	UNMEER in operation for thirty days.
2014	Nov	21	The UN Security Council meets on the question of Ebola.
2014	Dec	18	UN Secretary-General pledges support for affected countries in West Africa to rebuild their health systems.
2015	Jan	18	The Malian government and the UN declare the country Ebola-free after no new cases in 42 days.
2015	Jan	19	UN special envoy on Ebola reports that the outbreak has cost $4 billion, UN appeals for another $1 billion through June, 2015.
2015	Jan	28	The response to the EVD epidemic moves to a second phase: focus shifts from slowing transmission to ending the epidemic.
2015	Feb	15	Launch of the 60-day 'Zero Ebola' campaign in Sierra Leone, Guinea, Liberia, and Côte d'Ivoire to last until 16 April 2015.
2015	Feb	16	By this time, more than 800 African Union health workers have participated in the Ebola response.
2015	Feb	18	Foreign medical teams meeting on the EVD response in Geneva, Switzerland at WHO.
2015	July	10	UN Secretary-General Ban Ki-moon hosts the International Ebola Recovery Conference in cooperation with the governments of Guinea, Liberia, and Sierra Leone. The Conference is organized in partnership with the African Union, the African Development Bank, the European Union and the World Bank.
2015	July	31	UNMEER closes after having achieved its core objective of scaling up the response on the ground.
2015	Aug	13	The UN Security Council hears a briefing on Ebola from WHO Director-General and UN Special Envoy
2015	Aug	27	Médecins Sans Frontières calls the international response to Ebola "irresponsible" and "slow and derisory," saying health services in the affected countries needed to be "bolstered with operational support rather than politicians' empty promises."
2015	Dec	4	Economic Community of West African States (ECOWAS) reports deployment of 116 West African health care workers to the three countries acutely affected by EVD, including 49 to Guinea, 39 to Liberia, and 28 to Sierra Leone.
2016	Jun	21	MSF declares the second wave of the outbreak "totally out of control" and calls for massive resources

Table A–3. Key events in Guinea response to EVD outbreak

Year	Month	Date	Activity
2013	Dec	25	Unidentified EVD contracted in Guinea.
2014	March	10	MOH alerted to mysterious disease in Guékédou and Macenta prefectures.
2014	March	19	Guinean health officials announce outbreak of hemorrhagic fever.
2014	March	21	First ETC opened in Guéckédou; public schools closed.
2014	March	22	Ebola confirmed as infectious agent; government of Guinea (GoG) confirms outbreak.
2014	March	24	The first isolation center is established by MSF in Guéckédou prefecture.
2014	March	27	The WHO Global Outbreak Alert and Response Network (GOARN) travels to Guinea, headed by a senior WHO field epidemiologist.
2014	April	1	Guinea under the Ministry of Health appoints an Ebola coordinator
2014	May	5	Reported cases decreasing; ETU in Macenta closed.
2014	May	12	Cases are reported in Conakry.
2014	August	9	Borders with Sierra Leone and Liberia closed.
2014	August	13	Guinea declares a National Public Health Emergency.
2014	August	15	US Chargé d'Affaires declares a disaster, due to the magnitude of the EVD outbreak in Guinea.
2014	August	21	Russian Federal Service for Supervision of Consumer Rights Protection and Human Welfare deploys a mobile laboratory to Guinea to support EVD response efforts for up to five months. Russian support staff, including bacteriologists, epidemiologists, and virologists, accompanied the mobile lab to Guinea to assist in the EVD outbreak response.
2014	Sept	6	Schools in Guinea are closed.
2014	Sept	18	Health care team murdered in Womey, N'Zerékoré.
2014	Sept	22	Health actors continue efforts to establish four additional transit centers for EVD affected individuals in Guinea. One transit center, located in Forécariah prefecture, is under construction with GoG and UN support. Three additional transit centers are planned for Kérouané, Nzérékoré, and Yomou prefectures. UNICEF commits to supporting the completed transit centers by providing ambulances and addressing the nutrition, protection, and WASH needs of suspected and confirmed EVD patients in the centers.
2014	Sept	23	GoG announces plans to pre-position medical response stocks in six regions: Boké, Fouta Djallon, Guékédou, Kankan, Mamou, and Nzérékoré. WFP began delivering food to patients at the Guékédou ETU in Guinea. WFP is providing all patients discharged from the Guékédou ETU with a 60-day food ration upon leaving the ETU. WFP continues general food distributions in EVD-affected communities in Guinea, of 45-day rations—including rice, oil, pulses, and salt.
2014	Oct	2	The Governor of Conakry banned celebrations for Eid. MSF hands over control of a former EVD transit center site in Macenta to the Government of France (GoF) on September 24. The GoF is transforms the facility into a 60-bed ETU and reports plans to have the ETU operational by late October or early November, according to DART staff in Guinea.
2014	Oct	3	In Guinea, screening for EVD at Conakry International Airport is put into place.
2014	Oct	8	WHO begins to expand the national Emergency Operations Center model to the prefecture level in Guinea, including social mobilization, epidemiological, and logistics components. Priority response areas for Guinea include contact tracing and raising social awareness to reduce community resistance to EVD prevention activities, according to the UN.
2014	Oct	13	France pledges to build several treatment centers in Guinea and warns of possible bans on flights.
2014	Nov	11	The EVD outbreak peaks in Guinea.
2015	Jan	19	Guinea public schools reopen.
2015	Feb	7	Guinea authorizes the wider use of an experimental drug against EVD in treatment centers after successful initial trials.
2015	Feb	9	UNICEF sets up a temporary center to monitor children and parents infected with EVD in Guéckédou, a forest region in Guinea.

Year	Month	Date	Activity
2015	Feb	15	Launch of the 60-day "Zero Ebola" campaign in Sierra Leone, Guinea, Liberia, and Côte d'Ivoire to last until April 16, 2015. From February 15–19, the US Embassy in Conakry hosts a conference for the Global Health Security Agenda (GHSA)—a USG effort to both prevent and quickly respond to global disease outbreaks and promote global health security as an international security priority.
2015	March	17	In Guinea, a report from the weekend showed 21 new cases in a single day. The chain of new infections may have been linked to a woman who died of EVD and was not buried safely.
2015	March	28	Guinea deploys security forces to the southwestern part of the country in response to influx of Sierra Leoneans crossing the border to flee a three-day EVD lockdown.
2015	June	6	Teams of the Guinean Red Cross set up a mobile radio station in Dubréka and distribute solar radio sets for people to listen to Ebola messages.
2015	June	28	In Guinea, an average of 56 new contacts are registered per confirmed case and some 99 per cent of those contacts are being traced daily. Of the newly confirmed cases reported, 70 percent arose from registered contacts between June 1 and 28, 2015.
2015	Oct	29	Guinea is first declared Ebola-free.
2016	March	16	New cases detected in Guinea.
2016	June	1	Guinea is declared Ebola-free again.

Table A–4. Key events in Liberia response to EVD outbreak

Year	Month	Date	Activity
2014	March	24	The Liberian Ministries of Information, Culture, Tourism, and Health announces six suspected cases in the country, five of which had already died.
2014	March	30	Government of Liberia (GoL) confirms the EVD outbreak.
2014	June	17	Liberia reports that EVD has reached its capital, Monrovia.
2014	June	30	Liberia shuts schools and orders quarantining of worst-affected areas, deploying military.
2014	July	2	Two ETUs opens in Monrovia and Foya; government closes most border points and all schools.
2014	July	9	WHO supports the Ministry of Health community education to contain EVD in Liberia.
2014	July	27	Liberian President declares the closing of the country's borders; Roberts International Airport adds screening; football events are banned; schools and universities are closed; worst-affected areas are placed under quarantine.
2014	July	30	Liberia shuts schools and orders the quarantining of the worst-affected communities, employing its military.
2014	Aug	1	President declares a state of emergency; enhanced contact tracing and quarantining measures instituted.
2014	Aug	3	Liberia's government orders cremation of all bodies of people affected by Ebola.
2014	Aug	7	Liberia Call Center is launched.
2014	Aug	16	West Point ETU isolation center is attacked.
2014	Aug	18	MSF opens ELWA Three ETU.
2014	Aug	19	Liberia's President declares a nationwide curfew beginning Aug 20 and orders two communities to be completely quarantined, with no movement in or out of the areas. West Point protests.
2014	Aug	20	Dolo Town quarantine implemented.
2014	Aug	28	Ugandan team brings Ebola experts to Liberia.
2014	Aug	30	Liberia begins denying sailors from entering or disembarking from vessels at the country's four main seaports.
2014	Sept	1	In August and September, additional ETCs are built.
2014	Sept	8	Dolo Town curfew is lifted.
2014	Sept	15	UNDP economic projections for Liberia are revised downwards.
2014	Sept	21	Island Clinic ETU (100 Beds) opens.
2014	Sept	22	150-bed ETC is opens in Monrovia.
2014	Sept	23	CDC-Microplanning workshops with county leaders are held in Liberia.
2014	Sept	26	The GoL national-level emergency operation center (EOC) became operational on Sept 25 in Monrovia. USG and UN staff support the GoL to increase staffing and integrate effective incident command structures in the EOC, which will coordinate the GoL response to the EVD outbreak.
2014	Sept	28	WFP Liberia completed food distributions to the densely-populated West Point neighborhood in Monrovia. DOD technicians completed mobile laboratory site assessments in recent days near the Bong ETU and at the Island.
2014	Sept		Clinic ETU in Monrovia. Six additional DOD technicians and two mobile laboratories arrived. The EVD outbreak peaks in Liberia. All components of the DOD-supported 25-bed field hospital arrive in Monrovia. A three-person US Public Health Service team plans to assist with establishing the hospital.
2014	Sept	29	Ebola Response Social Mobilization Pillar Established in Liberia. A high-level USG delegation—including Assistant Administrator for USAID's Bureau for Democracy, Conflict, and Humanitarian Assistance and DOD Assistant Secretary of Defense arrive in Monrovia to assess ongoing EVD response efforts.
2014	Oct	2	The USG-provided laboratory at the Island Clinic ETU in Monrovia begins operations.
2014	Oct	6	Survivors help train health workers in Ebola care.
2014	Oct	14	International media report that HCWs ended a two-day strike to secure risk pay, noting that international requests and the desire to continue providing care to EVD patients influenced their decision to end the strike.

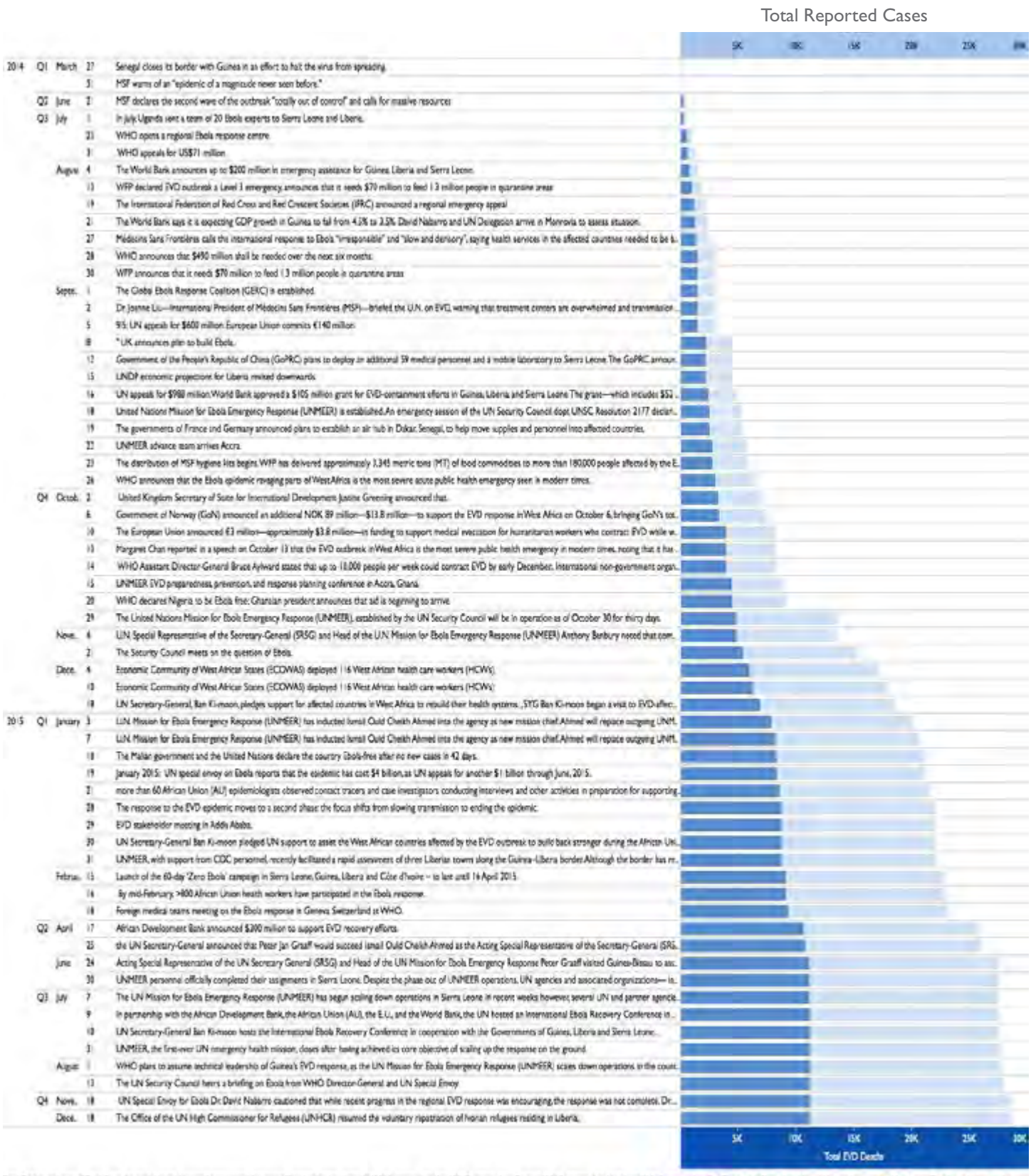
Year	Month	Date	Activity
2014	Oct	20	A new Ebola mobile lab speeds up diagnosis and improves care.
2014	Oct	25	National reporting transitions from aggregate to case-based data (lab and ETU lists), which may have contributed to the large peak in cases seen.
2014	Oct	29	WHO reports that the rate of infections in Liberia has slowed, due in part in changes in cultural mortuary practices.
2014	Oct	31	GoL officially opens an ETU constructed with USG assistance at the old GoL Ministry of Defense (MoD) site in Monrovia.
2014	Nov	5	UN is establishes five regional logistics hubs to increase storage and distribution capacity for the delivery of adequate amounts of PPE and other supplies to health facilities—including ETUs and CCCs—throughout Liberia. The UN plans to establish the new logistics hubs by the end of November in Bong, Grand Bassa, Grand Gedeh, Lofa, and Maryland counties. In Bomi, Grand Cape Mount, and River Gee counties, strikes by HCWs in more than half of operational non-EVD health facilities could significantly impair basic health services amid the EVD outbreak, according to the UN. In addition, the UN reports that a shortage of PPE for health care personnel poses a substantial hindrance to the provision of basic care in non-EVD health facilities.
2014	Nov	18	IOM opens ETU in Bomi county.
2014	Dec	13	State of Emergency is lifted in Liberia.
2014	Dec	31	Cremation in Liberia is stopped, to be replaced by safe burials.
2015	Jan	1	A clinical trial for a possible treatment for EVD begins in Liberia at MSF's Ebola Management Centre in Paynesville, Monrovia. Effective contact tracing documented (100% of confirmed cases were among known contacts).
2015	Jan	6	A new burial site for EVD victims is prepared in Monrovia as the GoL ends cremation of the dead from EVD.
2015	Jan	30	The Liberian Ministry of Education announces that it will delay reopening schools for two weeks to better prepare safety measures against EVD; reopening was initially scheduled on Feb 2, 2015.
2015	Feb	2	Trials for a new vaccine begin in Liberia, in the outskirts of Monrovia.
2015	Feb	15	Launch of the 60-day "Zero Ebola" campaign in Sierra Leone, Guinea, Liberia, and Côte d'Ivoire, to last until April 16, 2015.
2015	Feb	16	In Liberia, schools reopen after months of closing due to EVD outbreak.
2015	Feb	22	Liberia's President announces the lifting of nationwide curfews and re-opens borders shut at the height of the EVD outbreak.
2015	March	2	Liberia tightens EVD preventive measures at the borders with Sierra Leone, Guinea, and Côte d'Ivoire to prevent a resurgence of EVD. These measures included the placement of thermometers and buckets with chlorinated water for the washing of hands at border points.
2015	March	5	Liberia releases its last confirmed case of Ebola.
2015	May	9	Liberia is declared free of Ebola transmission.
2015	June	17	CDC recommends reduced screening for passengers from Liberia.
2015	June	29	A new EVD case is identified in Liberia, 50 days after the interruption of active transmission was achieved early May.
2015	July	8	A second case is confirmed in Liberia.
2015	Nov	20	Cluster of cases detected.
2016	Apr	1	Further cluster of cases detected.
2016	Jun	9	Liberia is declared Ebola-free again.

Table A–5. Key events in Sierra Leone response to EVD outbreak

Year	Month	Date	Activity
2014	May	24	WHO reports the first cases in Kenema, Sierra Leone. They are traced back to the funeral of a widely respected traditional healer from Kailahun, who had contracted the disease after treating EVD patients from across the border in Guinea.
2014	May	26	Sierra Leone confirms EVD outbreak.
2014	June	2	First ETC opens in Kailahun; plans for further ETCs begin; borders with Guinea and Liberia closed.
2014	June	11	Sierra Leone closes its borders with Liberia and Guinea and closes a number of schools around the country.
2014	June	12	Government of Sierra Leone (GoSL) declares a state of emergency in Kenema and Kailahun.
2014	July	2	Schools close.
2014	July	15	Ministry of Health of Sierra Leone establishes an Emergency Operations Centre (EOC) at the WHO Country Office in Freetown.
2014	August	1	Sierra Leone's President declares state of emergency and establishes a presidential task force.
2014	August	7	GoSL announces closure of nightclubs and cinemas, establishment of district level EOCs, prohibition of transport into EVD-affected areas.
2014	August	13	CDC laboratory established in Sierra Leone.
2014	August	15	US Chargé d'Affaires Kathleen FitzGibbon declares a disaster due to the effects of the EVD outbreak in Sierra Leone.
2014	Sept	8	UK announces plan to build EVD treatment center in Sierra Leone, and a month later reports it will send 750 troops to Sierra Leone.
2014	Sept	12	Cuban medical team heads for Sierra Leone.
2014	Sept	19	Nationwide lockdown from September 19 through 21.
2014	Sept	25	The GoSL places Bombali, Moyamba, and Port Loko districts—which have a total population of approximately 1.2 million people, according to international media—under quarantine. Government of China (GoC) delivers a second mobile laboratory to Sierra Leone.
2014	Sept	26	GoSL mobilizes nearly 200 volunteers to deliver EVD prevention messages in densely-populated areas of the capital city of Freetown, aiming to reach 500,000 people by early October.
2014	Oct	1	First curfews are imposed in Freetown.
2014	Oct	2	Government of Canada (GoC) sends a second mobile laboratory and two additional members of staff to Sierra Leone to increase EVD testing capacity. Public Health Agency of Canada places the laboratory in Kailahun, where Canadian staff assist with testing specimens from an 80-bed MSF ETU operating in Kailahun. The laboratory has the capacity to test 30 cases per day.
2014	Oct	4	Government of the UK delivers two ambulances, construction equipment, and supplies for a planned ETU and four additional vehicles to Sierra Leone.
2014	Oct	6	Burial teams in Sierra Leone refuse to work on Oct 7 due to a reported lack of hazard pay, according to international media.
2014	Oct	8	Sierra Leone's Deputy Health Minister states that the strike is over and media report witnessing burial teams removing bodies in the capital city of Freetown.
2014	Oct	12	The UK's International Development Secretary reports that the UK airlifted beds, PPE, tents, and 10 vehicles to Freetown, Sierra Leone, to support EVD response efforts. Aid flights from the UK to Sierra Leone deliver personnel and supplies for the construction and operation of a planned 92-bed ETU in Kerry Town, the first of at least five treatment facilities that the UK plans to build in Sierra Leone, according to the DFID. DFID previously announced the establishment of an NGO-managed Ebola Emergency Response Fund (DEERF) for Sierra Leone supporting actions to address gaps in the current EVD response via small grants to implementing partners. DFID also released a call for partners to staff, manage, and operate four new ETUs in Sierra Leone. Each of the four centers—planned for Freetown, Makeni, Port Loko, and Bo—has a planned capacity of 50–100 beds.

Year	Month	Date	Activity
2014	Oct	15	Representatives from CDC note that the number of EVD cases reported in Kenema and Kailahun—two of Sierra Leone's most-affected districts—declined in the prior four weeks. CDC assesses how the multiple EVD response efforts, such as ETUs, safe burial teams, and community mobilization activities, have contributed to the decreased caseload. CDC reports that surveillance in the districts of Western Area, Port Loko, Tonkolili, and Bombali has uncovered a considerable increase in EVD cases. CDC representatives note that controlling the EVD outbreak in urban areas may prove more difficult than controlling the spread in rural areas, due to population density and mobility.
2014	Oct	21	Riots break out in the Kono district in Sierra Leone to prevent the quarantine of a 90-year-old woman suspected of having EVD; youths are reportedly angry that there are no treatment centers in the diamond-rich Kono district. A daytime curfew is imposed
2014	Oct	26	EVD outbreak peaks in Sierra Leone.
2014	Nov	5	The DFID is reported to be providing three new laboratories and associated staff in Sierra Leone.
2014	Dec	17	Western Area Surge is officially launched in Sierra Leone. In partnership with WFP, UNDP, UNICEF, CDC, and others, the surge is intended to bring in urgently needed supplies and equipment, and also to ramp up community mobilization, surveillance, and contact tracing.
2015	Jan	8	In Sierra Leone, cases continue to be underreported and EVD is spreading rapidly in the western parts of the country, with capital Freetown reporting 93% of the new cases.
2015	Jan	19	The second phase of the Western Area Surge in Sierra Leone starts and will last until Feb 1, 2015.
2015	Jan	22	Sierra Leone cancels all internal quarantines, citing sharp drop in EVD transmission.
2015	Jan	23	Sierra Leone's President lifts movement restrictions.
2015	Feb	13	Sierra Leone announces that hundreds of homes in the capital have been placed under quarantine—about 700 homes—for 21 days.
2015	Feb	15	Launch of the 60-day "Zero Ebola" campaign in Sierra Leone, Guinea, Liberia, and Côte d'Ivoire, to last until April 16, 2015.
2015	Feb	18	Sierra Leone launches a door-to-door search for "hidden" EVD patients.
2015	Feb	25	In Sierra Leone, MSF announces that it will close its Ebola treatment center in Kailahun District to focus on other MSF centers that still have cases. The isolation unit will be handed over to the District Health Medical Team management, together with the case management responsibility.
2015	Feb	28	New cases across Sierra Leone prompt the government to reinstate the lifted ban.
2015	Mar	12	Sierra Leone's Ministry of Health and Sanitation reported 15 new cases and declares that new measures need to be put into place to contain the surges.
2015	Mar	27	Shutdown is scheduled to take place from March 27 through 29, 2015. Around six million people in Sierra Leone stay indoors on these dates as the country observes a shutdown to stop the spread of EVD.
2015	Mar	28	The President of Sierra Leone declares a reinforced health emergency for a period of 45 days in the west and southwest regions of the country to prevent the spread of the virus.
2015	Apr	1	Schools are reopened.
2015	Jun	12	Curfew is imposed in Port Loko and Kambia.
2015	Jun	16	In Sierra Leone, Operation Northern Push is launched. It is designed to identify, contain, and eradicate EVD from infected areas in the districts of Kambia and Port Loko.
2015	Sep	3	Vaccine trial for frontline workers underway.
2015	Nov	7	Sierra Leone is declared Ebola-free.
2015	Dec	4	USAID/OFDA partners with the IFRC to train volunteers in eight districts in safe and dignified burials and reaches nearly 1,700 people each week through door-to-door social mobilization campaigns. With USAID/OFDA support, IFRC is manages 49 safe burial teams, with 15 teams operating in Western Area (encompassing the capital city of Freetown).
2016	Jan	14	New case cluster is identified.
2016	Mar	17	Sierra Leone declared Ebola-free again.

Figure A–1. Key coordination events of UN, WHO, other international partners, by EVD cases and deaths (WHO estimates)*
Note" "Total Cases" reflects total reported cases



Total Deaths and sum of Total Cases for each United Nations/International Assistance Timeline broken down by WHO report date Year, WHO report date Quarter, WHO report date Month and WHO report date Day. The view is filtered on United Nations/International Assistance Timeline, which excludes Null.

Timeline Analysis of the EVD Outbreak

In Guinea, EVD is believed to have been first contracted by the human index case through zoonotic transmission in a small rural village called Meliandou, in Guékédou prefecture in late December, 2013. It spread undetected for three months. In March of 2014, it was reported that there was an unknown disease in circulation through Macenta and Guékédou prefectures, presumed to be Lassa Fever. From this point forward, EVD circulated through rural areas through common practices of traditional healing, informal healthcare, and kinship networks. The international community presumed that the disease outbreaks were highly localized and would be rapidly contained (WHO tweeted, "Ebola has always remained a localized event.").

This assumption under-estimated the intensity of migration and mobility across regional borders with Liberia and Sierra Leone, and between rural areas in Guinea's forest region and the capital city, Conakry. Regional and international efforts to contain the spread of EVD (e.g., MSF's establishment of ETUs in Guékédou and Conakry) fell short. These early failures facilitated transmission of EVD to Margibi County, Liberia in March 2014, Kailahun and Kenema Districts in Sierra Leone in May 2014, Lofa County, Liberia in June 2014, and more widespread transmission through Guinea, Liberia, and Sierra Leone thereafter.

OFDA allocated targeted defined resources to a narrow range of partner NGOs with the capacity to operate in Guinea. The primary function of OFDA actions was to fill gaps in the existing response, which was largely being administered by the government of Guinea and the WHO. These largely fell within the domains of additional social mobilization, ETU construction, and border surveillance capacities. OFDA funding pathways went to IPs rather than to overall response consortia. The reach and sophistication of OFDA interventions was very rough and limited. Baseline services such as IPC trainings, distribution of chlorine, and rough social mobilization campaigns were provided in Guinea, which paled in sophistication when compared to those introduced in Liberia.

In Liberia, OFDA engagement was more aggressive and sophisticated, even prior to the formal authorization of Congressional funding in November of 2014. There was an emphasis on building ETUs in response to case management needs (rather than prevention) early in the response, but the commensurate support for training and provision of burial teams and intensive investment in state-international-local coordination capacities are generally undervalued. Any misallocation of resources was being corrected by the first quarter of 2015, and resources were aggressively reallocated to survivor needs, with the establishment of several survivor clinics, the escalation of screening and IPC capacities at primary health care centers, community surveillance, contact tracing, and social mobilization. By mid-2015, it was increasingly difficult to differentiate which actors were responsible for which specific response interventions, as multiple actors were mainstreamed into a coordinated NGO response system. An additional benefit was that OFDA's donor capacities recognized the value of having WHO involved in both implementation and technical assistance/coordination, and a US $35 million grant to WHO in Q4 of 2014 helped advance a number of policy initiatives.

Liberia is notable for its rapid development of and engagement with a variety of novel surveillance systems policy initiatives, and health systems strengthening activities during the epidemic. It is not evident that the skills applied by OFDA partners in Liberia were easily or readily adapted to the other two most-affected countries.

In Sierra Leone, OFDA engagement was also late in coming, relative to the scale of Sierra Leone's epidemic response demands. The principal mode of support in Sierra Leone was through the provision of financial support to the major multilateral organizations (UNICEF, IOM) and direct support to known OFDA partners such as Medair, IMC, and Partners in Health. OFDA-funded projects in Sierra Leone were clustered in certain areas and sectors based on an understanding of gaps remaining after DFID's earlier awards.

Table A–6. OFDA-supported, USG-resourced interventions by country (calendar year and quarter)

Note: See Figure A–2 for color coding. Referenced documents do not show the continuation of coverage over time. Therefore, if an NGO is attributed to providing a service, that does not mean that another NGO ceased to provide that service, nor that the service was never provided by anyone other than the designated NGOs.

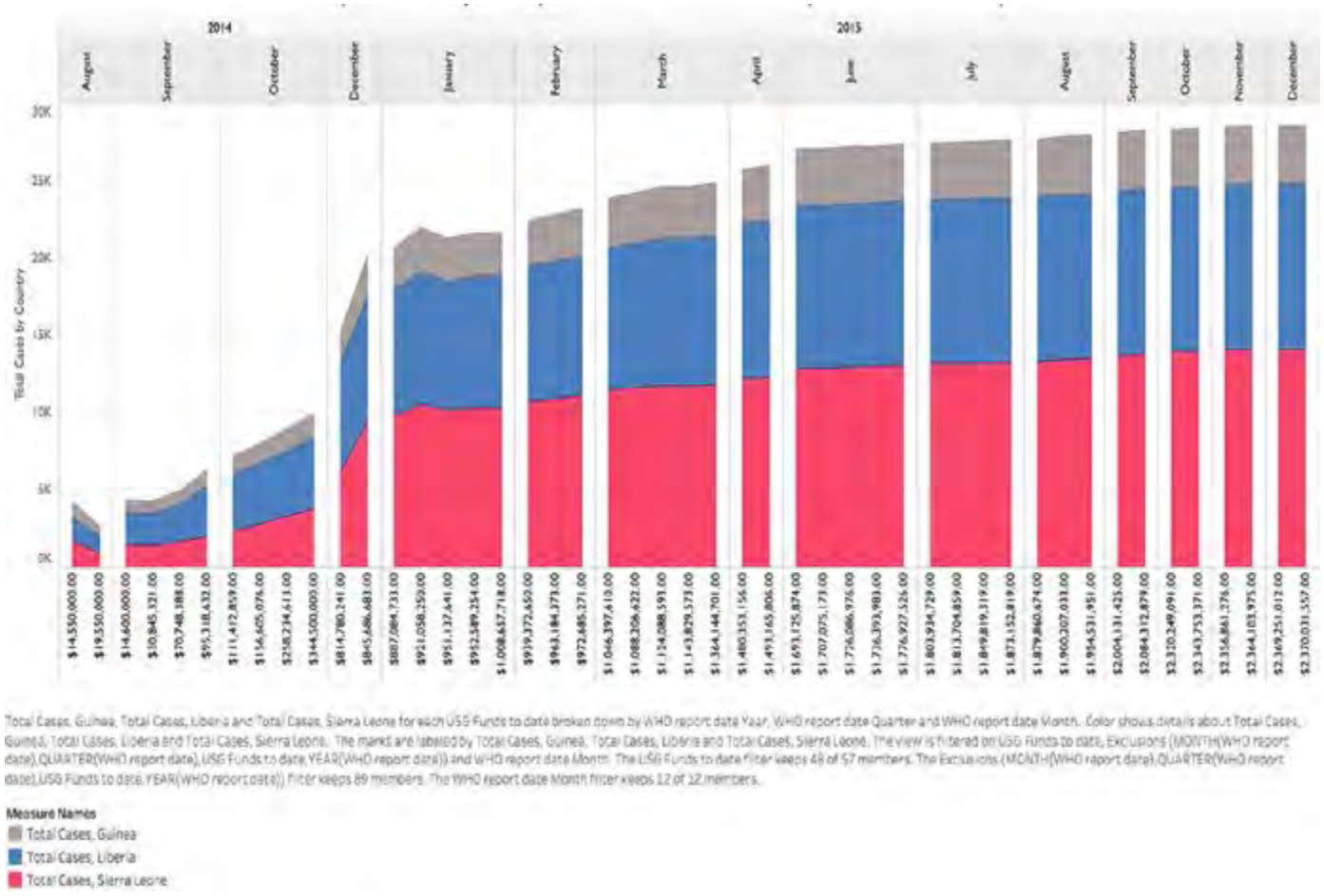
	Guinea	Liberia	Sierra Leone
Q3, 2014	Case investigation, contact tracing (Plan Int'l) Epidemiological investigation Public awareness/mass media (IFRC, CDC) Clinical case management Social mobilization (Plan Int'l)	USAID Salary Support to Liberia HCWs (USAID) Health messaging (HC3, GC) Support to country-level health teams (GC) Needs assessments (DOD) Outbreak response planning, nat'l and local (CDC) EVD training (GC) Response support (GC) Supply and distribution of gloves, water storage tanks, water treatment units, plastic sheeting, body bags (UNICEF) Supply and distribution of HH protection kits (OFDA) PPE distribution (DOD, WHO) Tent, PPE, cot, plastic sheeting supply and distribution (OFDA, DOD) Establishing ETUs (IMC, WHO) HCW/IPC training and surveillance (CDC, IRC, National IPC Taskforce) Social mobilization (GC) Case investigation, contact tracing (IRC, PCI) Procurement (IRC, PCI) Burial teams (GC, Liberian Red Cross) Airport entry and exit screening (CDC) Household-level protection (UNICEF) Public awareness/mass media (CDC) Response support/not specified (PCI, GC)	Public awareness/mass media (CDC) Funding for PPE procurement (OFDA) Funding for ETUs (OFDA) DART provides technical assistance to EOCs Airport entry and exit screening (CDC) Response support/not specified (SLRC) Needs assessments (WWH, FAO, GoSL)
Q4, 2014	Contact tracing (SC) Safe burial teams, vehicles (IFRC) Establishing ETUs (WFP, ALIMA) HCW/IPC training (JHPIEGO) PPE distribution Social mobilization (SC) Health surveillance efforts (SC) Border screening (IOM) Guinea landscaping mission (HC3) UNHAS Air support (WFP)	Tents, PPE, cots, plastic sheeting supplies and distribution (OFDA, DOD) Mobile laboratory (DOD, IMC) Case investigation, contact tracing (IRC, PCI, ACF) Building, operating ETUs (DOD, IMC, IOM, PCI, HHI, PiH) Burial teams (GC, Liberian Red Cross) Health messaging (HC3, ECN) Social mobilization (GC, IFRC, other OFDA partners) First EOCs built (DART, CDC, GoL) Rapid assessments, KAP studies (HC3) Psychosocial support (HHI, BRAC) Response support/not specified (HHI) Medical waste management (UNICEF) Water/sanitation activities (UNICEF) Community health volunteer training (HC3) Non-HC IPC training (JSI) Health messaging (CDC) Community Care Centers [CCCs] (Samaritan's Purse, SC) Interim Care Centers for Children Airport entry and exit screenings and trainings (CDC) Field epidemiology training program (CDC, African Union) IMS Support (IOM, IRC) UNHAS Air support (WFP)	Public awareness/mass media (IFRC) Support for safe burial teams, training and logistics (CDC, OFDA, DFID) ETU construction, operations (IMC) New burial teams (IFRC) Social mobilization campaigns (IFRC) Supply of PPE (OFDA) Supply of ambulances (OFDA) Establishment of DOD laboratory Support for UNICEF response efforts, including rapid response teams UNHAS Air support (WFP)

	Guinea	Liberia	Sierra Leone
Q1, 2015	HCW/IPC, PPE training (IOM) Community engagement (US Peace Corps, SC, FRC) Public awareness- mass media (InterNews) EOC equipment/supply deliveries (IOM, WFP) Chlorine supply, distribution (Guinea Central Pharmacy) Community transit centers (UNICEF, FRC) Building and opening ETUs (FRC) Converting CTCs to ETUs (FRC) Training community educators (Peace Corps-Gui) Youth training on EVD Prevention (Plan Int'l) New social mobilization guidelines (UNICEF) IT systems for health surveillance efforts (CDC, IOM–CEBS initiative) Targeted food distributions (WFP) Screening and referral (IMC) General response support activities (IMC) Delivery of relief items (UNICEF) Logistical support to EOCs (IOM)	New ETUs (PiH, Goal) Health messaging (HC3) Disease surveillance (ACF, IRC, MENTOR, WHO, CDC) IMS Support for EPR (IRC, 7 other partners) Support to non-EVD facilities (MTI, CDC) Transfer of national burial site (GC, MoH) Social mobilization, ToTs (Mercy Corps, PSI) IT systems for social mobilization (E-CAP) (Mercy Corps) Rapid assessments, KAP studies (HC3, Mercy Corps) Border areas trainings (Mercy Corps, PSI) Non-HC IPC training (JSI, MTI) Rapid response trainings (IOM) Helicopter service (IMC, OFDA) HCW and burial team IPC training (WHO, JHPIEGO) Rapid specimen transport (WHO) National fleet management (WHO) Planning for 15 EOCs to be built (DART, CDC, GoL) Decommissioning 3 ETUs (OFDA) HSS activities (triage and isolation in PHFs) (CRS) IPC materials distributions (WHO) Border trainings (CDC) Contingency plans for rainy seasons Epidemiological surveillance–CEBS (GC, IOM) Psychosocial support (HHI, BRAC)	Support for UNICEF to expand case management, mapping activities, referral system, database system Built ETUs, operations (Medair, IFRC) Built CCCs (PiH) Built holding centers (IFRC) HCW IPC training (IOM) Establishment of HCW training center (IMC) Non-HCF IPC training for households (IOM) Support for emergency response vehicle consortium (OFDA) DoD laboratory begins operations 4-day malaria campaign (UNICEF) Western Area Surge: Expansion of community engagement, surveillance strengthening, contact tracing (IFRC, IOM) 1st mobile training for HCWs (IOM) Targeted IPC materials distributions (Medair) Support for coordination–Ebola Response Consortium (IRC leads 8 NGOs in all districts) Assistance to quarantined households (Medair, Lifeline) Survivor conferences (UNICEF) Family reunification (UNICEF) Psychosocial support for survivors (UNICEF) Three-day stay at home period (all partners) Support to health messaging (HC3) Contingency plans for rainy seasons are developed

	Guinea	Liberia	Sierra Leone
Q2, 2015	Door-to-door visits, active case finding (CECI, Relief Intl) Building and opening new transit centers (UNICEF) Cross-border screening evaluations (ACF, IOM) Mapping exercises, sub-prefectural level (CDC) Safe burial teams (IFRC, GRC) Prefectural case finding operations Social mobilization (CECI) Active case finding Contact tracing (WHO) Triage unit (IMC) HCW/IPC, PPE training (IMC) Targeted food distributions (WFP) Contingency plans for rainy seasons	HCW training at ETUs (USPHS) Non-EVD HCF IPC training (JSI, MTI) IT training for social mobilization–E-CAP (Mercy Corps, PSI) Ebola survivor network mapping activity, support Health messaging (Samaritan's Purse) IPC materials distributions (Samaritan's Purse, JSI, GC) CCC operations (Samaritan's Purse) Support to county-level health teams (Samaritan's Purse, JSI) National and local disease surveillance (GC, ACF, IRC, MENTOR, WHO, CDC) Decommissioning of MMU, 5 ETUs Restoring healthcare facilities (IRC) Hygiene and sanitation at EVD-affected HCFs and schools (IRC) New case screening (IRC) Psychosocial support (IRC) HCW/IPC, PPE training (USPHS, JSI, PiH) Social mobilization, ECAP (Mercy Corps, 76 NGOs, MENTOR) Burial, disinfection teams (GC) Border trainings and surveillance (GC) Medical waste management (GC) Transition to post-EVD HSS Activities, burial plans (MENTOR, GC) Development of post-EVD national IPC policy (JHPIEGO, DART, CDC, IOM, other NGOs)	Rapid assessments (DART) Border assessment mission (IOM, CDC) Border screening (CDC, IOM) Conversion of holding centers to ETUs (IMC) Social mobilization (Christian Aid, CRS IOM, World Hope) Support for coordination–Ebola Response Consortium (IRC leads 8 NGOs in all districts) ERC works with communities to establish screening stations at PHUs ERC trains midwives, HCWs to conduct screenings IPC capacity improvement for SL hospitals (IRC) Qualitative studies (HC3) Chlorine supply, distribution (OFDA) Child protection services (UNICEF) Distribution of interim EVD care kits (Medair) Targeted house-to-house mobilizations and case finding campaigns (UNICEF) Ambulance sensitization project (CDC, Peace Corps, DFID, WHO) Community dialogue fora to address case hiding (Christian Aid) Operation Northern Push: Initiation of direct HH cash transfers (SC, others) Psychosocial support (IMC) Assistance to quarantined households (Medair, Lifeline, IMC) Vaccine campaigns initiated (UNICEF)
Q3, 2015	Awareness raising: Burial procedures (IFRC) Local EVD supervisor training (HKI) Social mobilization (CECI, UNICEF, CDC) Border screening (IOM) Logistical support to EOCs (IOM) IT systems for IPC supervision (DART/OCHA) HCW/IPC training (CRS) IPC materials distributions (CRS, Premiere Urgence) Water/sanitation activities (CRS) HSS activities (triage and isolation in PHFs) (Premiere Urgence)	Escalation of order surveillance Escalation of social mobilization Increased contact tracing coordination CHTs have taken over contact tracing and case management, with support (IMC, CDC, WHO, UNICEF, SC) Men's health/EVD screening program (CDC, WHO) Continued support of contact tracing, case investigation, social mobilization campaigns, safe burials, and surveillance and monitoring by all response actors IRC receives continued funding for NGO consortium leadership. Planned transition of EVD assets to government of Liberia (GoL) Rollout of GoL HCW Safe and Quality Services (SQS) training Continued decommissioning of ETUs, transfer of decontaminated ETU and assets to CHTs Continued border surveillance 4th EVD survivor clinic opens Livelihood recovery support provided Continued Integrated Disease Surveillance response (IDSR) systems trainings, including CEBS and sample collection guidance Reinforcement of IPC protocols at non-EVD health facilities	

	Guinea	Liberia	Sierra Leone
Q4, 2015	Border screening: Sierra Leone (IOM) HCW/IPC training (WAHA, CRS, WHO, JHPIEGO) HSS training (WAHA) IPC materials distributions (DRC, CRS) EVD prevention, early warning systems (DRC) Water/sanitation activities (DRC) Small clinic–EVD detection and response (DART) Small clinic–IPC training (CRS) Resolving PPE problems (DART)	Continued response coordination between RRTs and CHTs Continued support of RITE strategies Training of EHTs (GC) Continued decommissioning of ETUs, transfer of decontaminated ETU and assets to CHTs Continued provision of EVD survivor care at designated clinics Operation of mobile health clinics for survivors (IOM) Continued social mobilization trainings Continued assessment of IPC protocols	
Q1, 2016	Epidemiological surveillance–CEBS (IOM, ACH-Spain, IMC) Implementation of Ring IPC approach Reinforcement of IPC protocols at health facilities Residual response and rapid response capacities (IMC) Cross-border surveillance (IOM)	National epidemic prevention and response consortium Countrywide rollout of event surveillance eDEWS system Continued border screening (IOM)	

Figure A–2. EVD reported cases by country, cross-referenced with USG expenditures for EVD response



Summary

From the period of late August through mid-September 2014, there was a lack of adequate data to assess the rate of change in the number of cases. By October 2014, percent increases in total cases and deaths across the region were accelerating rapidly and funding was unable to keep pace with demand. The timeline analysis suggests that growth in EVD-related expenditures by the USG had no statistical association with the rate of increase in the number of EVD-related cases or the number of EVD-related deaths. However, epidemiological data about cases and deaths from this time period is unreliable.

Additional implications of this analysis are that existing resources available in the region, short-term shifts in resources from existing programs, and the smaller distributions of funds prior to the major infusion of resources resulted in a response unable to keep pace with demands. It also suggests (although this requires further validation) that the tipping point in the relationship between funding and program implementation occurred in late November or early in December of 2014. Prior to this time, it is likely that programs were unable to keep pace with demand for resources. After this time, the majority of funds were likely allocated to the continued maintenance of programs created during this time period (and in the three months afterwards), and reinforced existing response programmatic priorities.

ANNEX B. SCOPE OF WORK

EVALUATION SCOPE OF WORK [SECTION C: STATEMENT OF WORK]

C.1 Purpose

USAID/OFDA seeks to award a contract to evaluate the relevance, coordination, timeliness, and effectiveness of its response to the Ebola Virus Disease (EVD) outbreak in West Africa. The aim of this evaluation is to improve the United States government's (USG) understanding of the performance of its response to the EVD outbreak in Guinea, Liberia and Sierra Leone. The evaluation will provide information for future USG large-scale public health responses to infectious disease outbreaks. The evaluation will help identify the role that OFDA should play within large-scale public health responses. The evaluation will focus on the EVD response in Liberia, Guinea and Sierra Leone.

C.2 Background

According to UN officials, the West African EVD outbreak began in December 2013 in southeastern Guinea, before spreading to the neighboring countries of Liberia and Sierra Leone. Misinformation and lack of awareness among the public regarding EVD transmission modes, combined with inadequate health care facilities and lack of health staff trained in EVD response techniques, allowed EVD to spread rapidly—resulting in more than 15,200 total confirmed cases as of December 30, 2015.

In April of 2014, OFDA provided funding to the United Nations Children's Fund (UNICEF) to respond to the EVD outbreak and then, from July 2014 onward, deployed a Health Advisor to the region to monitor the situation. On August 5, 2014, the USG deployed a Disaster Assistance Response Team (DART)—a team that over the course of the response included disaster response and public health experts from OFDA, the US Department of Defense, the Centers for Disease Control and Prevention (CDC), the National Institutes of Health (NIH), and the US Public Health Service (PHS)—to the region to assist host country governments in containing the EVD outbreak. The USG created a corresponding Response Management Team (RMT) to support the DART and enhance coordination efforts.

During more than (14) fourteen months of operation, the DART coordinated the USG's $2.4 billion response to the EVD outbreak in West Africa through USG support for health and humanitarian coordination, case management, surveillance and epidemiology, restoration of essential health services through infection prevention and control measures, social mobilization and communications, and logistics activities. OFDA funded over $772 million in programs in response to the outbreak. Following the steady decrease in the EVD caseload to no active cases in late 2015, as well as strengthened in-country capacity for rapid response to new outbreaks, the DART and RMT deactivated on January 4, 2016.

C.3 Background: Programs to be Evaluated

This performance evaluation will focus on programs funded between March 1, 2014 and January 4, 2016 and actions taken under pillar one of the EVD response: controlling the outbreak.

OFDA's programming for the EVD outbreak response in West Africa in fiscal years (FYs) 2014 and 2015 was focused on the first pillar of the response, controlling the outbreak. In FY2016, OFDA continued to support the first pillar of the response with programs that focused on maintaining a residual capacity to respond to future EVD cases.

C.3.1 Goal, Objectives and Theory of Change

The goal of the first pillar of the USG's response to the EVD outbreak in West Africa initially was to control the outbreak by reducing the rate of transmission in the affected countries.

The theories of change (ToCs) behind this response were multifaceted, but all were designed to reduce the spread of the disease. Guiding the response overall were two principles of disease control: effective isolation of EVD cases and safe burials of those who died were required to decrease transmission and bring the outbreak under control; and simultaneously, massive education and outreach was required to increase population-wide understanding of the disease, how to recognize it, how to prevent transmission, and the importance of modifying behaviors that increase risk. Within these two general guiding principles, OFDA programming on the EVD response was informed by technical guidance, the experience of Médecins sans

Frontières (MSF), World Health Organization (WHO), and the CDC in responding to prior outbreaks and the application of public health principles to control the spread of a communicable disease through direct intervention and public outreach.

Some of the guidance that shaped the response included that:

1. access to relatively better quality care in ETUs would encourage people with symptoms of EVD and their caretakers to present for care;
2. tracing the contacts of infected individuals, coupled with active case finding, would allow identification of EVD patients early in their infectious period and limit opportunities for onward transmission;
3. providing safe and culturally appropriate burials would reduce transmission of EVD by reducing the number of people infected through the handling of dead bodies;
4. community-based social mobilization efforts and education to health care providers on case definition and infection prevention and control (IPC) would encourage the widespread adoption of behaviors that would limit the spread of EVD, slowing the rate of transmission;
5. community-based surveillance of potential cases of EVD would identify EVD patients early on and limit opportunities for transmission;
6. command and control support would enable national actors to make better-informed decisions in the face of the EVD outbreak and have those decisions quickly implemented by international actors in the EVD response;
7. logistics support would enable both national health structures and Ebola response actors to respond more quickly to the EVD outbreak by supplying them with the necessary medical equipment to implement IPC measures—especially through the provision of personal protective equipment (PPE)—and by creating a lab referral network to confirm and identify EVD cases;
8. strengthening infection prevention and control measures at health facilities in EVD-affected countries would ensure that EVD cases were identified for isolation and that primary health care would be able to continue during the outbreak due to the triage, safe referrals, and transport to isolation facilities of suspected EVD cases.

C.3.2 Existing performance data

The evaluation team will have access to OFDA implementing partners' (IPs') regular quarterly reporting and award agreements. The quarterly reporting should include data on outputs accomplished by the IP in line with the indicators referenced in OFDA Standard Indicators (attachment J.4). Some OFDA partners have reported some outcome-level indicators on their programs, but the data available is often for a very limited geographic zone—for example one county in Liberia—or collected with a less-than-statistically relevant sample. Additionally, a small number of OFDA's IPs will have completed project-level evaluations that would be of use to the evaluation team. The scope of these evaluations, however, remains at the project level and are not necessarily sufficient to be extrapolated out to the overall Ebola response in West Africa.

C.4 The Evaluation

C.4.1 Purpose and Use

The purpose of this evaluation is to improve the United States government's (USG) understanding of the performance of its response to the EVD outbreak in Guinea, Liberia, and Sierra Leone. The evaluation will focus on the effectiveness and relevance of the USG's response to the outbreak, as well as OFDA's role in coordinating the USG's international response.

OFDA intends to use the results from this evaluation to inform future USG large-scale public health responses in general and infectious disease outbreaks in particular, as well as to define the role that OFDA should play within large-scale public health responses. OFDA invested more than $700 million in responding to the EVD outbreak in West Africa in FY15, making it OFDA's largest humanitarian response in a single fiscal year. As a result, OFDA wants to ensure that the lessons learned in this response are evaluated, recorded, and capitalized upon for future responses.

C.4.2 Evaluation Objectives and Questions

This evaluation has four complementary objectives relating to the overall effectiveness, effectiveness of different programmatic components, relevance, and coordination of OFDA's response to the EVD outbreak. Each objective has multiple evaluation questions that the evaluation must answer. Data must be collected for all evaluation questions in Liberia, Sierra Leone, and Guinea.

Each of the four objectives of this evaluation should be considered as separate lines of effort within the same task order. In other words, each objective will have its own Evaluation Report deliverable. Details of the deliverables expected for each objective of the evaluation can be found in Section C.5.

OFDA does not regard these evaluation questions as final and could modify the evaluation questions through the design phase of the evaluation through conversations with the evaluation team. The evaluation questions will be considered final in the approved version of the inception report deliverable of this contract. While exact wording of evaluation questions could be modified through the design phase, the objectives of the evaluation and its intent and focus will not change.

Effectiveness of the Response:

1. 1. To what extent did OFDA-supported activities achieve their intended objectives? Why or why not?
2. 2. Which USG-funded activities, or combination of activities, if any, made the most significant contribution to controlling the EVD outbreak in West Africa?
3. 3. Many activities were designed to address one aspect of a set of interrelated control measures; how well did each activity fit within the overall response and contribute to controlling the outbreak?

Effectiveness of Programmatic Components:

4. 4. OFDA funded several different types of programs: case management, surveillance and contact tracing, social mobilization, safe burials, infection prevention and control, and command and control. What were the determining factors that contributed to the success or failure of each of the different types of programs?

Relevance:

5. 5. Did OFDA correctly prioritize and weight the most relevant activities over the course of the response to the outbreak in relation to the outbreak's changing epidemiology?
6. 6. Were OFDA funding mechanisms and in-kind support appropriate to respond to the EVD outbreak in a timely and targeted manner in affected areas?
7. 7. To what extent did attempting to adhere to technical "gold standards" affect the timeliness and quality of the response?

Coordination:

8. 8. How effectively did OFDA coordinate all USG efforts as the lead agency in this response?
9. 9. To what extent were the activities supported by the USG well-coordinated with the broader international and national response structures and well-coordinated operationally between organizations that the USG funded?
10. 10. How well did OFDA adjust to the changing epidemiology and priorities of the international response?

C.4.3 Evaluation Type

This evaluation is a summative evaluation. OFDA selected this evaluation type because this evaluation seeks to draw conclusions about a strategy and a set of activities that are completed. The evaluation will inform future iterations of this type of response; the evaluation will not inform mid-course corrections.

C.4.4 Evaluation Approach

This evaluation must be designed using an iterative approach, in which the evaluation will be designed through extensive consultation with OFDA, notably during feedback and discussions surrounding the inception report (C.5.4) and evaluation plan (C.5.5) deliverables.

The evaluators can use either a utilization-focused approach or a developmental evaluation approach to this evaluation. The specific approach will be proposed and approved through the inception report deliverable. The reason OFDA is considering a utilization-focused approach is because it's critical that the results and deliverables are precisely useful to the users of the evaluation. It is very important that this evaluation be conducted in a way that will help users make decisions and take actions based on the results of this work. OFDA is considering a developmental evaluation approach to this evaluation to examine a complex response that evolved organically and continues to adapt to the changing context in the region.

The evaluation will also focus on systems thinking and the interrelation of the different elements of the response.

The evaluation will be designed to ensure that the findings from the evaluation can directly inform future OFDA responses to large-scale infectious disease outbreaks. The evaluation team will need to tailor the evaluation approach to the specific context of each country in the geographic scope and analyze findings accordingly. The evaluation, however, must be designed to allow readers to draw comparisons across the three countries involved in the response.

C.4.5 Evaluation Audience

The intended users of this evaluation will include the OFDA Director and Senior Management Team, senior managers, program managers, and public health advisors.

This evaluation will be available to OFDA staff, as well as key stakeholders of the USG's response to large-scale infectious disease outbreaks within the CDC and USAID's Bureau for Global Health. The evaluation report will be available to the public on USAID's Development Experience Clearinghouse at https://dec.usaid.gov.

C.4.6 Evaluation Methods & Data Sources

GENERAL GUIDANCE

This evaluation must employ mixed methods: both qualitative and quantitative methods are required. Primary data must form the majority of the data collected for this evaluation; secondary data review alone will not suffice to inform the deliverables for this evaluation. The evaluation must use primary data collected

in Liberia, Guinea, and Sierra Leone to inform responses to the evaluation questions.

Any quantitative data collection that takes place as part of this evaluation must include a representative sample of the survey population and must use rigorous methods for data collection and analysis. The survey populations for any large-scale survey will be defined by country—not as an aggregate across all three—resulting in three separate surveys. The data must be representative at a sub-national level, though the exact level of representation will be determined during the design stage of the evaluation. OFDA prefers to have data with a less than 5% margin of error and more than 95% confidence level. However, the exact parameters of the survey design will be determined during the initial stages of the evaluation process. OFDA does not expect a simple random sample to be possible in this context. However, the contractor must propose other probability sample designs that are rigorous and representative.

If less rigorous quantitative methods are needed, the Contractor must submit a justification to the Contracting Officer's Representative (COR) for review and approval during the design process after the award of contract. Only after the COR has approved the less rigorous quantitative methods may they be used by the Contractor.

In the selection of methods, the contractor must include ethical considerations, do no harm precautions, and informed consent.

SPECIFIC METHODS

The exact methods to be used in this evaluation will be determined through the submission and acceptance of the Inception Report and Evaluation Plan deliverables. However, OFDA requires the set of methods described in the rest of this section to be used for certain evaluation questions. If, through the design process, the evaluation team finds that these methods are not suitable for responding to the identified evaluation questions, the Contractor must provide a clear justification. Changes to these methods requirements are subject to the review and approval of the COR. It is critical to note that for all evaluation questions, the Contractor must produce findings and conclusions for each country separately to allow users of the evaluation to compare between the three countries, as well as produce findings and conclusions for the response as a whole.

- *Which USG-funded activities, or combination of activities, if any, made the most significant contribution to controlling the EVD outbreak in West Africa?*
- *To what extent did OFDA-supported activities achieve their intended objectives? Why or why not?*

The evaluation questions stated above are the most critical questions that this evaluation will answer. The Contractor must use a creative evaluation design and a collection of complementary methods to respond to these questions in a comprehensive manner.

Quantitative methods, such as a large-scale survey with a representative sample, must be used to answer the evaluation questions above. In the first evaluation question stated above, OFDA recognizes that attribution between a set of activities and the reduction in EVD transmission is not possible to measure in this context. However, methods for this evaluation question specifically must be designed so that OFDA can understand the contribution that a set of activities made to the reduction in transmission. In addition to the quantitative methods that the evaluation team must use to answer this question, the Contractor is also required to use qualitative methods to supplement the quantitative data. Individual interviews, focus groups, document review, and secondary data analysis are required, but the Contractor may use additional qualitative methods as well.

- *OFDA funded several different types of programs: case management, surveillance and contact tracing, social mobilization, safe burials, infection prevention and control, and command and control. What were the determining factors that contributed to the success or failure of each of the different types of programs?*

Methods to respond to this evaluation question must be qualitative and quantitative. These types of questions lend themselves to qualitative inquiry—thus, individual interviews, focus groups, and document review will formulate the majority of the data collected for this question. However, OFDA seeks to understand not only the context of the determining factors contributing to success and failure, but also the scale and depth of these factors in all three countries. To that end, the contractor must use quantitative methods to respond to this evaluation question.

Additionally for the evaluation question listed above, the Contractor must look at the causes of variance in success of each component between the three different countries involved in the response—Liberia, Guinea, and Sierra Leone.

- *Many activities were designed to address one aspect of a set of interrelated control measures; how well did each activity fit within the overall response and contribute to controlling the outbreak?*
- *Did OFDA correctly prioritize and weight the most relevant activities over the course of the response to the outbreak in relation to the outbreak's changing epidemiology?*
- *To what extent did attempting to adhere to technical "gold standards" affect the timeliness and quality of the response?*
- *How effectively did OFDA coordinate all USG efforts as the lead agency in this response?*

- *Were OFDA funding mechanisms and in-kind support appropriate to respond to the EVD outbreak in a timely and targeted manner in affected areas?*
- *To what extent were the activities supported by the USG well-coordinated with the broader international response, national response structures and well-coordinated operationally between organizations that the USG funded?*
- *How well did OFDA adjust to the changing epidemiology and priorities of the international response?*

Many of the evaluation questions above relate to the quality of coordination and the coherence of the strategy. The questions lend themselves to measuring perceptions of quality. OFDA is interested in perceptions, but this type of data cannot be the only type of data gathered to respond to the above evaluation questions. The Contractor is required to develop indicators to measure real quality and effectiveness, instead of only perceptions of quality and effectiveness.

To answer these questions, the Contractor must employ both qualitative and quantitative methods.

POST-TRAUMATIC STRESS AND DO NO HARM

In all methods designed and carried out as part of this evaluation, the Contractor must employ do no harm principles. Most of the respondents in this evaluation have experienced a significant amount of post- traumatic stress. EVD survivors were most likely traumatized by their battle with the disease; thousands of people in Liberia, Sierra Leone, and Guinea have lost family members, friends, colleagues, or acquaintances to EVD; and national and international staff members of INGOs, PIOs, and the USG responding to the emergency experienced fright and extreme levels of stress throughout the response. The evaluators must use methods and data collection protocols that do not re-traumatize respondents and respect the fact that most respondents experienced significant amounts of post-traumatic stress throughout this emergency. It is essential that Contractors keep respondents anonymous, keep data coded and stored in a way that respects confidentiality of respondents, and that clear informed consent is granted at the beginning of every interview that contributes data to this evaluation. Particular protocols must be developed to ensure the protection of children, women, and any vulnerable group of respondents in this evaluation. Above all, this evaluation must do no harm to anyone involved in it.

DATA SOURCES

It is critical that the evaluation team interview the most relevant respondents for each of the evaluation questions. While each evaluation question will have a different set of respondents deemed to be most relevant, the evaluation team must collect data from the following groups of individuals, (contingent upon the receipt of informed consent):

1. 1. EVD survivors
2. 2. Community leaders of affected communities
3. 3. Families of EVD survivors
4. 4. Families of those deceased from EVD
5. 5. Health care workers
6. 6. Government officials
7. 7. Youth leaders
8. 8. National staff from INGOs and PIOs responding to the emergency
9. 9. International staff from INGOs and PIOs responding the emergency
10. 10. USG staff involved in the response
11. 11. The general population of Liberia, Sierra Leone, and Guinea (for the purposes of large scale surveys)

This list of respondents may include individuals who have departed the affected countries, who no longer work on the EVD response, or who no longer work for the organizations that employed them during the response. As such, the evaluation team must find an appropriate number of these individuals to interview. In other cases, people living in the affected countries may or not may not live in the same communities they lived in during the outbreak. The evaluation team must try to find key respondents in the affected countries who may have moved from their communities.

C.4.7 Limitations

The evaluation team may only have limited access to data from USG agencies other than OFDA. Additionally, case management data from the outbreak may not be complete or in a data-readable format, which will present difficulties for the evaluation team. Baseline data, performance monitoring data, and evaluation data may be incomplete or missing for many of the OFDA awards.

The data collection phase of this evaluation will take place after most the international staff involvement in the height of the response have left the countries. It is imperative that the evaluation find an appropriate number of staff members who would be useful respondents. This exercise will be a challenge, but it is important to the quality of the evaluation results.

C.4.8 Geographic Scope

The geographic scope of this evaluation is Liberia, Guinea, Sierra Leone, Senegal, Mali, Ghana, Guinea Bissau, the United

Kingdom, Switzerland, Sweden, Germany, Belgium, France, and the United States. Primary data collection for this evaluation—and thus travel for relevant members of the evaluation team—must occur in Liberia, Guinea, and Sierra Leone. Travel to Senegal, Mali, Ghana, Guinea Bissau, the United Kingdom, Switzerland, Sweden, Germany, Belgium, and France is allowable under this contract, but not necessarily required. Travel to these countries will be allowable only if the evaluation plan deliverable demonstrates a clear need. The evaluators must also prepare to interview respondents via the telephone or internet-enabled communication in countries outside of the aforementioned countries.

The Contractor is responsible for accessing the countries contained in the geographic scope of this contract and regions within the countries within the geographic scope of this contract. The exact locations of international and regional travel will be determined by the Evaluation Plan deliverable in this contract.

C.4.9 Programming Period Covered by Evaluation

This evaluation will cover the USG response to the EVD Outbreak in West Africa from March 1, 2014 to January 4, 2016.

C.4.10 Period of Performance of the Evaluation

This evaluation must be carried out under an agreed-upon schedule of work, determined through the work plan. The period of performance of this contract is twelve (12) months.

C.5 Deliverables

Deliverable	Contract Reference	Due date
Post-Award Conference Call	C.5.1	NLT 7 days after Effective Date of Contract
Work Plan	C.5.2	NLT 14 days after Effective Date of Contract
Kick-Off Meeting	C.5.3	NLT 21 days after Effective Date of Contract
Branding and Marking and Implementation Plan	M.4	NLT 30 days after Effective Date of Contract
Inception Report	C.5.4	To be determined in the work plan
Inception Report Presentation	C.5.5	To be determined in the work plan
Evaluation Plan	C.5.6	To be determined in the work plan
Evaluation Plan Presentation	C.5.7	To be determined in the work plan
Data Collection Tools	C.5.8	To be determined in the work plan
Monthly Progress Reports and Calls	C.5.9	To be determined in the work plan
Individual Evaluation Reports	C.5.10	To be determined in the work plan
Synopsis of the Evaluation	C.5.11	To be determined in the work plan
Presentation of Evaluation Reports	C.5.12	To be determined in the work plan
Electronic Copies of Raw Data	C.5.13	To be determined in the work plan

C.5.1 Post-Award Conference Call

A teleconference call must be conducted with the Contractor and OFDA to finalize the kick/off meeting agenda and clarify all aspects of the contract's requirements, including those of key deliverables. The post-award conference call must occur no later than seven (7) days after the effective date of the contract.

C.5.2 Work plan

The contractor must submit a work plan that includes the following elements:

- A schedule for the completion of all of the deliverables listed in this contract, with due dates mentioning a specific calendar date
- An explanation of the roles and responsibilities of the contractor's team members
- A communication plan explaining the points of contact between OFDA, the Contractor, and IPs

The Contractor must submit the work plan no later than fourteen (14) days after the effective date of the contract.

C.5.3 Kick-off Meeting

A kick-off meeting must be held in Washington, D.C. to review the work plan and discuss other deliverables of the contract. At a minimum, all key personnel listed in this task order must participate the kick-off meeting. Participants may join in person

or via the telephone or internet-enabled communication.

The kick-off meeting must take place no later than twenty-one (21) days after the effective date of the contract.

C.5.4 Inception Report

Based on the kick-off meeting and desk review, the Contractor must prepare an inception report that outlines how the evaluation will be conducted. The report must outline a clear methodological approach to addressing the evaluation questions in Section C.4.2. The intent of the inception report to assist OFDA in reaching a final list of evaluation questions through a clear presentation of relevant research, proposed methods, limitations of the proposed methods, alternative evaluation questions, and trade-offs of each of the alternatives.

At a minimum, the following sections must be included in the inception report, though other sections could be added:

- Introduction
  - State the purpose and objective of the evaluation
  - Describe the collection of programs to be evaluated
  - Presentation of findings and data from desk review
- Evaluation Framework
  - Conceptual framework for the evaluation
  - Theory of change
  - Key indicators
- Stakeholder Analysis
  - Identification of different levels of stakeholders in the Ebola Response
  - Discussion of plans to ensure utilization-focused approach in evaluation design
- Methodological Design of the Evaluation
  - Data Collection: Methods summary
  - Data Analysis: Methods summary
  - How the methodological design of the evaluation will ensure the evaluation questions are answered appropriately
  - Limitations
  - Context analysis
  - Gender Considerations
- Updated Work Plan

The deadline for this deliverable will be determined in the work plan.

C.5.5 Inception Report Presentation

The Contractor must deliver an in-person presentation of the inception report to OFDA in Washington, DC. The presentation should outline all the main elements of the inception report and provide a forum for key USG stakeholders to ask questions about the inception report and discuss key points.

The deadline for the presentation must be determined in the work plan.

C.5.6 Evaluation Plan

The Contractor must submit an evaluation plan that explains the data collection processes, considerations, and plans for the evaluation. The evaluation plan deliverable must include at a minimum four sections: (1) table format that outlines the proposed methods for each indicator in the evaluation; (2) design matrix for the evaluation that links each evaluation method to a specific evaluation question; (3) detailed description of the protocols for qualitative and quantitative data collection; and (4) data verification plan.

SECTION ONE:

In a Microsoft Excel spreadsheet, the Contractor must detail the data collection methods for each indicator in the evaluation. Specifically, this table must include the following information for each of the indicators associated with every evaluation question in this scope of work.

- Indicators (a list of all indicators created for each evaluation question)
- Precise definitions of indicators
- Data collection methods
- Data sources
- Location of data sources
- Timing of data collection
- Seasonal, political, and gender considerations
- Data analysis: disaggregation and comparison plans
- Time required

SECTION TWO:

The evaluation's design matrix should be composed of a table, drafted in either Microsoft Word or Excel, that lists all of the evaluation's questions and for each provides the following information:

- Evaluation question
- Data source
- Data collection method (including sampling methodology, where applicable)
- Data analysis method

SECTION THREE:

In a narrative Microsoft Word document, the Contractor must detail information related to the following topics and questions:

- **Qualitative protocol:** What procedures must the contractor follow to ensure the data collected through qualitative methods is collected in a systematic and ethical manner?
- **Quantitative protocol:** What procedures must the contractor follow to ensure data collected through quantitative methods is collected in a representative, systematic, and ethical manner?
- **Qualitative design:** Detail the following for the qualitative methods in the evaluation:
  - Focus group participant selection strategy
  - Focus group discussion strategy for replication and triangulation of findings
  - Limitations
  - Case study triangulation of findings strategy
  - Self-assessment strategy
  - Plans to tailor design to specific context during mobilization
- **Quantitative design:** Detail the following for the quantitative methods in the evaluation:
  - Population
  - Sampling frame
  - Sample size
  - Sampling strategy
  - Limitations
  - Plans to tailor design to specific context during mobilization
- Explanation of plans for travel and logistical arrangements for field work
- Explanation of plans for enumerator training
- Describe how seasonal, political, and conflict factors will be anticipated and addressed in the evaluations.
- Describe any protection, do no harm, and gender considerations for the evaluations, with a particular attention to do no harm considerations for Ebola survivors.

SECTION FOUR:

In a narrative Microsoft Word document, the Contractor must address the following issues related to data verification protocols for the evaluation:

- Describe the overall data verification strategy, including procedures and processes the Contractor will use to ensure the data was:
  - collected in the intended manner;
  - collected by the intended enumerator;
  - collected at the intended location;
  - collected with the intended respondent.
- Describe the process that the Contractor will follow should it discover any data was falsified or otherwise collected in a manner inconsistent with Sections 1 and 2 of the evaluation plan.

The deadline for this deliverable must be determined in the work plan.

C.5.7 Evaluation Plan Presentation

The Contractor must deliver an in-person presentation of the evaluation plan deliverable to OFDA in Washington, DC. The presentation should outline all the main elements of the evaluation plan and provide a forum for key USG stakeholders to ask questions about the evaluation plan and discuss key points of the evaluation's design.

The deadline for the presentation must be determined in the work plan.

C.5.8 Data Collection Tools

The Contractor must submit the survey tools, key informant interview guides, self-assessment guides, case study guides, focus group discussion guides, and any other data collection tools that will be used during this evaluation. The Contractor must also present plans to translate the data collection tools, tailor the questions for the three different contexts, and train enumerators on gender-sensitive approaches to interviewing women.

The deadline for these deliverables must be determined in the work plan.

C.5.9 Monthly Progress Reports and Conference Call

The Contractor must submit a report each month during the contract summarizing progress to date on deliverables and staff movements. A minimum of nine progress reports must be submitted and they must be submitted at roughly one month intervals. The Contractor must organize a monthly teleconference with USAID/OFDA to discuss the monthly report and progress made on the contract's deliverables.

This monthly report must be no longer than three pages and include the proposed agenda items for the monthly teleconference. The deadline for these deliverables must be determined in the work plan.

C.5.10 Evaluation Reports

The evaluation report must present findings for each of the evaluation questions, in accordance with section C.3 and C.4 of this task order. Since the evaluation is composed of four complementary objectives, the contractor must submit four separate evaluation reports each focused on one objective of the evaluation.

Each evaluation report must contain at a minimum the following sections:

1. Executive summary (no more than one page)
2. Introduction
3. Methodology
4. Limitations
5. Overall Results
6. Results by Country (Guinea, Liberia and Sierra Leone)
7. Analysis and Conclusions
8. Recommendations
9. Annexes
    - i. Annexes
    - ii. Scope of Work
    - iii. Survey Instruments
    - iv. Focus Group Discussion Guides
    - v. Map of Locations Evaluated

Each evaluation report must meet the following standards set out in the USAID Evaluation Policy (2011):

1. The evaluation report should represent a thoughtful, well-researched, and well-organized effort to objectively evaluate what worked, what did not, and why.
2. Evaluation reports must address all evaluation questions included in the Scope of Work.
3. The evaluation report should include the Scope of Work as an annex. All modifications to the Scope of Work, whether technical requirement, evaluation questions, evaluation team composition, methodology, or timeline need to be agreed upon in writing by the technical officer.
4. Evaluation methodology must be explained in detail and all tools used in conducting the evaluation, such as questionnaires, checklists, and discussion guides, must be included in an annex in the final report.
5. Evaluation findings must assess outcomes on males and females.
6. Limitations to the evaluation must be disclosed in the report, with particular attention to the limitations associated with the evaluation methodology (selection bias, unobservable difference between comparison groups, etc.).
7. Evaluation findings should be presented as analyzed facts, evidence and data and not based on anecdotes, hearsay, or the compilation of people's opinions. Findings should be specific, concise, and supported by strong quantitative or qualitative evidence.
8. Sources of information need to be properly identified and listed in an annex.
9. Recommendations need to be supported by a specific set of findings.
10. Recommendations should be action oriented, practical, and specific, with defined responsibility for the action.

In addition to the basic requirements stated in the above list, OFDA uses the following checklist to review the quality of evaluation reports: http://usaidlearninglab.org/sites/default/files/resource/files/mod11_checklist_for_assessing_evaluation_reports.pdf.

Most of the standards identified in this list are applicable to OFDA evaluations. However, some of them are not. Before drafting the report, the Contractor must confirm with OFDA which standards from the checklist are applicable to OFDA evaluations and must ensure that the evaluation report meets those identified standards.

The deadline for this deliverable must be determined in the work plan.

C.5.11 Synopsis of the Evaluation

The Contractor must submit a short synopsis of no more than ten pages that summarizes the results, conclusions and recommendations of the four evaluation reports in Section C.5.10 in one succinct document. This document should be designed for consumption by the senior management of USAID and the wider U.S. Government.

The deadline for this deliverable must be determined in the work plan.

C.5.12 Presentations of Evaluation Reports

The Contractor must deliver two in-person presentations, one to OFDA staff in Dakar, Senegal and one in Washington, D.C. that covers the final results, conclusions, and recommendations of the four evaluation reports produced by this evaluation. All documentation for this presentation must be submitted to OFDA at least forty-eight (48) hours prior to each presentation.

The deadline for the presentations must be determined in the work plan.

C.5.13 Electronic Copies of Raw Data

The Contractor must deliver electronic files containing all the raw data collected through this evaluation in a clearly labeled and organized file structure. Quantitative survey data must be submitted both in Microsoft Excel format and in comma separated values (CSV) format; qualitative data must be submitted in Microsoft Word format and in plain text with non-proprietary ASCII encoding. Any changes to the submission formats must be approved by the COR. OFDA may be required to upload this data into publicly-accessible archival databases and/or use the data in the future, so the Contractor must ensure that all personally-identifiable information is removed from the data, in line with Title 18 of the United States Code, section 1028d(7).

The deadline for the presentations must be determined in the work plan.

C.6 Key Personnel

The evaluation team will be comprised of the following key personnel:

- Evaluation Team Leader
- Public Health Advisor
- Home Office Project Director

The key personnel must meet the minimum requirements outlined in the position descriptions below.

C.6.1 Evaluation Team Leader

Position description: The team lead must provide overall team management, guidance, direction, and administrative and technical support to the contract. The team lead must be the point of contact for this evaluation between OFDA and the evaluation team. The team lead must be responsible for the completion of the deliverables for this evaluation, as well as overall compliance with the contract.

Experience: The team lead must have at least (10) ten years of work experience relevant to the contract subject matter. The team lead should have previous experience managing expatriate and local staff, designing and conducting evaluations, writing evaluation reports, and conducting quantitative and qualitative field research. The team lead should have previous experience conducting performance evaluations that include questions concerning outcomes. Field experience working with humanitarian response and public health programming is highly desirable. Experience working in the Liberia, Guinea, and/or Sierra Leone is also highly desirable.

Education: The team lead must hold a Master's degree in international affairs, social science, humanitarian affairs, disaster management, or a related field.

Skills: The team lead must have excellent oral and written communication skills, analytic skills, interpersonal skills, and team management skills.

C.6.2 Public Health Advisor

Position description: The expert must provide technical direction to the evaluation in terms of the public health response to outbreaks. The expert must work together with the team lead to design the evaluation plan and tools that the evaluation will use to answer the evaluation questions. The expert must also work on the methodological design of the evaluation that will be included in the Inception Report in order to make sure the evaluation is technically sound.

Experience: The expert must have at least (10) ten years work experience relevant to the contract subject matter. The expert must have experience designing evaluations of public health interventions in developing countries. It is desirable that the expert have experience either evaluating or implementing health interventions in response to the outbreak of an infectious disease. Experience working in the Liberia, Guinea, and/or Sierra Leone is also desirable.

Education: The expert must hold at least a Master's-level degree, such as a Master's degree in Public Health (MPH), Masters of Science in Public Health (MSPH), Master of Medical Science in Public Health (MMSPH) or a related field.

Skills: The expert must have strong analytical skills and written communication skills.

C.6.3 Project Director

Position description: The Project Director will provide technical oversight of the contract and will be significantly involved in the project management aspects of the Contract to ensure that the requirements of the contract are met. The Project Director will effectively communicate with USAID staff regarding the contract. The Project Director will provide expert technical advice to the evaluation team and will work closely with Evaluation Team Leader to ensure the evaluation is implemented using rigorous, ethical methods and that the deliverables are high quality and useful to USAID.

Experience: The Project Director must have at least (10) ten years work experience relevant to the contract subject matter. The Project Director must have experience managing evaluations and managing USAID evaluation contracts. It is desirable that the Project Director understands public health evaluation and has knowledge of EVD.

Education: The expert must hold at least a Master's degree.

Skills: The Project Director must have strong analytical skills, communication skills, and project management skills.

[END OF SECTION C]

ANNEX C. HOUSEHOLD SURVEY COLLECTION SITES

HOUSEHOLD SURVEY DATA COLLECTION SITES

ANNEX D. METHODOLOGY AND LIMITATIONS

Table 1. Source of information and methods for rvaluation of OFDA, utilization questions

Evaluation Key Question	Data Collection Methods	Data Sources	Locations and Sampling/Selection	Data Analysis Method
A. Effectiveness of response				
1. To what extent did OFDA supported activities achieve intended objectives?	■ Large structured surveys ■ KIIs ■ FGDs with UNICEF and all other IPs. KIIs would be held with other PIOs, and FGDs or workshops are planned for WHO	■ OFDA staff ■ Household (HH) adult (survivor) respondents ■ Contact tracers, local governments, health care professionals, and funding sources ■ EOCs, ETUs, CCCs, other evaluations	■ Selected stratified and cluster sampled areas of relevant regions of Guinea, Liberia, and Sierra Leone ■ Geneva, London, Paris, Washington, DC, Atlanta	■ Triangulation across sources of evidence ■ Review of surveillance data from secondary sources, matching against intervention timeframes ■ Analytic techniques will adjust for survivor bias of households were all adult members perished
2. Which USG-funded activities, alone or in combination, made the most significant contribution to controlling the EVD outbreak in West Africa?	■ HH surveys ■ KIIs ■ FGDs ■ Desktop review of existing literature	■ NGO program and M&E officers, UNICEF, WFP, IOM, and WHO, and local authorities ■ Review of internal reporting by 25 agencies, surveillance data. UNMEER, national health institutes, CDC, and the Uniformed Services University of Health Sciences (USUHS)	■ Each region of Guinea, Liberia, and Sierra Leone ■ Geneva, London, Paris, Washington, DC, Atlanta	■ Comparison of outcome data ■ Multiple regression, adjusting for ethnicity, age, location ■ Extrapolations based on surveillance trends per target area ■ Inferences based on KIIs
3. Of the many activities designed to address specific aspects of the set of interrelated control measures, how well did each activity fit within the overall response and control outbreak?	■ KIIs ■ Stakeholder roundtables	■ Surveillance data ■ Program reports from IPs ■ EOC, ETU, CCC records, administrators, and clinicians ■ OFDA staff	■ Each region of Guinea, Liberia, and Sierra Leone. ■ Geneva, London, Paris, Washington, DC, Atlanta	■ Explicit tests of assumptions and hypotheses ■ Scale and actual implementation (versus delays or barriers)
B. Effectiveness of programmatic components				
4. What were the determining factors that contributed to success or failure of each of the different types of programs that OFDA supported?	■ In-depth interviews with IPs, UNICEF, Centers for Disease Control (CDC), local clinic managers ■ Stakeholder roundtables	■ OFDA staff; DART teams; all relevant NGOs ■ Literature including after-action reviews IP/UNICEF/ CDC/local program and local clinic managers ■ Social mobilization, water, sanitation, and hygiene (WASH), livelihood, and other OFDA-funded activities	■ Each region of Guinea, Liberia, and Sierra Leone ■ Geneva, London, Paris, Washington, DC, Atlanta ■ Skype interviews with NGO officers	■ Summative across a range of data sources, largely quantitative ■ Expert Delphi judgments about the utility of each model of intervention, with explicit tests of their assumptions, hypotheses, scale, and actual implementation (versus delays or barriers)

Evaluation Key Question	Data Collection Methods	Data Sources	Locations and Sampling/Selection	Data Analysis Method
4(a). Case management	■ KIIs ■ Clinic records, treatment protocols ■ Stakeholder roundtables	■ HH adult (survivor) respondents ■ Local governments, health care professionals, and funding sources and MSF, IMC, Mediair, Heart to Heart, IOM, and WHO	■ West Africa, US, UK, Geneva ■ Structured surveys ■ KIIs ■ Stakeholder roundtables ■ Purposive and random sampling	■ Patterns of case-fatality rates per area, per program, per IP, and per treatment method ■ Treatment outcome rates-odds ratio by age and location ■ Cost/benefit analysis and return on investment (ROI) calculations
4(b). Surveillance	■ Records, interviews	■ Government officials, WHO, IPs, MSF, CDC ■ HH adult (survivor) respondents, local governments, health care professionals, and funding sources	■ Review of existing data where it is, including each region of Guinea, Liberia, Sierra Leone ■ Geneva, London, Paris, Washington, DC, Atlanta	■ Meta-analysis of IP population reporting, trend analysis ■ Regression using SPSS ■ Comparison with our large survey results
4(c). Contact tracing	■ Small sample stratified survey ■ FGDs, KIIs ■ Stakeholder roundtables at CDC	■ Survey of contact tracers, CDC medical personnel assigned to the field ■ HH adult (survivor) respondents, local governments, health care professionals, and funding sources	■ Structured surveys of 100 per country stratified sampling ■ KIIs, Atlanta, GA. In West Africa ■ Snow ball or Response Driven Sampling (RDS) through clinics	■ Quantitative and qualitative analysis ■ Matching extent of outreach with chain of transmission of diseases as inferred from health outcomes
4(d). Social mobilization	■ IPs' KAP surveys ■ IBTCI structured surveys and KIIs ■ Stakeholder roundtables	■ HH adults ■ Local governments health care professionals, and funding sources ■ IPs and local counterparts ■ OFDA	■ West Africa, US, UK, and Geneva ■ Purposive sampling among civil society organizations (CSOs)	■ Quantitative (comparative analysis by region, age, gender, location using chi square test) and qualitative analysis ■ Synthesis of findings from IPs' activity and output reporting
4(e). Safe burials	■ Structured surveys, community FGDs, KIIs ■ Direct observations	■ OFDA staff ■ Burial personnel ■ Community, commercial, private, health clinic, governments, Red Cross, Global Communities, World Vision, and any other IP	■ Guinea, Sierra Leone, and Liberia, one FGD in each target district ■ Cluster-sampled surveys ■ Red Cross offices ■ Government authorities	■ Quantitative and qualitative analysis, including breakdown by gender ■ Synthesis of findings from IPs' activity and output reporting
4(f). Infection prevention and control (IPC) (including WASH)	■ Document reviews, ■ Skype interviews ■ Field KIIs ■ Surveillance data	■ Structured surveys ■ Surveillance reports ■ IP program reports	■ Purposive sampling of key medical experts ■ Stratified to incorporate different responding organizations	■ Quantitative and qualitative analysis, including breakdown by gender ■ Synthesis of findings from IPs' activity and output reporting

Evaluation Key Question	Data Collection Methods	Data Sources	Locations and Sampling/Selection	Data Analysis Method
4(g). Command and control	■ KIIs, FGDs ■ Stakeholder workshops	■ OFDA (mix of senior and operational staff at OFDA), USAID, Bureau for Democracy, Conflict and Humanitarian Assistance (DCHA), CDC, DOD, HHs, UNMEER, governments, WHO, UNICEF, DFID, ECHO	■ West Africa, US, UK, Geneva ■ Purposive sampling among civil society organizations	■ Synthesis of key decision points, options and communications ■ Pattern analysis from KIIs
C. Relevance				
5. Did OFDA correctly prioritize and weight the most relevant activities over the course of the response in relation to the outbreak's changing epidemiology?	■ KIIs with DART team members, counterparts at WHO, etc. ■ HH-based sampling	■ Surveillance data ■ Large surveys conducted during this evaluation ■ Other secondary data, e.g. case studies (West Point) ■ Tracking internal OFDA reporting	■ Convenience sample of key players in West Africa, US, UK, Geneva ■ Selected cluster sampled areas of each region of Guinea, Liberia, Sierra Leone	■ Timelines that merge epidemiologic data about risks, transmission, and health outcomes against program options, IP discussions, grant proposals submitted, and estimates of ROI
6. Were OFDA funding mechanisms and in-kind support appropriate to respond to the EVD outbreak in a timely and targeted manner in affected areas?	■ Documentary review ■ Communications with IPs ■ Interviews at OFDA	■ Appeals, budgets in awards ■ Grant documents, OFDA funding records, timing of release of funds, appeals by WHO and UNICEF, NGO reporting	■ Selected cluster sampled areas of each region of Guinea, Liberia and Sierra Leone. ■ Convenience sample of key players in West Africa, US, UK, and Geneva	■ Economic analysis of ROI ■ Case study analysis, ■ Comparisons of natural controls ■ Program-by-program comparison of benefits from support for isolation, ETUs, interim measures, human remains management, etc.
7. To what extent did attempting to adhere to technical "gold standards" affect the timeliness and quality of the response?	■ KIIs, FGDs ■ Stakeholder workshops ■ Surveillance data	■ Nationwide surveys in Guinea, Sierra Leone, and Liberia ■ Documentation from (e.g.) WHO, MSF, CDC, MDM, Epicentre, Belgian Institute, Tropical Medicine, London School of Hygiene & Tropical Medicine (LSHTM), HHs, DOD	■ Convenience sample of key players in West Africa, US, UK, Geneva, Paris, Amsterdam, Brussels	■ Qualitative analysis using Atlas.Ti and weight of evidence
D. USG Coordination				
8. How effectively did OFDA coordinate all USG efforts as the lead agency in this response?	■ KIIs, FGDs ■ Stakeholder workshops	■ OFDA, Global Health Bureau, Food for Peace ■ CDC managers and Epidemic Intelligence Service (EIS) officers, and USPHS ■ DOD physicians and US Africa Command (AFRICOM)	■ Washington, DC, Atlanta, Bethesda ■ Purposive sample within target countries UK, Geneva, US, Paris, and Belgium	■ Qualitative analysis using Atlas.Ti and weight of evidence ■ Document coherency of intra-USG efforts and alignment among bureaus

Evaluation Key Question	Data Collection Methods	Data Sources	Locations and Sampling/Selection	Data Analysis Method
9. To what extent were the activities supported by USG well-coordinated with the broader international response, national response structures and well-coordinated operationally between organizations that the USG funded?	■ KIIs, FGDs ■ Stakeholder workshops ■ Review of program literature among IPs	■ Experts, analysts, and decision-makers at OFDA, DFID, EC, ECHO, Government of France, MSF, WHO, UNICEF, UN Population Fund (UNFPA), IOM, UN Office for the Coordination of Humanitarian Affairs (OCHA)	■ London, Brussels, Paris, Geneva, New York ■ Purposive sample within target countries UK, Geneva and US	■ Review of umbrella grants from OFDA ■ Triangulation among WHO, DFID, World Bank decision-makers
10 How well did OFDA adjust to the changing epidemiology and priorities of the international response?	■ KIIs ■ Surveillance data, EOC records ■ Stakeholder workshops	■ OFDA, Global Health Bureau ■ CDC managers and EIS officers ■ DOD physicians and AFRICOM ■ WHO, UNICEF, DFID, World Bank, and local governments	■ Purposive sample within target countries UK, Geneva and US	■ Qualitative analysis using Atlas.Ti and weight of evidence. Consideration of OFDA's past involvement in cholera, influenza, Lassa Fever, SARS, etc.
E. International Coordination				
8 How effectively did OFDA coordinate all USG efforts as the lead agency in this response?	■ KIIs, FGDs ■ Stakeholder workshops	■ OFDA, Global Health Bureau, Food for Peace ■ CDC managers and EIS officers, and USPHS ■ DOD physicians and AFRICOM	■ Washington, DC, Atlanta, Bethesda ■ Purposive sample within target countries UK, Geneva, US, Paris, and Belgium	■ Qualitative analysis using Atlas.Ti and weight of evidence ■ Document coherency of intra-USG efforts and alignment among bureaus
9. To what extent were the activities supported by USG well-coordinated with the broader international response, national response structures and well-coordinated operationally between organizations that the USG funded?	■ KIIs, FGDs ■ Stakeholder workshops ■ Review of program literature among IPs	■ Experts, analysts, and decision-makers at OFDA, DFID, EC, ECHO, Government of France, MSF, WHO, UNICEF, UNFPA, IOM, OCHA	■ London, Brussels, Paris, Geneva, New York ■ Purposive sample within target countries UK, Geneva and US	■ Review of umbrella grants from OFDA ■ Triangulation among WHO, DFID, World Bank decision-makers
10. How well did OFDA adjust to the changing epidemiology and priorities of the international response?	■ KIIs ■ Surveillance data, EOC records ■ Stakeholder workshops	■ OFDA, Global Health Bureau ■ CDC managers and EIS officers; DOD, AFRICOM, WHO, UNICEF, DFID, World Bank, and local governments	■ Purposive sample within target countries UK, Geneva and US	■ Qualitative analysis using Atlas.Ti and weight of evidence. Consideration of OFDA's past involvement in cholera, influenza, SARS, etc.

Table 2. Limitations

Limitation	Mitigation measures
Limited availability of IP performance measurement data restricted the ability to evaluate achievement of program outcomes or conduct trend analysis.	■ Key informants were used to understand IP implementation and performance measurement strategies and concordance with the theory of change. The household survey provided data directly from program beneficiaries.
The presence of multiple actors and programs, limited the ability to attribute outcomes to individual interventions.	■ Contribution analysis was used to understand whether certain ToCs were effective pathways to results, and enable associations to be drawn or lack of associations to be explained.
Limited availability of data on individuals who worked as CHWs and CTs restricted the ability to draw a representative sample for the quantitative surveys.	■ Using the available data, convenience samples were drawn for the CHW and CT surveys that will still provide valuable insights into the experiences of these individuals, despite the lack of result generalizability.
Many of the key individuals involved in the EVD response had since left the countries.	■ With the assistance of the IPs, every feasible effort was made to locate and contact key respondents for remote interviews.
The time period between the end of the response and data collection was long, which may have resulted in recall bias.	■ Survey questions were designed using anchor dates to facilitate recall, general time periods were discussed rather than specific dates, and respondents were given time to reflect before answering.
Some respondents provide what they deem to be a 'correct' answer, known as halo bias, or social desirability bias.	■ The survey teams were made aware of this potential bias, and trained extensively on interviewing skills and avoidance of leading questions, or prompting with close-ended questions.
Using multiple interviewers can lead to a lack of consistency, or subjective influence on interviews.	■ All interviewers participated in tool design, pre–testing and in-depth discussions on interviewing. During data collection, weekly debriefs provided a forum to discuss interview format and findings.
Numerous respondents, including senior USG officials, focused their recollections and comments disproportionately on the response in Liberia.	■ 82 FGDs and 77 KIIs were conducted in Sierra Leone and 46 and 72 in Guinea to ensure the experiences of those countries were well represented.
Little data was evident about gender dimensions. Although IBTCI interviewed roughly equal proportions of female and male respondents, how outcomes varied by gender is difficult to discern.	■ IBTCI asked key informants about gender dynamics and all quantitative survey data was disaggregated by gender in order to identify any differences.
IBTCI observed a tendency (known as Optimism Bias) for key stakeholders to feel and say that they did a good, successful or better than average job.	■ IBTCI spoke to key informants in many different roles to obtain a range of views to help triangulate, and used a combination of interview data, literature findings, and survey data.

ANNEX E. IMPLEMENTATION PARTNER AND FUNDING DETAIL

1. Listing of implementing partners, period of performance, dollar value, region, and primary activity category

GUINEA

Implementing partner	Period of performance	Dollar value	Region	Program Area				
				Management & coordination	Isolation & treatment	Safe burial	Restoration of health systems	Social mobilization
Action Against Hunger (ACF) AID-OFDA-G-16-00002	Aug 1, 2015 – June 30, 2016	$1,681,043	Forecariah		✔			
Catholic Relief Services (CRS) AID-OFDA-G-16-00001	July 23, 2015 – June 30, 2016	$1,846,005	Conakry, Macenta, and Nzerekore				✔	
Center for International Studies and Cooperation (CECI) AID-OFDA-G-15-00250	July 30, 2015 – Jan 29, 2016	$1,404,928	Boke and Boffa					✔
Child Fund AID-OFDA-G-15-00026	Dec 1, 2014 – Aug 31, 2015	$1,500,000	Dinguiraye, Dabola, Dalaba, Mamou, Pita, Faranah, Telimele, and Kindia					✔
Danish Refugee Council (DRC) AID-OFDA-G-15-00271	Aug 15, 2015 – March 31, 2016	$750,000	Kindia, Telimele, Boke, and Fria					✔
Foundation Terre Des Hommes AID-OFDA-G-15-00027	Dec 15, 2014 – Sept 14, 2015	$875,000	Forecariah, Coyah, Dubreka, and Telimele					✔
French Red Cross (FRC) AID-OFDA-G-15-00035	Dec 1, 2014 – April 15, 2016	$5,185,445	Forecariah and Macenta		✔	✔	✔	✔
HC3	Apr-15	$114,850	N/A (Digital Outreach)					✔
Helen Keller International (HKI) AID-OFDA-G-15-00030	Dec 1, 2014 – Nov 30, 2015	$1,719,455	Kankan, Siguiri, and Kouroussa					✔

Implementing partner	Period of performance	Dollar value	Region	Program Area				
				Management & coordination	Isolation & treatment	Safe burial	Restoration of health systems	Social mobilization
IFRC AID-OFDA-IO-14-00072	Oct 1, 2014 – Dec 31, 2015	$5,999,552	Border areas with Sierra Leone – Forecariah and Boke	✔	✔	✔	✔	✔
IMC AID-OFDA-G-15-00080	Feb 1, 2015 – Jan 31, 2016	$14,854,760	Coyah, Dubreka, Boffa, Forecariah, Kindia, Fria, Boke, Telimele, Pita, and Dalaba		✔		✔	✔
Internews AID-OFDA-G-15-00008	Oct 17, 2014 – April 15, 2016	$1,999,846	All prefectures					✔
IOM AID-OFDA-I0-15-00053	May 1, 2015 – Jan 31, 2016	$1,500,000	Boke, Kindia, and Conakry	✔				
IOM AID-OFDA-A-15-00025	May 28, 2015 – Feb 29, 2016	$5,475,000	Kindia, Faranah, Kissidougou, Yomou, Lola, Macenta, and Nzerekore	✔	✔		✔	✔
IOM AID-OFDA-I0-15-00010	Jan 19, 2014 – Feb 15, 2016	$5,792,220	Conakry		✔	✔	✔	
Plan International – Documentation Missing	N/A	N/A	N/A					
Premiere Urgence – Aide Medicale Internationale AID-OFDA-G-15-00260	Sept 1, 2015 – June 30, 2016	$1,295,000	Kindia region-Coyah, and Dubreka districts				✔	✔
Relief International (RI) AID-OFDA-G-15-00018	Nov 10, 2014 – Sept 30, 2015	$4,000,000	Kindia, Forecariah, Boffa, Boke, Coyah, Pita, Dalaba, and Labe					✔
Save the Children – Documentation Missing	N/A	N/A	N/A					
UNICEF AID-OFDA-I0-15-00009	Dec 18, 2014 – Aug 31, 2015	$1,000,000	Boke, Kindia, Faranah, Nzerekore, Labe, Mamou, and Kankan				✔	✔
UNICEF AID-OFDA-I0-15-00034	March 20, 2015 – Sept 30, 2015	$5,000,400	Western Guinea Prefectures				✔	✔
WHO AID-OFDA-IO-15-00051	April 14, 2015 – March 31, 2016	$19,626,849	All prefectures				✔	✔
WFP – Documentation Missing	N/A	N/A	N/A					

Implementing partner	Period of performance	Dollar value	Region	Program Area				
				Management & coordination	Isolation & treatment	Safe burial	Restoration of health systems	Social mobilization
Women and Health Alliance (WAHA) International AID-OFDA-F-16-00001	Aug 17, 2015 – March 31, 2016	$712,046	Kindia, Forecariah, and Boke		✔		✔	✔
Total Spent in Guinea		$ 82,332,399						

SIERRA LEONE

Implementing partner	Period of performance	Dollar value	Region	Program Area				
				Management & coordination	Isolation & treatment	Safe burial	Restoration of health systems	Social mobilization
Catholic Relief Services – Documentation Missing	N/A							
Christian Aid AID-OFDA-G-15-00056	Feb 1, 2015 – July 30, 2015	$945,690	Bombali, Tonkolili, Kambia, Bo		✔			✔
GOAL AID-OFDA-G-15-00060	Feb 1, 2015 – October 31, 2015	$2,005,780	Bombali District		✔		✔	
IFRC AID-OFDA-IO-15-00007	Dec 5, 2014 – June 30 2015	$9,500,000	All districts		✔	✔		✔
IMC AID-OFDA-G-15-00006	Oct 1, 2014 – Feb 29, 2016	$13,376,573	Port Loko, Kambia, Bombali, Kambia, Koinadugu		✔	✔	✔	✔
IOM AID-OFDA-IO-15-00059	May 1, 2015 – Feb 29, 2016	$2,230,000	Western Area Urban, Port Loko, Kambia, and Bombali	✔	✔			
IOM AID-OFDA-IO-15-00019	Jan 15, 2015 – Dec 15, 2015	$1,900,000	All districts		✔		✔	
IOM AID-OFDA-IO-15-00017	Jan 15, 2015 – July 14, 2015	$1,000,000	Bombali and Kono		✔			✔
IOM AID-OFDA-IO-15-00008	Dec 1, 2014 – Dec 31, 2015	$1,469,410	Western Area Rural, Western Area Rural, Port Loko, and Bombali		✔		✔	
IRC AID-OFDA-G-15-00025	Nov 15, 2014 – July 31, 2015	$4,400,000	Kambia, Bombali, Port Loko, Tonkolili, Bo, Kono, Moyamba, Kenema, Kailahun, Western Area Urban, Western Area Rural, Pujehun, Bonthe				✔	

Implementing partner	Period of performance	Dollar value	Region	Program Area				
				Management & coordination	Isolation & treatment	Safe burial	Restoration of health systems	Social mobilization
IRC AID-OFDA-G-15-00098	Feb 16, 2015 – Feb 15, 2016	$5,288,573	Kambia, Bombali, Port Loko, Tonkolili, Bo, Kono, Moyamba, Kenema, Kailahun, Western Area Urban, Western Area Rural, Pujehun				✔	
IRC AID-OFDA-G-15-00237	Aug 1, 2015 – Dec 31, 2015	$2,729,036	Bo, Bombali, Kailahun, Kambia, Kenema, Kono, Moyamba, Pujehun, and Tonkolili		✔			
IRC AID-OFDA-G-15-00281	July 1 2015 – May 15, 2016	$5,369,850	All districts				✔	
MedAir AID-OFDA-G-15-00039	Dec 1, 2014 – Dec, 31 2015	$5,349,216	Western Area Rural, and Western Area Urban		✔		✔	✔
Oxfam AID-OFDA-G-15-00054	Jan 1, 2015 – Dec 31, 2015	$690,656	Koinadugu		✔			✔
PIH AID-OFDA-G-15-00050	Jan 1, 2015 – Nov 30, 2015	$5,461,489	Kono and Kambia		✔		✔	✔
UNICEF AID-OFDA-IO-15-00003	Oct 1, 2014 – April 30, 2015	$4,496,000	All districts		✔			✔
UNICEF AID-OFDA-IO-15-00014	Jan 22, 2015 – July 31, 2015	$10,000,000	All districts		✔			
UNICEF AID-OFDA-IO-15-00002	Oct 29, 2014 – April 30, 2015	$1,584,214	All districts		✔		✔	
WFP AID-OFDA-IO-15-00022	Jan 29, 2015 - Dec 31, 2015	$19,144,028	Western Area Urban, Bo, Port Loko, Bombali, Moyamba, Kenema, Kailahun	✔				
WHO AID-OFDA-IO-15-00011	Dec 19, 2014 – June 30, 2015	$4,000,000	All districts		✔			
WHO AID-OFDA-IO-15-00066	June 24, 2015 – Jan 31, 2016	$8,000,000	All districts		✔			
World Vision AID-OFDA-A-15-00015	Dec 15, 2014 – Sept 30, 2015	$2,472,525	Bo, Bombali, Bonthe, Kailahun, Kambia, Kenema, Kono, Koinadugu Moyamba, Port Loko, Pujehun and Tonkolili	✔				
Total Spent in Sierra Leone		$ 111,431,040						

LIBERIA

Implementing partner	Period of performance	Dollar value	Region	Program Area				
				Management & coordination	Isolation & treatment	Safe burial	Restoration of health systems	Social mobilization
Action Contra le Faim – Documentation Missing	N/A	N/A	N/A					
American Refugee Committee (ARC) AID-OFDA-G-15-00017	Nov 1, 2014–Dec 31, 2015	$6,666,646	River Gee		✔			✔
BRAC AID-OFDA-G-15-00022	Dec 11, 2014–Sept 10, 2015	$1,177,902	Montserrado, Lofa, Nimba, Margibi, Bong, Grand Bassa and Grand Cape Mount					✔
CARE AID-OFDA-G-15-00016	Dec 3, 2014–June 2, 2015	$1,652,992	Grand Gedeh, Grand Kru, Maryland, River Ghee, and Sinoe		✔			✔
Catholic Relief Services AID-OFDA-G-15-00019	Oct 20, 2014–Oct 20, 2015	$960,447	Montserrado		✔			
Concern Worldwide AID-OFDA-G-15-00015	Nov 1, 2014–Dec 31, 2015	$5,422,492	Grand Bassa, and Montserrado		✔		✔	
Child Fund – Documentation Missing	N/A	N/A	N/A					
Global Communities AID-OFDA-G-14-00177	Aug 13, 2014–April 30, 2016	$34,039,820	All 15 counties/ Liberia			✔	✔	✔
GOAL AID-OFDA-A-15-00012	Nov 1, 2014–Dec 31, 2015	$7,281,500	Lofa		✔		✔	✔
Heart to Heart AID-OFDA-A-15-00004	Sept 21, 2014–May 31, 2015	$7,001,161	Nimba		✔			✔
IFRC – Documentation Missing	N/A	N/A	N/A					
IMC AID-OFDA-G-14-00202	Aug 29, 2014–Dec 31, 2015	$21,563,849	Bong, Margibi, and Nimba		✔			✔
IMC AID-OFDA-G-15-00007	Oct 8, 2014–Dec 31, 2015	$8,962,622	Bong, Margibi, Grand Bassa, River Cess, Sinoe, Grand Geddah, Bomi, Nimba, Grand Cape Mount, and Montserrado/ Liberia				✔	✔
IOM AID-OFDA-IO-15-00001	Sept 15, 2014–Sept 30, 2015	$32,877,989	Grand Bassa, Grand Cape Mount, Bomi/ Liberia	✔	✔		✔	✔
IRC AID-OFDA-A-15-00002	Oct 1, 2014–March 31, 2016	$12,097,587	Monrovia		✔		✔	✔

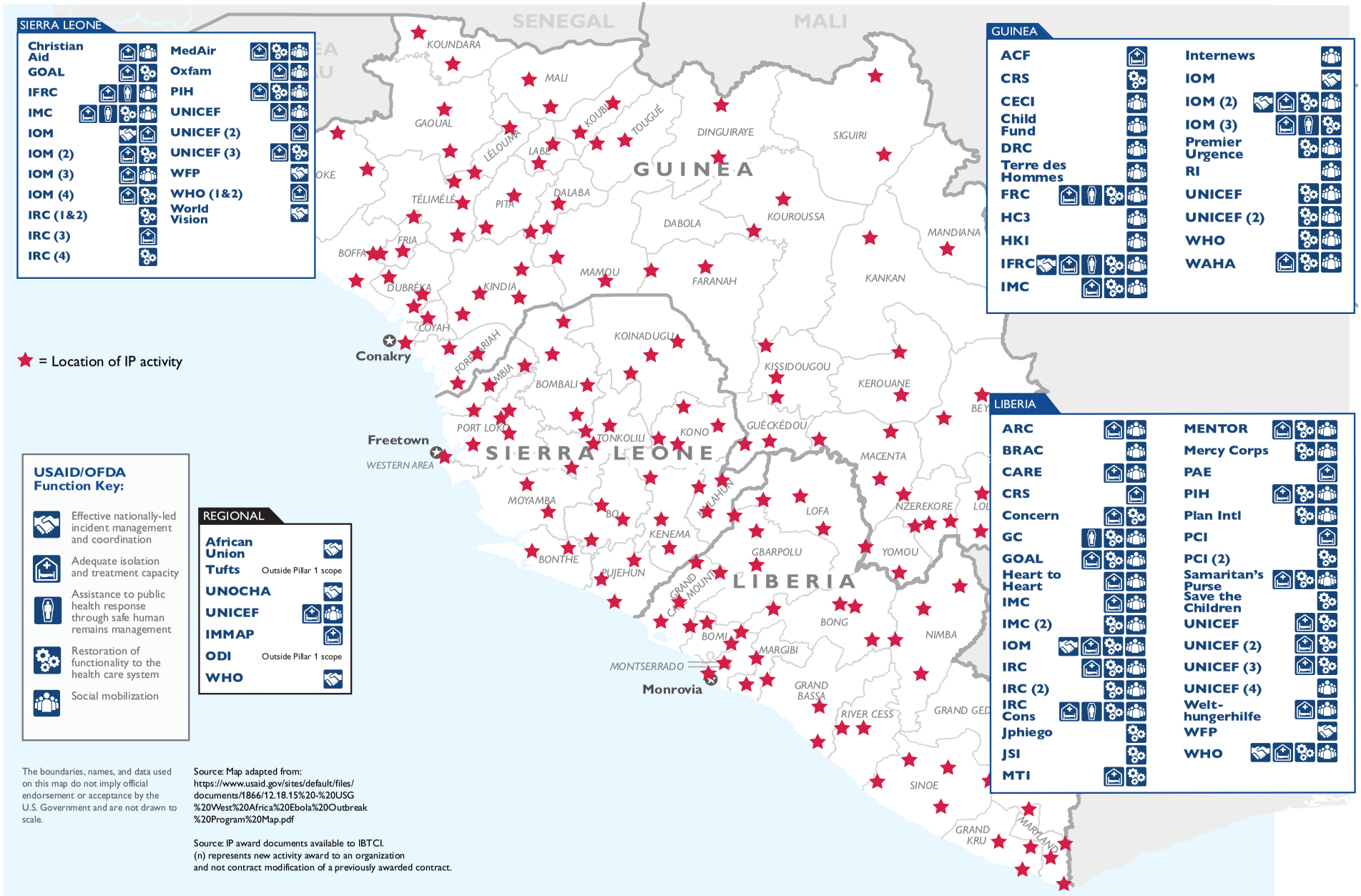
Implementing partner	Period of performance	Dollar value	Region	Program Area				
				Management & coordination	Isolation & treatment	Safe burial	Restoration of health systems	Social mobilization
IRC AID-OFDA-G-15-00109	April 1, 2015–Oct 31, 2015	$978,397	Monteserrado, Lofa, and Nimba				✔	✔
Jphiego AID-OFDA-G-15-00028	Dec 9, 2014–Dec 8, 2015	$2,814,287	Bong, Grand Bassa, Grand Gedeh, Lofa, Margibi, Maryland, Montserrado, and Nimba/ Liberia				✔	
John Snow International (JSI) AID-OFDA-G-15-00010	Dec 4, 2014–Dec 30, 2015	$7,233,653	All 15 counties				✔	
Medical Teams International (MTI) AID-OFDA-G-15-00037	Dec 15, 2014–Dec 31, 2015	$4,702,901	Bomi, Grand Cape Mount, and Sinoe		✔		✔	
MENTOR Initiative AID-OFDA-G-15-00003	Nov 19, 2014–Mar 31, 2016	$3,926,216	Monrovia		✔		✔	✔
Mercy Corps AID-OFDA-G-15-00005	Sept 13, 2014–April 12, 2015	$12,000,000	All 15 counties				✔	✔
PAE	Oct 1, 2014–Aug 2015	$89,000,000	Lofa, NImba, Grand Cru, Maryland, Sinoe, Rver Cess, Grand Gedeh, and Gbarpolu		✔			
Partners in Health (PIH) AID-OFDA-G-15-00014	Oct 15, 2014–Dec 31, 2015	$10,213,088	Grand Gedeh, Maryland, Rivercess, and Grand Cru		✔		✔	✔
Plan International USA AID-OFDA-G-00011	Nov 7, 2014–Aug 6, 2015	$1,508,821	Montserrado, Bomi, Lofa, Grand Cape Mount, and Gbarpolu				✔	✔
Project Concern International (PCI) AID-OFDA-G-00021	Dec 16, 2014–Dec 31, 2015	$5,675,372	Nimba		✔			
Project Concern International (PCI)	Oct 29, 2014–April 30, 2015	$4,128,390	Bong and Nimba				✔	
Samaritan's Purse AID-OFDA-G-15-00005	Sept 16, 2014–June 30, 2015	$7,782,027	Lofa and River Gee		✔		✔	✔
Save the Children AID-OFDA-G-15-00274	July 8, 2015–Dec 16, 2015	$2,357,933	Margibi county				✔	

Implementing partner	Period of performance	Dollar value	Region	Program Area				
				Management & coordination	Isolation & treatment	Safe burial	Restoration of health systems	Social mobilization
UNICEF AID-OFDA-IO-14-0005	Aug 20, 2014 – June 15, 2015	$6,993,104	Grand Bassa, Lofa, Nimba, Bong, Margibi, Bomi and Montserrado to start, eventually the entire country, Greater Monrovia		✔		✔	
UNICEF AID-OFDA-IO-15-00006	Dec 9, 2014 – June 30, 2015	$30,802,089	Nimba and Bong		✔		✔	
UNICEF AID-OFDA-IO-14-00070	Sep 15, 2014 – Dec 31, 2014	$2,224,044	Monrovia, Lofa, Rural Montserado, Margibi, Nimba, Bong, Grand Bassa		✔		✔	
UNICEF AID-OFDA-IO-15-00023	Feb 20, 2015 – Nov 30, 2015	$3,492,720	All counties					✔
Welthungerhilfe AID-OFDA-A-15-00001	Oct 6, 2014 –April 5, 2015 NCE to April 5, 2015	$1,302,322	Grand Gedeh, River Gee, Sinoe, Maryland		✔			✔
WFP AID-OFDA-IO-15-00005	Oct 15, 2014 – June 30, 2016	$39,324,526	Montserrado, Monrovia, All 15 counties (see proposal for list of 65 CCCs)	✔				
WHO AID-OFDA-IO-15-00035	March 25, 2015– June 30, 2016	$32,212,528	All regions of Liberia	✔	✔		✔	✔
Total Spent in Liberia		$ 419,610,895						

REGIONAL AWARDS

Implementing partner	Period of performance	Dollar value	Region	Program Area				
				Management & coordination	Isolation & treatment	Safe burial	Restoration of health systems	Social mobilization
African Union	Sept 28, 2014 – March 31, 2015	$10,000,000	All Three Countries	✔				
Tufts University	June 1, 2015 – June 1, 2016	$558,504	Global	(research)				
UNOCHA	Unknown	$400,000	West Africa	✔				
UNOCHA	Aug 19, 2015 – July 31, 2016	$2,400,000	West and Central Africa	✔				
UNICEF	Aug 19, 2015 – June 31, 2016	$1,000,000	Global	✔				✔
Information Management & Mine Action Programs (iMMAP)	Jan 10, 2014 – April 7, 2014	$385,990	All three countries		✔			
Overseas Development Institute (ODI)	July 2, 2013 – June 28, 2016	$629,359	All three countries	(research)				
UNHAS WFP – Documentation Missing	N/A	N/A	N/A		✔			
USAID/OFDA Airlifted Relief Commodities – Documentation Missing	N/A	N/A	N/A					
WHO	Aug 1, 2015 – Jan 31, 2016	$477,721	All Countries	✔				
Total Spent in Regional Awards		$ 15,851,574						

2. Map of implementing partner activity



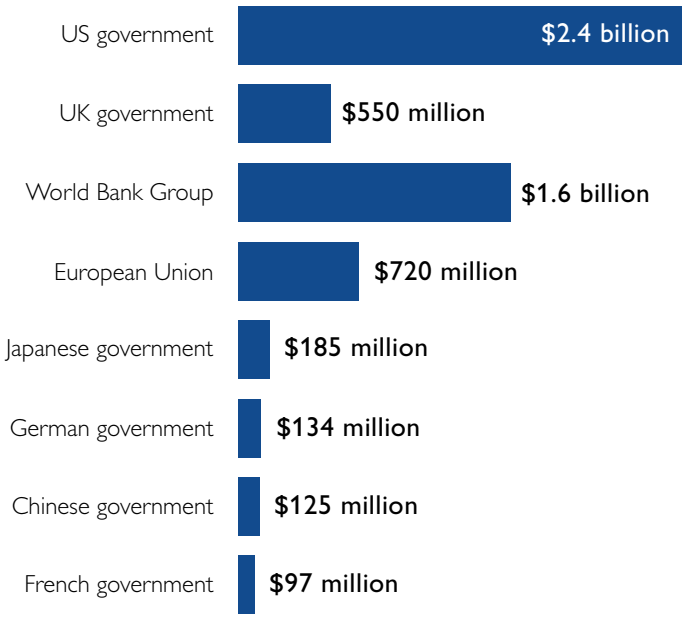
The boundaries, names, and data used on this map do not imply official endorsement or acceptance by the U.S. Government and are not drawn to scale.

Source: Map adapted from: https://www.usaid.gov/sites/default/files/documents/1866/12.18.15%20-%20USG%20West%20Africa%20Ebola%20Outbreak%20Program%20Map.pdf

Source: IP award documents available to IBTCI.
(n) represents new activity award to an organization and not contract modification of a previously awarded contract.

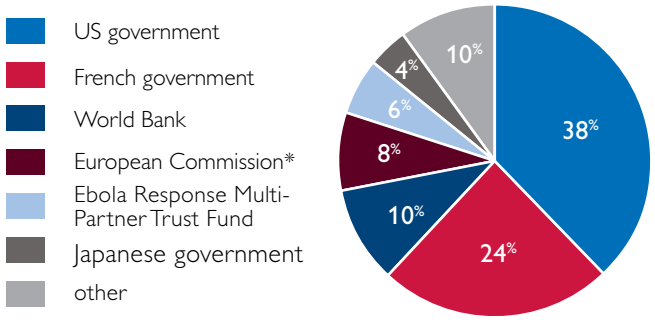
3. Funding distribution by response country and donor

Figure E1. Funding for the EVD outbreak response, 2014–2016



Sources Figure 3:
Source of US government funding total: *USAID/OFDA Fact Sheet #12 FY2016 September 30, 2016*
Source of UK government funding total: *https://www.gov.uk/government/news/the-end-of-the-ebola-outbreak converted from GBP to USD at a rate of 1.29 dollars for 1 pound*
Source of World Bank Group funding total: *World Bank Group Ebola Response Fact Sheet, http://www.worldbank.org/en/topic/health/brief/world-bank-group-ebola-fact-sheet*
Source of data for all other donors: *"Resources for Results V," Office of the UN Special Envoy on Ebola, 1 September 2014 to 31 October 2015*

Figure E2. Percentage funding distribution by donor in Guinea



**European Commission's Humanitarian Aid and Civil Protection Department*

Figure E3. Percentage funding distribution by donor in Sierra Leone

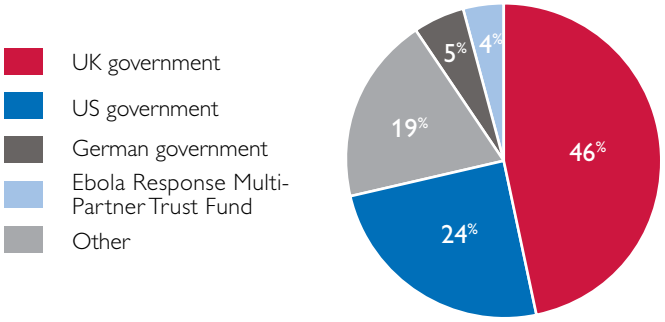
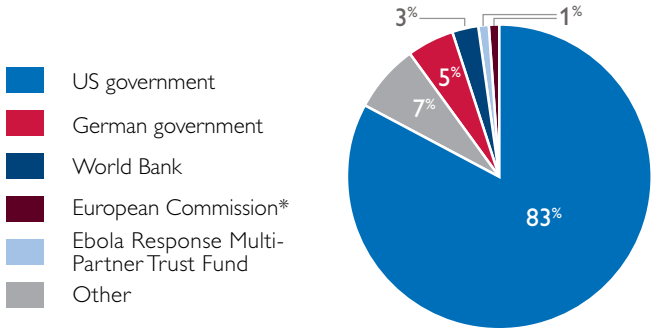


Figure E4. Percentage funding distribution by donor in Liberia



**European Commission's Humanitarian Aid and Civil Protection Department*

4. Funding and program area detail

Figure E5. Response by program area and country, all

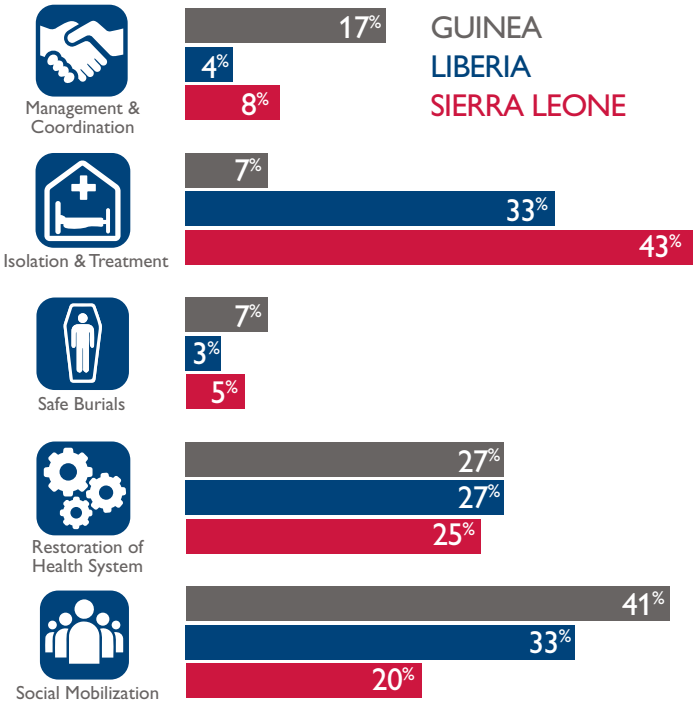
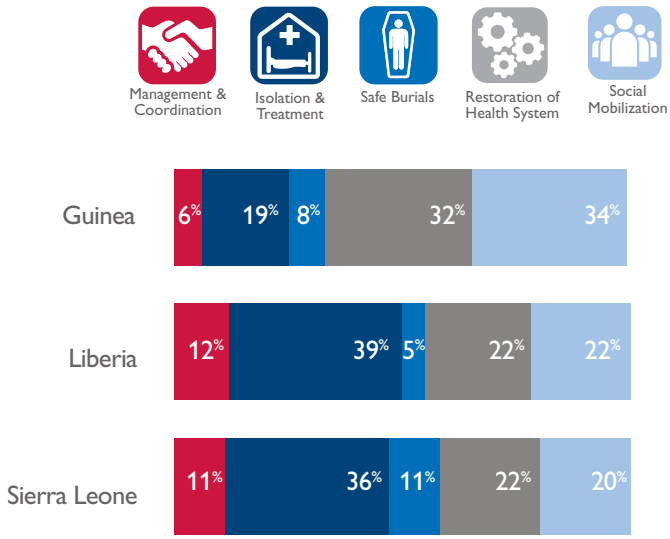


Figure E6. Funding by program area and country, all



5. OFDA-supported program areas and funding detail, Guinea

Figure E7. Guinea, distribution of program areas by activity

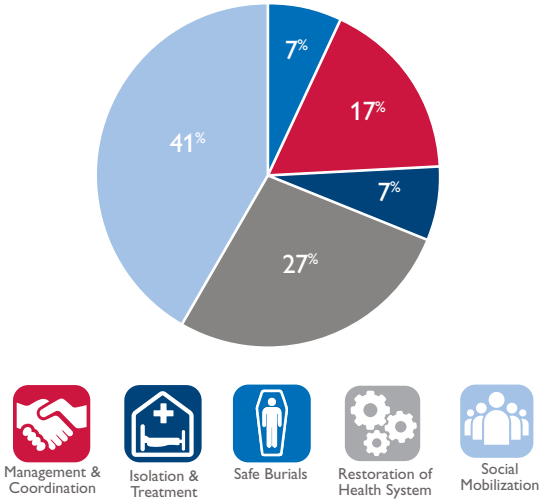


Figure E8. Guinea, distribution of program areas by funding

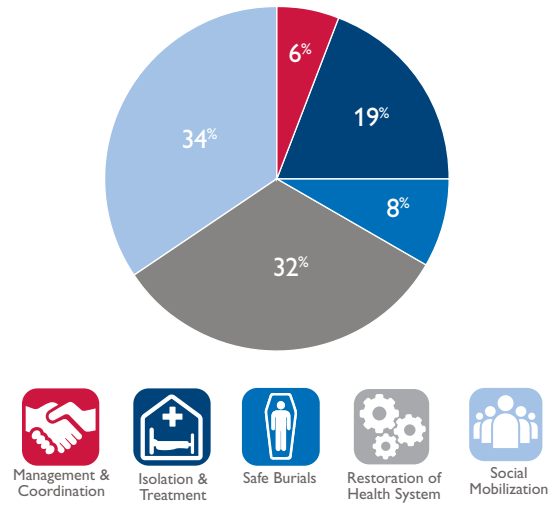


Figure E9. Guinea, number of interventions by region

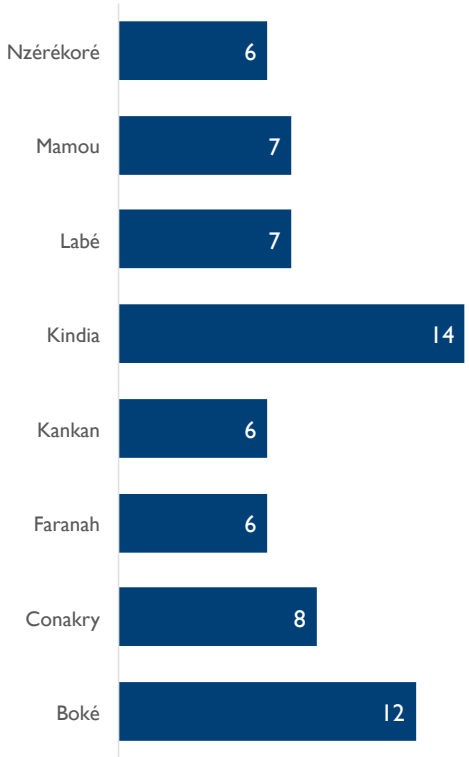
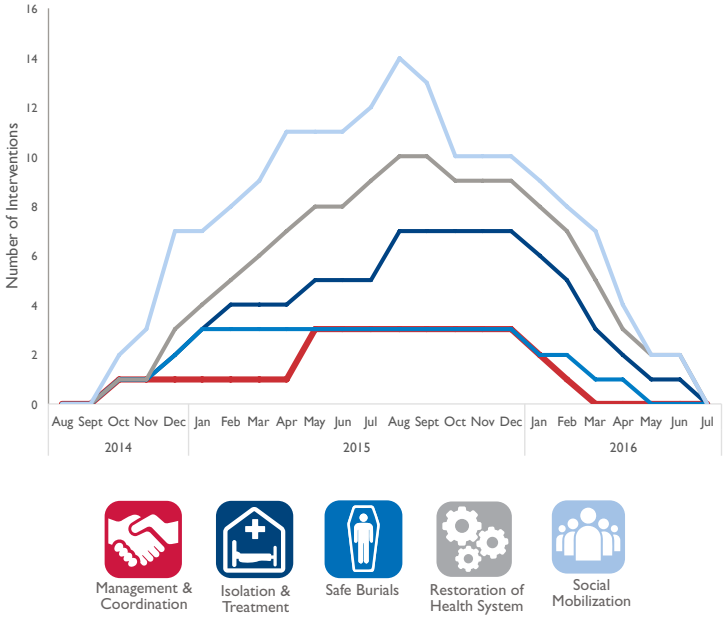


Figure E10. Guinea, number of interventions by activity and year/month



6. OFDA-supported program areas and funding detail, Sierra Leone

Figure E11. Sierra Leone, distribution of program areas by activity

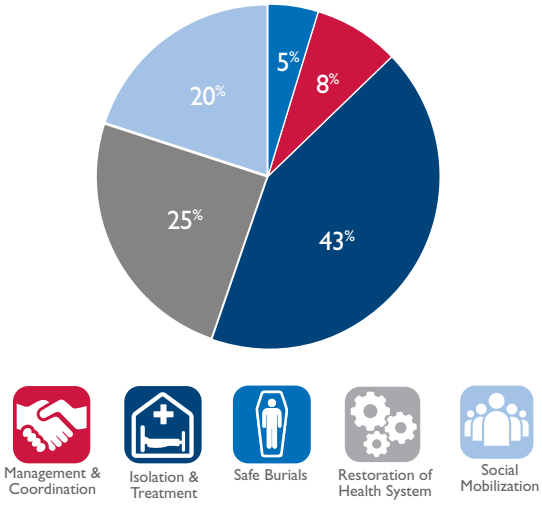


Figure E12. Sierra Leone, distribution of program areas by funding

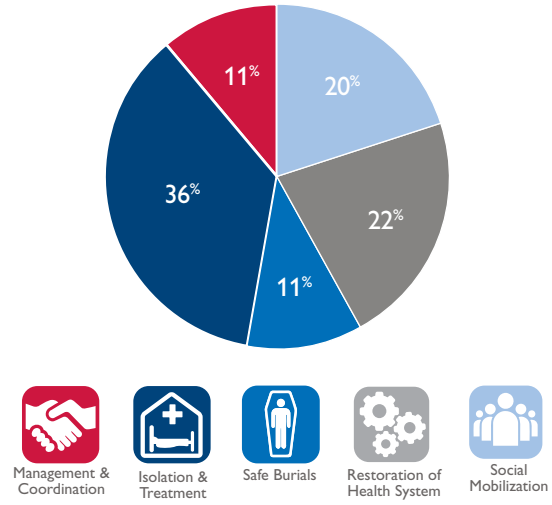


Figure E13. Sierra Leone, number of interventions by region

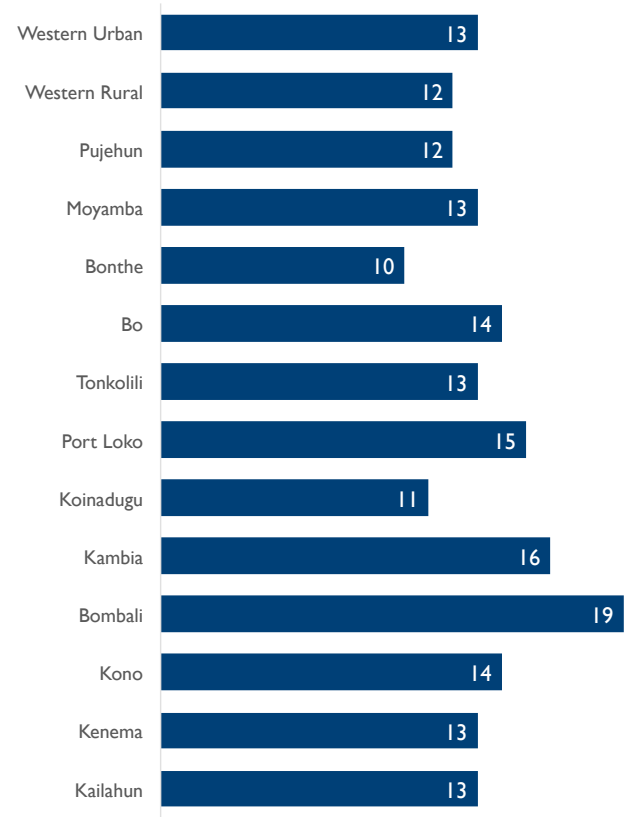
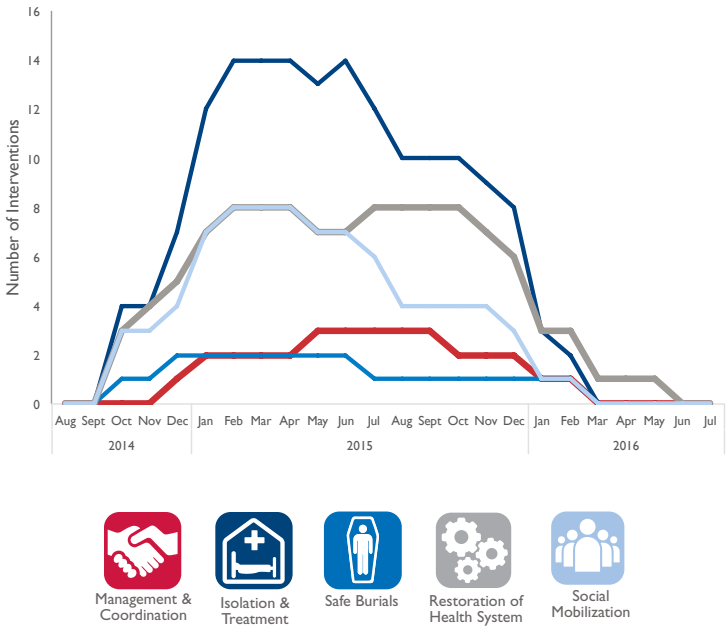


Figure E14. Sierra Leone, number of interventions by activity and year/month



7. OFDA-supported program areas and funding detail, Liberia

Figure E15. Liberia, distribution of program areas by activity

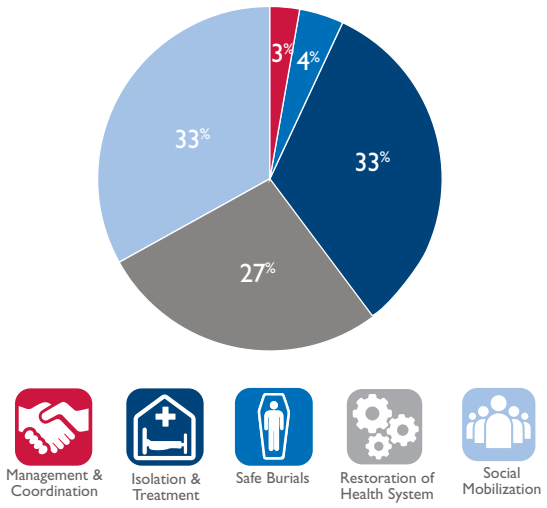


Figure E16. Liberia, distribution of program areas by funding

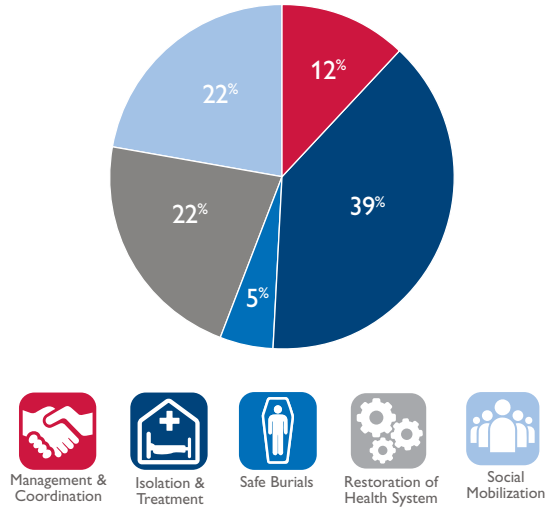


Figure E17. Liberia, number of interventions by region

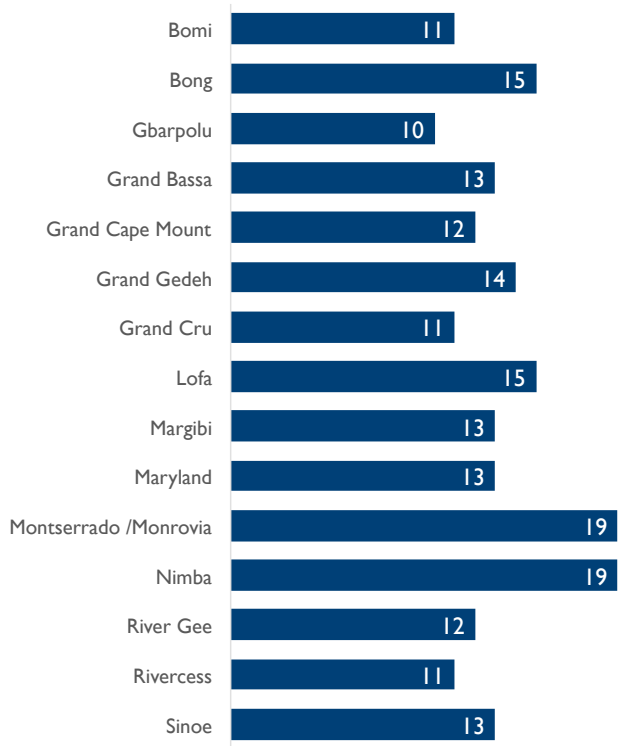
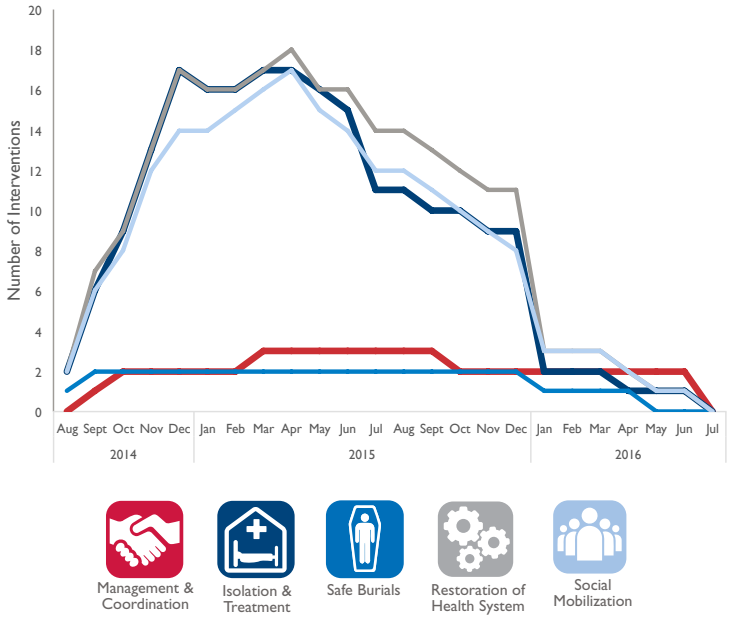


Figure E18. Liberia, number of interventions by activity and year/month



ANNEX F. DATA COLLECTION TOOLS

1. Introduction

This document provides the data collection tools and instruments, as annexes to the Evaluation Plan, wherein International Business & Technical Consultants, Inc. (IBTCI). It describes tools for use globally and specifically in West Africa and additionally a set for use by different implementing partners (IPs), their subs, local stakeholders, West African households, Community Health Workers (CHWs), safe burial diggers, the US. Department of Defense (DOD), the U.S. Centers for Disease Control and Prevention (CDC), the United States Agency for International Development (USAID), and others. It also describes plans to train enumerators and gender-sensitive approaches to interviewing women.

This submission expands on the Evaluation Plan by giving more detail about actual research modalities. It addresses questions that came up at the time of the presentation of the Evaluation Plan and Tools, namely, translations of tools, weather and logistics, and self-assessment. This document also updates OFDA about sampling methods, in particular the two-stage cluster sampling for the large-scale structured survey at households.

Key Design Aspect of Tools

Throughout most surveys, a critical aspect of the design is the sequence of questions and the ideas behind them. In particular, in both quantitative and qualitative tools, the order of questions carefully determines when issues are introduced.

In any survey, questions or terms that are introduced early in a sequence may influence answers given afterward. For instance, in this large structured household (HH) survey, respondents will not hear or use the term "Ebola" at all during the first part of the survey, to allow them to bring it up themselves as a health event in their family before being prompted by any questions. Among aid workers, questions that may lead them to worry about a "right" organizational answer, or which may put them "on the spot," are pushed toward the end. Sometimes, two or more questions are included that are intended to get at the same idea, but in different ways (with separate biases associated), and thus are separated so that one does not force cognitive dissonance on the answer for another.

Similarly, the overall length of the surveys will intentionally be kept to a reasonable time period in any given usage, so that the respondent does not become overly fatigued and give answers that may introduce error from a lack of thoughtful attention. For most of our structured surveys and KIIs, the target length is 40 minutes. The target duration for most of the FGDs is between one hour and 90 minutes.

All of the tools/instruments will be pre-tested (PT, or "pilot tested") and may be revised based on feedback. In some instances, this will mean the adjustment of specific words to avoid ambiguity or anxiety. In other cases, this may require changing the order of questions, combining questions, removing questions, or introducing new questions that capture points that respondents feel they need to state for clarity or relevance. Pilot testing of instruments in the field will occur at roughly the same time that enumerators are trained. OFDA will be informed and given opportunity to review in real-time during the period PT period. IBTCI will communicate details of changes and the evidentiary basis from the PT to the COR.

2. Visual Observation and Inspection

Where feasible and appropriate, the evaluation teams, will take advantage of opportunities to directly observe records, facilities, and systems in West Africa. The teams will employ a combination of record inspection (e.g., M&E data from project awardees, district health offices, archived data from regional ETUs, hospitals as available and appropriate), and more general visual observation (see below).

Subcontractors will also take dozens of photographs related to programs, infrastructure, laboratories, and systems wherever they travel, covering 100 or more locations. Photographs will not be used in a manner to identify survey or FGD respondents. They are meant to establish context only. Key personnel and

local survey coordinators will also visit health facilities to inspect surveillance records, lab and surveillance systems, quality and stocks of PPEs, communications equipment, and any remaining existing isolation infrastructure. Direct observation and photography allow the Team to evaluate whether "lessons learned" can be observed, and therefore provide evidence of effectiveness, institutionalization, and sustainability of institutional and human capacities supported by USG-funded financial and technical assistance. Such remaining sustainable activities as supply chain management systems, training programs, financial systems, communication systems, M&E reporting structures, and other proofs of sustainability can be observed.

Visual Observation and Inspection	Sites	Sample	Content
Treatment and isolation facilities, if functional	Ebola treatment units (ETUs), hospitals, community care centers (CCCs), isolation centers	5 locations x 3 countries=15	Visual understanding of the dimensions, location, scale, and access issues.
Local health coordination	District health offices	4 locations x 3 countries=12	Same as above
Laboratory facilities	Health offices, hospitals, (ETUs)	4 locations x 3 countries=12	Confirmation of equipment transfer and types, including from different donors
Command and control	National command centers	3+ locations	Understanding the context of meetings
Surveillance system	DHOs, MOHs, hospitals	6 locations x 3 countries=18	Physical nature of the system
Surveillance records		Where made available by DHOs, MOHs, CCCs, NGOs, local surveillance officers, etc.	Identify potential sources of relevant data
IP activity records	IP field offices	20–30	Same as above

3. Evaluation Explanations to Respondents' Personal Information and Confidentiality

Team members (including enumerators of sub-contractors) will give a standardized introduction explaining the purpose of the interviews, and request the respondent's permission to proceed. The Team will explain the confidentiality of the process, that they are free to not respond if any question potentially upsets them, and will ask respondents to sign informed consent forms.

The Team has no policy respecting the use of audio recordings; individual team members may use them at their discretion. If used, however, each recording must be given a number rather than a name in order to preserve respondent privacy. In each case, results of KIIs, FGDs, record review, and visual observations will be summarized into written form in terms of key evidence into a database which can asynchronously be added to by each team member on an ongoing basis. The Team will share this information with each other within days of collection to mitigate any shared collection issues and support Team preparedness for subsequent data analysis and interpretation. It also adds to the basis of verifiable observation of sustainable "lessons learned," as discussed in Annex I.

Background questions, such as location, interviewer, etc., appear at the start (or "front end") of all surveys, as follows. KIIs of global staff, donors, expatriate IP staff, experts, national authorities in West Africa, UN/NGO staff in West Africa, journalists, and other involved persons. All surveys among experts, IP personnel, officers, or former staff at USAID, DOD, or CDC will include the same meta-data which includes name, position when he or she was active in the EVD outbreak, location of his or her work or deployment, type of program he or she worked in, and duration of involvement. More specifically, the information will include:

1. 1. Date of interview
2. 2. Full name
3. 3. Mode of interview (e.g., in person, Skype, phone, correspondence)
4. 4. Organizational affiliation today
5. 5. Role and title today
6. 6. Organizational affiliation(s) during outbreak response
7. 7. Role and title during the outbreak response

8. 8. Location(s) (countries and counties) during response
9. 9. Gender
10. 10. Expertise with EVD prior to 2014
11. 11. Expertise with communicable disease outbreaks prior to 2016
12. 12. Publications (if any) about the 2014–2016 EVD outbreak

KIIs among local HHs or other local stakeholders. These interviews will NOT ask for nor record surnames nor, if local citizens, their organizational affiliations, publications, title, nor record the specific household address. Each interview with a HH or random citizen in West Africa will still include common, background metadata, including the enumerator's name, the geographic location (i.e. village or urban area), the date of the interview, observations about the physical environment, and, if HH, type of dwelling, more specifically:

1. 1. Date of interview
2. 2. Enumerator observations of physical environment
3. 3. Enumerator observations and categorization of dwelling
4. 4. Location (GPS tag)
5. 5. First name
6. 6. KII category (e.g., citizen, CSO leader, Imam, pastor, burial digger, ambulance driver, DHO)
7. 7. Gender
8. 8. Location of interview
9. 9. Mode of interview
10. 10. Approximate age of respondent (16-21 years; 21-30 years; 30-50 years; >50 years)

4. Self-Assessment Forms

The Evaluation Team was not certain what was meant by the contract language about a "Self-Assessment" form. Following discussions with USAID at the Evaluation Plan presentation, the following approach was prepared.

Strategic use of Self-assessment Forms

The Team is aware of the names of a great many people who worked in the response, among IPs, among CDC EIS officers, and even among USAID officers. Although the Team expects to conduct up to two hundred KIIs overall, there will be many more individuals with whom it will not be able to talk due to capacity and/or because these individuals are unavailable. Recognizing that the Team cannot personally interview every individual who has a relevant background, we will make use of several self-assessment survey forms to reach them. These forms may be delivered through a combination of SurveyMonkey (online survey), email, or other expeditious outreach that allows the respondent to reply at their own convenience.

Most of the questions asked will be framed in terms of Likert (1-5) scales.

The data generated by the self-assessment will be cross-cutting and contribute to indicators for more than one evaluation question. Evaluation indicators impacted by the self-assessment include but are not limited to Evaluation Questions 1, 3, 5, 6, 7, 8, and 9.

IP self-assessments will not be conducted. We plan to conduct in-depth key informant interviews with a sample of OFDA supported IPs.

SURVEY QUESTIONNAIRE

Questionnaire number ☐☐☐☐
Date completed DD ☐☐ MM ☐☐ YY☐☐

N°	Question	Coding Categories	Linked with EQ
1	Please specify your name, and name of your organization	NAME ORGANIZATION	
2	In which unit or department were you deployed during Ebola response during the outbreak period, 2014-2015? (e.g., DART, RMT, Field Mission, GH Bureau, Africa Bureau, HHS) *(check all that apply)*	1=DART MEMBER 2=RMT MEMBER 3=OTHER (SPECIFY) 4=OTHER (SPECIFY) 5=OTHER (SPECIFY)	
3	a) How many rotations did you complete? b) Please provide the total time-period for each rotation you worked during Ebola response outbreak period, 2014-2015.	TOTAL NUMBER OF ROTATIONS:_____ DK=DON'T REMEMBER ROTATION 1: TOTAL DURATION OF THE LONGEST ROTATION: _____Months DK=DON'T REMEMBER ROTATION 2:TOTAL DURATION OF THE LONGEST ROTATION: _____Months DK=DON'T REMEMBER ROTATION 3:TOTAL DURATION OF THE LONGEST ROTATION: _____Months MONTH(S) DK=DON'T REMEMBER	n/a
4	In which West African countries did you serve, including remote work? *(check all that apply)*	1=SIERRA LEONE 2=LIBERIA 3=GUINEA 4=OTHER (SPECIFY) 5=OTHER (SPECIFY) 6=OTHER (SPECIFY)	n/a

N°	Question	Coding Categories	Linked with EQ
5	What was/were your main role(s) or task(s)? Please specify.	MAIN ROLE (S)/TASK(S): 1. 2. 3.	1-10
6	Did you participate in any interagency coordination meetings?	1. YES 2. NO <SKIP TO 9> 3. DECLINE TO ANSWER <SKIP TO 9> 4. DON'T KNOW <SKIP TO 9>	8-9
7	From your experience, what were the most valuable mechanisms – formal or informal – that you used and observed for how OFDA coordinated among USG agencies, offices, or bureaus, including at the Mission level? *(check all that apply)*	1. COORDINATING MEETINGS 2. COMMUNICATION PROTOCOLS 3. VIRTUAL MEETINGS 4. EMAIL CORRESPONDENCE 5. TASK ORDERS 6. OTHER (SPECIFY) _____ 7. DON'T KNOW	n/a
8	How often did you call in to or meet in any of the National Emergency Command Centres (with different names) for interagency coordination?	a) Liberia 1. WEEKLY 2. SEMI-MONTHLY 3. MONTHLY 4. OTHER (SPECIFY) _____ 5. NEVER b) S Leone 1. WEEKLY 2. SEMI-MONTHLY 3. MONTHLY 4. OTHER (SPECIFY) _____ 5. NEVER c) Guinea 1. WEEKLY 2. SEMI-MONTHLY 3. MONTHLY 4. OTHER (SPECIFY) _____ 5. NEVER	1-10
9	To what extent did you make decisions about which Implementing partner (IP) activities were funded?	1= AT ALL TIMES 2=SOMETIMES 3=NOT AT ALL 4=OTHER (SPECIFY)_____	1-10
10	How often did you receive activity reports from IPs?	1= MONTHLY 2=QUARTERLY 3=ANNUALLY 4=NOT AT ALL 5=OTHER (SPECIFY)_____	1-10
11	To what extent did you verify performance of IP activities	1= AT ALL TIMES 2=SOMETIMES 3=NOT AT ALL 4=OTHER (SPECIFY) _____	

In the next set of questions, rate your perception of the relative effectiveness of different interventions in containing or reducing the rate of transmission in the affected countries.								
Provide answers to the following to the extent that you had experiences or observations. Otherwise, select n/a for any that do not apply to your experience or observations. On a scale of 1 – 5, with 1 being least, 5 being most, and n/a being does not apply, select the number from the scale.								
N°	Intervention	Least				Most		Linked with EQ
12	Isolation of suspected cases?	1	2	3	4	5	N/A	1, 2, 3, 8
13	Construction of Ebola Treatment Centers (ETUs)?	1	2	3	4	5	N/A	3-5
14	Training of medical personnel: doctors and nurses, working in health facilities	1	2	3	4	5	N/A	1-6
15	Provision of Personal Protective Equipment, including suits/masks?	1	2	3	4	5	N/A	1-5
16	Training of burial workers?	1	2	3	4	5	N/A	2-6
17	Funding of surveillance systems?	1	2	3	4	5	N/A	4
18	Decontamination and cleaning of health facilities?	1	2	3	4	5	N/A	4, 5
21	Water, Sanitation and Hygiene education at community levels?	1	2	3	4	5	N/A	3
22	Food and nutritional support to families facing quarantine, isolation of family members or market disruptions.	1	2	3	4	5	N/A	1, 2, 4, 5
23	Support to national emergency command centers?	1	2	3	4	5	N/A	1, 2, 4, 5
24	Creation of Community Care Centers (CCCs)?	1	2	3	4	5	N/A	10, 2, 4
25	Community social mobilization through mass media, community health workers and the like?	1	2	3	4	5	N/A	10, 2, 4
26	Contact tracing?	1	2	3	4	5	N/A	1, 2, 3, 4
27	Creating lab referral network?	1	2	3	4	5	N/A	1, 2, 3, 4
Please answer the following questions based on your own experience or observations, to be the best of your ability. Otherwise, select n/a for any that do not apply to your experience or observations. On a scale of 1 – 5 ,with 1 being least, 5 being most, and n/a being does not apply, select the number from the scale.								
N°	Intervention	Least				Most		Linked with EQ
28	How would you rate OFDA's ability to prioritize the most relevant activities in response to changes in epidemiologic data?	1	2	3	4	5	N/A	2, 8-9
29	How would you rate OFDA's ability to measure the performance of funded activities over the course of the response to the Ebola Virus Disease (EVD) outbreak?	1	2	3	4	5	N/A	2, 8-9
30	How would you rate OFDA's ability to adjust relevant activities in response to the activity monitoring reports received from IPs?	1	2	3	4	5	N/A	2, 8-9
31	During your period of involvement, how clear would you say was the USG strategy for reducing transmission of EVD?	1	2	3	4	5	N/A	2, 8-9
32	How would you rate the work of UNMEER facilitating coherence in the multi-agency response to EVD?	1	2	3	4	5	N/A	2, 8-9
33	How effective were the national command centres run by national officials in providing information to OFDA and other key actors?	1	2	3	4	5	N/A	10
34	How effective was OFDA's coordination across other USG agencies?	1	2	3	4	5	N/A	7

The next three questions are open-ended for you to expand on any observations you have			
35	What were the most important roles that the US Embassies and USAID Missions in West Africa played in the EVD response?		2, 8, 9
36	Please share any other thoughts, including how to improve future responses to public health emergencies due to infectious disease outbreaks.		1-10
37	What other written reports, documents, or dataset (other than the OFDA documents or data) would you suggest for review by the Ebola Response Evaluation team?		n/a
The final question requests your availability to meet for an interview and/or focus group discussion on the following days in the month of May at OFDA's offices in the National Press Club Building at 529 14th St. NW, Washington, DC.			
38	On which of the following days would you be available to participate in an interview and/or focus group discussion?	MAY 4, AFTERNOON _____ MAY 11, AFTERNOON _____ MAY 18, AFTERNOON _____ MAY 25, AFTERNOON _____ OTHER (SPECIFY)	

5. Structured Surveys

Structured Surveys	Unit of Analysis	Sampling Method	Sample Size	Key Questions
A. Household and siblings	HHs and siblings	Two-stage cluster sample, per country	Total sample size for 3 countries = 15,000 (Liberia: 6,000, SL: 5,500, Guinea: 3,500)	Health outcomes at the population level, relative risks and other associations
B. CHWs and community mobilizers (as identified by district health office)	Community mobilizers, CHWs	Random and opportunistic, from each IP's list, with only rough balance between countries	70–120 x 3 = 300	What health messages did each individual actually convey? What misconceptions or resistance did they observe?
C. Local contact tracers (as identified by CDC and OFDA awardee Project Managers and/or awardee documents)	Locals who were trained to investigate EVD cases	Combination of stratified selection from the CDC and other training lists, and purposive.	~100 overall	How effective was the linkage between their field work and centralized surveillance? What resistance did they encounter?

Population-based, Structured Quantitative Survey at the HH Level

When administering the questionnaire below, the enumerators will frequently refer to a calendar of key local events or commonly recognized milestones to ground the conversation and the respondents' memories of "before" and "after" phases, and improve respondents' recall and accuracy of reported events between the start of 2014 until the end of 2015. These local events will be tailored to each survey approach, based on the country and region, and will vary from region to region. They will specifically avoid circular links to the EVD Outbreak, but refer to holidays, school year markers, local newsworthy events, memorable political or economic occurrences, etc., will be specified in advance by regional enumerator teams, and integrated into the enumerator surveys. These will triangulate with memories report by "month."

The data generated by the HH survey will be cross-cutting and contribute to indicators for more than one evaluation question. Evaluation indicators impacted by the HH survey include but are not limited to Evaluation Questions 1, 2, 4, 5, 6, 8, and 9.

USAID/OFDA EBOLA Response Evaluation
Quantitative Household Survey Questionnaire

Note for the enumerator: This questionnaire should be administered to the head of the household. If the head of the household is not present, interview another member of the household who is capable of providing information needed to fill in the questionnaire. If an adult is not available, do not interview a minor; instead, go on to the next household, and call back at the first household later. If the second time an adult is not available to interview, find a replacement household.

	Question	Answer codes	Question format
MODULE 1 - PRESURVEY			
P1	Interviewer number		Autofill
P2	Interview date		Autofill
P3	Interview start time		Autofill
P4	Country	1. Liberia 2. Guinea 3. Sierra Leone	Select one
P5	GPS Coordinates		Autofill

CONTACT SECTION

- **If no one is at home (i.e., premises empty) after <u>two</u> visits, note 5 on the table below and continue with household selection according to the skip pattern.**
- **If the selected respondent refuses to participate, note 2 on the table below and continue with household selection according to the skip pattern.**

P6. Interim Outcome	**Visit # 1**	**Visit # 2**
Date (MM/DD/YYYY)		
Time (HH:MM:SS)		
Interim outcome code **SCRIPTER: IF CODE 1, CONTINUE TO RESPONDENT SELECTION** 1. Contact made **(go to Respondent selection P7)** **SCRIPTER: IF CODE 2, SAVE AS INCOMPLETE (MUST BE ABLE TO BE RESUMED LATER); SAVE AS CODE 2 IN VISIT #** 2. No reply / No one at home **(=> Put Code 2 for the visit and plan re-visit)** **SCRIPTER: IF CODE 3, SAVE AS CODE 3 IN VISIT #,** 3. Ineligible address **(=> Put Code 3 for the visit; code 6 in P10)**		

MODULE 2 – CONSENT AND INTRODUCTION

If Contact Made:

P7. My name is …… I am with a team that is in your community talking to people to learn more about your experiences with Ebola and services provided during Ebola outbreak. Can I speak to the head of household or another member of the household who is capable of providing information about this household?

1	**YES**	→P8
2	**NO**	
P7b.	**Can I come back later to talk?**	
1	**Yes**	→Make an appointment and save the interview
2	**No**	→Code as 3, end interview

P8.

	Read: My name is …… I am with a team that is in your community talking to people to learn more about your experiences with Ebola and services provided during Ebola outbreak. The information we collect will be used by aid agencies to evaluate their performance in the outbreak response, and the performance of their partners. Participation in this interview is voluntary; you do not have to participate if you don't want to. You may skip any question that you don't want to answer, and you can stop at any time. Your responses are private and will not be used to identify you or any member of your family. You will not receive any benefits for participating in the survey. We hope that you will be willing to share your experiences so we can help improve future services. What questions do you have about what I have explained?		
P9.	Do you want to take part in this study by answering our questions?	(1) Consents <Go to MODULE 3> (2) Does not Consent < Go to MODULE 3A>	Select One

P10. Final Outcome.		
Successful interview	1	Code if the last questions is answered
Refused to be interviewed	2	Code if *P9 = 2*
Refused by head of household/caretaker/other family member/person who opened door	3	Code if P7 and P7b = 2
Person selected was never at home after at least 2 visits	4	Code if: First visit P7b=1 and Second visit P7 =2
Household/Premises empty after 2 visits	5	Code if P6=2 twice
Ineligible Address/Did not speak a survey language	6	Code if P6=3
Incomplete interview / breakoff	7	

MODULE 3 – TO BE COMPLETED BY ENUMERATOR			
1	District/County/Region (Country specific)		Select One – list will be provided
2	Country specific, if: 1. Liberia 2. Guinea 3. Sierra Leone : Chiefdom		Select One – list will be provided
3	PSU (Country specific)		Select One – list will be provided
4	Place of interview	(1) Home (2) Other (specify):_____	Select one
5	Name of community/location		Dropdown list
6	Urban/rural	(1) Urban (2) Periurban (3) Rural	Precode based on the sample
7	Gender expression of respondent	(1) Female (2) Male (3) Other	Select one
MODULE 3A – TO BE COMPLETED BY ENUMERATOR			
8	Gender expression of the person who refused	(1) Female (2) Male (3) Other	Select one
E2	Interview end time		Autofill
<END SURVEY>			
MODULE 4 – DEMOGRAPHICS			
9	How old are you?		Numerical entry
10	What is the highest level of education you have	7L: If P4 = 1 (Liberia)	Select one

	are mentioned. Prompt 'Anything else?'	(3) By air (4) Bad odor or smell (5) Mosquito bites (6) Preparing bush meat as a meal (7) Eating bush meat (8) Eating fruits likely to have been bitten by bats (9) Saliva of an infected person (10) Blood of an infected person 11) Sweat of an infected person (12) Urine of an infected person (13) Feces of an infected person (14) Breast milk of an infected person (15) Sperm or vaginal fluid of an infected person (16) Other infected contact with an infected person (17) God's will (18) Witchcraft (19) Other (specify):_____ (88) Don't know (99) Declined to answer	
17	What are some of the signs and symptoms of someone infected with Ebola? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?*	(1) Any fever (2) Sudden onset of high fever (3) Severe headache (4) Muscle pain (5) Weakness (6) Diarrhea (with or without blood) (7) Vomiting (with or without blood) (8) Abdominal (stomach) pain (9) Lack of appetite (10) Difficulty breathing (11) Bleeding (internal or external) (12) Hiccups (13) Delirium/confusion (14) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
18	Is it possible to prevent oneself from getting Ebola?	(1) Yes (2) No <skip to Q19> (88) Don't know (99) Declined to answer	Select one
19	Can I prevent myself from getting Ebola by avoiding contact with the blood and bodily fluids of someone infected with Ebola?	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select one
20	Can I prevent myself from getting Ebola by bathing with salt and hot water?	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select one
21	Can I prevent myself from getting Ebola by avoiding funeral or burial rituals that involve directly touching the body of someone who died from Ebola?	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select one
MODULE 6 – SOURCES OF INFORMATION			
22	We would like to know how you learned about Ebola. I'm going to read you a list of sources, and for each, please tell me whether you remember	(1) Yes (2) No (88) Don't know/Not sure	Select yes/no for each option

	are mentioned. Prompt 'Anything else?'	(3) By air (4) Bad odor or smell (5) Mosquito bites (6) Preparing bush meat as a meal (7) Eating bush meat (8) Eating fruits likely to have been bitten by bats (9) Saliva of an infected person (10) Blood of an infected person 11) Sweat of an infected person (12) Urine of an infected person (13) Feces of an infected person (14) Breast milk of an infected person (15) Sperm or vaginal fluid of an infected person (16) Other infected contact with an infected person (17) God's will (18) Witchcraft (19) Other (specify):_____ (88) Don't know (99) Declined to answer	
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18	Is it possible to prevent oneself from getting Ebola?	(1) Yes (2) No <skip to Q19> (88) Don't know (99) Declined to answer	Select one
19	Can I prevent myself from getting Ebola by avoiding contact with the blood and bodily fluids of someone infected with Ebola?	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select one
20	Can I prevent myself from getting Ebola by bathing with salt and hot water?	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select one
21	Can I prevent myself from getting Ebola by avoiding funeral or burial rituals that involve directly touching the body of someone who died from Ebola?	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select one
MODULE 6 – SOURCES OF INFORMATION			
22	We would like to know how you learned about Ebola. I'm going to read you a list of sources, and for each, please tell me whether you remember	(1) Yes (2) No (88) Don't know/Not sure	Select yes/no for each option

	learning about Ebola from that source. (A) Radio (B) Television (C) Megaphone public announcement (D) Church/mosque/other religious venues (E) Family members, friends, and community members/neighbors (F) Newspapers (G) Flyers/brochures/other printed materials (H) Internet/blog/website/social media (I) Mobile phone/text message (J) House to house visits by health educators (K) House visits by contact tracers (L) Traditional/community leaders (M) Government /District health team (N) Call center/hot line (O) Burial team that was in your community (P) Community organizations (specify):_____ (Q) International aid agency (specify):_____ (R) Other (specify):_____	(99) Decline to answer (88) Don't know/Don't remember (99) Declined to answer	
23	Did a health worker or any other health educator come to your house or speak with you directly about Ebola?	(1) Yes (2) No <skip to 22> (88) Don't know/Don't remember <skip to 22> (99) Declined to answer <skip to 22>	Select one
24	When did they first come to your house? *Read answer choices*	(1) Before Ebola came to my community (2) During the Ebola outbreak in my community (3) After Ebola left my community (88) Don't know (99) Declined to answer	Select one
25	Who gave you accurate health information about Ebola? *Read list, and select all that are mentioned. Prompt 'Anything else?'.*	(1) Government/Ministry of Health (2) The mass media-TV/radio/newspaper (3) Doctor (4) Nurse (5) Community health worker/educators (6) Family and friends (7) Religious leaders (8) Traditional healers (9) Community organizations (specify):_____ (10) International aid agency (specify):_____ (11) Other (specify):_____ (12 No one (DO NOT READ) (88) Don't know (99) Declined to answer	Select all that apply
MODULE 7 – ATTITUDES			
	Read: For each of the following statements, tell me whether you agree, disagree, or are not sure.		
26	Anyone can get Ebola (even healthy people).	(1) Agree (2) Disagree (88) Don't know/Not sure (99) Decline to answer	Select one
27	I am worried about getting Ebola.		
28	I am afraid of people with Ebola.		
29	I am afraid of people who live with Ebola patients.		

30	I would know if I had Ebola symptoms.		
31	I know how to protect myself from getting Ebola.		
32	If I got Ebola symptoms, I would seek treatment.		
33	If I got Ebola symptoms, I would be afraid of going to a treatment center.		
34	If I got Ebola symptoms, I would go to a traditional healer.		
35	If I got Ebola symptoms, I would hide away in my house.		
36	If a friend or family member gets Ebola, I would take them to a treatment center.		
37	If a friend or family member gets Ebola, I would take them to a traditional healer.		
38	If a friend or family member gets Ebola, I would keep them in my house.		
39	I am afraid to live with someone who have been cured of Ebola.		
40	If a shopkeeper survived Ebola, I would buy fresh vegetables from them.		
41	If a neighbor survived Ebola, I would welcome them back into my community/neighborhood.		
MODULE 8 – BEHAVIORS			
42	In what ways have you changed your behavior or what actions have you taken to avoid being infected with Ebola? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(0) None <skip to 42> (1) Wash hands with soap and water more often (2) Wash hands with disinfectant more often (3) Avoid crowded places (4) Drink BitterCola (5) Drink a lot of water or juice (6) Take traditional herbs (7) Take antibiotics (8) Wear gloves (9) Avoid touching people I suspect have Ebola (10) Avoid touching everyone (11) Do not touch dead bodies during or preparing for burial ceremonies (12) Wash with salt and hot water (13) Other (specify):_____ (88) Don't know <skip to 42> (99) Declined to answer <skip to 42>	Select all that apply
43	What prompted you to make those changes? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(1) After I spoke to health worker(s)/community health educator(s) (2) After I listened to radio program(s) (3) After I watched TV program(s) (4) After I read billboard message(s) or educational material(s) (5) After I received advice from my family member(s) or friend(s) (6) After I received instruction(s) at my workplace or school (7) Other (specify)--------- (88) Don't know (99) Declined to answer	Select all that apply
44	What actions have you taken to protect your family members and friends from Ebola? *Do not read list. Listen to reply, and select all that*	(0) None (1) Telling them about hand washing and hygiene (2) Telling them what to do when someone in the	Select all that apply

	are mentioned. Prompt 'Anything else?'	community is sick (3) Telling them not to touch a sick person or dead body (4) Preparing chlorine water every day for bad washing and bathing (5) Buying protection like medicines, plastic bags, gloves (6) Informing local leader, health facility, or hotline if someone is sick in the community (7) Informing local leader, health facility, or hotline if someone has died (8) Other (specify):_____ (88) Don't know <skip to 42> (99) Declined to answer <skip to 42>	
45	If you have a high fever, for any reason, will you go to a health facility?	(1) Yes <skip to 44> (2) No (88) Don't know <skip to 44> (99) Decline to answer <skip to 44>	Select one
46	Why not? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(1) I have no money/can't afford to pay (2) There is no health facility nearby that I can get to (3) The health facility is contaminated by Ebola (4) People will think I have Ebola (5) I prefer to go to a pharmacy (6) I prefer to go to a traditional healer (7) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
47	What will you do if you suspect someone in your family has Ebola? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(1) Nothing (2) Care for them at home (3) Care for them at home using personal protective gear (4) Call the hospital/Ebola line (5) Take the person to a health facility (6) Take the person to an Ebola Treatment Unit (7) Take the person to a Community Care Center (8) Bring a healthcare worker to the home (9) Seek assistance from a traditional healer (10) Seek assistance from a spiritual healer (11) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
48	Has anyone in your household been suspected of having Ebola?	(1) Yes (2) No (88) Don't know (99) Decline to answer	Select one
49	Has anyone in your household been diagnosed with Ebola by a health care professional?	(1) Yes (2) No <skip to Module 9> (88) Don't know <skip to Module 9> (99) Decline to answer <skip to Module 9>	Select one
50	What did you do to care for that person(s)? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	<same answer choices as Q44>	Select all that apply
51	How many people in your household had Ebola and recovered fully?	(1) <enter number> (88) Don't know (99) Decline to answer	

52	How many people in your household have a disability resulting from Ebola?	(1) <enter number> (88) Don't know (99) Decline to answer	
53	How many people in your household died from Ebola?	(1) <enter number> <if 0 skip to Module 9> (88) Don't know <skip to Module 9> (99) Decline to answer <skip to Module 9>	
54	What did you do with the body after they died? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(1) Called for burial team to collect the body (2) Wore gloves while preparing the body (3) Wore protective clothes when preparing the body (4) Did not clean the body (5) Did not touch the body during funeral (6) Wore gloves while burying the body (7) Wore protective clothes when burying the body (8) Wrapped body in provided bag (9) Wrapped body in other protective layer (10) Other (Specify):_____ (88) Don't know/Don't Remember (99) Decline to Answer	Select all that apply
MODULE 9: EXPOSURE TO THE RESPONSE			
55	Was an Ebola Treatment Unit established near enough to your home for you to get to?	(1) Yes (2) No (88) Don't know (99) Decline to answer	Select one
56	Was a Community Care Center established near enough to your home for you to get to?	(1) Yes (2) No (88) Don't know (99) Decline to answer	Select one
57	Have you ever called the Ebola hotline?	(1) Yes (2) No <skip to 56> (88) Don't know/Don't Remember <skip to 56> (99) Decline to answer <skip to 56>	Select one
58	What was the reason for calling the hotline? *Read list, and select all that are mentioned. Prompt 'Anything else?*	(1) Get health information on Ebola (2) Report a death (3) Report a suspected case (4) Want to know if the number is working (5) Other (Specify):_____ (88) Don't know/Don't Remember (99) Decline to Answer	Select all that apply
59	Did you or any member of your family have to be isolated or quarantined for 3 weeks (21 days) due to contact with someone who was known or suspected to have Ebola?	(1) Yes (2) No <skip to 64> (88) Don't know/Not sure <skip to 64> (99) Decline to answer <skip to 64>	Select one
60	When did this first occur?	(1) <enter month and year> (88) Don't know (99) Declined to answer	
61	Were you or any member of your family given information about the quarantine?	(1) Yes (2) No (88) Don't know/Not sure (99) Decline to answer	Select one
62	Who (what organization) provided the information?	Specify:_____ (88) Don't know/Don't Remember (99) Decline to Answer	
63	Were you or any member of your family given food support while in isolation?	(1) Yes (2) No <skip to 62>	Select one

		(88) Don't know/Not sure<skip to 62> (99) Decline to answer<skip to 62>	
64	Who (what organization) provided the food support?	Specify:_____ (88) Don't know/Don't Remember (99) Decline to Answer	Select all that apply
65	Were you or any member of your family given financial support while in isolation?	(1) Yes (2) No <skip to 64> (88) Don't know/Not sure<skip to 64> (99) Decline to answer <skip to 64>	Select one
66	Who (what organization) provided the financial support?	Specify:_____ (88) Don't know/Don't Remember (99) Decline to Answer	Select all that apply
67	Did you provide any kind of assistance (information, food, or finance support) to others who experienced isolation or quarantine?	(1) Yes (2) No (88) Don't know (99) Decline to answer	Select one
68	Was your household visited by a professional looking for Ebola cases or investigating contacts of Ebola cases?	(1) Yes (2) No <skip to 67> (88) Don't know <skip to 67> (99) Decline to answer <skip to 67>	Select one
69	What organization were they with?	Specify:_____ (88) Don't know/Don't Remember (99) Decline to Answer	Select all that apply
70	Did your household receive any protective clothing or kits of special cleaning materials to help protect against Ebola?	(1) Yes (2) No <skip to 72> (88) Don't know <skip to 72> (99) Decline to answer <skip to 72>	Select one
71	What organization was it from?	Specify:_____ (88) Don't know/Don't Remember (99) Decline to Answer	Select all that apply
72	Did your household receive any protective clothing or kits of special cleaning materials to aid in preparing and burying the bodies of people who died from Ebola?	(1) Yes (2) No <skip to 71> (88) Don't know <skip to 71> (99) Decline to answer <skip to 71>	Select one
73	What organization was it from?	Specify:_____ (88) Don't know/Don't Remember (99) Decline to Answer	Select all that apply
74	Did your household receive any food assistance, coming from international organizations at any point during the Ebola outbreak?	(1) Yes (2) No <skip to 73> (88) Don't know <skip to 73> (99) Decline to answer <skip to 73>	Select one
75	What organization was it from?	Specify:_____ (88) Don't know/Don't Remember (99) Decline to Answer	Select all that apply
76	Have you participated in any community activities to stop Ebola in your community?	(1) Yes (2) No <skip to MODULE 10> (88) Don't know/ Don't Remember <skip to MODULE 10> (99) Decline to answer <skip to MODULE 10>	Select one
77	Which of the following activities did you participate in? *Read list, and select all that are mentioned. Prompt 'Anything else?'*	(1) Spread awareness (2) Demonstrated prevention activities (3) Attended meetings about Ebola (4) Gave instructions to/supervised others (5) Distributed materials for protection (6) Distributed materials for education	Select all that apply

		(7) Contact tracing and case finding (8) Conducting safe burials as part of burial teams (9) Other (Specify):_____ (88) Don't know/Don't Remember (99) Decline to Answer	
78	What organization did you do this with?	Specify:_____ (88) Don't know/Don't Remember (99) Decline to Answer	Select all that apply
MODULE 10 – END			
	Read: Thank you for talking the time to talk with us today. Do you have any questions? We understand that it may have been difficult for you to answer some of these questions. If you would like to talk with someone about how you are feeling, please let me know and I can help you to do so. As a reminder, your responses are confidential - we will not include your name, and no one will know what your individual responses were. Thanks again.		
E1	Referral given?	(1) Not requested (2) Gave referral information to respondent (3) Made phone call to referral organizations (4) Made arrangement to take respondent to referral organizations (5) Someone from referral organization came to the respondent	
E2	Interview end time		Autofill
<END SURVEY>			

SURVEY B: CHWS AND COMMUNITY MOBILIZERS

USAID/OFDA Ebola Response Evaluation
CHW/CHV Survey Questionnaire

	Question	Answer codes	Question format
MODULE 1 - PRESURVEY			
P1	Interviewer number		Enter Number
P2	Interview date		Autofill
P3	Interview start time		Autofill
P4	Country	7. Liberia 8. Guinea 9. Sierra Leone	Select one
P5	District/County/Region		Select one
MODULE 2 – CONSENT AND INTRODUCTION			
	Read: My name is …… I work with an organization called IBTCI which is conducting an evaluation of the U.S. government's involvement in the response to the Ebola epidemic. The information we collect will be used to evaluate their performance in the outbreak response, and the performance of their implementing partners. We are talking to individuals who worked as community health workers (CHWs) or community health volunteers (CHVs) during the response. We hope that you will be willing to share your experiences doing this work with us. Participation in this interview is voluntary; you do not have to participate if you don't want to. If you decide to participate, you may skip any question that you don't want to answer, and you can stop at any time. You will not receive any benefits for participating in the survey. We hope that you will be willing to share your experiences so we can help improve future services. This interview will be confidential. Your responses will be combined with those of other contact tracers. While the organization you worked for may see the combined results, they will not see the responses from you in particular or from any individual. What questions do you have about what I have explained?		
P6	Do you want to take part in this study by answering our questions?	(1) Consents (2) Does not Consent <Go to END>	Select One
MODULE 3 – DEMOGRAPHICS			
1	How old are you? *Round to the nearest whole year.*	<record whole number>	
2	What is your gender?	(1) Female (2) Male (3) Other (99) Declined to answer	Select one
3	What is the highest level of education you have completed?	3L: If P4 = 1 (Liberia) (1) No formal education (2) Some primary (3) Completed primary (4) Middle or Junior High (5) Secondary or Senior Secondary (6) Vocational/Technical degree (7) Tertiary/University (8) Professional/Advanced degree (88) Don't know (99) Declined to answer 3G: If P4 = 2 (Guinea) (1) No formal education (2) Some primary (3) Completed primary	Select one

		(4) Middle or Lower Secondary (5) Secondary to Academic Upper Secondary (6) Vocational/Technical degree (7) Tertiary/University (8) Professional/Advanced degree (88) Don't know (99) Declined to answer 3SL: If P4 = 3 (Sierra Leone) (1) No formal education (2) Some primary (3) Completed primary (4) Middle or junior secondary (5) Senior Secondary (6) Vocational/Technical degree (7) Tertiary/University (8) Professional/Advanced degree (88) Don't know (99) Declined to answer	
4	Prior to the Ebola epidemic, did you work as a health worker or health volunteer?	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select one
5	Prior to the Ebola epidemic, did you have experience in community health education (raising awareness, or peer education)?	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select one
MODULE 4 – EMPLOYMENT DETAILS			
1	For what organization did you work as community health worker or volunteer?	(1) Local government clinic (2) Local private clinic (3) Local community organization (4) I am a general community volunteer, not employed with any organization<skip to 3> (5) Other (specify)_____ 88) Don't know<skip to 3> (99) Declined to answer<skip to 3>	Select all that apply
2	Did you work for this organization prior to the Ebola epidemic?	(1) Yes (2) No (99) Declined to answer	Select one
3	For how long (in months) did you work as a community health worker or volunteer during the Ebola outbreak?	---(number of months) (88) Don't know (99) Declined to answer	Select one
4	Did you receive compensation (money or otherwise) for your work?	(1) Yes (2) No <skip to 6> (88) Don't know <skip to 6> (99) Declined to answer <skip to 6>	Select one
5	What did you receive? *Read list. Select all that apply.*	(1) Money (2) Food (3) Health supplies (4) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply

6	Did you receive any specific training related to Ebola?	(1) Yes (2) No <skip to 10> (88) Don't know <skip to 10> (99) Declined to answer <skip to 10>	Select all that apply
7	"Did you receive the training on each of the following topics? YES/NO"	(1) Community education/behavior change communication about Ebola (2) Community surveillance for detecting Ebola cases (3) General hygiene and health promotion (4) Other (specify):_____ (88) Don't know (99) Declined to answer	
8	What agency/organization trained you? *Do not read list. Listen to reply, and select all that are mentioned.*	(1) MSF (2) WHO (3) US CDC (4) MoH (x) <list of IPs> (x) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
9	How many days of training did you receive? *Round to the nearest whole number.*	<record whole number>	
10	Were you given standardized guidelines (in written form such as guidebook, charts, check-lists etc.) for your work?	(1) Yes (2) No <skip to 15> (88) Don't know <skip to 15> (99) Declined to answer <skip to 15>	Select one
11	What organization provided the guidelines? *Do not read list. Listen to reply, and select all that are mentioned.*	(1) MSF (2) WHO (3) US CDC (4) MoH (x) <list of IPs> (x) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
12	Did the guidelines change over time?	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select one
13	Did you follow all CHW guidelines all of the time?	(1) Yes <skip to 15> (2) Sometimes (3) No (88) Don't know <skip to 15> (99) Declined to answer <skip to 15>	Select one
14	Why not? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(1) They were not appropriate for the setting in which I worked (2) They changed and I continued following previous guidelines (3) Conditions changed so it was no longer appropriate to follow the guidelines (4) I was instructed to do my job differently by the organization I worked for (5) They were too difficult to follow (6) It did not seem important (7) Other (specify):_____ (88) Don't know	Select all that apply

		(99) Declined to answer	
15	How did you travel in the course of your work? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(1) Organization vehicle (2) Public transportation (3) Taxi (4) Private car (5) Motorbike (6) Bicycle (7) Walking (8) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
16	Did you travel to geographic areas requiring you to be away from your residence for at least one night for this work each week?	(1) Yes (2) No (88) Don't know (99) Declined to answer	
17	Were you given any equipment or supplies to aid in your work as a community health worker or volunteer?	(1) Yes (2) No <skip to 19> (99) Declined to answer <skip to 19>	Select one
18	For each of the following, please tell me whether you received it.	(1) Notebook (2) Forms/logs (3) Digital device (4) Identifying clothing/hat/apron (5) ID card/name badge (6) Personnel Protective Equipment (7) Medications (8) Other health supplies (9) Posters/banners/visual displays (10) Pamphlets/booklets/flyers for distribution (88) Don't know (99) Declined to answer	Select all that apply
19	What was your most important tool as a community health worker or volunteer? *Do not read list.*	<same answer choices as 18> <x> (Other specify):_____	Select one
20	What did you not have that would have aided your work? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	<same answer choices as 18> <x> (Other specify):_____	Select all that apply
21	Did you use an app on a digital device as part of your work?	(1) Yes (2) No <skip to 23> (88) Don't know <skip to 23> (99) Declined to answer <skip to 23>	Select one
22	What was the name of the app?	(1) Ebola Care (2) CommCare (8) Other (specify):_____ (88) Don't know (99) Declined to answer	
23	How often did you meet and coordinate with other community health workers or volunteers?	(1) Daily (2) Every few days (3) Weekly (4) Every two weeks (5) Monthly (6) A few times, not regularly (7) Never – I did not meet and coordinate with other community health workers	Select one

		(88) Don't know (99) Declined to answer	
24	How closely linked or coordinated was your work with the efforts of contact tracers?	(1) Not coordinated (2) Mostly uncoordinated (3) Somewhat coordinated (4) Very well coordinated (88) Don't know (99) Declined to answer	Select one
25	How often did you meet with or coordinate government health authorities (such as District Health Officers)?	(1) Daily (2) Every few days (3) Weekly (4) Every two weeks (5) Monthly (6) A few times, not regularly (7) Never - I did not meet and coordinate with government health authorities (88) Don't know (99) Declined to answer	Select one
26	How often did you receive supervision support from your supervisor?	(1) Daily (2) Every few days (3) Weekly (4) Every two weeks (5) Monthly (6) A few times, not regularly (7) Never - I did not receive supervision support (88) Don't know (99) Declined to answer	Select one
MODULE 5 – EBOLA KNOWLEDGE			
1	What causes Ebola? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(1) Virus (2) Bacteria (3) Bats/ Monkeys/ Other wild animals (4) God or higher power (5) Witchcraft (6) Evildoing/sin (7) Curse (8) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
2	How does a person get Ebola? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(1) Bad hygiene (2) From travel (3) By air (4) Bad odor or smell (5) Mosquito bites (6) Preparing bush meat as a meal (7) Eating bush meat (8) Eating fruits likely to have been bitten by bats (9) Saliva of an infected person (10) Blood of an infected person 11) Sweat of an infected person (12) Urine of an infected person (13) Feces of an infected person (14) Breast milk of an infected person	Select all that apply

		(15) Sperm or vaginal fluid of an infected person (16) Other infected contact with an infected person (17) God's will (18) Witchcraft (19) Other (specify):_____ (88) Don't know (99) Declined to answer	
3	What are some of the signs and symptoms of someone infected with Ebola? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?*	(1) Any fever (2) Sudden onset of high fever (3) Severe headache (4) Muscle pain (5) Weakness (6) Diarrhea (with or without blood) (7) Vomiting (with or without blood) (8) Abdominal (stomach) pain (9) Lack of appetite (10) Difficulty breathing (11) Bleeding (internal or external) (12) Hiccups (13) Delirium/confusion (14) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
MODULE 6 – PERCEPTIONS			
1	What is your best estimate of the number of households you interacted with in this role?	<record whole number>	
2	When working as a community health worker or volunteer, did you feel respected by community members?	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select one
3	When working as a community health worker or volunteer, did you feel trusted by community members?	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select one
4	Do you feel that the compensation you received for your work as a community Health worker or volunteer was adequate?	(1) Yes (2) No (3) I did not receive compensation (88) Don't know (99) Declined to answer	Select one <display logic: don't display if answered no to Q5 in M4>
5	What were the most difficult hurdles you faced in your work as a community health worker or volunteer? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(1) Transportation (2) Lack of cooperation from community (3) Rains (4) Inadequate training (5) Inadequate tools/supplies (6) Inadequate support/compensation (7) Lack of support from my organization (8) Lack of information (9) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
6	How often did you feel threatened in any communities	(1) Never	Select one

	where you worked? *Read answer choices.*	(2) Sometimes (3) Often (99) Declined to answer	
7	How often did you experience stigma or discrimination because of your work as a community health worker or volunteer? *Read answer choices.*	(1) Never (2) Sometimes (3) Often (99) Declined to answer	Select one
MODULE 7 – OPEN ENDED			
	Read: Now I'm going to ask you a series of questions without answer choices. Please answer each question in one sentence if possible.		
1	As a community health worker or volunteer, what is the most important message that you communicated to communities?	1.---------- 2. Don't know 3. Declines to answer	
2	In your work, what was the top question asked to you by community members?	1.---------- 2. Don't know 3. Declines to answer	
3	In your opinion, what was the most common example of misinformation/misunderstanding/myth that you heard?	1.---------- 2. Don't know 3. Declines to answer	
4	What was the most common source of misinformation/misunderstanding/myth that you heard?	1.---------- 2. Don't know 3. Declines to answer	
5	In your opinion, what message do you think had the biggest influence on changing peoples' behavior?	1.---------- 2. Don't know 3. Declines to answer	
6	What is your top suggestion for improving outbreak response in the future?	1.---------- 2. Don't know 3. Declines to answer	
MODULE 8 – END			
	Read: Thank you for talking the time to talk with us today. Do you have any questions? We understand that it may have been difficult for you to answer some of these questions. If you would like to talk with someone about how you are feeling, please let me know and I can help you to do so. As a reminder, your responses are confidential - we will not include your name, and no one will know what your individual responses were. Thanks again.		
E1	Requested Referral?	(1) Yes (2) No	
E2	Interview end time		Autofill
<END SURVEY>			

SURVEY C: CONTACT TRACERS

USAID/OFDA Ebola Response Evaluation
Contact Tracers Survey Questionnaire

	Question	Answer codes	Question format
MODULE 1 - PRESURVEY			
P1	Interviewer number		Enter Number
P2	Interview date		Autofill
P3	Interview start time		Autofill
P4	Country	4. Liberia 5. Guinea 6. Sierra Leone	Select one
P5	District/County/Region		List
MODULE 2 – CONSENT AND INTRODUCTION			
	Read: My name is …… I work with an organization called IBTCI which is conducting an evaluation of the U.S. government's involvement in the response to the Ebola epidemic. We are talking to individuals who worked as contact tracers during the response. We hope that you will be willing to share your experiences doing this work with us. Participation in this interview is voluntary; you do not have to participate if you don't want to. If you decide to participate, you may skip any question that you don't want to answer, and you can stop at any time. You will not receive any benefits for participating in the survey. We hope that you will be willing to share your experiences so we can help improve future services. This interview will be confidential. Your responses will be combined with those of other contact tracers. While the organization you worked for may see the combined results, they will not see the responses from you in particular or from any individual. What questions do you have about what I have explained?		
P6	Do you want to take part in this study by answering our questions?	(1) Consents (2) Does not Consent <Go to END>	Select One
MODULE 3 – DEMOGRAPHICS			
1	How old are you? *Round to the nearest whole year.*	<record whole number>	
2	What is your gender?	(1) Female (2) Male (3) Other (99) Declined to answer	Select one
3	What is the highest level of education you have completed?	3L: If P4 = 1 (Liberia) (1) No formal education (2) Some primary (3) Completed primary (4) Middle or Junior High (5) Secondary or Senior Secondary (6) Vocational/Technical degree (7) Tertiary/University (8) Professional/Advanced degree (88) Don't know (99) Declined to answer 3G: If P4 = 2 (Guinea) (1) No formal education (2) Some primary (3) Completed primary	Select one

		(4) Middle or Lower Secondary (5) Secondary to Academic Upper Secondary (6) Vocational/Technical degree (7) Tertiary/University (8) Professional/Advanced degree (88) Don't know (99) Declined to answer 3SL: If P4 = 3 (Sierra Leone) (1) No formal education (2) Some primary (3) Completed primary (4) Middle or junior secondary (5) Senior Secondary (6) Vocational/Technical degree (7) Tertiary/University (8) Professional/Advanced degree (88) Don't know (99) Declined to answer	
4	Prior to the Ebola epidemic, did you work as a health worker or for an organization doing health related work?	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select one
5	Prior to the Ebola epidemic, did you have experience in community work, raising awareness, or peer education?	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select one
MODULE 4 – TRAINING AND TOOLS			
1	For what organization did you work as a contact tracer?	<list of IPs in that area>	Select all that apply
2	Did you work for this organization prior to the Ebola epidemic?	(1) Yes (2) No (99) Declined to answer	Select one
3	Did you receive compensation (money or otherwise) for your work as a contact tracer?	(1) Yes (2) No <skip to 5> (88) Don't know <skip to 5> (99) Declined to answer <skip to 5>	Select one
4	What did you receive? *Read list. Select all that apply.*	(1) Money (2) Food (3) Health supplies (4) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
5	What month did you begin working as a contact tracer?	<List months in 2014 and 2015>	Select one
6	What month did you conclude working as a contact tracer?	<List months in 2014 and 2015>	Select one
7	When were you trained in contact tracing?	(1) Never <skip to 10> (2) During prior employment (x) <List months in 2014 and 2015> (88) Don't know <skip to 10> (99) Declined to answer <skip to 10>	Select all that apply
8	What agency/organization trained you?	(1) MSF	Select all that

	Do not read list. Listen to reply, and select all that are mentioned.	(2) WHO (3) US CDC (4) MoH (x) <list of IPs> (x) Other (specify):_____ (88) Don't know (99) Declined to answer	apply
9	How many days of training did you receive? *Round to the nearest whole number.*	<record whole number>	
10	Were you given standardized guidelines (in written form such as guidebook, charts, check-lists etc.) for contact tracing?	(1) Yes (2) No <skip to 15> (88) Don't know <skip to 15> (99) Declined to answer <skip to 15>	Select one
11	What organization provided the guidelines? *Do not read list. Listen to reply, and select all that are mentioned.*	(1) MSF (2) WHO (3) US CDC (4) MoH (x) <list of IPs> (x) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
12	Did the guidelines change over time?	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select one
13	Did you follow all contact tracing guidelines for every contact?	(1) Yes, for all <skip to 15> (2) Yes, for some (3) No (88) Don't know <skip to 15> (99) Declined to answer <skip to 15>	Select one
14	Why not? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(1) They were not appropriate for the setting in which I worked (2) They changed and I continued following previous guidelines (3) Conditions changed so it was no longer appropriate to follow the guidelines (4) I was instructed to do my job differently by the organization I worked for (5) They were too difficult to follow (6) It did not seem important (7) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
15	How did you travel in the course of your work? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(1) Organization vehicle (2) Public transportation (3) Taxi (4) Private car (5) Motorbike (6) Bicycle (7) Walking (8) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
16	Did you travel to geographic areas requiring you to be away from your residence for at least one night for	(1) Yes (2) No	Select one

	this work each week?	(88) Don't know (99) Declined to answer	
17	Were you given any equipment or supplies to aid in your work as a contact tracer?	(1) Yes (2) No <skip to 19> (99) Declined to answer <skip to 19>	Select one
18	For each of the following, please tell me whether you received it.	(1) Notebook (2) Forms/logs (3) Digital device (4) Identifying clothing/hat/apron (5) ID card/name badge (6) Personnel Protective Equipment (88) Don't know (99) Declined to answer	Select all that apply
19	What was your most important tool as a contact tracer? *Do not read list.*	<same answer choices as 18> <x> (Other specify):_____	Select one
20	What did you not have that would have aided your work? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	<same answer choices as 18> <x> (Other specify):_____	Select all that apply
21	Did you use an app on a digital device to record contact information?	(1) Yes (2) No <skip to 23> (88) Don't know <skip to 23> (99) Declined to answer <skip to 23>	Select one
22	What was the name of the app?	(1) eDetection (2) WHO's Field Information Management System (FIMS) (3) Epi Info's Viral Hemorrhagic Fever (VHM) (4) Contact Tracing (5) Ebola Contact Tracing (ECT) (6) Sense Followup (7) CommCare (8) Other (specify):_____ (88) Don't know (99) Declined to answer	
23	How often did you provide contact tracing report to your supervisor?	(1) Daily (2) At least once in a week (3) At least once in a month (4) A few times, not regularly (5) Never (88) Don't know (99) Declined to answer	Select one
24	How often did you meet and coordinate with other contact tracers?	(1) Daily (2) Every few days (3) Weekly (4) Every two weeks (5) Monthly (6) A few times, not regularly (7) Never - I did not meet and coordinate with other contact tracers (88) Don't know (99) Declined to answer	Select one
MODULE 5 – EBOLA KNOWLEDGE			

1	What causes Ebola? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(1) Virus (2) Bacteria (3) Bats/ Monkeys/ Other wild animals (4) God or higher power (5) Witchcraft (6) Evildoing/sin (7) Curse (8) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
2	How does a person get Ebola? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(1) Bad hygiene (2) From travel (3) By air (4) Bad odor or smell (5) Mosquito bites (6) Preparing bush meat as a meal (7) Eating bush meat (8) Eating fruits likely to have been bitten by bats (9) Saliva of an infected person (10) Blood of an infected person 11) Sweat of an infected person (12) Urine of an infected person (13) Feces of an infected person (14) Breast milk of an infected person (15) Sperm or vaginal fluid of an infected person (16) Other infected contact with an infected person (17) God's will (18) Witchcraft (19) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
3	What are some of the signs and symptoms of someone infected with Ebola? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?*	(1) Any fever (2) Sudden onset of high fever (3) Severe headache (4) Muscle pain (5) Weakness (6) Diarrhea (with or without blood) (7) Vomiting (with or without blood) (8) Abdominal (stomach) pain (9) Lack of appetite (10) Difficulty breathing (11) Bleeding (internal or external) (12) Hiccups (13) Delirium/confusion (14) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
MODULE 6 – JOB KNOWLEDGE			
1	For each of the following, please tell me whether it was one of your job responsibilities as a contact tracer.	(1) Look for sick people (2) Interview sick people about contacts (3) Locate contacts	Select all that apply

		(4) Find out where visitors in the community have come from (5) Find dead bodies (6) Educate the community about Ebola (88) Don't know (99) Declined to answer	
2	What did you do during your first meeting with a new contact? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(1) Assess the health status of the contact (2) Alert the contact of his/her status (3) Interview the contact (4) Explain the follow-up procedures (5) Identify an appropriate meeting place and time for follow-up (6) Make a list of their contacts (7) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
3	What did you do during follow up visits with contacts? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(1) Observe the contact's general condition for signs of illness (2) Interview the contact regarding health status (presence or absence of specific symptoms) (3) Fill out contact follow-up form/log (4) Ask if the contact knows of anyone else who is sick. (5) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply
4	For each of the following, please tell me whether they should be recorded as contacts of an Ebola case? (1) Someone who touched the case directly since symptom onset (2) Someone who had sex with the case since symptom onset (3) Someone who lived in the same household with the case since symptom onset (4) Someone who visited the case since symptom onset (at any location) (5) Staff at healthcare facilities visited by the case since symptom onset (6) If the case is a health worker, someone who has been their patient since symptom onset (7) If the case has died, someone who touched the deceased person (8) If the case has died, someone who attended burial ceremonies	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select all that apply
5	What information do you need to collect about contacts? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(1) A contact's relationship to the case (2) Date of last interaction (3) Type of interaction (4) Contact information (address, phone number) (88) Don't know (99) Declined to answer	Select all that apply
6	How often do you follow up with each contact?	(1) every day (2) every few days (3) once a week	Select one

		(4) one time (88) Don't know (99) Declined to answer	
7	For how many days do you follow a contact?	<record whole number>	
8	What did you do if you encountered someone who was showing signs of Ebola? *Read list, and select all that apply*	(1) Contact a supervisor (2) Contact a transportation team (3) Tell them to go to a health facility (4) Bring them to a health facility yourself (5) Provide information about Ebola (6) Trace their contacts (7) Isolate (quarantine) their contacts (88) Don't know (99) Declined to answer	Select all that apply
MODULE 7 – PERCEPTIONS			
1	What is the approximate number of identified contacts you followed over time during the Ebola outbreak?	<record whole number> (88) Don't know <skip to 4> (99) Declined to answer <skip to 4>	
2	Of all the identified contacts you followed over time, what is your best estimate of the percentage that you successfully followed up with for the full 21 day period?	<record whole number>	
3	Of all the identified contacts you followed over time, what is your best estimate of the percentage that were lost to follow-up because of illness?	<record whole number>	
4	Did you encounter households that intentionally prevented contact tracing?	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select one
5	What is your best estimate of the number of Ebola cases identified through your tracing work?	<record whole number> 88) Don't know (99) Declined to answer	
6	When working as a contact tracer, did you feel respected by community members?	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select one
7	When working as a contact tracer, did you feel trusted by community members?	(1) Yes (2) No (88) Don't know (99) Declined to answer	Select one
8	Do you feel that the compensation you received for your work as a contact tracer was adequate?	(1) Yes (2) No (3) I did not receive compensation (88) Don't know (99) Declined to answer	Select one <display logic: don't display if answered no to Q3 in M4>
9	What were the most difficult hurdles you faced in your work as a contact tracer? *Do not read list. Listen to reply, and select all that are mentioned. Prompt 'Anything else?'*	(1) Transportation (2) Lack of cooperation from community (3) Rains (4) Inadequate training (5) Inadequate tools/supplies (6) Inadequate support/compensation (7) Other (specify):_____ (88) Don't know (99) Declined to answer	Select all that apply

10	How often did you feel threatened in any communities where you worked? *Read answer choices.*	(1) Never (2) Sometimes (3) Often (99) Declined to answer	Select one
11	How often did you experience stigma or discrimination because of your work as a contact tracer? *Read answer choices.*	(1) Never (2) Sometimes (3) Often (99) Declined to answer	Select one
MODULE 8 – OPEN ENDED			
1	Do you have any suggestions on how to improve contract tracing activity in the future?		
MODULE 9 – END			
	Read: Thank you for talking the time to talk with us today. Do you have any questions? We understand that it may have been difficult for you to answer some of these questions. If you would like to talk with someone about how you are feeling, please let me know and I can help you to do so. As a reminder, your responses are confidential - we will not include your name, and no one will know what your individual responses were. Thanks again.		
E1	Requested Referral?	(1) Yes (2) No	
E2	Interview end time		Autofill
<END SURVEY>			

6. Roundtable Meetings

Roundtables will be an infrequent yet distinctive method to be used in only a few circumstances, where there is a local density of potential participants interested to join a larger conversation that compares evidence about the EVD outbreak, not only their own work experience. They do not replace KIIs or FGDs. But they offer another route to discovering relevant stakeholders and unexpected information.

The data generated by the roundtable discussions will be cross-cutting and contribute to indicators for more than one evaluation question. Evaluation indicators impacted by the roundtables include but are not limited to Evaluation Questions 1, 2, 3, 4, 7, 8, 9.

Instructions to organizers:

- No roundtable is designed to bring people from afar. The Team expects all target participants to manage their own travel and other arrangements to attend.
- Refreshments or lunch may be provided, but the goal is to try to make each event a "half day," to strike a balance in how much of a distraction it becomes.
- All roundtables are intended to follow Chatham House rules, in that participants are welcome and encouraged to candidly represent their own views and observations, and need not strictly adhere to any party line. Chatham House rules means that participants agree in advance that no specific comments, points of view, or quotes will be attributed to any specific individual or agency.
- Organizers can introduce the key questions formally in advance, and explain that the distinct purpose of the roundtable is to hear cross-fire and debate from people from different organizations, offices or perspectives.
-

ROUNDTABLE AND KEY INFORMANT INTERVIEW GUIDES

Facilitated by Core Evaluation Team / Field Coordinators

Types of RT/KII respondents and RT/KII Guide Number

1. WHO country team: RT/KII Guide 1
2. CDC country team: RT/KII Guide 2
3. OFDA DART/RMT: RT/KII Guide 3

State the ground rules

- Speak honestly, one at a time, no "right or "wrong" answers, ask questions if you need to. (obtain group consensus on the rules)
- Ask the group to suggest some ground rules. After they brainstorm some, make sure the following are on the list.
- Everyone should participate to share their observations and experiences.
- You will not receive any kind or cash incentive to participate in the group.
- Information provided in the focus group must remain private to the group.
- Stay with the group and please don't have side conversations
- Turn off cell phones if possible
- Have fun

Assure participants on the confidentiality.

Roundtable and Key Informant Interview Guides
Informed consent form:
GREETING: (Introduction & Informed Consent)

Good morning/Good afternoon:

My name is _____, and my colleague (s) is (are) _____.

I am/we are part of the evaluation team that is examining the performance of the USG-funded response to Ebola outbreak in West Africa countries- Guinea, Sierra Leone and Liberia. This performance evaluation focuses on programs and activities funded between the start of 2014 and end of 2015. The goal of the USG-funded response was to control the outbreak by reducing the rate of transmission in the affected countries. I/we would like to learn about the effectiveness of the overall response and its program components, relevance, and coordination of the response activities in the target areas. The information you provide help inform future U.S. responses to health emergencies.

This interview will take approximately 45 minutes to one hour. The information you will provide will remain confidential, the information you provide will not be linked to you personally in the report. You may choose to refuse to participate or not answer all the questions or stop the interview any time. Therefore, we request that you feel comfortable telling us what you know or have observed about the project performance, including the support the project has provided to the project areas in the target provinces and the related facilities.
`

Please let us know if you have any objection to participating in this interview and also if you have any questions before we start. If you have any questions after you have completed the interview, you can always contact a study team member like me, or you can call the ----------(Country Coordinator), whose names and phone numbers are on this form.

Please check the box below and sign to show you agree to participate in this interview.

☐ I understand this information and agree to participate fully under the conditions stated above:

Signature:----------Date: ----------

Thank you very much.
Let the participants introduce themselves.

Round table/KEY INFORMANT INTERVIEWS AT WORLD HEALTH ORGANIZATION AT COUNTRY/REGIONAL OFFICES (RT/KII Guide 1)

Our target respondents will include WHO teams- Team leader, Technical Advisor, Data Manger, Surveillance Officer.
Facilitated by Country Coordinator, Core Evaluation Team Member

Instructions to Facilitator: *Conduct KIIs with WHO country team at WHO Country HQ.*

Informed consent must be signed by every respondent.

SECTION A: ADMINISTRATIVE INFORMATION

KII Questionnaire number:	☐☐☐☐
Discussion date:	**DD** ☐☐ **MM** ☐☐ **YY** ☐☐
Time of interview: (*24 hour clock*)	
Name Of Facilitator:	
Place of Discussion:	
Country:	
Name and Position:	

SECTION B: QUESTIONS

IMPLEMENTATION EXPERIENCE AND CHALLENGES FACED BY WHO

#	*EQ # Designation*	*Question*	*Instruction for Facilitator*
1	9, 6	What sources did you put into place to collect epidemiological information during the outbreak? What geographic areas, specifically, were covered by your work? How was the data flow? Can you talk about the quality of these sources?	*Probe, if not mentioned* *What were the sources of information or data about cases that you recorded?* *Confirmed cases of Ebola* *Suspected cases of Ebola* *Case fatality* *Population at risk* *In your view, what were any gaps in the coverage of the surveillance system?* *How much confidence did you have in your sources?* *How did you cross-check incoming epidemiologic data?*
2	9	What was your experience as a WHO rep in communicating with other stakeholders?	*Probe if not mentioned:* *1. Communicating with the leaders of national governments?* *2: communicating with international government and non-government agencies?* *3: communicating with donor agencies about the EVD outbreak situation?* *4: Accessing resources?*

3	9	As a WHO rep, what facilitated or constrained your own work, and how did it differ between beginning and end of outbreak?	
4	9	What is your opinion of WHO's strategic objectives in contributing to the overall international response to the EVD outbreak, and the specific outbreaks in Guinea, Liberia, and/or Sierra Leone?	*After understanding overall objectives, guide discussion towards what roles and specific activities WHO carried out. Where these carried out in phases and were they unique to each country?*
WHAT PROGRAMS SHOULD HAVE BEEN SCALED UP MORE OR EARLIER?			
#	***EQ # Designation***	***Question***	***Instruction for Facilitator***
5	4, 5, 6, 8	As, a WHO rep, what is your observation regarding the effectiveness of training health care workers implemented during the Ebola outbreak?	
6	4, 5, 6, 8, 10	As, a WHO rep, what is your observation regarding the effectiveness of programs of behavior change communication implemented during the Ebola outbreak?	
KEY BENEFITS AND CONSTRAINTS IN WORKING WITH NATIONAL AND REGIONAL COUNTERPARTS?			
#	***EQ # Designation***	***Question***	***Instruction for Facilitator***
7	9	Tell me about your coordination with local partners? National Government- MOH? National non-government partners? Tell me about your coordination with WHO Head Quarter? What worked well? What didn't work well?	*If not discussed, ask participants what made these groups efficient and effective. Oppositely have participants discuss which were inefficient and why.*
HOW EFFECTIVE WAS OFDA IN ASSISTING WHO's RESPONSIBILITIES FOR COORDINATING EBOLA RESPONSE EFFORTS?			
#	***EQ # Designation***	***Question***	***Instruction for Facilitator***
8	9	What was your experience in working with OFDA DARTs, and with other non-US donors?	*Probe; OFDA method of prioritization and adjustment to interventions*
9	1, 2	In your opinion, what were the services/activities that contributed to reducing the number of Ebola cases in ----– (*country*)?	

10	1, 2	What advice would you give on how WHO's role can be improved in case of a future public health emergency of similar magnitude and severity?	

Round table/KEY INFORMANT INTERVIEWS OF CDC PROFESSIONALS AT COUNTRY/REGIONAL OFFICES (RT/KII Guide 2)

Our target respondents will include CDC team members- Team leader, Technical Advisor, Data Manager/ Surveillance Officer.
Facilitated by Country Coordinator, Core Evaluation Team Member

Instructions to Facilitator: Conduct KII with CDC country team at CDC Country HQ.

Informed consent must be signed by every respondent.

SECTION A: ADMINISTRATIVE INFORMATION

KII Questionnaire number:	☐☐☐☐
Discussion date:	**DD** ☐☐ **MM** ☐☐ **YY** ☐☐
Time of interview: (*24 hour clock*)	
Name Of Facilitator:	
Place of Discussion:	
Country:	
Name and Position:	

SECTION B: QUESTIONS

KEY BENEFITS AND CONSTRAINTS IN WORKING WITH LOCAL PARTNER AGENCIES

#	*EQ # Designation*	*Question*	*Instruction for Facilitator*
1	8, 9	Tell me about your coordination with local partners? National Government- MOH? National non-government partners? Tell me about your coordination with CDC Head Quarter? What worked well? What didn't work well?	*If not mentioned, have participants describe which not worked well. and reasons*

EVIDENCE FROM CDC ABOUT WHAT SEEMED TO WORK BEST IN REDUCING EVD TRANSMISSION

#	*EQ #*	*Question*	*Instruction for Facilitator*
2	1, 2, 3, 4, 5, 6, 10	Tell me about the CDC interventions in ---- (*country*)? What worked best to reduce EVD transmission? Why you say so? In your opinion, what worked the least and why?	*Have participants discuss which interventions did not work, and/or what challenges/obstacles affected interventions in Guinea, Liberia, and Sierra Leone. Ask the participants to define what they mean by "best". What was their evidence for ascribing "best" or 'least' to any individual or combined*

			intervention(s)?
3	5, 6, 8	In your opinion, what was CDC's involvement in providing technical advice for improving the quality of the services during the Ebola Outbreak?	*Probe, if not mentioned: Ebola Treatment Units (ETUs), Community Care Centers (CCCs), Contact Tracer or Surveillance Teams, Command and control, Logistics*
4	4, 5, 6, 8	As, a CDC worker, what is your observation regarding the effectiveness of training of health care workers implemented during the Ebola outbreak?	*Probe, if not mentioned: On the principles and practice of IPC in health care facilities as implemented by CDC* ***(4a)*** *and other IPs* ***(4b)?***
5	4, 5, 6, 8, 10	As, a CDC worker, what is your observation regarding the effectiveness of behavior change communication programs implemented during the Ebola outbreak?	
6	9	What was your experience in working with OFDA? And with other non-US donors?	*Probe; OFDA method of prioritization and adjustment to interventions*
7	1, 2	What advice would you give on how CDC's role can be improved in case of a future public health emergency of similar magnitude and severity?	

Round table/KEY INFORMANT INTERVIEWS AT OFDA DART and RMT (RT/KII Guide 3)	
Facilitated by Core Evaluation Team Member **Informed consent must be signed by every respondent.**	
SECTION A: ADMINISTRATIVE INFORMATION	
KII Questionnaire number:	☐☐☐☐
Discussion date:	**DD** ☐☐ **MM** ☐☐ **YY** ☐☐
Time of interview: (*24 hour clock*)	
Name Of Facilitator:	
Place of Discussion:	
Country:	
Name and Position:	
SECTION B: QUESTIONS	

#	***EQ # Designation***	***Question***	***Instruction for Facilitator***
1	4, 5,9	What were the OFDA's strategic objectives in the overall USG response to the EVD outbreak? Any differences in strategies to the specific outbreaks in: A) Guinea, B) Liberia, and C) Sierra Leone?	*After understanding overall objectives, guide discussion towards what roles and specific activities OFDA carried out. Where these carried out in phases and were they unique to each country?*
2	5, 10	How did you prioritize different activities? What methods or sources did you use to prioritize or make adjustments to activities during the outbreak? Did the strategies/activities change with time? If yes, how?	*Probe, if not mentioned* *What were the sources of information or data?* *How much confidence did you have in your data sources?* *How did you cross-check incoming epidemiologic data or program activity reports?* *In your view, what were any gaps in the coverage of the surveillance system?*
3	4, 6	What do you think about the nature of OFDA's funding mechanism to implementing partners?	*Probe: Was it timely, accessible and targeted for affected areas?* *What can you tell about the adequacy of funding?*

4	7	Can you tell me about the extent to which OFDA funded implementing partners adhered to technical gold standard guidelines?	*Probe: What technical guidelines did IPs use? Whether attempting to adhere to technical gold standard guidelines lead to any challenges? Was there any effect on the timeliness and quality of response?*
5	9	As an OFDA DART/RMT member, what facilitated or constrained your own work, and how did it differ between beginning and end of outbreak?	
6	9	Tell me about your coordination with partners? National Government- MOH? International implementing partners? International non-USG response partners? What worked well? What didn't work well?	*If not discussed, ask participants what were the coordination mechanisms? Were the mechanisms efficient and effective? Oppositely have participants discuss which were inefficient and why.*
7	8,9	What was your experience as an OFDA DART/RMT member in coordinating/communicating with other USG agencies?	*Probe if not mentioned:* *Communicating roles and tasks* *Coordinated implementation of activities*
8	1, 2	In your opinion, what were the services/activities that contributed most to reducing the number of Ebola cases in West Africa?	
9	1, 2	What advice would you give on how OFDA's role can be improved in case of a future public health emergency of similar magnitude and severity?	

7. Key Informant Interviews

The primary research tools to which the Evaluation Team will allocate their time will be original KIIs and FGDs. For local informants, IBTCI will make every effort to reach a combination of different individuals representing rural and urban areas and different parts of each country. The following table provides indicative targets for people who are intended to be reached either by KIIs or FGDs, or both.

The data generated by the KIIs and FGDs will be cross-cutting and contribute to indicators for more than one evaluation question. Evaluation indicators impacted by these interviews include but are not limited to Evaluation Questions 1, 4, 5, 6, 8, and 10.

Qualitative Research	Sampling Method	Sample Size	Content
DART/RMT	Purposive	100-120	Range of observations and reflections about how they/OFDA made strategic decisions and coordinated
Food for Peace	Self-defined	5–10	Perceptions of what worked and what leads to further evidence
Other USAID	Purposive	10–15	Perceptions of what worked and what leads to further evidence
DOD	Purposive	20–40	Culling from a range of After Action Reviews
CDC	Purposive	20–40	Understanding of both EIS officer and senior manager strategies
IP M&E officers	Purposive	~50	Project metrics and surveys
IP health personnel	Purposive	~70	What worked, epidemiologically
IP headquarters managers	Purposive	~70	Coordination with OFDA
IP humanitarian managers	Purposive	~30	Coordination with OFDA
IP trainers	Purposive	~30	Skills transferred and retained
IP sub-award personnel	Purposive	~120	Local partner experiences
Traditional healers	Heterogeneous	8	Health-seeking behavior of EVD-affected populations
National or local command and control support	Purposive	15	Details of command/control; participation and contributions by different actors; what worked?
Local ETU, hospital or CCC nurses	High proportion	15	Effectiveness of quarantine, therapeutics, and timing of outside assistance, including training
Local ETU, hospital or CCC physicians	As available	15	Effectiveness of quarantine, therapeutics, and timing of outside assistance, including training
ETU or health facility administrators	As available	15	Factors affecting utilization and adequacy of equipment, cleaning, etc.
Private practice medical workers	Convenience	8	Health-seeking behavior of EVD-affected populations
Local laboratory workers	Convenience	10	Utilization or limits of their findings
MOH or DOH officials	Purposive	20	Command and control and surveillance
Bikers and merchants	Convenience	5	Roles in adapting or spreading EVD
Religious leaders	Convenience	12	Decisions about how, where, and when to communicate to flocks about EVD
Village heads	Convenience	10	Decisions about how, where, and when to communicate to flocks about EVD
Ambulance drivers	Convenience	6	How role evolved over time and links to safe burials and community cooperation

Qualitative Research	Sampling Method	Sample Size	Content
Burial workers	From lists	25	How role evolved over time and existing links to safe burials and community cooperation
Radio & TV stakeholders	Purposive	12	Testing and metrics about messaging
Social media stakeholders	Any found	12	Testing and metrics about messaging
...and other stakeholders cited in the Evaluation Plan and Inception Report			

A wide range of KII instruments will be used, the majority tailored to the individual in question, based on their involvement in the outbreak, their role, level, agency, background expertise, country, sector, etc. Some KIIs will be at the local community level, but, again, targeting a range of community leaders, merchants, thought-leaders, and members of CSOs and associations.

KIIs methods are "semi-structured" in that the conversations are framed to allow pursuit of topics that are idiosyncratic to that individual's experience and domain of knowledge. Therefore, the questions posed from here onward are indicative of the questions to be mixed and reconfigured for each KI.

Informed consent must be signed by every respondent.

Semi-structured KIIs at community Level, Performed by the Sub-contractor and IBTCI field team: the following questions are in order of priority:

PRIORITY

1. During the outbreak, what contact did your family have, if any, with persons representing any other agencies, like the Red Cross or aid agencies, including visits by Community Health Workers?
2. When did social mobilization programs (in Guinea, they say "sensitization") for Ebola start in your village? (anchoring event/calendar options)
3. If you listened to or heard about important messages about Ebola and how to avoid it, when did you first hear?
4. Please describe the content of this message as you remember it.
5. Please describe whether and in what ways you modified your behavior as a result of that message.
6. From among those messages that you took most seriously, how did you first hear of Ebola?
   (Clarify: social media, word of mouth, neighbors, billboards, radio, CHWs, etc.)
7. What services do you feel were the most needed during the 2014–2015 period to protect your community from Ebola?
8. How did these programs affect village behavior and practices?
   (Probes: How did this affect burials, social mobilization, hygiene, prevention, and understanding of the virus?)
9. Can you describe the source of the information you most relied upon for news about the Ebola epidemic throughout the epidemic? Did your information sources vary from the beginning (2014), to the middle (2015), or to the end (2016)?
10. During the outbreak, what contact did your family have, if any, with persons representing the Ministry of Health, or District Health Officers?
11. What did this community (or village) do when they found a family member or friend was sick with Ebola? Probe for any occurrence of:
    a. Take them to an ETU or health care center
    b. Call hotline and wait for health care workers to transport them
    c. Take care of them at home
    d. Engage ambulance service
    e. Seek a traditional healer
    f. Seek a private medical provider
    g. See an off-duty nurse

SECONDARY PRIORITY

1. Was there any time when the instructions you were given about protecting yourself from Ebola conflicted with your religious beliefs or customs? Can you give examples?
2. In general, what did you and your family feel about the response to the epidemic by your local and national government officials? Were there any specific issues you would like to tell us about and discuss here?
3. At what point (during what month) during the epidemic did you think that you really understood how Ebola was transmitted, and how to protect your family from Ebola?

TERTIARY PRIORITY

4. What do wish you had known more about, at the beginning of the epidemic in your area? Knowing what you know now, would you have done anything differently?
5. What kinds of resources did your household pay for, out of pocket, to protect yourself from Ebola or to respond to it in your community, directly or indirectly? How much money did you spend on these resources? Can you describe the economic losses you experienced as a result of the epidemic?
6. Have you, your neighbors, or anyone in your community received financial, educational, or health care support for orphan(s) of Ebola survivors, to contribute to a) their short-term needs (education, clothes, housing, food); or b) their long-term care (long-term educational expenses)?
7. Were there any success stories you care to share? Were there responders and services that you found extremely helpful to you, your family, or community? Can you describe or list them?
8. Overall, in what other ways did the Ebola epidemic affect you, your family, or your household?
9.

KII GUIDES

Guides for Key Informant Interviews

Types of KII respondents and KII Guide Number

1. OFDA Supported IPs: KII Guide 1
2. USG Response Partners: KII Guide 2
3. International Response (non-USG) Partners: KII Guide 3
4. Ministry of Health At National/Regional Levels: KII Guide 4
5. National/Regional Hospitals or Country Health Team Leadership: KII Guide 5
6. Community Leaders: KII Guide 6

Facilitated by Core Evaluation Team / Field Coordinators
Key Informant Interview Consent Form I (administered to all types of KII respondents)

GREETING: (Introduction & Informed Consent)

Good morning/Good afternoon:

My name is _____, and my colleague (s) is (are) _____.

I am/we are part of the evaluation team that is examining the performance of the USG-funded response to Ebola outbreak in West Africa countries- Guinea, Sierra Leone and Liberia. This performance evaluation focuses on programs and activities funded between the start of 2014 and end of 2015. The goal of the USG-funded response was to control the outbreak by reducing the rate of transmission in the affected countries. I/we would like to learn about the effectiveness of the overall response and its program components, relevance, and coordination of the response activities in the target areas. The information you provide help inform future U.S. responses to health emergencies.

This interview will take approximately 45 minutes to one hour. The information you will provide will remain confidential, the information you provide will not be linked to you personally in the report. You may choose to refuse to participate or not answer all the questions or stop the interview any time. Therefore, we request that you feel comfortable telling us what you know or have observed about the project performance, including the support the project has provided to the project areas in the target provinces and the related facilities.

Please let us know if you have any objection to participating in this interview and also if you have any questions before we start. If you have any questions after you have completed the interview, you can always contact a study team member like me, or you can call the ----------(Country Coordinator), whose names and phone numbers are on this form.

Please check the box below and sign to show you agree to participate in this interview.

☐ I understand this information and agree to participate fully under the conditions stated above:

Signature:----------Date: ----------

Thank you very much.

KEY INFORMANT INTERVIEW with OFDA Supported IMPLEMENTING PARTNERS (KII Guide 1)	
Facilitated by Core Evaluation team members or Field Coordinator The following is a guide. Try to ask all the questions below in the order given. Suggested probes have been included. **Informed consent must be signed by every respondent.**	
SECTION A: ADMINISTRATIVE INFORMATION	
KII Questionnaire number:	☐☐☐☐
Discussion date:	**DD** ☐☐ **MM** ☐☐ **YY** ☐☐
Time of Interview: (*24 hour clock*)	
Name Of Facilitator:	
Place of Interview:	
Country:	
Prefecture (Guinea)/District (SL) /County (Liberia):	
Name of Organization:	
Name of Interviewee and Gender	Name: Male: ☐ Female: ☐
Name of Subcontractor Organization:	
Type of Interviewee	☐ **Project Director- HQ/ Chief of Party--------(country)** ☐ **Health Technical Lead/Advisor** ☐ **Humanitarian Assistance Technical Lead/Advisor** ☐ **M&E Lead/Advisor** ☐ **Other (specify)----------** ☐ **Subcontractor Organization Representative**

SECTION B: QUESTIONS		
#	***EQ # Designation***	***Questions and Instructions for Facilitator***
1	1	a. What role did [your organization*] play during the Ebola outbreak between the start of 2014 and end of 2015? *(* substitute the appropriate IP name)* *Probe: what type of OFDA funded program/activities were implemented by your organization?* *What were the strategic objectives?* *What were the expected results of the program/activity?* *Who were the target population(s) and geographic areas of coverage?* b. In your opinion, to what extent did [*OFDA funded program/activities implemented by your organization*]* achieved its/their intended objectives? *Probe: Can you please elaborate by giving examples or are there any data to support achievements?*

2	1, 3	a. What changes did your organization intend or expect when implementing OFDA-funded activities? In other words, what 'theories of change' were intended for those OFDA supported intervention(s) managed by your organization? *OFDA funded several different types of inter-related control measures such as 1. Management of cases in Ebola Treatment Units (ETUs), 2. Contact tracing, 3. Infection prevention and control through Isolation of suspected cases, triage and community care centers (CCC), 4. Community-based surveillance, 5. Safe burials, 6. Social mobilization, 7. Logistics support-equipment for infection control (personal protective equipment) and creating lab referral network, 8. command and control support for better informed decision* b. How did the [*OFDA funded program/activities implemented by your organization*]* fit in the overall response to Ebola outbreak? *(* substitute the mentioned OFDA funded IP activities)*
3	1, 2	In your opinion, which [OFDA funded program/activities implemented by your organization*] alone or in combination, contributed the most to reducing the number of Ebola cases in your area? *Probe: and why do you think so?*
4	3, 4	Can you tell me which [*OFDA funded activities implemented by your organization*]* was/were successful? If yes, what factors contributed to its success? *Probe: What specifically made the named experiences successful?* *Probe (only if needed): health system related factors, environmental factors, social factor, political factors*
5	3, 4, 7	Can you tell me which [*OFDA funded activities implemented by your organization*]* was/were not successful? If yes, *what specifically made those occurrences challenging?* *Probe: What standardized guidelines did you follow? Whether adherence to technical gold standard guidelines lead to any challenges? Was there any effect on the timeliness and quality of services?* *Probe (only if needed): health system related factors, environmental factors, social factor, political factors*
6	6, 10	a. What was [your organization*] experience working with OFDA in terms of technical and management support? *(* substitute the appropriate IP name)* *Probe: What do you think about the appropriateness of OFDA's funding mechanism and/or in-kind support? Was it timely, and accessible?* *What can you tell about the adequacy of funding?* *a.* Tell me about your experiences with OFDA's feedback on your progress reports? *Probe: How often did you submit activity/program progress report? How often did you receive any feedback on reports?* *Probe: Was the feedback from OFDA timely, and targeted?* *Did you make any adjustments to program/activities based on the OFDA feedback?*

7	9	a. What do you think about the coordination by OFDA with [your organization*]? b. What do you think about the coordination by OFDA with national government/ national Ebola response? c. What do you think about the coordination by OFDA with other non-USG donors? *Probe on:* *What were the communication mechanisms between organizations?* *Any examples of coordinated implementation of activities?* *What worked well to facilitate coordination?*
8	5, 10	What do you think about OFDA's prioritization of its supported program/activities in response to the changes in disease epidemiology such as increase or decrease in the number of Ebola cases? *Probe on: Did the priorities match with other international responders?* *Did the priorities match with national responders?*
9	1, 2	What would your organization do differently in a response to a future public health emergency of similar magnitude and severity?
10	1, 2	What would you suggest to USG to do differently in a response to a future public health emergency of similar magnitude and severity?

KEY INFORMANT INTERVIEW with USG Partners (KII Guide 2)	
Facilitated by Core Evaluation team members **Informed consent must be signed by every respondent.**	
SECTION A: ADMINISTRATIVE INFORMATION	
KII Questionnaire number:	☐☐☐☐
Discussion date:	**DD** ☐☐ **MM** ☐☐ **YY** ☐☐
Time of Interview: (*24 hour clock*)	
Name Of Facilitator:	
Place of Interview:	
Country:	
Prefecture (Guinea)/District (SL) /County (Liberia):	
Name of Organization:	
Name of Interviewee and Gender	Name: Male: ☐ Female: ☐
Type of Interviewee	☐ DOD ☐ USAID/GH ☐ USAID/FFP ☐ USAID/Mission----------(country) ☐ CDC HQ ☐ HHS ☐ NIH ☐ Other (specify)----------

SECTION B: QUESTIONS		
#	***EQ # Designation***	***Questions and Instructions for Facilitator***
1	n/a	a. What role did [your organization*] play during the Ebola outbreak between the start of 2014 and end of 2015 in West Africa? *(* substitute the appropriate organization name)* *Probe: what type of program/activities did you implement in West Africa?* *What were the strategic objectives?* *What were the expected results of the program/activity?* *Who were the target population(s) and geographic areas of coverage?* b. What changes did your organization intend or expect when implementing activities? In other words, what 'theories of change' were intended for those OFDA supported intervention(s) managed by your organization?

2	2, 4	In your opinion, which USG supported program or activities, alone or in combination, contributed the most to reducing the number of Ebola cases in West Africa? *Probe: and why do you think so?*
3	8	What do you think of OFDA as the leader of the USG response? What was [your organization*] experience working with OFDA? *(* substitute the appropriate name)* *Probe:* *Did you have clear understanding of your role while being led by OFDA?* *Did you received specific scope of work or terms of reference for the tasks assigned while being led by OFDA?*
4	3, 4	OFDA funded several different types of inter-related control measures such as 1. Management of cases in Ebola Treatment Units (ETUs), 2. Contact tracing, 3. Infection prevention and control through Isolation of suspected cases, triage and community care centers (CCC), 4. Community-based surveillance, 5. Safe burials, 6. Social mobilization, 7. Logistics support- equipment for infection control (personal protective equipment) and creating lab referral network, 8. command and control support for better informed decision How did the [OFDA funded program/activities*] fit in the overall response to Ebola outbreak? What can you tell us about the effectiveness of the intervention? *Probe determining factors for success or failure* (* list each type of OFDA funded program/activities) *Probe (only if needed): health system related factors, environmental factors, social factor, political factors*
5	6	What do you think about the nature of OFDA's funding mechanism and/or in kind support? *Probe: Was it timely, accessible and targeted for affected areas?* *What can you tell about the adequacy of funding?*
6	7	Can you tell me about the extent to which OFDA funded implementing partners adhered to technical gold standard guidelines? *Probe: What technical standards did IPs follow? Whether attempting to adhere to technical gold standard guidelines lead to any challenges? Was there any effect on the timeliness and quality of response?*

7	8, 9	d. What do you think about the coordination by OFDA with [your organization*]? e. What do you think about the coordination by OFDA- funded implementing partners with [your organization*]? f. What do you think about the coordination by OFDA with other non-USG donors? *Probe on:* *What were the communication mechanisms between organizations?* *Any examples of coordinated implementation of activities?* *What worked well to facilitate coordination?*
8	5, 10	What do you think about a. OFDA's prioritization of its supported program/activities in response to the changes in disease epidemiology such as increase or decrease in the number of Ebola cases? *Probe on: Did the priorities match with other international responders?* *Did the priorities match with national responders?* b. OFDA's adjustment to its supported program/activities in response to the changes in disease epidemiology? *Probe on: Did OFDA adjust appropriately using monitoring and evaluation of its supported program/activity? Examples?* *Were the adjustments timely?*
9	1, 2	What would your organization do differently in a response to a future public health emergency of similar magnitude and severity?
10	1, 2	What would you suggest to OFDA to do differently in a response to a future public health emergency of similar magnitude and severity?

KEY INFORMANT INTERVIEW with INTERNATIONAL RESPONSE PARTNERS- Other non-USG Donors and Non-USG funded Technical Partners (KII Guide 3)	
Facilitated by Core Evaluation team members **Informed consent must be signed by every respondent.**	
SECTION A: ADMINISTRATIVE INFORMATION	
KII Questionnaire number:	☐☐☐☐
Discussion date:	**DD** ☐☐ **MM** ☐☐ **YY** ☐☐
Time of Interview: (*24 hour clock*)	
Name Of Facilitator:	
Place of Interview:	
Country:	
Prefecture (Guinea)/District (SL) /County (Liberia):	
Name of Organization:	
Name of Interviewee and Gender	Name: Male: ☐ Female: ☐
Type of Interviewee	☐ **MSF** ☐ **DFID** ☐ **UNMEER** ☐ **WHO** ☐ **Other (specify)----------**

SECTION B: QUESTIONS		
#	***EQ # Designation***	***Questions and Instructions for Facilitator***
1	n/a	What role did [your organization*] play during the Ebola outbreak between the start of 2014 and end of 2015 in West Africa? *(* substitute the appropriate organization name)* *Probe: what type of program/activities did you implement in West Africa?* *What were the strategic objectives?* *What were the expected results of the program/activity?* *Who were the target population(s) and geographic areas of coverage?*

2	2	a. What types of Ebola response programs or activities supported by the USG agencies are you aware of? USG agencies included OFDA, CDC, DOD, FFP, USAID country mission. b. In your opinion, which USG supported program or activities, alone or in combination, contributed the most to reducing the number of Ebola cases in West Africa? *Probe: and why do you think so?*
3	3, 4	OFDA funded several different types of inter-related control measures such as 1. Management of cases in Ebola Treatment Units (ETUs), 2. Contact tracing, 3. Infection prevention and control through Isolation of suspected cases, triage and community care centers (CCC), 4. Community-based surveillance, 5. Safe burials, 6. Social mobilization, 7. Logistics support- equipment for infection control (personal protective equipment) and creating lab referral network, 8. command and control support for better informed decision How did the [OFDA funded program/activities*] fit in the overall response to Ebola outbreak? What can you tell us about the effectiveness of the intervention? *Probe determining factors for success or failure* (* list each type of OFDA funded program/activities) *Probe (only if needed): health system related factors, environmental factors, social factor, political factors*
4	6	What do you think about the nature of OFDA's funding mechanism and/or in kind support? *Probe: Was it timely, accessible and targeted for affected areas?* *What can you tell about the adequacy of funding?*
5	7	Can you tell me about the extent to which OFDA funded implementing partners adhered to technical gold standard guidelines? *Probe: What technical standards did IPs follow? Whether attempting to adhere to technical gold standard guidelines lead to any challenges? Was there any effect on the timeliness and quality of response?*

6	9	g. What do you think about the coordination by OFDA with [your organization*]? h. What do you think about the coordination by OFDA- funded implementing partners with [your organization*]? i. What do you think about the coordination by OFDA with other non-USG donors? *Probe on:* *What were the communication mechanisms between organizations?* *Any examples of coordinated implementation of activities?* *What worked well to facilitate coordination?*
7	5, 10	What do you think about c. OFDA's prioritization of its supported program/activities in response to the changes in disease epidemiology? *Probe on: Did the priorities match with other international responders?* *Did the priorities match with national responders?* d. OFDA's adjustment to its supported program/activities in response to the changes in disease epidemiology? *Probe on: Did OFDA adjust appropriately using monitoring and evaluation of its supported program/activity? Examples?* *Were the adjustments timely?*
8	1, 2	What would your organization do differently in a response to a future public health emergency of similar magnitude and severity?
9	1, 2	What would you suggest to USG to do differently in a response to a future public health emergency of similar magnitude and severity?

KEY INFORMANT INTERVIEW with NATIONAL RESPONSE PARTNERS- MOH/DOH Officials (KII Guide 4)	
Facilitated by Core Evaluation team members or Field Coordinator The following is a guide. Try to ask all the questions below in the order given. Suggested probes have been included. **Informed consent must be signed by every respondent.**	
SECTION A: ADMINISTRATIVE INFORMATION	
KII Questionnaire number:	☐☐☐☐
Discussion date:	**DD** ☐☐ **MM** ☐☐ **YY** ☐☐
Time of Interview: (*24 hour clock*)	
Name Of Facilitator:	
Place of Interview:	
Country:	
Prefecture (Guinea)/District (SL) /County (Liberia):	
Name of Organization:	
Name of Interviewee and Gender	Name: Male: ☐ Female: ☐
Type of Interviewee	☐ **Ministry of Health – National Level Director/Manager** ☐ **Ministry of Health – National Level Technical Advisor** ☐ **Ministry of Health – Regional/County/District Level Director/Manager** ☐ **Ministry of Health – Regional/County/District Level Technical Advisor** ☐ **Other (specify)----------**

SECTION B: QUESTIONS		
#	***EQ # Designation***	***Questions and Instructions for Facilitator***
1	2	What kind of services or support did [your organization*] receive from USG during the Ebola outbreak between the start of 2014 and end of 2015? *(* substitute the appropriate MOH name)* *Probe: What types of support were received from different USG agencies? Different USG agencies included OFDA, CDC, DOD, FFP, USAID country mission.* *Who were the target population(s) and geographic areas of coverage?* *What were the expected results of the program/activity?*

2	2	In your opinion, which USG supported program or activities, alone or in combination, contributed the most to reducing the number of Ebola cases in your -----(*name of country*)? *Probe: and why do you think so?*
3	3, 4	OFDA funded several different types of inter-related control measures such as 1. Management of cases in Ebola Treatment Units (ETUs), 2. Contact tracing, 3. Infection prevention and control through Isolation of suspected cases, triage and community care centers (CCC), 4. Community-based surveillance, 5. Safe burials, 6. Social mobilization, 7. Logistics support- equipment for infection control (personal protective equipment) and creating lab referral network, 8. command and control support for better informed decision How did the [*OFDA funded program/activities*]* fit in the overall response to Ebola outbreak? What can you tell us about the effectiveness of the intervention? *Probe determining factors for success or failure* *(* list each type of OFDA funded program/activities)* *Probe (only if needed): health system related factors, environmental factors, social factor, political factors*
4	5, 10	What do you think about e. OFDA's prioritization of its supported program/activities in response to the changes in disease epidemiology? *Probe on: Did the priorities match with other international responders?* *Did the priorities match with national responders?* a. OFDA's adjustment to its supported program/activities in response to the changes in disease epidemiology? *Probe on: Did OFDA adjust appropriately using monitoring and evaluation of its supported program/activity? Examples?* *Were the adjustments timely?*
5	6	What was [your organization*] experience working with OFDA in terms of technical and management support? *(* substitute the appropriate MOH name)* *Probe: What do you think about the appropriateness of OFDA's funding mechanism and/or in kind support? Was it timely, accessible and targeted for affected areas?* *What can you tell about the adequacy of funding?*

6	9	j. What do you think about the coordination by OFDA with [your organization*]? k. What do you think about the coordination by OFDA- funded implementing partners with [your organization*]? l. What do you think about the coordination by OFDA with other non-USG donors? *Probe on:* *What were the communication mechanisms between organizations?* *Any examples of coordinated implementation of activities?* *What worked well to facilitate coordination?*
7	1, 2	What would you or your organization do differently in a response to a future public health emergency of similar magnitude and severity?
8	1, 2	What would you suggest to USG to do differently in a response to a future public health emergency of similar magnitude and severity?

KEY INFORMANT INTERVIEW with NATIONAL RESPONSE PARTNERS- National Hospital or Regional Health Facility Staff (KII Guide 5)	
Facilitated by Core Evaluation team members or Field Coordinator The following is a guide. Try to ask all the questions below in the order given. Suggested probes have been included. **Informed consent must be signed by every respondent.**	
SECTION A: ADMINISTRATIVE INFORMATION	
KII Questionnaire number:	☐☐☐☐
Discussion date:	**DD** ☐☐ **MM** ☐☐ **YY** ☐☐
Time of Interview: (*24 hour clock*)	
Name Of Facilitator:	
Place of Interview:	
Country:	
Prefecture (Guinea)/District (SL) /County (Liberia):	
Name of Organization:	
Name of Interviewee and Gender	Name: Male: ☐ Female: ☐
GPS Coordinates	**Longitude: _____Latitude: _____**
Type of Interviewee	☐ **National Hospital- Director/Manager** ☐ **District/County/Regional Hospital- Director/Manager** ☐ **Other (specify)----------**

SECTION B: QUESTIONS		
#	***EQ # Designation***	***Questions and Instructions for Facilitator***
1	1, 2, 5, 10	a. Did this health facility see cases during the Ebola outbreak between the start of year 2014 and end of 2015? *Probe: If EVD cases were present, when was the first time Ebola case reported? _____(approximate date/month)* *How many total cases were registered with this health facility? ----------* *(approximate number of total cases)* *When was the last case registered?_____(approximate date/month)* *Were you prepared to respond to the Ebola outbreak?* b. How did you monitor the number of cases over time? Did you see any changes in Ebola case load with time?

<table>
<tr>
<td>2</td>
<td>4, 5, 6</td>
<td>What skills did you learn that you feel were critical to your work?

If yes, probe KI to describe who provided the training and when.
If yes, When did you receive the support?
Name of organization provided the training
<table>
<tr><th>Type of skills</th><th>Training-yes/no</th><th>Who provided?</th><th>When?</th></tr>
<tr><td>Community Education and information</td><td></td><td></td><td></td></tr>
<tr><td>Case management at ETUs</td><td></td><td></td><td></td></tr>
<tr><td>Isolation procedures/quarantine</td><td></td><td></td><td></td></tr>
<tr><td>Case triage and referral</td><td></td><td></td><td></td></tr>
<tr><td>Lab diagnosis</td><td></td><td></td><td></td></tr>
<tr><td>Facility waste management</td><td></td><td></td><td></td></tr>
<tr><td>Infection control and PPE use</td><td></td><td></td><td></td></tr>
<tr><td>Contact tracing</td><td></td><td></td><td></td></tr>
<tr><td>Safe burial services</td><td></td><td></td><td></td></tr>
<tr><td>Surveillance and reporting</td><td></td><td></td><td></td></tr>
</table>
</td>
</tr>
<tr>
<td>3</td>
<td>3, 6</td>
<td>What type of services were available to Ebola cases in this health facility?
If yes, probe KI to describe who provided the technical support and/or in-kind support and when?
<table>
<tr><th>Type of services</th><th>Service available-yes/no</th><th>Who provided technical and/or in-kind support?</th><th>When?</th></tr>
<tr><td>Community Education and information</td><td></td><td></td><td></td></tr>
<tr><td>Case management at ETUs</td><td></td><td></td><td></td></tr>
<tr><td>Isolation procedures/quarantine</td><td></td><td></td><td></td></tr>
<tr><td>Case triage and referral</td><td></td><td></td><td></td></tr>
<tr><td>Lab diagnosis</td><td></td><td></td><td></td></tr>
<tr><td>Facility waste management</td><td></td><td></td><td></td></tr>
<tr><td>Infection control and PPE use</td><td></td><td></td><td></td></tr>
<tr><td>Contact tracing</td><td></td><td></td><td></td></tr>
<tr><td>Safe burial services</td><td></td><td></td><td></td></tr>
<tr><td>Surveillance and reporting</td><td></td><td></td><td></td></tr>
</table>

Do you think that the technical or training/ in-kind support provided to your district/health facility were sufficient, timely and appropriate?</td>
</tr>
</table>

<table>
<tr><td>4</td><td>3, 7</td><td>What, if any challenges, did you face while dealing with Ebola cases in your facility?

If not discussed, guide the KI to discuss what specifically made those named challenging and why.

Any effect on health workers- illness, recovery, or death?
Did you feel safe working with Ebola patients?
Were you able to manage other non-Ebola routine cases in your health facility during the outbreak?
Did you face any challenges in adhering to in any of the following: case management/ infection control/ isolation/ surveillance/ case referral/safe burial guidelines?</td></tr>
<tr><td>5</td><td>9</td><td>Tell me about the coordination with other stakeholders? What were the communication mechanisms?

Probe, if not mentioned:
How did you coordinate with organizations providing technical or in-kind support to your facility?

How did you coordinate with higher-level authorities such as MOH at national/regional level?

Any coordination with community leaders?

Roles (if any) of private, commercial or traditional health care providers during the outbreak?</td></tr>
<tr><td>6</td><td>3, 4</td><td>In your view, what factors facilitated access to Ebola services in your district/catchment areas?
<table>
<tr><th>Type of services</th><th>Health-system related factors?</th><th>Environment factors?</th><th>Social factors?</th><th>Political factors?</th></tr>
<tr><td>Community Education and information</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Case management at ETUs</td><td></td><td></td><td></td><td></td></tr>
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<tr><td>Lab diagnosis</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Facility waste management</td><td></td><td></td><td></td><td></td></tr>
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<tr><td>Contact tracing</td><td></td><td></td><td></td><td></td></tr>
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</table>
Probe: health system related factors, environmental factors, social factor, political factors</td></tr>
</table>

<table>
<tr><td>7</td><td>3, 4</td><td>In your view, what factors inhibited access to Ebola services in your district/catchment areas?
<table>
<tr><th>Type of services</th><th>Health-system related factors?</th><th>Environment factors?</th><th>Social factors?</th><th>Political factors?</th></tr>
<tr><td>Community Education and information</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Case management at ETUs</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Isolation procedures/quarantine</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Case triage and referral</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Lab diagnosis</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Facility waste management</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Infection control and PPE use</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Contact tracing</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Safe burial services</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Surveillance and reporting</td><td></td><td></td><td></td><td></td></tr>
</table>
Probe: health system related factors, environmental factors, social factor, political factors</td></tr>
<tr><td>8</td><td>1, 2</td><td>In your opinion, what were the services/activities that contributed to reducing the number of Ebola cases in your district/catchment area?</td></tr>
<tr><td>9</td><td>1, 2</td><td>What advice would you give improve health facility services in case of future outbreaks?</td></tr>
</table>

KEY INFORMANT INTERVIEW with COMMUNITY LEADERS (KII Guide 6)	
Facilitated by ORB Facilitators **Informed consent must be signed by every respondent.**	
SECTION A: ADMINISTRATIVE INFORMATION	
KII Questionnaire number:	☐☐☐☐
Discussion date:	**DD** ☐☐ **MM** ☐☐ **YY** ☐☐
Time of Interview: (*24 hour clock*)	
Name Of Facilitator:	
Place of Interview:	
Country:	
Prefecture (Guinea)/District (SL) /County (Liberia):	
GPS Coordinates	**Longitude: _____Latitude: _____**
Name of Interviewee and Gender	Name: Male: ☐ Female: ☐
Type of Interviewee	☐ **Village chief/ Traditional leader** ☐ **Women's group leader** ☐ **Youth group leader** ☐ **Civil society representative/local politician** ☐ **Religious leader- Imam** ☐ **Religious leader- Pastor** ☐ **Business/Merchant leader**

SECTION B: QUESTIONS		
#	***EQ # Designation***	***Questions and Instructions for Facilitator***
1	1, 2,	Tell me about how [*your community**] was affected by Ebola outbreak between the start of 2014 and end of 2015? *(* substitute the appropriate group as per the type of participant e.g. women's group for women's group leader)* As their leader, what type of help were people seeking from you? *Probe: what information was available to you at that time? Did the messages or information change over time and how?* Tell me why and when people came or didn't come to seek your help? *Probe: What advice did you provide? Did the advice change over time and why?*
2	8	Tell me what role, as a leader, you played to help get goods and services out to community members?

3	3, 4	Can you tell me about successful experience(s) you had working with aid groups? *(* substitute the appropriate group as per the type of participant e.g. women's group for women's group leader)* *Probe: Was it a governmental group or nongovernmental group?* *Probe: What specifically made the named experiences successful?*
4	3, 4	What challenges did you face as a leader when Ebola affected your community during Ebola outbreak? *or* If your community was not affected by Ebola, were there still any challenges? *Probe: What specifically made those occurrences challenging?* *Probe: Was there any effect on routine services?*
5	3, 4, 6	What services were available to [*your community**] during the outbreak? *Probe for type and time of provision of the support and by which agency (name of organization)* *Communities without cases may have received support (healthcare, vaccine campaigns, food distributions, community health education, etc.) even if they didn't have cases.* *Possible Health Services received:* *Education and behavior change messages* *Case treatment management* *Isolation/quarantine* *Contact tracing* *Community/border surveillance* *Safe burial services* *In-kind services: personal hygiene equipment, food, financial support*
6	7	What do you think about the quality of services provided to [*your community**]? *Probe on timeliness, sufficiency and appropriateness* *Probe: Did your community advocate for or against the particular way a service was provided? Please explain.*
7	1, 2	In your opinion, what assistance or services contributed the most to reducing the number of Ebola cases in your community?
8	1, 2	What advice would you give to improve assistance or services in case of future outbreaks?

KEY INFORMANT INTERVIEW OF CDC PROFESSIONALS

Depending on interview, and the specific individuals participating, a subset of the following questions will be moderated:

SECTION A: ADMINITRATIVE INFORMATION

KII Questionnaire number:	☐☐☐☐
Interview date:	**DD** ☐☐ **MM** ☐☐ **YY** ☐☐
Time of Interview: (*24 hour clock*)	
Name of Interviewer:	
Place of Interview:	
Country:	

SECTION B: QUESTIONS

IMPLEMENTATION EXPERIENCE AND CHALLENGES FACED BY CDC

#	*EQ # Designation*	*Question*
1	6	Please describe your area of intervention or work in the outbreak response? Including your role and where you were posted.
2	6, 7, 8	If you wrote up any of your findings, observations or lessons, can you share these or point to where they might have been published?
3	4, 6	Whom did you interact **with as your CDC supervisor? Your local supervisor/counterpart? With what** other implementing agencies **did you coordinate, cooperate, or collaborate?**
4	1, 2, 3	Did you have any opportunities to collaborate with OFDA or USAID? Can you describe its nature?
5	1, 2, 3	**Did you receive a clearly stated Scope of Work in writing (as for a copy)? Did you receive a pre-departure briefing (if so, what were the key components)?** What roles and specific activities did you carry out or accomplish? **Did you participate in an After-Action Briefing (If so, did you submit an After-Action-Report – *ask for a copy*)?**
6	1, 2, 3, 10	What were the biggest challenges you faced? **For each challenge mentioned, describe how you responded.**

EVIDENCE FROM CDC ABOUT WHAT SEEMED TO WORK BEST IN REDUCING EVD TRANSMISSION

#	*EQ # Designation*	*Question*
7	1, 2, 3, 5, 6, 10	To what extent did you feel your work reduced EVD transmission in [Name where worked]
8	5, 6, 8	What factors did you, or CDC more generally, encounter that **constrained (8a) or enhanced (8b)** interventions to reduce EVD transmission in [where worked]
9	5, 6, 8	What can you describe about **the performance and quality of the work environment (9a), equipment (9b), supplies (9c), professional staff (9d), and support staff (9e) in the setting in which you worked – i.e., in District Health Offices, laboratories,** Ebola Treatment Units (ETUs), the Community Care Centers (CCCs), Contact Tracer Teams, or Burial Teams?
10	5, 6, 8	What evidence did CDC obtain regarding the effectiveness of training health care workers on the principles and practice of IPC in health care facilities as

		implemented by CDC **(10a)** and other IPs **(10b)?**	
11	5, 6, 8, 10	What evidence did CDC obtain regarding the effectiveness of programs of behavior change communication to reduce EVD transmission in communities as implemented by CDC **(11a)** and other implementing partners **(11b)**?	
KEY BENEFITS AND CONSTRAINTS IN WORKING WITH LOCAL PARTNER AGENCIES			
#	***EQ # Designation***	***Question***	***Instruction for Interviewer***
12	8, 9	What were your experience in **working with and communicating with** the OFDA DARTs **(12a)** and with other donors **(12b)**?	
13	8,9	To the extent that you observed OFDA or USAID decision-making, **please** can you comment about how well they based their decisions on **previously published scientific principles (13a),** evidence **and information from local epidemiologic surveillance data (13b)**, or **other sources to be specified (13c)**.	
14	8,9	**Did you observe examples of a whole-of-government (DoD, DoS, DHHS, DHS, etc.) approach in the USG response to the Ebola outbreak (14a)? If so, please describe examples of what you observed (14b), and comment on the effectiveness of such an approach in controlling the outbreak (14c).**	

8. Focus Group Discussion Guide & Questions

Focus Group Discussion Guide: FGDs are not intended as necessarily to be in place of KIIs. In some instances, such as at WHO, UNICEF or FFP, a FGD is useful to engender the cross-stimulation among participants, and discovery from that of issues that would not otherwise be known to the KII interviewer. In any instances, a KII can be used as follow up.

Types of FGD respondents and FGD Guide Number

1. Community Youth Volunteers/Burial Team Members: FGD, 1
2. Families of Ebola Deceased and Survivors: FGD, 2
3. Community members in Ebola affected areas- Women group: FGD, 3
4. Community members in Ebola affected areas- Men group: FGD, 3
5. Community members living in bordering areas not affected by Ebola: FGD, 4

INTRODUCTION & WARM UP FOR ALL FOCUS GROUPS

1. Introduce yourself *and* fill Section A: Administrative information

- *Who we are, and what we are trying to do*
- *What will be done with this information*
- *Why we asked you to participate*

2. Explain focus group discussion

- *Ask the group if anyone has participated in a focus group before. Explain that focus groups are being used more and more often in health and human services research.*

About focus groups

- We learn from you (positive and negative)
- Not trying to achieve consensus, we are gathering information that you have observed or experienced
- In this project, we are doing both surveys and focus group discussions. We will be asking you questions related to your experience and observation. The reason for using both of these tools is that we can get more in-depth information from a smaller group of people in focus groups. This allows us to understand the context behind the answers given in the written survey, and helps us explore topics in more detail than we can do in a written survey.

Logistics

- Focus group will last about from one hour to 90 minutes.

3. Introduce the topic of discussion

I am with a team that is in your community talking to people to learn more about your experiences with Ebola and services provided during Ebola outbreak, as part of a study for the U.S. Government.

4. State the ground rules

- *Speak honestly, one at a time, no "right or "wrong" answers, ask questions if you need to. (obtain group consensus on the rules)*
- *Ask the group to suggest some ground rules. After they brainstorm some, make sure the following are on the list.*
- *Everyone should participate to share their observations and experiences.*
- *You will not receive any kind or cash incentive to participate in the group.*
- *Information provided in the focus group must remain private to the group.*
- *Stay with the group and please don't have side conversations*
- *Turn off cell phones if possible*
- *Have fun*

5. Introduce equipment to be used (tape recorder, if used when appropriate) and why.

- *We would like to tape the focus groups (when appropriate), so we can make sure to capture the thoughts, opinions, and ideas we hear from the group. No names will be attached to the focus groups and the tapes will be destroyed as soon as they are transcribed.*
- *Sign-in sheet (when appropriate)*
- *Consent forms (one copy for participants, one copy for the team) (when appropriate)*
- *Focus Group Discussion Guide for Facilitator*
- *Notebook for note-taking*
- *Refreshments*

6. Read the consent form and assure participants on the confidentiality

Informed consent form:

You have been asked to participate in a focus group discussion. The information learned in the focus groups will be used by aid agencies to evaluate their performance in the Ebola outbreak response, and the performance of their partners. It will also be used to help inform future U.S. responses to health emergencies. You can choose whether or not to participate in the focus group and stop at any time. Your responses will remain anonymous and no names will be mentioned in the report. There are no right or wrong answers to the focus group questions. We want to hear many different viewpoints and would like to hear from everyone. We hope you can be honest even when your responses may not be in agreement with the rest of the group. In respect for each other, we ask that only one individual speak at a time in the group and that responses made by all participants be kept confidential.

If you have any questions now or after you have completed the discussion, you can always contact a study team member like me, or you can call the ----------(Country Coordinator), whose names and phone numbers are on this form.

Please check the boxes below and sign to show you agree to participate in this focus group.

☐ *I understand this information and agree to participate fully under the conditions stated above:*

Signature:----------Date: ----------

Let the participants introduce themselves (age, occupation, family status).

5. Introduce equipment to be used (tape recorder, if used when appropriate) and why.

- *We would like to tape the focus groups (when appropriate), so we can make sure to capture the thoughts, opinions, and ideas we hear from the group. No names will be attached to the focus groups and the tapes will be destroyed as soon as they are transcribed.*
- *Sign-in sheet (when appropriate)*
- *Consent forms (one copy for participants, one copy for the team) (when appropriate)*
- *Focus Group Discussion Guide for Facilitator*
- *Notebook for note-taking*
- *Refreshments*

6. Read the consent form and assure participants on the confidentiality

Informed consent form:

You have been asked to participate in a focus group discussion. The information learned in the focus groups will be used by aid agencies to evaluate their performance in the Ebola outbreak response, and the performance of their partners. It will also be used to help inform future U.S. responses to health emergencies. You can choose whether or not to participate in the focus group and stop at any time. Your responses will remain anonymous and no names will be mentioned in the report. There are no right or wrong answers to the focus group questions. We want to hear many different viewpoints and would like to hear from everyone. We hope you can be honest even when your responses may not be in agreement with the rest of the group. In respect for each other, we ask that only one individual speak at a time in the group and that responses made by all participants be kept confidential.

If you have any questions now or after you have completed the discussion, you can always contact a study team member like me, or you can call the ----------(Country Coordinator), whose names and phone numbers are on this form.

Please check the boxes below and sign to show you agree to participate in this focus group.

☐ *I understand this information and agree to participate fully under the conditions stated above:*

Signature:----------Date: ----------

Let the participants introduce themselves (age, occupation, family status).

FGD1: FOCUS GROUP DISCUSSION OF BURIAL TEAMS INCLUDING YOUTH VOLUNTEERS/BURIAL TEAM MEMBERS	
Our target respondents will include all burial workers, professional and youth/community workers recruited for burial services, some of whom may do cremation or ambulance work as well. Facilitated by ORB Facilitators ***Instructions to Facilitator:*** *Burial teams were composed of 6-8 persons, each having a distinct role such as one disinfector, four burial diggers, one ambulance driver, and one family liaison. The aim is to have similar composition for the focus group. When meeting with burial teams, selection should aim to meet two types of groups (one group professional burial teams, and the second group to include youth/community members who were recruited for burial services). Having homogenous groups is a first priority.* **Informed consent must be signed by every respondent.**	
SECTION A: ADMINISTRATIVE INFORMATION	
FGD Questionnaire number:	☐☐☐☐
Discussion date:	**DD** ☐☐ **MM** ☐☐ **YY** ☐☐
Time of discussion: (*24 hour clock*)	
Name Of Facilitator:	
Place of Discussion:	
Country:	
Prefecture (Guinea)/District (SL) /County (Liberia):	
GPS Coordinates	**Longitude: _____Latitude: _____**
Name of village/clan/chiefdom:	
Number of participants, Gender distribution	Number: Male: Female:

SECTION B: QUESTIONS			
#	***EQ # Designation***	***Question***	***Instruction for Facilitator***
1	2, 5, 10	Can we go around the room and learn from each of you what kind of work you did as a member of a burial team during the Ebola epidemic, and when did you get involved? _____ _____ _____ _____	
2	5, 6, 10	What key skills did each of you learn that you feel were critical to your work? _____ _____ _____ _____	*If not brought up, guide the group to discuss:* *Why they felt the skills mentioned were critical? Probe the group to describe who provided the skills trainings, materials and when.* *Did you receive any formal training to work during Ebola outbreak response?* *Did you receive any materials to assist in your work? To keep you safe from Ebola and educate others in the community about Ebola?*

3	3	How did people feel about how Ebola burials were conducted?	*If not discussed, guide the group to discuss examples of experience dealing with family members of the Ebola deceased* *Were there any challenges for you to be able to do safe and dignified burials?* *What specifically made those named challenging and why?*
4	3, 7	What did you think of the safe burial guidelines?	*Probe: on availability and use of PPE, time management and workload* *Did you receive safe burial guidelines and necessary equipment? Who provided these?* *Which parts of safe burial procedures were good and easy to do? Which parts were difficult, essential?*
5	1, 2	In your opinion, what were the services/activities that contributed to reducing the number of Ebola cases in the communities you have worked?	

6	1, 2	What advice would you give to improve services to community in case of future outbreaks?	
7	1, 2	Are there any negative consequences for you now for having done your work during Ebola outbreak?	

FGD2: FOCUS GROUP DISCUSSION OF FAMILIES AFFECTED BY EBOLA

Our target respondents will include adult household members affected by Ebola- Families of Ebola survivor and Ebola deceased
Facilitated by ORB Facilitators

Instructions to Facilitator: *Conduct FGD with a group of adult member of families affected by Ebola, organized in consultation and assistance with community leader/village head.*

Informed consent must be signed by every respondent.

SECTION A: ADMINISTRATIVE INFORMATION

FGD Questionnaire number:	☐☐☐☐
Discussion date:	**DD** ☐☐ **MM** ☐☐ **YY** ☐☐
Time of discussion: (*24 hour clock*)	
Name Of Facilitator:	
Place of Discussion:	
Country:	
Prefecture (Guinea)/District (SL) /County (Liberia):	
GPS Coordinates	**Longitude:** _____ **Latitude:** _____
Name of village/clan/chiefdom	
Number of participants, Gender distribution	Number: Male: Female:

SECTION B: QUESTIONS

#	*EQ # Designation*	*Question*	*Instruction for Facilitator*
1	1, 2, 5, 10	What did each of you know about Ebola before your family member got sick? _____ _____	*Probe of following, if not described during the discussion:* *Where did you learn what you knew?* *How did you learn your family member was sick due to Ebola?*

			Do you know of a situation when family members of Ebola patients did not inform authority or take patients to a health facility?
2	3, 4, 5, 6, 7, 10	Tell me about the services or help your family member received when s/he was ill?	*Probe: on availability, timeliness and quality of services* *Probe group to describe the service* *What type?* *Services such as :* *Ebola education and services information messages* *In-kind support- personal hygiene equipment, Food support* *Case treatment management* *Isolation/quarantine* *Contact tracing/community surveillance* *Safe burial services* *Can you remember the names of organizations that provided the support/services?* *Did the help that you were given match the needs of you and your family?* *Did the help you needed come in time?* *Did you receive any in-kind*

			support or services for Ebola before your family member got sick? During the sickness? After the sickness?
3	3, 4	What helped you get assistance for your families? _____ _____ _____ _____	*Probe: Who gave you the best information when your family member was sick, and afterwards? What organizations or groups were the most helpful?*
4	3	What, if any challenges, did you face while seeking health care for family members? _____ _____ _____ _____	*If not discussed, guide the group to discuss what specifically made those named challenging and why.* *Probe- stigma and discrimination* *Any refusal for assistance* *Any challenges from other community members, neighbors*
5	1, 2	In your opinion, what were the services/activities that contributed to reducing the number of Ebola cases in your community? _____ _____ _____ _____	
6	1, 2	What advice would you give to improve aid to people and families affected by Ebola in case of future outbreaks?	

FGD 3: FOCUS GROUP DISCUSSION OF COMMUNITY MEMBERS (community with Ebola case)	
Our target respondents will include adult community members in community affected by Ebola Facilitated by ORB Facilitators ***Instructions to Facilitator:*** *Conduct FGD with* ***two separate group of adult member of community (one FGD for women and other FGD for men, all ages above 18 years).*** *The FGD to be organized in consultation and assistance with community leader/village head.* **Informed consent must be signed by every respondent.**	
SECTION A: ADMINISTRATIVE INFORMATION	
FGD Questionnaire number:	☐☐☐☐
Discussion date:	**DD** ☐☐ **MM** ☐☐ **YY** ☐☐
Time of discussion: (*24 hour clock*)	
Name Of Facilitator:	
Place of Discussion:	
Country:	
Prefecture (Guinea)/District (SL) /County (Liberia):	
GPS Coordinates	**Longitude:** _____ **Latitude:** _____
Name of village/clan/chiefdom	
Number of participants, Gender distribution	Number: Male: Female:

SECTION B: QUESTIONS			
#	***EQ # Designation***	***Question***	***Instruction for Facilitator***
1	1, 2, 5, 10	What did you know about Ebola before *your* community was particularly affected? _____ _____ _____ _____	*Probe of following, if not described during the discussion:* *If you listened to or heard about important messages about Ebola and how to avoid it, when did you first hear?* *Please describe the content of this message as you remember it.* *Did the messages or information change over time and how?*
1	1, 2, 5	In what ways were members of this community particularly affected? _____ _____ _____ _____	*Probe of following, if not described* *Any effect on employment?* *School/education?* *Trade? Agriculture?* *Movement of people within communities?*

2	3, 4, 5, 6, 7, 10	Tell me about the services or help your community received during the outbreak. .	*Probe: on availability, timeliness and quality of services* *Probe group to describe the service* *What type?* *Services such as :* *Ebola education and services information messages* *In-kind support- personal hygiene equipment, Food support* *Case treatment management* *Isolation/quarantine* *Contact tracing/community surveillance* *Safe burial services* *Can you remember the names of organizations that provided the support/services?*
3	3	Tell me about whether there was any effect on other routine health services for the community during the outbreak.	*If not discussed, guide the group to discuss on availability, timeliness and quality of services* *Any changes in routine maternal, newborn, and child health services?* *Any challenges?*

4	1, 2	In your opinion, what were the services/activities that contributed to reducing the number of Ebola cases in your community?	
5	1, 2	What advice would you give to improve aid to people and families affected by Ebola in case of future outbreaks?	

FGD4: FOCUS GROUP DISCUSSION OF COMMUNITY MEMBERS (community with no Ebola case)			
Our target respondents will include adult community members in community with no Ebola cases reported during the Ebola outbreak Facilitated by ORB Facilitators ***Instructions to Facilitator:*** *Conduct FGD with adult member (men and women) of community. The FGD to be organized in consultation and assistance with community leader/village head.* **Informed consent must be signed by every respondent.**			
SECTION A: ADMINISTRATIVE INFORMATION			
FGD Questionnaire number:	☐☐☐☐		
Discussion date:	**DD** ☐☐ **MM** ☐☐ **YY** ☐☐		
Time of discussion: (*24 hour clock*)			
Name Of Facilitator:			
Place of Discussion:			
Country:			
Prefecture (Guinea)/District (SL) /County (Liberia):			
GPS Coordinates	**Longitude: _____Latitude: _____**		
Name of village/clan/chiefdom			
Number of participants, Gender distribution	Number: Male: Female:		
SECTION B: QUESTIONS			
#	***EQ # Designation***	***Question***	***Instruction for Facilitator***
1	1, 2, 5, 10	What did you know about Ebola before *your neighboring* community was particularly affected? _____ _____ _____ _____	*Probe of following, if not described during the discussion:* *If you listened to or heard about important messages about Ebola and how to avoid it, when did you first hear?* *Please describe the content of this message as you remember it.* *Did the messages or information change over time and how?*
1	1, 2, 5	In what ways were members of this community particularly affected? _____ _____ _____ _____	*Probe of following, if not described* *Any effect on employment?* *School/education?* *Trade? Agriculture?* *Movement of people within communities?*

2	3, 4, 5, 6, 7, 10	Tell me about the services or help your community received when your neighboring community had the Ebola outbreak. _____ _____ _____ _____	*Probe: on availability, timeliness and quality of services* *Probe group to describe the service* *What type?* *Services such as :* *Ebola education and services information messages* *In-kind support- personal hygiene equipment, Food support* *Case treatment management* *Isolation/quarantine* *Contact tracing/community surveillance* *Safe burial services* *Can you remember the names of organizations that provided the support/services?*
3	3	Tell me about whether there was any effect on other routine health services for the community. _____ _____ _____ _____	*If not discussed, guide the group to discuss on availability, timeliness and quality of services* *Any changes in routine maternal, newborn, and child health services?* *Any challenges?*

4	1, 2	In your opinion, what were the services/activities that prevented an Ebola outbreak in your community? _____ _____ _____ _____	
5	1, 2	What advice would you give to improve aid to people and families affected by Ebola in case of future outbreaks? _____ _____ _____ _____	

ANNEX G. DOCUMENTS CONSULTED

General

"A conversation with Dr. Joanne Liu, President of Doctors without Borders" *Washington Post,* August 25, 2014.

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ANNEX H. INTERVIEWS & DISCUSSIONS

1. KEY INFORMANT INTERVIEWS

N°	Interviewee(s)	Association
Guinea (42)		
1	Mme Rachel Honorine Camara (Mrs Gomez)	CECI
2	Mamadou Lamine Sonko	Child Fund
3	Professor Yolande Hyjazi	Jhpiego
4	Mr Fode Tass Sylla	CNLE
5	Dr Jean-Marie Bihizi	CRS
6	Stéphane Lobjois	IMC
7	Ibrahim Forgotten Bamba	HKI
8	Michael Asima	IOM
9	Thierno Maka Barry	Plan Guinea
10	Dr Aboubacar Sakoba	CNLE
11	Mme Tamar Bah	USAID
12	Lise Martel	CDC
13	Guillame Bakadi Mukenge	HC3
14	Dr Robert Camara	MoH
15	Dr Pepe Bilivogui	MoH
16	Dr Moumie Barry	CNLE
17	Pr Lamine Koivogui	National Institute of Public Health
18	Dr Issiaga Konate	WHO
19	Dr Joseph Miburo	IFRC
20	Dr Alpha Diallo	Clinic Pasteur
21	Mamadou Kaba Barry	Terre des Hommes
22	Marc Rubin	Unicef
23	Thomas Mauget	French Red Cross
24	Dr Mariama Cire/Dr Gaku Tata (Conakry Health Director)	Health Directorate of Conakry - DSVCO
25	Dr Salematou Toure	Communal Health Directorate of Matam
26	Professor Madiou Diakite	Donka Nat'l Hospital Lab
27	Dr Abdourahamane Bachili	Ebola Coordination
28	Dr Catherine Loua	Communal Health Directorate of Matoto
29	Dr Karamo Cherif	Guinea Red Cross
30	Dr Lansana Kerouane Camara	Prefectural Directorate of Forecariah
31	Dr Moustapha Toure	Prefectural Hospital Lab
32	Dr Kaly Youla	Youla Private Clinic
33	Dr Jules Aly Koundouno	Association of Ebola Survivors

N°	Interviewee(s)	Association
34	Dr Teoro Koikoi Gneme	Prefectural Directorate of Coyah
35	Dr David Azoko	Prefectural Hospital of Coyah
36	Dr Naby Sekou Conte	Prefectural Hospital of Coyah
37	Dr Sekou Keita	Communal Health Center of Matam - CMC Matam
38	Dr Bangaly Soumah	Communal Health Center of Miniere - CMC Miniere
39	Dr Boubacar Diallo	RTI
40	Professor Alpha Amadou Bano	General Lansana Conte University - UGLC
41	Dr Fatoumata Binta Diallo	Communal Health Center of Flamboyant - CMC Flamboyant
42	Dr Doussou Toure	Communal Health Center of Coleah - CMC Coleah
Liberia (44)		
1	Malnuddin Ahmed	BRAC
2	Augustin Koryon	IRC
3	Nimah Candy	Liberian Red Cross
4	Rev. Sumo	MOH
5	Mervyn Johnson	Ebola Holding Ctr & Nursing Dir., Redemption Hosp.
6	Thomas Knue Nagbe	MOH
7	Elizabeth Geddeh	Global Communities
8	Dr. Anthony S. Chan	USAID/L
9	Philippe Accilien	USAID/L
10	Mervyn Farroe	
11	Tolbert Nyensuah	MOH
12	Dr. Alex Gasasira	WHO
13	Dr. Desmond Williams	CDC
14	Lisha McCormick	Last Mile Health
15	Dr. Beatrice Kirubi	IOM & MSF
16	Penny Andrews	Mercy Corps
17	Judith Oakey	JSI
18	Timothy Owhochukwu	Concern Worldwide
19	Kevin W. Fleming	Peace Corps
20	Cate Oswald	Partners in Health
21	Amanda Boachie	USAID
22	Bev Kauffeldt	Samaritan's Purse
23	Emily Caudwell	Samaritan's Purse
24	Yvonne Kodl	JSI
25	Monica Dea	CDC
26	Regina Parham	USAID/OFDA
27	Martha Keselly ETU staff	ELWA ETU/MSF-ETU
28	Nehwon Suah Youth Leader	YMCA
29	Mohammed Hussein Religious Leader	Imma Plumko Mosque
30	Harris S. Darkpah	Tradittional Council Of Liberia
31	Felecia Toe	County Health Team Montserrado
32	Richard Dolo	Community leader
33	Victor Nadoe	Global Communties /IOM/Red Cross/Concern

N°	Interviewee(s)	Association
34	Othello Contowor	Global Communties /IOM/Red Cross/Concern
35	Martha Kangar	Global Communties /IOM/Red Cross/Concern
36	Pastor McCauley	Global Communties /IOM/Red Cross/Concern
37	Zondeh Duo	Global Communties /IOM/Red Cross/Concern
38	Gabriel B. Kassay	Global Communties /IOM/Red Cross/Concern
39	Siaffa J. Perry	Global Communties /IOM/Red Cross/ITM
40	Salfula Sonnie	Global Communties /IOM/Red Cross/ITM
41	Soko S. Kamara	Global Communties /IOM/Red Cross/ITM
42	Patrick L. Kamara Sr.	Global Communties /IOM/Red Cross/ITM
43	Alihaji Zordua	Global Communties /IOM/Red Cross/ITM
44	Moses T. Geffie Jr.	Global Communties /IOM/Red Cross/ITM
Sierra Leone (48)		
1	John Kalokoh	ChildFund
2	Musa Sano Kontach	Munafa M'Pate Federation
3	Zuliatu Cooper	Ministry of Health and Sanitation
4	Amara Jambai	Ministry of Health and Sanitation
5	Yabom T Sesay-Koroma	Office of the President
6	Madina Rahman	Ministry of Health and Sanitation
7	Sarian Kamara	Ministry of Health and Sanitation
8	Rajiv Shrivasava	Oxfam
9	Sara Hersey	CDC
10	Eilidh Higgins	IRC
11	Dr. Brima Kamara	Ministry of Health and Sanitation
12	Dr. A. Pekezou	IOM
13	Darren Hertz	IRC
14	Mohamed Kakay	WHO
15	Sandra Lattouf	Unicef
16	Kshitij Joshi	Unicef
17	Alfred Kamara	Ministry of Health and Sanitation
18	Ibrahim Turay	Ministry of Health and Sanitation
19	Mohamed Konteh	Ministry of Health and Sanitation
20	Umaru Dumbuya	Ministry of Health and Sanitation, Sierra Leone
21	Kadiatu Koromo	Community Leader, Kabala, Sierra Leone
22	Maada Alpha B. Ndoleh	Community Leader, Kailahun, Sierra Leone
23	Isata Ndoleh	Community Leader, Kailahun, Sierra Leone
24	Davidson Jonah	Child Fund
25	Rev. Chief Fengai Nyandemoh	District Ebola Response Committee, Deputy Coordinator
26	Finda Aminata Sinnah	Traditional leader, Kono
27	Steven Ansumana	Religious Leader - Pastor
28	Sheik Amadou Mattia	Religious Leader - Imam
29	Sahr Richard Fears	Traditional leader, Kono
30	Richard Gborie	Ministry of Health and Sanitation, Sierra Leone
31	Jonathan Ellie	Ministry of Health and Sanitation, Sierra Leone

N°	Interviewee(s)	Association
32	John Abu Rakarr Contef	Youth Leader
33	Rev John Keifala	Religious Leader- Pastor/ Community Organizer - Bo
34	Dr. Foday Sesay	Ministry of Health and Sanitation, Sierra Leone
35	Sheikh Abdulai A. Koroma	Chief Imam- Central Mosque, Mile 91
36	Santigie Kamara	Community Leader/Business Man
37	Osman Conteh	Community Leader/
38	Ibrahim K. Fullah	Community Leader, Mile 91
39	Albert Foday Kamara	Ministry of Health and Sanitation, Sierra Leone
40	Mohamed Hassan Kanu	Ministry of Health and Sanitation, Sierra Leone
41	Carrie Jo Kindi	World Hope International
42	Dr. Santigie Sesay	Ministry of Health and Sanitation, Sierra Leone
43	Daniel S. Turay	Kalasogoia Chiefdom, Bumbuna
44	Yayah A. Conteh	Ministry of Health and Sanitation, Sierra Leone
45	Dr. Brima Kargbo	Ministry of Health and Sanitation, Sierra Leone
46	Rev. Alimamy A. Bangura	Emmanuel Baptist conference, Sierra Leone
47	Theresa Bagray	Christian Aid, Sierra Leone
48	Kevin Weseni	World Vision International, SL
US & Europe (99)		
1	John Redd	CDC
2	Brian Wheeler	CDC
3	Dan Jernigan	CDC
4	Mark Anderson	CDC
5	Pratima Raghunathan	CDC
6	Satish Pillai	CDC
7	Ezra Barzilay	CDC
8	Barbara Marston	CDC
9	Jeff Bryant	CDC
10	Ed Rouse	CDC
11	Athalia Christie	CDC
12	Inger Damon	CDC
13	Mark Anderson	CDC
14	Jordan Tappero	CDC
15	Thomas Friedan	CDC
16	Kristen Debord	HHS
17	Jimmy Kolker	HHS
18	Jeff Lightsey	DOD – 101st Airborne
19	Paul Reed	DOD – USUHS
20	Thomas Kirsch	DOD – USUHS
21	Eric P Nikolai	DOD – TransCom
22	Leroy Juenger	DOD – TransCom
23	Iraq Gharagouzloo	DOD
24	Matthew Doan	DOD
25	Jose Sanchez	DOD

N°	Interviewee(s)	Association
26	Juanita Rilling	RMT
27	Giselle Zimmerman	RMT
28	John Zavales	RMT
29	Cara Christie	RMT
30	Karey Haywood	RMT
31	Jonathan Kennedy	RMT
32	Samuel F Sells	RMT – DOD
33	Al Gembara	RMT
34	James Nuttle	DART
35	Ethan Arnhalm	DART
36	Tim Callaghan	DART
37	Chi-Poe (CP) Hsia	DART
38	Laura Shevchik	DART
39	Dori Gebregziabher	DART
40	Justin Pendarvis	DART
41	Linda Mobula	DART
42	Metta Karlsen	DART
43	Dina Esposito	FFP
44	Jeremy Haldeman	American Refugee Committee (ARC)
45	Benjamin Phillis	ChildFund International
46	Piet DeVries	Global Communities (currently FHI360)
47	Rachel Silverman	Center for Global Development
48	Susan Morawetz	Global Communities
49	Brett Sedgewick	Global Communities
50	Pia Wanek	Global Communities
51	Else Kirk	GOAL
52	Fay Ballard	GOAL
53	Sophie Messan	InterNews
54	Pierre Mignault	InterNews
55	Adrienne Villani	Global Communities
56	Sean Casey	IMC
57	Natalie Sarles	Global Communities
58	Laura Stana	IMC
59	Stephen Hatch	IMC
60	Emmanuel d'Harcourt	IRC
61	Laura Miller	IRC
62	Ruwan Ratnayake	IRC
63	Dr. SA McMahon	IRC
64	Erin Stone	IRC
65	Armand Sprecher	MSF
66	Jim DiFrancesca	Project Concern International
67	Jesse Hartness	Save the Children
66	Gagik Karapetyan	World Vision USA

N°	Interviewee(s)	Association
69	Daniel Lucey	Georgetown University Medical Center
70	John Monahan	Global Health Institute, Georgetown University
71	Amira Roess	George Washington University
72	Beth Ann Plowman	UNICEF
73	Paul Pronyk	UNICEF
74	Imran Mirza	UNICEF
75	Kristen Barredo	World Vision
76	Bruce Aylward	WHO
77	Richard Brennan	WHO
78	Robin Dartell	WHO
79	Samuel Plasmati	Harvard Humanitarian Initiative
80	Richard Cash	Harvard School of Public Health
81	Sinead Walsh	Irish Ambassador to Sierra Leone
82	Thierry Delbreuve	OCHA
83	Anne Golaz	University of Geneva
84	Leonard Doyle	IOM
85	Peter Jan Graaf	UNMEER
86	Anonymous	UNAIDS
87	David Nabarro	UNDP
88	Adrien Adams MAJ	DoD
89	Jordan Simmers MAJ	DoD
90	Ross Coffey LTC	DoD
91	Amy Ehmann	DoD
92	Ian Norton	WHO
93	Tom Kenon	CDC and Project Hope International
94	Eugene Richardson	Harvard University
95	Ali Khan	WHO; University of Nebraska Medical School
96	Brian McClosky	Public Health England
97	Emma Ross	Chatham House Centre on Global Health Security
98	Victoria Parkinson	OBE – Formerly Senior Governance advisor-National Ebola Advisor for Tony Blair African Governance Initiative, Sierra Leone
99	Chris Walker	Former consultant to DFID CHASE

2. FOCUS GROUP DISCUSSIONS

N°	Group	Location	Gender
Guinea (19)			
1	Medicine Faculty – Female Students	Conakry	F
2	Medicine Faculty - Male Students	Conakry	M
3	Community Youth Group	Conakry	M/F
4	Community Group of Fishermen	Conakry	M/F
5	Religious Leaders	Conakry	M/F
6	Community Housewives Association	Conakry	F
7	Young girls of professional saloon	Conakry	F
8	Male Health Agents	Conakry	M
9	Female Health Agents	Conakry	F
10	Religious Leaders	Conakry	M/F
11	Social Action Members	Forecariah	M/F
12	Community Youth Group	Forecariah	M/F
13	Female Health Agents	Forecariah	F
14	Red Cross Volunteers	Forecariah	M/F
15	Male Health Agents	Forecariah	M
16	Female Health Agents	Coyah	F
17	Male Health Agents	Coyah	M
18	Community Housewives	Coyah	F
19	Community Youth Group	Coyah	M/F
Liberia (21)			
1	UNICEF Staff	Monrovia	M/F
2	National Traditional Council of Chiefs & Elderes	Monrovia	M/F
3	USAID Staff	Monrovia	M/F
4	CARE Staff	Monrovia	M/F
5	Save the Children Staff	Marghibi	M
6	WFP Staff	Monrovia	M
7	Ministry of Health (Female)	Monrovia	F
8	Global Communities/MOH	Monrovia	M/F
9	Burial Team (GC & MoH)	Monrovia	M/F
10	Community Residents (Beneficiaries of MoH, Red Cross, & Global Communities)	Besonville City	F
11	Community Residents (Beneficiaries of MoH, Red Cross, Global Communities, & ZOAH)	Besonville City	F
12	Community Residents (Beneficiaries of GC, MOH, & Red Cross)	Monrovia	M
13	Community Leaders	Monrovia	M/F
14	Female Community Leaders	Monrovia	F
15	Community Residents (Beneficiaries of MoH, Red Cross, & Concerned World Wide)	Monrovia	M
16	Community Residents (Beneficiaries of MoH, Red Cross, & Concerned World Wide)	Monrovia	
17	IREX/MoH Project Staff	Buchanan City	M/F
18	Red Cross/IFRC Project Staff	Buchanan City	M/F
19	Burial Team (Red Cross/GC)	Grand Bassa County	M
20	Burial Team (Red Cross/GC)	Grand Bassa County	M
21	Families Affected by Ebola	Buchanan City	M/F

N°	Group	Location	Gender
Sierra Leone (19)			
1	IMC – CHWs	Lunsar, Port Loko	M/F
2	Community Members (Community without Ebola)	Kabala	M/F
3	Youth Burial Team	Kabala Town	M/F
4	Ebola Survivors and Family Members	Makeni/Petbana	M/F
5	Women – Ebola Affected Community	Kailahun Town	F
6	Men – Ebola Affected Community	Kailahun Town	M
7	Burial Team	Kenema Town	M/F
8	Ebola Survivors and Family Members	Kenema Town	M/F
9	Ebola Survivors and Family Members	Bumpe, Kono	M/F
10	Men – Ebola Affected Community	Port Loko Town	M
11	Women – Ebola Affected Community	Bumpe, Kono	F
12	Men – Ebola Affected Community	Bumpe, Kono	M
13	Burial Team	Koidu, Kono	M/F
14	Community Members (Community without Ebola)	Koidu, Kono	M/F
15	Burial Team	Port Loko Town	M/F
16	Community Members (Community without Ebola)	Makeni/Mena	M/F
17	Men – Community Members (Ebola Affected Community)	Macdonald, Freetown	M
18	Women - Community Members (Ebola Affected Community)	Macdonald, Freetown	F
19	Ebola Survivors and Family Members	Macdonald, Freetown	M/F

3. DATA COLLECTED BY ORB INTL.

IBTCI subcontracted ORB International, based in Charlottesville, VA, to conduct large numbers of surveys and focus groups in West Africa as part of this evaluation. The table below presents the numbers of key informant interviews and group discussions held by group and by location, in addition to the structured surveys described elsewhere.

LIBERIA	Cape Mount	Lofa	Margibi	Bong	Grand Bassa	Nimba	Bomi	Gbarpolu	River Cess	Sinoi
Focus Group Discussions										
Burial Teams	1	1	1	1	1	1	1	1	0	0
Families of Ebola survivor and deceased in affected areas	1	1	1	1	1	1	1	1	0	0
Community-level male groups from Ebola-affected communities	1	1	1	1	1	1	1	1	1	0
Community-level female groups from Ebola-affected communities	1	1	1	1	1	1	1	1	0	1
Community-level in bordering areas not affected by Ebola (mixed gender)	1	1	1	1	1	0	0	0	0	1
Total	5	5	5	5	5	4	4	4	1	2
Key Informant Interviews										
Village chief/ traditional leader	1	1	1	1	1	1	1	1	1	1
Religious leader-pastor	1	0	1	1	0	0	0	0	0	1
Religious leader-Imam	0	0	0	0	0	0	0	0	0	0
Women's group leader	1	0	1	1	1	0	0	0	1	0
Youth group leader	0	1	0	0	1	0	0	1	0	0
Merchant/business leader	0	1	0	0	1	1	0	0	0	0
Other civic association representative	1	1	1	1	0	0	1	0	0	0
Total	4	4	4	4	4	2	2	2	2	2

SIERRA LEONE	Kenema	Kailahun	Port Loko	Kambia	Bombali	Tonkolili	Bo	Moyamba	Western Area Rural 1	Western Area Rural 2
Focus Group Discussions										
Burial Teams	1	1	1	1	0	1	0	0	0	0
Families of Ebola survivor and deceased in affected areas	1	1	1	0	1	1	0	0	0	0
Community-level male groups from Ebola-affected communities	0	1	0	1	1	1	1	0	1	0
Community-level female groups from Ebola-affected communities	1	1	1	0	1	1	0	1	0	0
Community-level in bordering areas not affected by Ebola (mixed gender)	1	0	0	1	0	0	0	1	1	1
Total	4	4	3	3	3	4	1	2	2	1
Key Informant Interviews										
Village chief/ traditional leader	1	1	1	1	1	1	1	1	1	1
Religious leader-pastor	1	0	0	0	0	0	1	0	0	0
Religious leader-Imam	0	0	1	0	0	1	0	1	0	0
Women's group leader	1	0	1	0	1	0	0	0	0	0
Youth group leader	0	1	0	1	0	0	0	0	1	1
Merchant/business leader	1	0	0	1	1	1	0	0	0	0
Other civic association representative	1	1	1	0	0	1	0	0	0	0
Total	5	3	4	3	3	4	2	2	2	2

GUINEA	All
Focus Group Discussions	
Burial Teams	5
Families of Ebola survivor and deceased in affected areas	5
Community-level male groups from Ebola-affected communities	6
Community-level female groups from Ebola-affected communities	6
Community-level in bordering areas not affected by Ebola (mixed gender)	5
Total	27
Key Informant Interviews	
Village chief/ traditional leader	10
Religious leader-pastor	1
Religious leader-Imam	3
Women's group leader	4
Youth group leader	4
Merchant/business leader	4
Other civic association representative	4
Total	30

ANNEX I. STATEMENTS OF DIFFERENCE

After collection of data and analysis, the IBTCI evaluation team did not find differences of opinion.

ANNEX J. CONFLICT OF INTEREST FORMS

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	Dr. Ronald Waldman, M.D.
Title	Senior Science Advisor
Organization	International Business & Technical Consultants, Inc. (IBTCI)
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	IDIQ TO AID-OAA-I-15-00022/AID-OAA-TO-16-00034
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Performance Evaluation of OFDA's Response to Ebola Virus Disease (EVD) Outbreak in West Africa, IDIQ TO AID-OAA-I 15-00022/Aid-OAA-TO-16-00034 with IBTCI
I have real or potential conflicts of interest to disclose.	☒ Yes ☐ No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to:* 1. *Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated.* 2. *Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation.* 3. *Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project.* 4. *Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated.* 5. *Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated.* 6. *Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation.*	1. I am the recipient of an IPA agreement from USAID that includes reimbursement of 50% of my salary from June 2017 - October 2018, then 36% from November 2017 - May 2019. I received 25% from May 2016 - April 2017. None of these funds come from USAID/OFDA 2. I served as technical advisor to Save the Children from April 2014 - August 2015, including during the Ebola outbreak

I certify (1) that I have completed this disclosure form fully and to the best of my ability and (2) that I will update this disclosure form promptly if relevant circumstances change. If I gain access to proprietary information of other companies, then I agree to protect their information from unauthorized use or disclosure for as long as it remains proprietary and refrain from using the information for any purpose other than that for which it was furnished.

Signature	Ronald Waldman
Date	July 10, 2017

closure of Conflict of Interest for USAID Evaluation Team Members

me	Dr. Phillip Nieburg, M.D.
e	Senior Policy Advisor
ganization	International Business & Technical Consultants, Inc. (IBTCI)
luation Position?	☐ Team Leader ■ Team member
luation Award Number *(contract other instrument)*	IDIQ TO AID-OAA-I-15-00022/AID-OAA-TO-16-00034
AID Project(s) Evaluated *(Include ject name(s), implementer ne(s) and award number(s), if licable)*	Performance Evaluation of OFDA's Response to Ebola Virus Disease (EVD) Outbreak in West Africa, IDIQ TO AID-OAA-I 15-00022/Aid-OAA-TO-16-00034 with IBTCI
ve real or potential conflicts of erest to disclose.	☐ Yes ☒ No
es answered above, I disclose the lowing facts: *l or potential conflicts of interest may include, ore not limited to:* *lose family member who is an employee of the SAID operating unit managing the project(s) eing evaluated or the implementing rganization(s) whose project(s) are being valuated.* *inancial interest that is direct, or is significant ough indirect, in the implementing rganization(s) whose projects are being valuated or in the outcome of the evaluation.* *urrent or previous direct or significant though direct experience with the project(s) being valuated, including involvement in the project esign or previous iterations of the project.* *urrent or previous work experience or seeking mployment with the USAID operating unit anaging the evaluation or the implementing rganization(s) whose project(s) are being valuated* *urrent or previous work experience with an rganization that may be seen as an industry ompetitor with the implementing rganization(s) whose project(s) are being valuated.* *reconceived ideas toward individuals, groups, rganizations, or objectives of the particular rojects and organizations being evaluated that ould bias the evaluation.*	

rtify (1) that I have completed this disclosure form fully and to the best of my ability and (2) that I will update this closure form promptly if relevant circumstances change. If I gain access to proprietary information of other companies, n I agree to protect their information from unauthorized use or disclosure for as long as it remains proprietary and rain from using the information for any purpose other than that for which it was furnished.

nature	Phillip Nieburg
te	June 26, 2017

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	Dr. Richard Stuart Olson, Ph.D.
Title	OFDA Historian Expert
Organization	International Business & Technical Consultants, Inc. (IBTCI)
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	IDIQ TO AID-OAA-I-15-00022/AID-OAA-TO-16-00034
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I have real or potential conflicts of interest to disclose.	☐ Yes ☒ No
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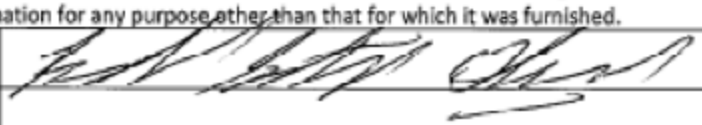
Signature	
Date 6/26/19	

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	Samuel Delito Turay, MPH
Title	Sierra Leone Field Coordinator
Organization	International Business & Technical Consultants, Inc. (IBTCI)
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	IDIQ TO AID-OAA-I-15-00022/AID-OAA-TO-16-00034
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Performance Evaluation of OFDA's Response to Ebola Virus Disease (EVD) Outbreak in West Africa, IDIQ TO AID-OAA-I 15-00022/Aid-OAA-TO-16-00034 with IBTCI
I have real or potential conflicts of interest to disclose.	☐ Yes ☒ No
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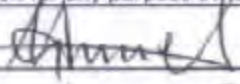
Signature	
Date	June 27th, 2017

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	Dr. Sharon Abramowitz, Ph.D., M.D.
Title	Qualitative Researcher
Organization	International Business & Technical Consultants, Inc. (IBTCI)
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	IDIQ TO AID-OAA-I-15-00022/AID-OAA-TO-16-00034
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Performance Evaluation of OFDA's Response to Ebola Virus Disease (EVD) Outbreak in West Africa, IDIQ TO AID-OAA-I-15-00022/Aid-OAA-TO-16-00034 with IBTCI
I have real or potential conflicts of interest to disclose.	☐ Yes ☒ No
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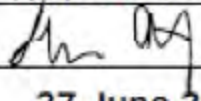
Signature	
Date	27 June 2017

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	William Lyerly, MPH
Title	Senior Humanitarian Aid and Emergencies Advisor
Organization	International Business & Technical Consultants, Inc. (IBTCI)
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	IDIQ TO AID-OAA-I-15-00022/AID-OAA-TO-16-00034
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Performance Evaluation of OFDA's Response to Ebola Virus Disease (EVD) Outbreak in West Africa, IDIQ TO AID-OAA-I 15-00022/Aid-OAA-TO-16-00034 with IBTCI
I have real or potential conflicts of interest to disclose.	☐ Yes ☒ No
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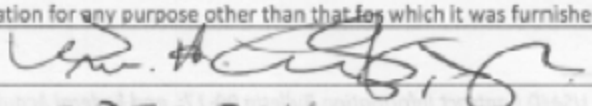
Signature	
Date	15 DEC 2016

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	Dr. Deborah Rugg, Ph.D.
Title	Senior Evaluation Specialist
Organization	International Business & Technical Consultants, Inc. (IBTCI)
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	IDIQ TO AID-OAA-I-15-00022/AID-OAA-TO-16-00034
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Performance Evaluation of OFDA's Response to Ebola Virus Disease (EVD) Outbreak in West Africa, IDIQ TO AID-OAA-I 15-00022/Aid-OAA-TO-16-00034 with IBTCI
I have real or potential conflicts of interest to disclose.	☐ Yes ☒ No
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Signature	Deborah Rugg
Date	26 June 2016

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	Dr. Barry Mahmoud, MD
Title	Guinea Field Coordinator
Organization	International Business & Technical Consultants, Inc. (IBTCI)
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	IDIQ TO AID-OAA-I-15-00022/AID-OAA-TO-16-00034
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Performance Evaluation of OFDA's Response to Ebola Virus Disease (EVD) Outbreak in West Africa, IDIQ TO AID-OAA-I 15-00022/Aid-OAA-TO-16-00034 with IBTCI
I have real or potential conflicts of interest to disclose.	☐ Yes ☑ No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to:* *1. Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated.* *2. Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation.* *3. Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project.* *4. Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated.* *5. Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated.* *6. Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation.*	

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Signature	Barry Mahmoud
Date	07/20/2017

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	Jennifer Leigh, MPH
Title	Public Health Advisor
Organization	International Business & Technical Consultants, Inc. (IBTCI)
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	IDIQ TO AID-OAA-I-15-00022/AID-OAA-TO-16-00034
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Performance Evaluation of OFDA's Response to Ebola Virus Disease (EVD) Outbreak in West Africa, IDIQ TO AID-OAA-I 15-00022/Aid-OAA-TO-16-00034 with IBTCI
I have real or potential conflicts of interest to disclose.	☐ Yes ☑ No
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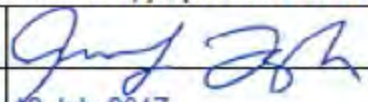
Signature	
Date	13 July 2017

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	Dr. Michael Toole, M.D.
Title	Senior Evaluation & Public Health Specialist
Organization	International Business & Technical Consultants, Inc. (IBTCI)
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	IDIQ TO AID-OAA-I-15-00022/AID-OAA-TO-16-00034
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Performance Evaluation of OFDA's Response to Ebola Virus Disease (EVD) Outbreak in West Africa, IDIQ TO AID-OAA-I 15-00022/Aid-OAA-TO-16-00034 with IBTCI
I have real or potential conflicts of interest to disclose.	☐ Yes ☒ No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to:* 1. *Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated.* 2. *Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation.* 3. *Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project.* 4. *Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated.* 5. *Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated.* 6. *Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation.*	

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Signature	Michael Toole
Date	6/27/2017

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	Natalie Pedersen, MPH
Title	Public Health Specialist
Organization	International Business & Technical Consultants, Inc. (IBTCI)
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	IDIQ TO AID-OAA-I-15-00022/AID-OAA-TO-16-00034
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Performance Evaluation of OFDA's Response to Ebola Virus Disease (EVD) Outbreak in West Africa, IDIQ TO AID-OAA-I 15-00022/Aid-OAA-TO-16-00034 with IBTCI
I have real or potential conflicts of interest to disclose.	☒ Yes ☐ No
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Signature	[signature]
Date	27 June 2017

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	Dr. Naomi Rutenberg, Ph.D.
Title	Senior Analyst / Writer
Organization	International Business & Technical Consultants, Inc. (IBTCI)
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	IDIQ TO AID-OAA-I-15-00022/AID-OAA-TO-16-00034
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Performance Evaluation of OFDA's Response to Ebola Virus Disease (EVD) Outbreak in West Africa, IDIQ TO AID-OAA-I 15-00022/Aid-OAA-TO-16-00034 with IBTCI
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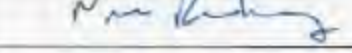
Signature	
Date	06/26/2017

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	Philip Graitcer, MPH, DMD
Title	Senior Public Health Specialist
Organization	International Business & Technical Consultants, Inc. (IBTCI)
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	IDIQ TO AID-OAA-I-15-00022/AID-OAA-TO-16-00034
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Performance Evaluation of OFDA's Response to Ebola Virus Disease (EVD) Outbreak in West Africa, IDIQ TO AID-OAA-I 15-00022/Aid-OAA-TO-16-00034 with IBTCI
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Signature	Philip E Graitcer
Date	27 June 2017

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	Gayla Cook, M.Sc.
Title	Project Director
Organization	International Business & Technical Consultants, Inc. (IBTCI)
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	IDIQ TO AID-OAA-I-15-00022/AID-OAA-TO-16-00034
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Signature	Gayla Cook
Date	07/01/2017

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	Dr. Swati Sadaphal, M.D.
Title	Team Leader
Organization	International Business & Technical Consultants, Inc. (IBTCI)
Evaluation Position?	■ Team Leader ☐ Team member
Evaluation Award Number *(contract or other instrument)*	IDIQ TO AID-OAA-I-15-00022/AID-OAA-TO-16-00034
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Performance Evaluation of OFDA's Response to Ebola Virus Disease (EVD) Outbreak in West Africa, IDIQ TO AID-OAA-I 15-00022/Aid-OAA-TO-16-00034 with IBTCI
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Signature	Swati Sadaphal
Date	07/01/2017

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	Steve Hansch, MPH
Title	Senior Humanitarian Aid and Emergency Advisor
Organization	International Business & Technical Consultants, Inc. (IBTCI)
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	IDIQ TO AID-OAA-I-15-00022/AID-OAA-TO-16-00034
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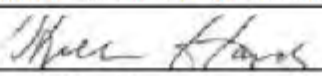
Signature	
Date	07/01/2017

ANNEX K. SUMMARY OF TEAM MEMBERS

The core evaluation team included Dr. Swati Sadaphal, Team Leader; Jennifer Leigh, Public Health Advisor (PHA); Gayla Cook, Project Director; Steven Hansch, Senior Evaluation Specialist; and Dr. Michael Toole, Senior Evaluation Specialist. Fieldwork was supported by Dr. Barry Alpha Mahmoud (Guinea Coordinator); Kokpar Wohwoh (Liberia Coordinator); Samuel Turay (Sierra Leone Coordinator); and ORB International (quantitative surveys and community-level qualitative data collection). Short-term technical consultants provided focused technical assistance per needs and requests by the core evaluation team. Data management, logistics, and administrative support was provided by program administrative staff, and technical quality assurance support was provided by the senior technical staff in the IBTCI home office.

Dr. Swati Sadaphal, MBBS, MHS - Team Leader

Dr. Swati Sadaphal is a monitoring and evaluation (M&E) and public health expert with over 17 years of experience conducting research, evaluating, and managing health interventions. Dr. Sadaphal played a major role in the proposal for the US Office of Foreign Disaster Assistance (OFDA) Ebola Response Evaluation and was instrumental in the initial design of the evaluation. She has worked in diverse settings, including clinical management of infectious diseases in primary care; specialty care and with targeted interventions; training and mentoring of health workers; epidemiological and clinical research; quality assurance; M&E; and creating and reviewing guidelines and policies for disease prevention and control. Currently, Dr. Sadaphal is a Director of M&E for IBTCI in the Global Health Practice, where she has served as Project Director for a number of projects, including the US Agency for International Development (USAID)/Kenya Evaluation Services and Program Support project, Performance Evaluation of the USAID-funded Integrated Health Project in the Democratic Republic of Congo (DRC/IHP), Impact Evaluation of the DRC/IHP pilot Results-based Financing (RBF) intervention, Mid-term evaluation of the USAID/Malawi Support for Service Delivery Integrated (SSDI) Project, and a Final Evaluation of USAID/Zambia HIV prevention Project. She has extensive expertise leading both performance and impact evaluations and conducting qualitative and quantitative data analysis. Dr. Sadaphal also has eight years of experience in analyzing complex multi-stage survey data and population-based household surveys, and extensive knowledge and experience with sampling methodologies and conducting complex statistical analysis, such as multivariate analysis, factor analysis, and cluster analysis. At IBTCI, Dr. Sadaphal served as Evaluation Specialist and Data Analyst for a quasi-experimental prospective impact evaluation study of pilot RBF and before-after performance evaluation of USAID funded DRC/IHP. In the past, she served as an M&E expert for the Elizabeth Glaser Pediatric AIDS Foundation for the PEPFAR-funded Help Expand Antiretroviral Therapy for Children and Families (Project HEART), and described the level and trends in HIV palliative and ART care in treatment facilities in South Africa, Mozambique, Zambia, Tanzania, and Côte d'Ivoire. She served as the primary author of four evaluation reports on USAID DRC health projects. Dr. Sadaphal also conducted field research on public health issues in Cambodia, India, the DRC, and much of Southern Africa. She completed her undergraduate medical education and post-graduate training in Dermatology, Venereology and Leprology from University of Delhi, India and earned her Master's in Health Science from the Johns Hopkins Bloomberg School of Public Health with a focus on epidemiology, bio-statistics, and evaluation research.

Jennifer Leigh, MPH - Public Health Advisor

Jennifer Leigh is a public health expert with over ten years of experience providing technical assistance, project management, and M&E for global health programs. Currently, Ms. Leigh is a Research Fellow at the Harvard Global Health Institute (HGHI), providing research support to the HGHI/London School of Hygiene and Tropical Medicine Independent Panel on the Global Response to Ebola. Ms. Leigh has excellent skills in qualitative and quantitative research design, data collection and analysis, and program design, management, and M&E. She has designed and implemented evaluations and baseline

assessments of public health interventions in Brazil, Nepal, Russia, and Ukraine, among others. She is a contributing author to a number of peer-reviewed publications on public health, particularly in complex humanitarian emergencies and conflict settings. Ms. Leigh has a Master's in Public Health with a focus on humanitarian assistance and health and human rights from Johns Hopkins Bloomberg School of Public Health. She is currently pursuing a Doctor of Public Health degree from the Harvard T.H. Chan School of Public Health.

Gayla Cook, MSc - Project Director

Ms. Gayla Cook is an M&E specialist who has led or overseen M&E teams and development programs throughout Africa and the Middle East for over 35 years in sectors including education and training; individual and institutional capacity development; private sector investment supporting economic development; the impacts of HIV and AIDS; youth, agriculture and the environment; democracy and governance; humanitarian assistance; and gender equity. She has served as Chief of Party for USAID's Mission-Wide M&E and learning contracts for USAID/Somalia, the USAID/OFDA humanitarian portfolio in Yemen, and USAID's Regional Center for Southern African, working with the Southern Africa Development Community (SADC). She has overseen M&E for USAID's Africa Education Initiative, covering M&E activities in 40 countries. Ms. Cook has led or participated in public health evaluations, including serving as Project Director for the performance evaluation of the Azerbaijan Strengthening Health Systems through Integrated Programs project and that of the Government of Lesotho Health Reform Project with the World Bank. Ms. Cook has performed various other evaluations and assessments in Africa on behalf of USAID, NGOs, and the private sector. She holds a Master's in Communications from Syracuse University and a B.A. in English Literature and Africana Studies from Cornell University.

Steven Hansch, MPH - Senior Humanitarian Aid and Emergencies Advisor

Mr. Steven Hansch is a humanitarian aid analyst with over 35 years of experience working in over 65 countries with implementing agencies to cull and document lessons. He has technical expertise in conducting field-based program evaluations, designing surveys, gathering evidence, and conducting interviews. Mr. Hansch is a trained epidemiologist, and has extensive experience designing, implementing, and evaluating programs regarding their effects on malaria, cholera, malnutrition, and other health-related challenges to vulnerable populations, specifically within the context of complex emergencies and in fragile states. He has worked in most countries of Eastern, Central, Western, and Southern sub-Saharan Africa, as well as in crisis zones in Latin America, Asia, the Middle East, and the Balkans. He has been published in books, peer reviewed articles, and industry grey literature reports about the statistics of health outcomes in emergencies and about the organization of humanitarian architecture within the US Government (USG) and United Nations (UN). He is familiar with the program strategies and tactics of the top 30 nonprofit organizations, having worked on emergency programming, design, evaluations, or boards with most of the main humanitarian NGOs, in addition to the UN Children's Fund (UNICEF), World Health Organization (WHO), the International Federation of Red Cross and Red Crescent Societies (IFRC), and the International Committee of the Red Cross (ICRC). In recent years, he has specialized in evaluation designs, team leading, and project management for OFDA, Food for Peace, and USAID. Mr. Hansch holds a Master's in Public Health in Epidemiology and Biostatistics from Boston University, and a B.A. in Human Biology from Stanford University.

Kokpar Wohwoh, MPH - Liberia Field Coordinator

Mr. Kokpar Wohwoh has five years of experience in global health and M&E, with experience working in Liberia, Somalia, Kenya, Sierra Leone, Senegal, Nigeria, South Africa, and the US. Most recently, he served as the Monitoring and Evaluation Specialist for eHealth Africa, providing technical support on research assessments, M&E systems, data quality and management, and disease surveillance. Prior to that, he served as the M&E Coordinator for the USAID/OFDA-funded International Ebola Response project, coordinating the design and implementation of the M&E system and supporting the district health teams in conducting effecting monitoring activities and collecting qualitative and quantitative data. He has broad experience in managing data collection, ensuring data quality control, and training partners and government officials in M&E best practices in the public health sector. He earned his Master's in Public Health from Moi University in Kenya and a B.S. degree in zoology and chemistry from the University of Liberia.

Samuel Delito Turay, MPH, MEd - Sierra Leone Field Coordinator

Mr. Samuel Turay is an experienced research coordinator, particularly for large-scale surveys, and a background in public health. He has over 15 years of experience working and collaborating with governmental institutions, agencies, and nongovernmental organizations in conducting surveys, evaluating programs, and formulating policy on health care and human services. His recent experience includes conducting numerous household and institutional surveys throughout all twelve districts of Sierra Leone to evaluate government programs implemented by different ministries and departments for the Office of the Chief of Staff of the President of Sierra Leone, preparing the survey tools for a household health financing survey carried out by the Sierra Leone Ministry of Health and Sanitation, and serving as the team leader for an evaluation of the obesity prevention program for young African and Caribbean immigrant children and their families in the Greater Philadelphia area. Mr. Turay possesses extensive knowledge of the geography and cultural practices of the people of Sierra Leone and has traveled to every district in the country. Mr. Turay holds a Master's in Public Health from the University of the Sciences in Pennsylvania and a Master's in Education from Njala University College in Sierra Leone.

Dr. Barry Mahmoud, M.D., Ph.D., MPH - Guinea Field Coordinator

Dr. Barry Mahmoud has more than 14 years of experience managing public health programs and community health interventions, particularly for USAID projects. From 2009 to 2010, he served as the Chief of Party for the USAID/Guinea Project ESPOIR. He also has experience conducting M&E of public health projects and served as the M&E Technical Leader for a USAID project in Guinea, developing an M&E system, designing monitoring tools, and overseeing data collection. He served as an independent consultant during the Ebola outbreak in Guinea, supporting projects through the Ministry of Health, UNICEF, and Plan International Guinea. Dr. Mahmoud earned his M.D. from the University of Conakry, holds a Doctor of Public Health degree from the University of Montreal, and a Master's in Public Health in epidemiology from the University of Oklahoma.

Dr. Michael Toole, MBBS - Senior Evaluation & Public Health Specialist

Dr. Mike Toole has 40 years of experience working in the health sector in low- and middle-income countries in Asia, Africa, the Middle East, and the Pacific. He is a medical epidemiologist and public health physician, with expertise in maternal and child health, including nutrition; communicable diseases control, including HIV prevention and care; primary health care program design and evaluation; sexual and reproductive health; and public health in conflict-affected and refugee populations. He has served as a team leader or member on numerous evaluations of public health interventions and provided technical expertise to develop and review national health strategies. He is currently Deputy Director (International Health Strategy) of the Burnet Institute. Between 1995 and 2012, he was the Head of the Institute's Centre for International Health, providing technical and management leadership to this 150-person unit based in Melbourne, and supervised a number of overseas offices supporting a range of community health projects in the Asia-Pacific region and Southern Africa. He earned his Bachelor of Medical Science and Surgery from Monash University and earned a Diploma of Tropical Medicine and Hygiene from the London School of Hygiene and Tropical Medicine.

Dr. Deborah Rugg, Ph.D. - Senior Evaluation Specialist

Dr. Deborah Rugg has over 33 years of experience in international public health and research, with practical knowledge of infectious disease, chronic disease, HIV/AIDS, sexual and reproductive health, and adolescent health. Her technical expertise includes behavioral intervention research, global and country M&E systems, large scale impact evaluations, and national evaluation capacity building. Dr Rugg is now a professor at Claremont Graduate University, and serves as the Founder and Executive Director of the Claremont Evaluation Center- New York (CEC-NY). CEC-NY is the New York City flagship expansion of the main Claremont Evaluation Center at Claremont Graduate University located in Claremont, CA, which offers tailored evaluation leadership trainings and coaching, organizes thought-leadership events that connect the dots between sectors, and actively participates in evaluation studies of international significance. Dr. Rugg has significant experience in providing technical assistance to UN member states, national governments, and both bilateral and multilateral donor agencies.

Since 2012, she has chaired the UN Evaluation Group, which is responsible for producing evaluation guidelines and strategies for building national evaluation capacity. As a Team Leader for the Monitoring, Operations and Evaluation Team for the Joint United Nations Programme on HIV/AIDS (UNAIDS), Dr. Rugg led a team of 55 M&E professionals by developing a strategic vision and executing the implementation of a work plan. She additionally served as the Associate Director and Team Leader for Monitoring and Evaluation for the CDC, where she designed and oversaw a global strategy to monitor and evaluate the effectiveness of the CDC's $484 million Global AIDS Program in over 25 countries. Dr. Rugg earned her Ph.D. from the University of California San Francisco's School of Medicine.

Senior Technical Advisors

Dr. Sharon Abramowitz, Ph.D., MA - Qualitative Researcher

Dr. Sharon Abramowitz is a medical anthropologist with over 10 years of experience in public health, particularly in developing countries. She specializes in humanitarian intervention and health sector transitions and has technical expertise in evaluation and qualitative and quantitative research. Dr. Abramowitz has served as a Consultant for UNICEF in Sierra Leone, where she led a qualitative research-based analysis of 48 UNICEF Ebola Community Centers. She additionally led the Emergency Ebola Anthropology Initiative for the American Anthropological Association, coordinating 300 anthropologists, social scientists, and practitioners in contributing information to actors in the West African Ebola outbreak. Dr. Abramowitz has worked in Guinea, Côte d'Ivoire, and Liberia, where she led a field-based evaluation of Save the Children Ebola Community Care Centers. Dr. Abramowitz earned her Ph.D. in Sociocultural and Medical Anthropology from Harvard University and her Master's degree in Medical Sociology from Rutgers University. She speaks French in addition to her native English.

Dr. Gilbert Burnham, M.D., Ph.D., MSc - Senior Survey Advisor

Dr. Gilbert Burnham is a public health expert and experienced evaluator with over 30 years of experience. He has significant knowledge of emergency preparedness and response, particularly in humanitarian needs assessment, program planning, and evaluation arenas that address the needs of vulnerable populations, and the development and implementation of training programs. He also has extensive experience in the development and evaluation of community-based health program planning and implementation, health information system development, management and analysis, and health system analysis. Additionally, Dr. Burnham has worked with numerous humanitarian and health development programs for multilateral and non-governmental organizations, regional health departments, ministries of health (national and district level), and communities in sub-Saharan Africa, Asia, and Eastern Europe. Dr. Burnham earned his M.D. at Loma Linda University, has a Ph.D. in medicine from the University of London, and an Master's in Science from the London School of Hygiene and Tropical Medicine.

Philip Graitcer, MPH - Senior Public Health Specialist

Philip Graitcer served as a medical epidemiologist for the Centers for Disease Control and Prevention (CDC) for 22 years, serving assignments in sub-Saharan Africa focused on immunization. He created, developed, and directed CDC's computer-based national epidemiology surveillance/disease reporting system for the collection, reporting, and analysis of state morbidity data. During the Ebola outbreak from 2015 to 2016, he served as the laboratory director for the CDC Ebola Response Team in Guinea and was responsible for the introduction of a simple laboratory test for the Ebola virus. He currently serves as an Adjunct Professor at the Rollins School of Public Health with a special focus on injury epidemiology. He also serves as a freelance radio reporter on news, culture, and health, developing reports for National Public Radio, Voice of America, and BBC's The World, among others. Mr. Graitcer has an Master's in Public Health from Harvard University's School of Public Health and speaks fluent English and French.

William Lyerly, MPH - Senior Humanitarian Aid and Emergencies Advisor

Mr. William Lyerly is an expert on disasters and emergency management and humanitarian response with over 30 years of experience working in Africa, Central Europe, Central Asia, and the Middle East. He is a medical doctor and epidemiologist with significant expertise working with public health emergencies and global health security. He currently serves as Director of International Affairs, as Director of Strategic Foresight and Global Partnerships, and also as Lead Executive for Risk Management in the US Department of Homeland Security Office of Health Affairs. From 1999 until late 2001, Mr. Lyerly served as Senior Advisor for Crisis Mitigation, Transition and Recovery at USAID for all crisis/emergency management issues. Mr. Lyerly worked for USAID for more than 12 years,

coordinating USAID's responses to crises in Africa, including epidemics such as HIV/AIDS and malaria. During several crises, Mr. Lyerly worked for the OFDA serving as a Disaster Assistance Response Team (DART) Advisor; he also helped to develop crisis-mitigation strategies in more than 25 African countries and post-conflict transition strategies in Rwanda, Angola, Liberia, and the Democratic Republic of Congo. Mr. Lyerly graduated from the US Air Force Academy with a B.S. and earned his Master's in Public Health from Johns Hopkins University.

Dr. Phillip Nieburg, M.D., MPH - Senior Policy Advisor

Dr. Phillip Nieburg is a public health professional with over 30 years of experience in supporting national and global health programs, specifically regarding disease surveillance systems, outbreak investigations, epidemiologic research, and program design and evaluation. He has expertise in HIV/AIDS, tuberculosis, vaccine-preventable diseases, nutrition, and the teaching of field epidemiology. Dr. Nieburg has worked extensively in Africa, Asia, Latin America, and the Middle East. He has held various positions for the CDC, including Team Leader for an HIV/AIDS assessment in China and Field Epidemiology Resident Advisor in Mexico City. Dr. Nieburg has consulted on various USAID programs and evaluations, such as the evaluation of USAID/Ethiopia's Emergency Feeding Program. Dr. Nieburg earned his Master's in Public Health from Johns Hopkins Bloomberg School of Public Health, in addition to his M.D. from Case Western Reserve University. He speaks both English and Spanish.

Dr. Richard Stuart Olson, Ph.D., MA - OFDA Historical Expert

Dr. Richard Stuart Olson is an experienced researcher and Project Director with over 30 years of experience in managing health and foreign disaster programs. He has served as the Project or Co-Director on various OFDA-funded projects, such as the Disaster Risk Reduction project as well as the Assessment of Risk Management in Latin American and Caribbean Higher Education. Dr. Olson has led several studies as the Principal Investigator for The Mexico City 1985 Disaster and Emergent Organizations: A 10-Case Study, as well as several other National Science Foundation-funded studies. Dr. Olson has his Ph.D. in Political Science from the University of Oregon, in addition to an M.A. from the University of California Los Angeles.

Natalie Pedersen, MPH - Public Health Specialist

Ms. Natalie Pedersen is an experienced public health specialist with over nine years of experience in humanitarian response and development. She has significant experience leading multi-disciplinary teams of clinicians and public health specialists in health service delivery, program design, implementation, M&E, and high-level representation, particularly in maternal health and community-based health care in fragile states. She has significant knowledge of both implementing and evaluating public health programs in Sierra Leone, where she served as the Senior Health Coordinator for IRC/Sierra Leone and served as an evaluation team member for a mixed-methods evaluation of an Early Childhood Development and Health Promotion program. Ms. Pedersen has a Master's in Public Health from the London School of Hygiene and Tropical Medicine.

Dr. Naomi Rutenberg, Ph.D., MA - Senior Analyst / Writer

Dr. Naomi Rutenberg is an experienced and strategic leader of complex global health and development programs. She is an expert in sexual and reproductive health, including HIV and adolescent programming. Her skills and experience include research, evaluation, and strategy development. She served as the Vice President and Director of the HIV and AIDS Program at the Population Council, where she led a portfolio of 60+ behavioral and biomedical research studies and capacity building projects in 14 countries, developed organization-wide strategy documents, and significantly grew and diversified the Population Council's staff and portfolio. Previously, she worked as a senior researcher and survey expert, where she conducted M&E activities for reproductive health programs and provided technical assistance and training in survey design and implementation. She has published more than 40 peer-reviewed articles. Dr. Rutenberg earned her Ph.D. and Master's in Sociology and Demography from Princeton University.

Dr. Ronald Waldman, M.D., MPH - Senior Policy Advisor

Dr. Ron Waldman is a seasoned policy advisor with over 30 years' experience in public health. He began his career at the WHO working on the Global Smallpox Eradication Program in Banglesh. He has since worked with several international actors including USAID and CDC, where he worked for 20 years, and WHO, investigating disease outbreaks all over the world. More recently, in 2010 he served as the USG's Health Sector Coordinator during the Haiti earthquake relief effort. He later served as the Senior Health Advisor to the UN Humanitarian Coordinator during the Pakistan flood response. Dr. Waldman earned his M.D. from the University of Geneva and also holds a Master's in Public Health from Johns Hopkins University.

ANNEX L. DEMOGRAPHIC PROFILES

1. HOUSEHOLD SURVEY RESPONDENTS' DEMOGRAPHIC PROFILE, BY COUNTRY (SOURCE: HH SURVEY)

Demographic Profile	Sierra Leone	Guinea	Liberia
	5,855 (100%)	4,134 (100%)	6,376 (100%)
Mean age of respondent (SD) M/F = M4, Q9	F= mean- 36.17/sd (13.8), n= 2,510 M= mean- 40.95/ sd (16.0), n= 3,345	F= mean - 35.5/sd (14.4), n=1,009 M= mean- 42.5/ sd (16.2), n=3,135	F= mean - 32.6/sd (11.6), n=3,140 M= mean – 35.6/ sd (12.9), n=3,236
Gender distribution, M3, Q7	F= 2,510 (42.87) M= 3,345 (58.94)	F= 1,009 (24.41) M=3,125 (75.59)	F= 3,140 (49.25) M=3,236 (50.75)
Place of residence (urban/ rural) M3, Q6	U= 2,404 (41.06) R= 3,451 (58.91)	U= 1,536 (37.16) R= 2,598 (62.84)	U= 3,061 (48.01) R= 3,315 (51.99)
Household size distribution M4, Q13	mean (9.4), sd (6.3), N (5,855), min (1) max (80)	mean (10.7), sd (8.7), N (4,134), min (1) max (100)	mean (8.4), sd (5.1), N (6,376), min (1) max (73)
Level of Education distribution M4, Q10 (for P1=LB, P2=GU & P3=SL)	No Formal Edu = 2,192 (37.44) Some primary = 390 (6.66) Completed primary = 401 (6.85) Jr. Secondary = 587 (10.03) Secondary = 471 (8.04) Sr. Secondary = 1,204 (20.56) Vocational/Tech = 125 (2.13) Tertiary/University = 429 (7.33) Professional/Advance = 30 (0.51) Declined =26 (0.44) N= 5,855 (100.00)	No Formal Edu= 1,508 (36.48) Some primary= 292 (7.05) Completed primary= 287 (6.94) Jr. Secondary= 620 (15.00) Secondary= 425 (10.30) Sr. Secondary= 176 (4.27) Vocational/Tech= 274 (6.64) Tertiary/University= 476 (11.54) Declined= 76 (1.84) N= 4,134 (100.00)	No Formal Edu= 1,165 (18.27) Some primary= 654 (10.26) Completed primary= 393 (6.16) Jr. Secondary= 1,354 (21.24) Secondary= 2,052 (32.18) Sr. Secondary= 292 (4.58) Vocational/Tech= 381(5.98) Tertiary/University= 84 (1.32) Declined= 1 (0.02) N= 6,376 (100.00)
% HH surveyed had at least one suspected or confirmed Ebola case M8, Q48=yes or Q49=yes	Suspected Case= 353 (6.03) Confirmed Case= 254(4.34) N = 5,855 (100.00)	Suspected Case= 165 (4.00) Confirmed Case= 88 (2.13) N = 4,134 (100.00)	Suspected Case= 454 (6,365) Confirmed Case= 259 6,364) N = 6,376 (100.00)

2. CHW SURVEY RESPONDENTS' DEMOGRAPHIC PROFILE, BY COUNTRY (SOURCE: CHW SURVEY)

Demographic Profile	Sierra Leone N (81, 28.13%)	Guinea N (85, 29.51%)	Liberia N (122, 42.36%)
Mean age of respondent (sd) M3, Q1	35.72 (10.38)	36.73 (10.43)	36.73 (9.27)
Gender distribution Female Male M3, Q2	F: 23 (28.40) M: 58 (71.60)	F: 23 (27.06) M: 62 (72.94)	F: 29 (23.77) M: 93 (76.23)
Place of residence Urban Rural M1, P5	U: 45.49% R: 54.51%	U: 96.47% R: 3.53%	U: 10.66% R: 89.34 %
Level of Education M3, Q3 (for P1=LB, P2=GU & P3=SL)	No Formal Edu. : 6.17% Some Primary: 7.41% Completed Pri.: 0.00% Junior High: 13.58% Sec or Sr. Sec: 20.99% Vocational/Tech.: 29.63 % Tertiary/Uni.: 2.47% Prof./Adv. degree: 19.75%	No Formal Edu. : 3.53% Some Primary: 1.18 % Completed Pri.: 2.35% Junior High: 10.59% Sec or Sr. Sec: 23.53% Vocational/Tech.: 3.53% Tertiary/Uni.: 11.76% Prof./Adv. degree: 43.53%	No Formal Edu. : 0% Some Primary: 0.82% Completed Pri.: 7.38% Junior High: 7.38 % Sec or Sr. Sec: 34.43% Vocational/Tech.: 27.05% Tertiary/Uni.: 18.85% Prof./Adv. degree: 4.10%
% CHW worked previously as CHW M3, Q4	91.36%	81.18%	78.69%

3. CONTACT TRACER SURVEY RESPONDENTS' DEMOGRAPHIC PROFILE, BY COUNTRY (SOURCE: CT SURVEY)

Demographic Profile	Sierra Leone (n=61)	Guinea (n=65)	Liberia(n=124)
	N (%)	N (%)	N (%)
Mean age of respondent (range) M3, Q1	37.11 (20-68)	37.78 (20-65)	33.52 (19-58)
Gender distribution M3, Q2			
Female	15 (24.59%)	10 (15.38%)	41 (33.06%)
Male	46 (75.41%)	55 (84.62%)	83 (66.94%)
Place of residence M1, P5			
Urban	28 (45.90%)	50 (76.92%)	48 (38.71%)
Rural	33 (54.10%)	15 (23.08%)	76 (61.29%)
Level of Education M3_1_O1	Female/Male/Total	Female/Male/Total	Female/Male/Total
No formal education	20.0/ 0.0/ 4.92	10.0/5.45/6.15	0.0/ 0.0/ 0.0
Some primary	6.67 4.35/ 4.92	0.00/3.64/3.08	0.0/ 0.0/ 0.0
Completed Primary	6.67/ 0.0/ 1.64	0.0/0.0/0.0	2.44/ 3.61/ 3.23
Junior/Middle/Lower	6.67/ 15.22/ 13.11	10.00/9.09/9.23	12.20/ 16.87/ 15.32
Secondary	26.67/ 10.87/ 14.75	20.00/9.09/10.77	36.59/ 31.33/ 33.06
Vocational/Technical	20.0/ 45.65/ 39.34	10.00/10.91/10.77	31.71/ 20.48/ 24.19
Tertiary	0.0/ 0.0/ 0.0	10.00/1.82/3.08	17.07/ 26.51/ 23.39
Professional/Advanced Degree	13.33/ 23.91 / 21.31	40.00/60.00/56.92	0.0/ 1.20/ 0.81
% reporting work as a health worker or for an organization doing health related work prior to the EVD epidemic M3, Q4	78.69	76.92	56.45
Female	86.67	60.0	63.41
Male	76.09	80.0	53.01
	(0.3933)	(0.1725)	(0.2754)
Urban	82.14	84.00	45.83
Rural	75.76	53.33	63.16
	(0.5517)	(0.0130)	(0.0588)
% reporting work in community work, raising awareness, or peer education prior to the EVD epidemic M3, Q5	91.80	76.92	79.84
Female	100.00	70.0	73.17
Male	89.13	78.18	83.13
	(0.1886)	(0.5792)	(0.1964)
Urban	92.86	84.0	75.00
Rural	90.91	53.33	82.89
	(0.7866)	(0.0130)	(0.2896)

ANNEX M. LITERATURE REVIEW

The literature review findings presented below describe the epidemiology of the EVD outbreak in Guinea, Sierra Leone, and Liberia and key background events in the outbreak response in each country from December, 2013 to January, 2016. The review provided insight into the individual country contexts, to allow a more thorough understanding and interpretation of evaluation data related to the effectiveness of the overall response.

The West African EVD outbreak was the largest Ebola outbreak in history, for the first time occurring predominantly in an urban setting. Liberia has the largest urban population (50%) of the three countries and the highest literacy rate (48%) for the total population. Guinea is the most populous of the three countries and has the largest rural population, at 62.8%. Sierra Leone also has a large rural population, at 60% of total population (World Bank Development Indicators, 2016). According to WHO reports, EVD infected an estimated 28,616 people (including confirmed, probable, and suspected cases) and caused an estimated 11,310 deaths across Guinea, Sierra Leone, and Liberia—the three worst-affected countries (WHO, 2016a).[1] Of the three countries, the EVD case fatality rate (CFR) was the highest in Guinea, at 66.7% (EVD deaths:total cases, 2,544:3,814). The CFR in Sierra Leone was lowest at 28% (EVD deaths: total cases,3,956:14,124). Liberia's CFR was 45% (Ebola deaths:total cases, 4,810:10,678). The evaluation team observed that it was invalid to compare the CFRs in the three affected countries, because the denominators (number of EVD cases) were differently defined; both Liberia and Sierra Leone included large numbers of suspected cases, whereas Guinea did not. If only confirmed and probable cases are included in the calculation, the CFR in Sierra Leone was 42% rather than the 28% that has been widely reported. It is not possible to do this analysis for Liberia, as data on the number of deaths in probable and suspected cases are not available.

Guinea

EVD in West Africa was first reported during early March, 2014 in Guinea's three southeastern prefectures (Gueckedou, Macenta, and Kissidougou), which border Liberia and Sierra Leone. However, retrospective investigations indicate EVD transmission might have occurred in Guinea almost three months earlier. On December 2, 2013, a 2-year-old boy in the remote Guinean village of Meliandou fell ill with a mysterious illness characterized by fever, black stools, and vomiting. He died two days later. Retrospective case-finding by the WHO would later identify that child as West Africa's first case of EVD (WHO, 2015a).[2] Meliandou is in Guéckédou prefecture in the Forest Region of Guinea, where the borders of Liberia, Sierra Leone, and Guinea intersect. The retrospective analysis conducted by WHO found that there were likely 14 undiagnosed cases of EVD who all died in January or February, 2014, one of whom died in Sierra Leone. One of these patients was admitted to Gueckedou Hospital, followed by another nine similar cases that led to blood samples being sent to the *Institut Pasteur* in Paris, which confirmed the diagnosis of EVD.

WHO published the official notification of EVD on its website on March 23, 2014. By that time, WHO had already shipped supplies of personal protective equipment (PPE) to Conakry. EVD rapidly spread through much of Guinea, where it was eventually reported in 32 of 34 prefectures. The first medical teams under the WHO Global Outbreak Alert and Response Network (GOARN) umbrella were on the ground by March 25. On March 27, cases were confirmed in Conakry—and thus began the world's first urban EVD epidemic. Dr. Sakoba Keita from the Guinean Ministry of Health (MOH) was appointed Ebola Coordinator in April, 2014.

Social resistance to the EVD response was widespread in Guinea. In the Forest Region, where it was most violent, anthropologists have described how efforts to isolate those infected and conduct safe burials were insensitive to traditional beliefs about the importance of observing proper funeral practices (touching and washing the body) for intergenerational family well-being and continuity. Communication messages from MOH that linked the EVD infection with certain death were not helpful, and made people fearful of seeking treatment. There was also a political dimension, wherein local ethnicities in the Forest Region and the Manding savannah empire conflicted with Conakry-centered political networks, which have extensions in the north and west of the country. In some prefectures, especially Forecariah, there was considerable support for the previous President, and resentment and suspicion of the current government. For local populations, epidemic containment activities in health facilities and health messaging campaigns in local communities were closely aligned with previous experiences of political and social repression (A. Wilkinson, 2017).

The Guinean government and the international community were slow to recognize the source of these issues, and failed to take timely efforts to engage in preemptive social mobilization. As a result, social resistance resulted in violent attacks on responders. *Médecins sans Frontières* (MSF) opened the first Ebola Treatment Center (ETC) in Macenta on March 24, 2014, within days of EVD's being formally identified.[3] Only a week later, on April 4, urban youth attacked it and threatened the 50 or more newly arrived expatriates, arguing that the threat of EVD was "false" or that it was being spread by outsiders (J. Fairhead, 2016). Twenty-two people were wounded in a riot in Nzerekore city, triggered when public health officials sprayed disinfectant in the market. In June and July, 2014, twenty-six villages in Guéckedou prefecture isolated themselves from the EVD response, cutting bridges and felling trees to prevent vehicle access and stoning intruding vehicles (J. Fairhead, 2016). On August 13, President Alpha Condé declared a National Public Health Emergency, and on September 4, appointed Dr. Sakoba Keita as head of the newly established National Coordination Cell (CNLE). On September 16, eight members of a high-level educational delegation of doctors, politicians, and journalists were murdered in the administrative "sous-prefecture" headquarters of Womey. Nationwide, an average of ten attacks per month were reported against Red Cross volunteers in Guinea in the last six months of 2014, ranging from verbal to physical assaults (J. Fairhead, 2016). Overall, this hostile reaction to control measures discouraged people from seeking health care and contributed to the epidemic gaining a grip in the region.

In Guinea, the number of new confirmed cases never went beyond 200 per week, less than half the peak figures in Liberia and Sierra Leone, yet case numbers remained steady over a long period, both persistent and dispersed. According to published literature (and also reported by the respondents of KIIs and FGDs conducted during this evaluation), the initial response was marked by weak coordination, inadequate community surveillance, ineffective contact tracing, inappropriate and mostly ineffective communication messages, and extensive community resistance to the EVD response (O. Cenciarelli, 2015).[4] Moreover, financial support from major donors was slow to arrive (beginning around September, 2014). Another reason for the slow response was the epidemiology of reported early transmission. During April and May, 2014, there were periods of up to 21 days when no new EVD cases were reported, leading to a relaxation in control efforts. In part because earlier EVD outbreaks had been relatively easy to quickly contain, the international community presumed that these outbreaks would follow the same pattern (WHO tweeted, "Ebola has always remained a very localized event.") (Sack et al, 2014).[5] However, this presumption did not account for the intensity of migration and mobility across regional borders with Liberia and Sierra Leone, and between rural areas in Guinea's Forest Region and its capital city, Conakry.

In terms of USG engagement, the first response was a five-person CDC team which arrived in Guinea in late March, 2014 to support MOH and WHO in controlling the outbreak. For most of the period between March 25 and mid-July, CDC maintained a staff presence in Guinea, ranging from two to ten persons. In parallel, CDC sent staff to Liberia and Sierra Leone as cases were reported as early as late March. Following a further increase in EVD cases in Guinea, Sierra Leone, Liberia, and its spread to Nigeria, the CDC Emergency Operations Center (EOC) in Atlanta was activated on July 9 and CDC deployments surged in all EVD-affected countries during August and September, 2014. In mid-August 2014, Guinea declared a National Public Health Emergency and the United States Chargé d'Affaires Ervin Massinga issued a USG disaster declaration focused on Guinea's EVD outbreak. The first DART deployment to Guinea occurred in late August. OFDA-supported IPs began their operations in October, 2014. Guinea was first declared EVD-free on December 26, 2015; it had two subsequent flare ups between March and April, 2016 and was declared EVD-free again on June 1, 2016.

Sierra Leone

Sierra Leone's first EVD case was confirmed on May 25, 2014 in the Kailahun district of the Eastern Province. The epidemiological investigation identified a link between this index case and the burial of a traditional healer, who had treated EVD patients from Guinea. Further investigations by epidemiologists identified 13 additional cases, all females who had attended a burial in Guinea (S. Gire, 2014).[6] EVD spread rapidly from Eastern districts to Freetown, the nation's capital, where the first case was identified on July 11, 2014. By this time, over 300 confirmed cases with 99 deaths had been reported throughout the country. The Ministry of Health and Sanitation (MOHS) established an EOC, co-led with the WHO.[7] Sierra Leone's health system was already weak and the government was unable to mount a robust response.

Sierra Leone's government declared a State of Emergency on July 30, 2014 and announced the establishment of a Presidential Task Force on Ebola, to which the EOC would report.[8] On August 13, United States Chargé d'Affaires Kathleen FitzGibbon declared a disaster due to the effects of Sierra Leone's EVD outbreak. The CDC team arrived in Sierra Leone in early August, 2014 and began supporting the EOC. In early September, the UK, through a joint civilian/military operation, took a leading role in coordination and operations among Sierra Leone's international partners.

Similar to the situation in Guinea, there were episodes of violence and outright community resistance to the outbreak control measures. In July, 2014, there was a large riot in Kenema, when crowds threatened to burn the hospital where an EVD treatment center was located. There was also a political dimension to resistance, with traditional mistrust between the ethnicities in the Eastern Province and the Western-ruling government. A common belief was that the outbreak was allowed to get out of control by the government, in order to depopulate opposition areas. In addition to riots, early communication messages were ineffective. Families refused to allow their loved ones to be taken to EVD wards. To overcome resistance and mistrust, extraordinary authoritarian interventions such as forced quarantines were enacted under the State of Emergency regulations (A. Wilkinson, 2017).[9]

The number of confirmed cases continued to increase, peaking in early November, 2014, after a three-day nationwide quarantine on September 19–21, 2014 and a one-week quarantine in October, 2014. The Sierra Leone government heavily used national and regional state-enforced quarantine measures, compared with Liberia and Guinea. During the quarantine campaign, community workers and volunteers went door-to-door looking for active EVD cases and bringing suspected cases to treatment facilities (L. Fang, 2016).[10] New bylaws for EVD prevention and treatment were created to fight the outbreak, and criminalized a range of acts and omissions, many of which carried a penalty of imprisonment. By October, 2014, the EOC was transformed into a separate structure, the National Ebola Response Center (NERC). The Minister of Defense and former military officer Alfred Palo Conteh was appointed Chief Executive of the NERC on special assignment, and its governing body was overseen by President Ernest Koroma. District Ebola Response Centers (DERCs), with district EVD situation rooms and EVD response components, each with a district coordinator, were established at the district level.

By late November, the number of cases reported was around 500 cases per week. By this time, EVD cases were reported in all 14 districts and 114 of 150 chiefdoms in Sierra Leone. Case numbers started to decline in late December, 2014, but flared up again in Porto Loko and Kambia districts in April and May, 2015. Operation Northern Push was initiated in mid-June, 2015 with 21-day in-country travel restrictions on the movement of citizens and quarantines. A major part of Operation Northern Push was the implementation of strong efforts to find, isolate, and track people who did not report their suspected illness to a health center or worker and an increase in community surveillance, enhanced by stricter enforcement of the safe burial procedures and bylaws in Kambia and Porto Loko districts (MOHS, 2015).[11]

OFDA-supported IPs began their operations in October, 2014. In coordination with international and national response partners, services, and resources were targeted for districts in need, and afterward only a few cases were confirmed each day. On November 7, 2015, WHO declared transmission had been stopped in Sierra Leone. In January, 2016, the NERC and DERCs were decommissioned, and their responsibilities transferred to other governmental departments.

Liberia

The EVD outbreak first spread to Liberia from neighboring Guinea in March, 2014 and Liberia experienced very high transmission rates, peaking at over 300 new cases per week during August and September, 2014 (WHO situation reports, August and September 2014). Rates of transmission began to slow in mid-September and by early December, 2014, Liberia's EVD case numbers were below those of Sierra Leone. However, at that point, Liberia still had West Africa's highest number of EVD deaths. By November, 2014, all counties were reporting a drop in transmission rates, with Montserrado, which includes the capital Monrovia, accounting for the majority of new cases in the country.

On August 4, 2014, the US ambassador to Liberia declared a disaster, on August 6, the President of Liberia declared a state of emergency, and on August 8, the WHO called Ebola in West Africa a public health emergency of international concern. These emergency declarations signaled the gravity of the situation, as did the subsequent closure of land borders with neighboring Sierra Leone and Guinea. Entry and exit screening at airports had already started in late July, 2014, and domestic movement of ill persons was restricted.[12] OFDA-supported IPs began their operations in Liberia in mid-August, 2014.

Liberian communities (similar to those in Sierra Leone and Guinea) were unfamiliar with EVD, and many had never heard of it before the 2014 outbreak. Drivers of high-risk behavior related to the virus included lack of information and low levels of trust in the initial warning messages, contributing to resistance to behavior change. In Monrovia, swampy topography and heavy rains in early August, 2014 led to the surfacing of recently buried bodies, causing public outrage (Nyenswah, 2016).[13] The President of Liberia decreed mandatory cremation, a practice that was accepted reluctantly, incompletely, and disproportionately affecting poor populations. The decree was lifted in late December, 2014, when a public cemetery for people who had died of EVD was opened outside the capital.

In Liberia, Phase 1 of the response (August to December, 2014) focused on rapid scale-up of treatment beds, safe and dignified

burial teams, and building capacity to deliver BCC messages. Phase 2 (January to July, 2015) was directed at enhanced the capacity for case finding, contact tracing, and community engagement. The key objectives of Phase 3, beginning August, 2015, were first, to accurately define and rapidly interrupt all remaining chains of EVD transmission and second, to identify, manage, and respond to the consequences of residual EVD risks. This involved full community engagement in implementation.

On May 9, 2015, WHO declared Liberia free of EVD. However, on June 29, 2015, a postmortem diagnosis of EVD was made for a 17-year-old boy, and five other cases were subsequently confirmed among his contacts. No further spread was noted. Liberia was again declared EVD-free on September 3, 2015. Then, a 15-year-old-boy in Montserrado county tested positive for EVD on November 22, 2015 and died the next day. Two other family members subsequently tested positive and survived. Rapid response and containment were achieved, using the containment strategies and procedures put in place by national and international response efforts. Liberia was again declared EVD-free on January 14, 2016.

Ebola Emergency Action Plan

In late July 2014, in response to the severity of the EVD outbreak, WHO along with the leaders of Guinea, Sierra Leone, and Liberia, activated a $100 million dollar Ebola Emergency Action Plan to contain the already rapid spread of the virus and to assure continuation of critical outreach and clinical services to underserved and directly affected communities.[14] The action plan included school closures, furloughs for non-essential government staff, and additional support to expanding disinfection and sanitization efforts across all public institutions through health worker training and access to medical and hygiene supplies.

However, in all three countries, the effectiveness of action planning initiatives was tempered by slow mobilization of resources, limited reach into rural communities, failure to mobilize existing local leadership structures, and persistent lack of access to information and education among the general public—often leading to increased risk in impoverished and isolated communities, where traditional healing practices and poorly run health facilities amplified the potential of exposure to the virus.

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3. http://www.msf.org/en/article/ebola-crisis-update-30th-october-2014

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ANNEX N. GENDER ANALYSIS OF QUALITATIVE DATA

1 Five Strategy Areas

EFFECTIVE NATIONALLY-LED INCIDENT MANAGEMENT AND COORDINATION

1. Border control
2. Warehouse-level logistics (not handing out)

ADEQUATE ISOLATION AND TREATMENT CAPACITY

1. Quarantine/isolation and treatment
2. ETUs and staffing
3. Contact Tracing/Surveillance
4. Case management

ASSIST PUBLIC HEALTH RESPONSE THROUGH SAFE HUMAN REMAINS MANAGEMENT

1. Safe Burials

RESTORE FUNCTIONALITY TO THE HEALTH CARE SYSTEM

1. Logistics to local Health Centers
2. IPC – Facility-based
3. Training Facility Staff

SOCIAL MOBILIZATION

1. Behavior change
2. Media initiatives
3. Training CHWs

2 Key Findings

This gender analysis focuses on points of difference between genders in qualitative data collected during the IBTCI study. It is not a sociocultural analysis of all aspects of the response, nor does it address issues where there is consistent agreement between genders.

STRATEGY AREA 1: FUNDING & COORDINATION

1. It does not seem as though variation by gender was factored into funding decisions.
2. Social mobilization activities included women's groups and women's leaders, but seemed to have a lack an awareness of how the response operated along gender/age/vulnerability axes.
3. Women's groups reported a lack of responsiveness to locally-driven suggestions for improving programs.
4. Ministries of gender in Liberia and Sierra Leone were integrated into the response through targeted programs [e.g., cash distributions] associated with national social safety net programs.
5. Locally trusted women's groups and networks flagged by NGOs should be prioritized in social mobilization outreach strategies.

STRATEGY AREA 2 AND 4: ADEQUATE IPC/RESTORING HEALTH SYSTEMS FUNCTIONING

1. Pregnant women, lactating mothers, and women in labor were denied health care due to Ebola. They also avoided care due to fears about EVD risk.
2. In contexts in which health care systems are collapsing or individuals are being denied care, family members, close relations, and traditional midwives should be prioritized among the first intervention targets for home-based hygiene kits, home protection kits, and trainings. This is because they are among the most likely to provide care to a possibly infected pregnant woman when health care providers refuse access to health care or clinics or hospitals are closed. This kind of care will be provided even when PPE and access to other materials is delayed.

STRATEGY AREA 3: THERE WERE NO OBSERVED DIFFERENCES BY GENDER IN REPORTS ABOUT SAFE BURIALS.

1. In unsafe burials, men and women were likely to have played different, but equally high-risk roles. For traditional burials, men were transporters of corpses or officiants of ceremonies; women were the preparers of bodies.
2. For conventional burials, both women and men were involved in private mortuary practice businesses.

STRATEGY AREA 5

1. Communications
   a. Women in rural communities reported having been educated about EVD prevention during distributions or in interactions with social mobilizers more often than men. Many reported having access to radio early on, but not believing the radio messages.
      i. e.g., Guinea: Women would have had less access to first modes of information delivery in this scenario: *"Here was an information change, at first the information was transmitted through radios, next the youth were trained to sensitize people door to door. They taught people how to wash hands village to village. Because some villages were not reached by medias."*[1]
   b. Men reported learning through word of mouth, informal social networks, or via radio about outbreaks elsewhere (in Gbarpolu or Lofa county), and admonitions on the radio to avoid eating bushmeat and to avoid people with a range of symptoms. Men were more likely to report having seen earlier outbreaks in the Democratic Republic of Congo on television.
   c. There may be a gender difference in which methods of communication were most likely to have been experienced as persuasive or effective, especially in rural areas.
   d. In rural areas, women were more likely to report that direct social mobilization activities were important in changing their attitudes and practices about EVD, while men may have been more likely to report other sources of information.

1. Guinea_Transcript_FGD_Type 3_Kindia_ District of Kindia

3 Strategy Area 1. Gender in the context of coordination

WOMEN AND LEADERSHIP/COMMUNITY

Failure to acclimate to local conditions

National coordination officials in Liberia commented, *"He cited that the technical or training/ provided was sufficient, appropriate and timely. However, he said the funding agencies were unwilling to take advice from the local partners or counterparts, and they failed miserable to acclimate to the local context."*[2]

In Liberia, A KII with Mercy Corps suggested that efforts to ramp up mobilization benefitted from women's groups' advice to use known, existing, trusted groups. *"Some women's groups, women's secret societies, agriculture group – said use the groups you already have and are known and trusted. Some groups [were] in same area, but afforded different entry points."* It is worth reflecting upon the fact that the reason that many (not all, but many) of those known and trusted groups were present at all is due in part to intensive OFDA investments in gender equity, civil society, women's economic and educational advancement, and gender violence from the post-war period through the present. A trusted, gendered infrastructure might not have otherwise been available for rapid mobilization in order to address issues of community trust.

LACK OF RESPONSIVENESS OF LOCAL IMPLEMENTATION PARTNERS

One woman leader in Grand Bassa reported that local partners were held closely accountable, that priorities were aligned with national priorities, and that their activities were successful. However,

> *The leader BAWODA said her experience working with funding agencies was that the aid agencies were not willing to accept suggestions from the local counterparts or adjust the planned activities.*[3] *AND The Head of the women said we will strongly advise that the international organizations supported by the USG/ OFDA/USAID should be a bit flexible to accept our suggestions wherever necessary since we are the end-users.*

GENDER AND DATA COLLECTION

Food insecurity: Women consistently reported issues with food insecurity due to collapse of food markets, collapse of meat/ hunting trade, and lack of access to farms. But according to OFDA staff, *"Re FFP: certain degree of skepticism if food insecurity was as widespread as reported but certainly there were affected areas and WFP repurposed some food."*[4] Eventually, food distributions

2. KII _7 Liberia MOH Montserrado County
3. FGD_ Liberia Woman leader IP Grand Bassa County02
4. KII_USAID-Liberia_Farroe_24May_GC

were used as a way to stabilize communities to prevent food crises.

Epidemiology: Data about the gender of patients was not systematically collected until November and December, 2014, making it difficult to identify differences by gender in rates of transmission, networks/contacts, and utilization of ETU/hospital services.

GENDER AND FUNDING (e.g., UN WOMEN, DOS OFFICE OF GLOBAL WOMEN'S ISSUES)

Liberia and Sierra Leone's Ministries of Gender were involved in the response.

- Sierra Leone's Ministry of Children and Gender Affairs contributed psychosocial support to IMC-supported community/health facility.
- Liberia's Ministry of Gender took a role in addressing community-level conflicts
- With partners like WFP,[5] Liberia's Ministry of Gender[6] supported distributions of IPC, blankets, mattresses during quarantines,[7] food, financial support,[8] and ran trainings.[9]
- Liberia Ministry of Gender activities were coordinated through the task force.
- In Liberia, financial aid was coordinated through a cash transfer program in the Liberia Ministry of Gender as part of the social safety net program.[10] A similar program existed in Sierra Leone: Rapid Ebola Social Safety Net (RESSN).
- Liberia's Ministry of Gender engaged in gender-based violence activities to support psychosocial interventions for EVD.[11]

5. Liberia_Transcript_KII_CivicSocietyRep_RobertSports_#1
6. Liberia_Transcript_KII_CivicSocietyRep_RobertSports_#1
7. Liberia_Note_KII_CivicSocietyRep_Robertsports_#1
8. Liberia_Note_KII_CivicSocietyRep_Robertsports_#1; Liberia_Transcript_FGD_FemaleGroup_Voinjaman_#4
9. Liberia_Note_KII_VillageChief_Kakata_#2
10. KII_Liberia_Mercy Corps_Andrews_GCook
11. Liberia_Note_KII_VillageChief_Kakata_#2

4 Strategy Area 2 & 4. Gender and access to health care

PREGNANCY, DELIVERY, AND BIRTH

Qualitative evidence confirms that demonstrates that there was widespread lack of access to prenatal, labor and delivery, and antenatal care during the EVD epidemic in Sierra Leone, Guinea, and Liberia.

While pregnant women were admitted to ETUs, there was a lack of continuity of care and referral between hospitals, clinics, and ETUs for pregnant women.[12]

> *My brother's wife was in pain, taken to the ELWA Hospital and was rejected, at that time, Good Will Clinic was now closed and we were forced to take the pregnant home there she delivered.*[13]

Reports from Liberia indicate that pregnant women with EVD were at times not taken to ETUs.

> *One discussant said a lady came down with the fever in their community; four persons interacted with her including her three children got sick and died. The lady was taken to the ELWA ETU but and died later. According to the discussant, the three children were not taken to the ETU. He said one was pregnant and later died, while the kids died at home. According to him, calling the ambulance was very difficult for them due to the communication gap and distance to their community.*[14]

Patients and health care workers were both afraid of contracting the virus from each other, leading to a collapse of prenatal and antenatal care. In some situations, the denial of care was precipitated by the death of health care workers on staff or by HCW's fears of infection.

> *Five participants said that from the onset, delivery, child care and other manor sicknesses were treated, but when the hospital doctor died, the hospital was not receiving any pregnant women and other treatment went down very slowly. However, other nearby clinics were not closed to the public.*[15]

Access to care in local clinics varied widely. In Liberia, clinics were closed to prevent the spread of infection. It remains unclear if clinics that stayed open provided services to pregnant women. Some private facilities refused care.

> *A lactating mother in the FGD said that maternal and child health service was greatly affected. She said I was refused by a health worker to enter his private facility because I was about to give birth to my baby. She said, "I missed death by an inch during*

12. FGD__09_Liberia_Families of Ebola
13. FGD__01_Liberia_Families of Ebola
14. FGD__ 04_Liberia_Community men group
15. Five participants said that from the onset, delivery, child care and other manor sicknesses were treated, but when the hospital doctor died, the hospital was not receiving any pregnant women and other treatment went down very slowly. However, other nearby clinics were not closed to the public.

my labor pain" This can be assumed that maternal, newborn and child health services was affected during the outbreak because the care provided refused to cater to pregnant mothers and children.[16]

Some clinics did provide care to pregnant women.

They also said that maternal and child care services were available in their community, and it rendered services to pregnant women during the crisis.[17]

[At Phebe hospital]: *Yes. Especially the pregnant women. The midwife used to take the pregnant women from here and do the delivery themselves.*[18]

[In Robertsport Liberia]: RESPONDENT: *Whenever I go to the hospital, during the Ebola, I still used to see pregnant women.*

MODERATOR: *Were there any changes in maternal, newborn, and child health services?*

RESPONDENT: *No.*

MODERATOR: *No, what?*

RESPONDENT: *There were no changes. Women still gave birth at the hospital like the way they did under normal condition, when there was no Ebola. They were taking care of people.*[19]

Perceptions about the continuity of access to care conflicted in the same locations. For example, in a Western Rural FGD, one person said, *"The pregnant women gave birth as usually in hospitals and the children that went were given their routine vaccines."*[20] Another person in the same group, however, said *"Pregnant women were afraid and the children under five years old too were not taken for their regular vaccines for fear of contacting the virus."*

In Kailahun, key informants reported that pregnant women avoided attending clinics to prevent infection; while other responses indicated that *"Pregnant women were left to deliver on their own because nurses were afraid. Plenty died in labour."*[21]

Other reports indicate that pregnant women with bleeding, pain, or other symptoms were denied care or were turned away at the door of clinics. Regular check-ups were disrupted.

She started to vomit and began to experience pain in her stomach. She said, the movement her daughter started vomiting and was helpless, the nurses refused to cater to her. Later, the Ebola team came and decided to transfer her daughter to the ELWA ETU. While on their way, she dies.[22]

She said that one day, one of her friends got infected but was also pregnant and later she died at the ELWA ETU.

She also registered her disappointment over the manner in which pregnant women were treated by community clinic's staff. She stated that pregnant women were often refused to enter clinic facilities when in labor pain. She further said "I assumed that some pregnant women died at the doors of most community clinics."[23]

The problem, it was a tough time. Because we all know normally when a person sick, you depend on the clinic or hospital, especially pregnant women need to go to the clinic for regular check-up but nothing was done that way. That was really a tough time for us. As I rightly said, it was just by the grace of God.[24]

[At CH Rennie Hospital]: RESPONDENT: *It happened right in front of me, right to CH Rennie hospital, I went to visit my friend, this big belle (pregnant woman) was in pain, I don't know which destination they took her from, but she was in the car in pain, the nurse that was at the hospital was afraid, the woman left in the car and she was not feeling well, and she left in the car and she died right in front of me. It's not they say. You see people were getting sick and not going to the hospital. That was one of the reasons.*[25]

For my own observation, everything was normal, but our pregnant women who went to give birth, many of them were deny, especially those that was involve with bleeding, I had a girl who was living here, she went to give birth, they rejected her and she left bleeding until she died.[26]

GENDER AND TRADITIONAL HEALERS/ MIDWIVES

When women were denied care during delivery, they delivered at home with the help of family members, friends, traditional midwives, or they delivered alone. This was perceived to be associated with a surge in maternal mortality.

[Home, TBAs] *Pregnant women resorted to giving birth at home or with TBAs. A lot of women and children died during delivery because of lack of care.*[27]

[No care] *She stated that pregnant women were often refused to enter clinic facilities when in labor pain. She further said "I*

16. FGD 3_ Liberia_Ebola affected communtiy02
17. FGD_4 Liberia_ Community with no Ebola_Montserrado County10
18. Liberia_Transcript_FGD_BorderinCommunitynotaffectbyEbola_SKT_#4
19. Liberia_Transcript_FGD_FemaleGroup_Robersport_#5
20. FGD_Sierra Leone_Men Group_Western Rural_Samuel Turay_05072017_transcript
21. FGD_Community without_Kabala_Samuel Turay_05062017_transcript
22. FGD__05_Liberia_Families of Ebola
23. FGD_3 Liberia_ Community Men Group Montserrado County
24. Liberia_Transcript_FGD_BorderingAreanotAffectedbyEbola_Kakata_#1
25. Liberia_Transcript_FGD_MaleGroup_Kakata_#2
26. Liberia_Transcript_FGD_MaleGroup_Kakata_#2
27. KII_Women Group Leader_Queen Isata Ndoleh_Kailahun_Samuel Turay_08062017

assumed that some pregnant women died at the doors of most community clinics."[28]

[Parental/Home care] *Life was upside down. It was very a tough time we went through. No clinic or hospital was opened. I had my daughter; she was pregnant at that time, during the heat of the crisis, no clinic at all. The information hit me when pain cut her, at that time, I was in the garden. I was discouraged. Where do I carry her at that time? So as I previously said, it was just by God's grace, so I had no alternative, but I put the problem in God's hand. I said God! This is the problem for you and not for me. You know the tough time we were going through; you take control of the situation. And definitely God was on my side and everything was fine for us here.*[29]

[Midwife] *It happened my sister daughter was pregnant, she was in Kakata, she was in labour pain, they carried her to the hospital there, and they refused her and end up bringing her here, and that's our chairman's daughter. And the midwife here said that, they people say we must not touch anybody. The girl's mother said in God and work on this girl, if we leave her like that, either she dies or the child die. So the woman trust God and took care of the girl, and she delivered. So we were only depending on God, and we continue to depend on him.*[30]

[Midwife] MODERATOR*: So going through your pregnancy at the time, you had a midwife that was taking care of you, because you said you were rejected by the hospital?*

RESPONDENT: *Yes, it was only an old lady who I visited and explained my problem to her and she took an herbal chalk and gave it to me, but to be checked the way hospitals check patient I didn't get that.*

MODERATOR: *So there were no medical facilities around within your community here?*

RESPONDENT: *Even if they are around, will they want to touch you?*

RESPONDENT: *They were all over, but no one wants to touch you.*[31]

Health care workers and traditional midwives tried to navigate the risk of providing care to pregnant women by implementing "no-touch" during care. This was problematic, and could result in a lack of health care access and poor communication with patients.

Well it really changed, like for now if you are pregnant and you go to the hospital, like Cottage, the nurses will talk nicely to you, but during the Ebola, even if you are in labour, they will not touch you at all, even to talk to you it was a problem, because when the Ebola had spread, everyone was afraid of each other.[32]

Initially, traditional birth attendants (TBAs) were afraid to provide care to women due to EVD. They referred them to hospitals.

When the Ebola started, the TBA people too were afraid, so they stopped. They were referring the pregnant women to go to hospital.[33]

However, in some situations, traditional midwives and country medicine healers were the only source of health care for pregnant women.[34]

RESPONDENT: *The problem there, the hospital was not open, so we were just doing our country medicine.*

RESPONDENT: *Yes, that time I was pregnant myself, it was country medicine my mother use to boil and I will drink it, different leaves. And I will drink them and by the grace of God, I will get well.*

RESPONDENT: *As the old ma said, they refused the big belle. That was not hospital problem she was having, she stayed with the people the whole day, and it was one of the midwife knew the leave to give her and she was able to give birth.*

RESPONDENT: *Yes! We had midwife, they use to come to us in the morning to check on us. Yes! I allowed her to touch me; she was available at all times.*

RESPONDENT: *As for me, when I was in pain, she was on her farm and they called her, but before she touched me, she told my mother to pray and she left there until I gave birth.*

Providing care to a pregnant woman during the EVD epidemic could result in social stigma.

She said where she sat, everybody left that bench and they even refused to accept because she was taking care of a pregnant woman who was in pain delivery pain. The woman delivered safely.[35]

RESPONDENT: *At that time it was not easy because I was pregnant and sister in-law died and when I cooked people will not eat my food. When we are even going in the market and bring out lecture they would go far from me, but when they cooked and want to give me I would also say no to them too.*

MODERATOR: *People stopped eating from you because your sister in-law died?*

RESPONDENT: *At that time I was pregnant to even cook there was no way, when you are pregnant to get to the hospital use to be a problem, because the hospital used to also refused pregnant women and it was not easy it was only by the grace of God.*[36]

Family members, friends, and midwives often justified their interventions by invoking faith in God, ["Let God protect me"]. This suggests that family members, close relations, and traditional midwives should be among the first intervention targets for home-based hygiene kits, home protection kits, and trainings, because they are among the least likely to refuse care to a possibly infected pregnant woman when health care providers

28. FGD 3_Liberia_Ebola affected community01
29. Liberia_Transcript_FGD_BorderingAreanotAffectedbyEbola_Kakata_#1
30. Liberia_Transcript_FGD_BorderingAreanotAffectedbyEbola_Kakata_#1
31. Liberia_Transcript_FGD_FemaleGroup_Kakata_#3
32. Sierra Leone_Transcript_FGD_Type5_West Rural_#1
33. Sierra Leone_Transcript_FGD_Type5_West Rural_#1
34. Liberia_Transcript_FGD_BorderingAreanotAffectedbyEbola_Kakata_#1
35. FGD__09_Liberia_Families of Ebola
36. Liberia_Transcript_FGD_FemaleGroup_Kakata_#3

refuse access to health care or clinics or hospitals are closed. This kind of care will be provided even when PPE, access to other materials is delayed.

MODERATOR: *So looking at you now as women, I would want another person to respond to this question that I am asking. Looking at you as a woman who is humanitarian and you got feeling for your friend woman when she is in labor pain, how you feel sometimes when your friend is in a pain or did you managed because I guessed that doing the Ebola outbreak we have women here that were still pregnant how did you people managed because normally sometimes when a woman is in pain women would go there to show sorrow how you people really went along with that, how you think you really went along with that?*

RESPONDENT: *During that time some midwives were in the community. They were helping some women. This was by the grace of God. Some people when they are dying when they get to the hospital they will not touch you. Why some people going to deliver would delivered in the room and the women would surrounded the lady with cloths in their hands around her we did all of those during the Ebola outbreak disgrace by Ebola.*

MODERATOR: *So meaning that when the woman is pregnant with the exception of you getting sick but when the woman is pregnant and about to deliver nurses can't wear the PPE or doctors there to carry on a saved delivery?*

RESPONDENT: *That was lately they started doing that when they started bringing their supply.*[37]

Community messages about pregnancy were interpreted as follows:

As far as am concerned, they said Ebola was going to affect more people, pregnant women and this and that. They said we should be careful of ourselves, the children and wives so that Ebola will not give anybody problem. So we said okay that we will take care of ourselves. … Then the main thing is they said no pregnant woman should deliver at home. If you are pregnant, go straight to the hospital to go and deliver. That was among the warning they gave. And we did not play over it at all.[38]

Attitudes toward providing health care to pregnant women changed over time, after social mobilization and community interventions. This resulted in expanded access to health care.

We now take every pregnant woman to the hospital, we refer them all to the hospital, and we don't allow any woman to give birth at home.[39]

[HCWs] *But the nurse did some sensitization, reminding the people of how she had always been caring and helpful to the community. Community people built confidence in the nurse and started sending their pregnant women to deliver at the clinic.*[40]

[County Health Teams] RESPONDENT: *Well, during that time they used to go to Gbatala even though when they used to go to Gbatala, there was a man there who used to separate them and when the county health team got there, they got mad about the idea and wanted to punish them.*[41]

In Sierra Leone, people attributed the EVD-related closure of schools to a surge in new pregnancies.[42]

5 Gender and health care workers' experiences

No observed differences.

However, there are moving passages about how the communities perceived health care workers' exposure to EVD as a kind of stigma. The passage below also highlights the kind of decision making that individuals were confronted with when dealing with a sick child:

One day I stayed at the CTE, my wife called me where your child is like this, he is doing diarrhea accompanied by blood, I was sitting, I had just left in the high-risk area, I was sitting in the room, I got the call, directly I did not discuss, I asked permission to my leader, he agreed, I went home. Arrived home, even the neighbours there were informed that really I contaminated my daughter. And there I took my daughter on my two hands. Only my family, my wife and I, even the neighbours, have all withdrawn. Conscientiously I took my daughter, saying, my daughter that you follow me and if it is true that it is Ebola that contaminated you, it is not you, it is sought, it is me myself who sent the disease. If it is true that it is Ebola, you will not go alone. There I said that.[43]

6 STRATEGY AREA 3: Gender and funerary practices

No observed differences.

37. Liberia_Transcript_FGD_FemaleGroup_Kakata_#3
38. Liberia_Transcript_KII_TraditionalLeader_BigJoeTown_#2
39. SierraLeone_Transcripts_KII_Village Chief Type1_WesternRural_2
40. FGD_Community without_Kabala_Samuel Turay_05062017_transcript
41. Liberia_Transcript_FGD_MaleGroup_SKT_#2
42. Sierra Leone_Transcript_FGD_Type5_West Urban_#1
43. Guinea_transcript_FGD_Type 1_Nzerekore_District of Nzerekore Anonymized

7 Strategy Area 5. Gender and social mobilization (strategy area V)

FGDs suggest that women and men were both recognized as legitimate sources of information and services about EVD.

GENDER AND ACCESS TO INFORMATION

Men in focus groups reported that their first point of access to information was in March, 2014, mainly through radio, flyers, and posters; information was rapidly backed up by announcements from political leaders and the social mobilization activities of NGOs. This was followed by distributions of hygiene materials. Information, reporting, and referral phone numbers were not provided until later. Men reported that contact tracers were strangers to local communities and were therefore unable to differentiate between locals and strangers (this had implications for the trustworthiness of individual reports).

In contrast, women in rural communities reported having been educated about EVD prevention during distributions or in interactions with social mobilizers more often than men. Women in FGD groups also reported learning about EVD through radio and word of mouth, but accounts emphasize "everyone's" disbelief in early information about EVD and community denial of the virus. They started to believe in the virus only when people began to die.[44]

In most FGDs, at least one FGD respondent reported that their first report EVD came from family members (both male and female) who were health care workers. Most reported that the health care workers died due to EVD.

Men reported learning through word of mouth through informal social networks or via radio about outbreaks elsewhere (in Gbarpolu or Lofa county), and admonitions on the radio to avoid eating bushmeat and to avoid people with a range of symptoms. Men reported being most affected by restrictions in movement, employment, restricted mobility between homes and urban centers, change in social practices (not practicing football anymore).

44. Liberia_Transcript_FGD_FemaleGroup_Kakata_#3

8 Risks and vulnerabilities, by gender

GENDER AND CAREGIVING ROLES [STRATEGY AREA 2]

People preferred to care for the sick at home and bury their dead according to customs and traditions—rather than leave them at the mercy of the hospital staff, with no record of their loved ones' movements or places of burial. The lack of care and concern in the hospitals and nurses, too, deterred people from releasing their sick loved ones into their care.[45]

> *Sick family members were not kept away from the non-sick members and friends at home because the community never received enough education about the Ebola Virus and had fear.*[46]

Restrictions on mobility, social isolation, quarantine, and stigma caused hunger and famine in communities without access to food and water sources.[47]

GENDERED DISTRIBUTION OF LABOR

At the outset of the outbreak, men in Liberia reported accelerated movement in order to reunite with spouses and children—to relocate them from high-risk areas to lower-risk areas. Men also reported being separated from spouses and children for long periods of time due to restrictions on mobility (they were away for work/were unable to return, etc.).[48]

Women involved in market and food supply changed business practices (restricted credit, stopped selling food supplies) due to uncertainty about food emergencies. Men were also affected by this because they lacked access to food credit.[49] Food distributions were inconsistent and incomplete.

There were several reports in Liberia and Guinea of gendered relationships [intra-household relationships, marriages, conflicts between spouses or co-wives] that impacted the use of information about EVD.

One FGD of Liberian women talked about the difficulties they experienced managing child care after schools were closed.

> *They closed the schools and to keep the children home because the children are used to walking about. Keeping them home is nothing easy, we the parents, when we talk to the children they don't want to listen, so you're afraid. You can't restrict their movement. This Ebola thing you're just scare, if your child goes out and you don't know who or she they're going to meet with and they are going to come back home and that was very scaring. You're home and trying to keep them, no way. Even the younger ones, they want to get out*

45. FGD_Women Group _Makeni_Samuel Turay_06062017_transcript
46. FGD_Women Group _Makeni_Samuel Turay_06062017_transcript
47. Guinea_Transcript_FGD_Type 4_Kankan_ District of Kankan
48. Liberia_Transcript_FGD_MaleGroup_Tubmanberg_0003
49. Liberia_Transcript_FGD_MaleGroup_Tubmanberg_0003

there to play. The whole thing was just scaring, especially that part of it for the children.[50]

In Guinea, one woman reported that restrictions on mobility were easier for men because they did not travel to their farms [?]. For her, she could not travel between communities to make market and her whole business was interrupted.[51]

Among families of survivors in Guinea, women reported performing the following kinds of home-based health care without sufficient support at the time of infection of a family member:

- Asked to take individuals who were sick to hospitals and clinics
- Home-based feeding and cleaning
- Assuming caregiving roles when other family members abandoned patients
- Advocating for patients at hospitals
- Inquiring about the status of patients
- Massaging patients
- Being fired from jobs due to time lost for quarantines, caregiving
- [after death] Paying expenses for funerals
- [after death] Leaving professional careers to run family farms, take over head-of-household businesses[52]

HH PRACTICES (e.g., Household IPC, Access To HH IPC)

In FGDs, both men and women reported the widespread distribution of bleach, buckets, and soap. Women reported that food and IPC material distributions were insufficient, late, and inconsistent. They did not reference the distribution of PPE, and gloves were occasionally reported by women with reference to providing home-based health care, and by men for public activities (such as marketing).

Within the household, women were likely to be selected as primary health care providers for sick individuals. The following quote recounts the efforts taken by a health care worker who became infected, and had his niece provide care for him. He later died.

After 3 days he was not able to come outside the house; he said all his joints were hurting. He told his niece to treat him but when she's treating him, she should wear gloves and dress-up. Whenever she took medicine to him, he used to tell her to drop the medicine on the bed. Whenever you go to speak to him, he'll tell you not to go close to him. He called his friend from the county health team to come for him but some people hid him and refused for him to go.

50. Liberia_Transcript_FGD_FemaleGroup_Tubmanberg_0004
51. Guinea_Transcript_FGD_Type 4_Kankan_ District of Kankan
52. Guinea_Transcript_FGD_Type 2_Forecariah_district of Kindia Anonymized

9 Gender-based Violence

A group came to train on gender based violence which I was part of so they brought drinking cups for us to distribute in the community. Most times, when they come, they go to the community chairman and the chairman has co-workers and wing leaders to distribute the goods. People were selected by the zonal head also to do the distribution. Mostly when they come they go straight to the community chairman and this chairman and the eventually the community participated in the distribution.[53]

MODERATOR: *What made you feel successful in working with this people for your community?*

RESPONDENT: *I was one of the member of the gender based violence that was trained by the people, so the reports we gave from here was highly commended on compared to other areas so this made me know that I am successful. Also by talking, educating and sensitizing people because people heeded to the advice which made them not be affected with Ebola and they survived and up till now we can still mingle with one another.*[54]

10 Children

CHILDREN AS COMPONENTS OF THE RESPONSE

In Grand Kru, Liberia, IPs were too far removed from the field to provide direct response to communities, so the policy was "stay in place." Children were identified as at high risk and were targeted for direct training, and for participating in CHW work through "hygiene clubs." This was a successful strategy for social mobilization. Later examples of direct child engagement in the response might include Plan International's in-school WASH project, which was coordinated across multiple partners.

53. Liberia_Transcript_KII_TradtionalLeader_Kakata_#2
54. Liberia_Transcript_KII_TradtionalLeader_Kakata_#2

In Guinea, one example of training by ALIMA resulted in the following statement:

> *In our different families, we made every effort to ensure that parents, girls, children, at least the whole family, had the courage to apply hygiene measures. Hygiene to prevent children from becoming infected. Here. OK.*[55]

CHILD VULNERABILITY

According to KII with CARE in Grand Kru, Liberia, a gap in the response was addressing the long-term caregiving needs of children whose parents died or were removed for EVD.

Women provided deep descriptions of parental acknowledgment or denial of children's sicknesses or symptoms that help explain the spread of the epidemic.[56] Women also reported resisting sending sick children to hospitals and clinics for treatment, for fear that they would be taken away from them.

> *Another challenge was when parents notice their children with the virus and then vomiting and you're fighting to save the life of that child and others. You don't want to turn you child over to the health team and at the same time you are risking other family members. That was really challenging.*[57]

Others reported that they did not receive support while family members were sick. Instead, they received help after—at least some—family members had died.

> *We benefited from support but not when our son was sick, it is when deceased. At the beginning we were firmly opposed to send him to hospital. But when, before their son died, from the moment he was talking, he was able to speak, they came many times to try to send him to the center of djekedou for treatment, but they were strongly opposed to that, they had to even send militaries to totally circle/cover this area with pickups and everyday pickups were coming and going.*[58]

CHILDHOOD HEALTH CARE AND VACCINATIONS

Children who became sick for any reason during the epidemic lacked access to health care. This was mainly attributed to widespread closures of pharmacies (not clinics or hospitals), and thus parents could not purchase medicine. The epidemic resulted in widespread declines in child and maternal (during-pregnancy) vaccinations.

> *No one goes for ante-natal clinics or take children for vaccinations. No one trusted the other (providers and patients).*[59]

TRADITIONAL PRACTICES

Male children were not being circumcised according to custom and traditions, for fear of contacting or spreading the virus.[60]

Clashes at Womey were sparked by interruption of excision rituals.[61]

55. Guinea_transcript_FGD_Type 1_Nzerekore_District of Nzerekore Anonymized
56. Liberia_Transcript_FGD_FemaleGroup_SKT_#3
57. Liberia_Transcript_FGD_FemaleGroup_SKT_#3
58. Guinea_Transcripts_FGD_Type 2_ Faranah _District of Faranah_2
59. KII_Women Leader_Kadiatu Koroma_Kabala_Samuel Turay_05062017
60. FGD_Sierra Leone_ Women Group_Kono_Samuel Turay_15062017_transcript
61. Guinea_transcript_FGD_Type 1_Nzerekore_District of Nzerekore Anonymized

ANNEX O. CHART DETAIL, OBJECTIVE 3

1. Objective 3, Relevance of the Response

Table O3–1. Household level exposure to the EVD response, cross-country comparison						
	Households with suspected or confirmed EVD cases			Households with NO suspected or confirmed EVD cases		
	Guinea (n=188)	S. Leone (n=410)	Liberia (n=492)	Guinea (n=3,850)	S. Leone (n=5,418)	Liberia (n=6,357)
% of HH reporting ETU accessibility	26.1%	34.6%	32.5%	8.7%	19.0%	23.1%
% of HH reporting CCC accessibility	37.2%	37.0%	44.5%	28.1%	26.8%	34.0%
% of HH visited by a contact tracer	29.8%	76.0%	51.6%	11.2%	55.6%	29.33
% of HH receiving any PPE	43.1%	52.7%	70.7%	41.5%	47.8%	56.4%
% HH experiencing isolation or quarantine	27.7%	53.7%	47.2%	1.5%	5.7%	6.58
% of HH quarantined that reported receiving food support	69.2%	72.6%	59.1%	55.2%	64.3%	55.18
% of HH quarantined that reported receiving financial support	48.1%	24.2%	26.3%	41.4%	15.4%	23.83
% of HH with at least one Ebola death	24.5% (46)	46.8% (192)	40.2% (198)			
% of HH with an Ebola death that reported practicing safe burial	80.4% (37)	95.8% (184)	98.0% (194)			
% of HH with an Ebola death that reported receiving any PPE for body preparation and safe burial	21.7%	20.8%	37.9%			

Table O3–2. Household level exposure to the EVD response, Guinea							
	Households with suspected or confirmed EVD cases			Households with NO suspected or confirmed EVD cases			Overall comparison
	Overall (n=188)	Urban (n=64)	Rural (n=124)	Overall (n=3,850)	Urban (n=1,450)	Rural (n=2,400)	p-value
% of HH reporting ETU accessibility	26.1%+	29.7%	24.2%	8.7%+	13.6%+	5.8%+	<0.001
% of HH reporting CCC accessibility	37.2%*	34.4%	38.7%*	28.1%	24.3%+	30.3%+	<0.05
% of HH visited by a contact tracer	29.8%+	32.8%	28.2%	11.2%+	10.7%*	11.5%*	<0.001
% of HH receiving any PPE	43.1%+	51.6%	38.7%	41.5%+	43.9%	40.0%	<0.001
% HH experiencing isolation or quarantine	27.7%	25.0%	29.0%	1.5%	1.3%	1.6%	0.571
% of HH quarantined that reported receiving food support	69.2%	87.5%	61.1%	55.2%	52.6%	56.4%	0.130
% of HH quarantined that reported receiving financial support	48.1%	62.5%	41.7%	41.4%	21.1%*	51.3%*	0.480
% of HH with at least one EVD death	24.5% (46)	17.2%	28.2%				
% of HH with an EVD death that reported practicing safe burial	80.4% (37)	81.8%	80.0%				
% of HH with an EVD death that reported receiving any PPE for body preparation and safe burial	21.7%	45.5%*	14.3%*				

NOTE: Statistical significance, *at .05 level, +at .001 level

Table O3–3. Household level exposure to the EVD response, Sierra Leone							
	Households with suspected or confirmed EVD cases			Households with NO suspected or confirmed EVD cases			Overall comparison
	Overall (n=410)	Urban (n=192)	Rural (n=218)	Overall (n=5,418)	Urban (n=2,196)	Rural (n=3,222)	p-value
% of HH reporting ETU accessibility	34.6%+	35.9%	33.0%	19.0%+	25.1%	14.9%	<0.001
% of HH reporting CCC accessibility	37.0%+	43.8%*	31.2%*	26.8%+	35.3%	22.8%	<0.001
% of HH visited by a contact tracer	76.0%+	78.1%	74.3%	55.6%+	56.1%	55.3%	<0.001
% of HH receiving any PPE	52.7%	51.6%	54.1%	47.8%	51.7%	45.1%	<0.001
% HH experiencing isolation or quarantine	53.7%	55.73%	51.8%	5.7%	5.3%	6.0%	0.055
% of HH quarantined that reported receiving food support	72.6%*	77.6%	68.2%	64.3%*	76.9%	56.7%	<0.05
% of HH quarantined that reported receiving financial support	24.2%*	23.4%	25.7%	15.4%*	17.1%	14.4%	<0.05
% of HH with at least one EVD death	46.8% (192)	46.4%	47.3%				
% of HH with an EVD death that reported practicing safe burial	95.8% (184)	94.4%	97.1%				
% of HH with an EVD death that reported receiving any PPE for body preparation and safe burial	20.8%	18.0%	23.3%				

NOTE: Statistical significance, *at .05 level, +at .001 level

Table O3–4. Household level exposure to the EVD response, Liberia							
	Households with suspected or confirmed EVD cases			Households with NO suspected or confirmed EVD cases			Overall comparison
	Overall (n=492)	Urban (n=221)	Rural (n=271)	Overall (n=6,357)	Urban (n=2,836)	Rural (n=3,029)	p-value
% of HH reporting ETU accessibility	32.5%+	34.8%	30.1%	23.1%+	25.4%	20.9%	<0.001
% of HH reporting CCC accessibility	44.5%+	46.6%	42.8%	34.0%+	33.2%	34.7%	<0.001
% of HH visited by a contact tracer	51.6%+	48.4%	54.2%	29.33+	29.4%	29.2%	<0.001
% of HH receiving any PPE	70.7%+	73.8%	68.3%	56.4%+	53.6%	59.1%	<0.001
% HH experiencing isolation or quarantine	47.2%+	50.2%	44.7%	6.58%+	5.8%*	7.3%*	<0.001
% of HH quarantined that reported receiving food support	59.1%	60.4%	57.9%	55.18%	54.6%	55.7%	0.347
% of HH quarantined that reported receiving financial support	26.3%	27.0%	25.6%	23.83%	24.9%	23.1%	0.493
% of HH with at least one EVD death	40.2% (198)	39.8%	40.6%				
% of HH with an EVD death that reported practicing safe burial	98.0% (194)	97.7%	98.2%				
% of HH with an EVD death that reported receiving any PPE for body preparation and safe burial	37.9%	35.23%	40.00%				

NOTE: Statistical significance, *at .05 level, +at .001 level

Table O3–5. Utilization of technical guidelines, by country						
	Guinea		Sierra Leone		Liberia	
	CTs (n=65)	CHWs (n=85)	CTs (n=61)	CHWs (n=81)	CTs (n=124)	CHWs (n=122)
% reporting receipt of standardized guidelines	93.9%	82.4%	91.8%	88.9%	89.5%	87.7%
Top sources of guidelines	■ ACF 20.0% ■ WHO 15.4% ■ MSF 13.9% ■ MOH 13.9%	■ UNICEF 34.7% ■ MOH 26.5% ■ MSF 18.4%	■ MOH 29.8% ■ WHO 18.0% ■ IRC 14.8%	■ IRC 36.7% ■ MOH 33.3% ■ MSF 11.7%	■ MOH 54.0% ■ WHO 12.1% ■ PIH 11.3%	■ MOH 36.6% ■ WHO 19.6% ■ GC 14.3%
% reporting changes in the guidelines over time	41.0%	55.7%	44.6%	43.1%	27.0%	33.6%
% reporting following all of the guidelines all of the time	91.8%	85.7%	92.9%	94.4%	93.7%	97.2%

Table O3–6. Utilization of technical guidelines, Guinea				
	Contact Tracers (n=65)			CHWs (n=85)
	Urban	Rural	p-value	
% reporting receipt of standardized guidelines	92.0%	100.0%	(0.2651)	82.4%
Top sources of guidelines	■ IFRC 20.0% ■ WHO 15.4% ■ MSF 13.9% ■ MOH 13.9% ■ UNICEF 13.9 % ■ US CDC 10.8%			■ UNICEF 34.7% ■ MOH 26.5% ■ MSF 18.4%
% reporting changes in the guidelines over time	43.5%	33.3%	(0.4960)	55.7%
% reporting following all of the guidelines all of the time	Overall	91.8%		85.7%
Yes for all	93.5%	86.7%		
Yes for some	6.6%	2.2%		
No	1.7%	0		
Reasons reported for not following the guidelines	Overall counts only			
They were not appropriate for the setting in which I worked	3			
They changed and I continued following previous guidelines	0			
Conditions changed so it was no longer appropriate to follow them	1			
I was instructed to do my job differently by the org I worked for	0			
They were too difficult to follow	3			
It did not seem important	1			

Table O3–7. Utilization of technical guidelines, Sierra Leone				
	Contact Tracers (n=61)			CHWs (n=81)
	Urban	Rural	p-value	
% reporting receipt of standardized guidelines	92.9%	90.9%	(0.7866)	88.9%
Top sources of guidelines	■ MOH 29.5% ■ WHO 18.0% ■ MSF 8.2%			■ IRC 36.7% ■ MOH 33.3% ■ MSF 11.7%
% reporting changes in the guidelines over time	34.6%	53.3%	(0.1658)	43.1%
% reporting following all of the guidelines all of the time	Overall	92.9%		94.4%
Yes for all	88.5%	96.7%		
Yes for some	7.7%	3.3%		
No	3.9%	0		
Reasons reported for not following the guidelines	Overall counts only			
They were not appropriate for the setting in which I worked	1			
They changed and I continued following previous guidelines	0			
Conditions changed so it was no longer appropriate to follow them	0			
I was instructed to do my job differently by the org I worked for	1			
They were too difficult to follow	3			
It did not seem important	0			

Table O3–8. Utilization of technical guidelines, Liberia				
	Contact Tracers (n=124)			CHWs (n=122)
	Urban	Rural	p-value	
% reporting receipt of standardized guidelines	85.4%	92.1%	(0.2398)	87.7%
Top sources of guidelines	■ MOH 54.0% ■ WHO 12.1% ■ PIH 11.3%			■ MOH 36.6% ■ WHO 19.6% ■ GC 14.3%
% reporting changes in the guidelines over time	26.8%	27.1%	(0.9717)	33.6%
% reporting following all of the guidelines all of the time	Overall	93.7%		97.2%
Yes for all	96.1%	92.9%		
Yes for some	6.3%	4.9%		
No	0	0		
Reasons reported for not following the guidelines	Overall counts only			
They were not appropriate for the setting in which I worked	1			
They changed and I continued following previous guidelines	0			
Conditions changed so it was no longer appropriate to follow them	0			
I was instructed to do my job differently by the org I worked for	0			
They were too difficult to follow	3			
It did not seem important	0			

Table O3–9. Comparison of response exposure between high prevalence (HP) and low prevalence (LP) areas* by country									
Indicator	Guinea			Sierra Leone			Liberia		
	LP	HP	P-value+	LP	HP	P-value	LP	HP	P-value
HH reporting ETU accessibility (M9, Q55)	10.3	7.2	**0.0026**	6.8	23.4	**0.0000**	22.4	26.3	**0.0003**
HH reporting CCC accessibility (M9, Q56)	23.6	40.5	**0.0000**	15.3	30.5	**0.0000**	32.6	38.7	**0.0000**
HH visited by a contact tracer (M9, Q68)	12.0	11.4	0.5866	44.6	60.1	**0.0000**	29.0	34.6	**0.0000**
HH receiving any PPE (M9, Q70)	44.4	30.8	**0.0000**	44.9	48.9	**0.0157**	50.30	70.1	**0.0000**
HH experiencing isolation or quarantine (M9, Q59)	2.7	2.5	0.7682	4.5	10.2	**0.0000**	7.0	14.5	**0.0000**
HH quarantined that reported receiving food support (M9, Q63, HHs with Q59=yes)	68.3	42.9	**0.0166**	66.7	68.1	0.8409	59.2	54.5	0.2354
HH quarantined that reported receiving financial support (M9, Q65, HHs with Q59=yes)	48.8	32.1	0.1285	21.6	19.1	0.6702	31.6	19.1	**0.0003**
HH with at least one Ebola death (M8, Q53, HHs with Q53>0)	1.1	1.1	0.9270	1.1	3.8	**0.0000**	2.4	4.3	**0.0000**
HH with an Ebola death that reported practicing safe burial (M8, Q54, HHs with M8, Q53>0)	88.2	58.3	**0.0247**	100.0	96.1	0.4890	99.0	98.0	0.5749
HH with an Ebola death that reported receiving any PPE for body preparation and safe burial (M9, Q72, HHs with M8, Q53>0)	17.7	33.3	0.2673	25.0	20.6	0.7153	45.9	30.0	**0.0209**

*Counties (Liberia), Provinces (Sierra Leone), and Regions (Guinea were assigned into the high- or low-prevalence group, according to whether Ebola occurrence was above or below the mean value for that country.

+P-levels in **bold** are significant at the ≤.05 level.