Sierra Leone Better Positioned to Respond to Public Health Emergencies

The Challenge

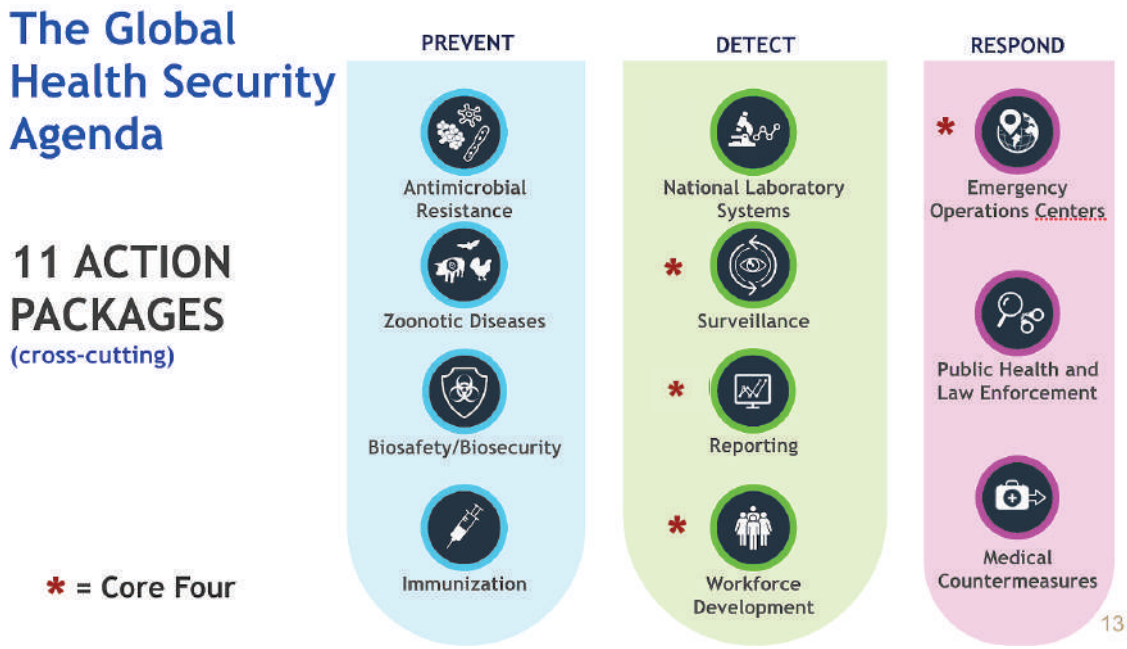
In 2014, the World Health Organization (WHO) declared the Ebola Virus Disease (EVD) outbreak in West Africa a Public Health Emergency of International Concern (PHEIC). The outbreak in Sierra Leone, exposed several weaknesses in the country's health system, particularly its inability to effectively detect and respond to disease outbreaks. Sierra Leone recorded the first Ebola case in late May 2014 and on July 30, 2014, approximately 10 weeks later, the Government of Sierra Leone declared a state of emergency. By March 29, 2016, when the WHO lifted the PHEIC status on the EVD outbreak, Sierra Leone had the highest number of total (suspected, probable and confirmed) cases and laboratory-confirmed cases of EVD. The country recorded approximately 3,900 deaths due to the outbreak. It is believed that a more effective disease surveillance and reporting system may have helped prevent the spread of the epidemic.

The U.S. Centers for Disease Control and Prevention (CDC) played a pivotal role in ending the epidemic by coordinating disease control activities and providing technical assistance with several partners between 2014 and 2016. At the end of the epidemic, the Sierra Leonean health system was even more fragile, in addition to its inability to detect and respond to disease outbreaks, there were inadequate public health emergency management programs and health care workers lacked the required skills to prepare for or respond to these public health emergencies.

A Long term solution

Aligning its health initiatives with those of the Global Health Security Agenda (GHSA), the CDC then initiated and funded the Cooperative Agreement (CoAg) "Rapid Response to Ebola Viral Disease" program in Sierra Leone in 2016. The program included several projects aimed at strengthening the country's health system from a variety of entry points in order to realize the objective of early detection of, effective response to, and ultimately prevention of any future disease outbreaks in Sierra Leone. eHealth Africa (eHA) was one of several partners involved in implementing several of these projects.

Three of these projects- electronic Integrated Disease Surveillance and Response (eIDSR), Emergency Management and Preparedness (EMP) and Field Epidemiology Training Program (FETP), though implemented separately, have each contributed to a "Prevent, Detect and Respond" cycle in a number of outbreak scenarios in Sierra Leone since the inception of the CoAg.



Real-time surveillance and reporting are two key areas of effort, action packages, of the GHSA. In order to meet the requirement of the GHSA on real-time surveillance and reporting to increase Sierra Leone's ability to detect public health emergencies, the **eIDSR solution was created to enhance disease prevention and control through electronic capture and submission of data** on 26 epidemiologically important diseases including Yellow Fever and Measles at the health facility level. eHA developed the mobile solution that has now systematically increased the disease reporting rates in the Sierra Leone health system. EMP contributes to the Emergency Operations Centers action package of the GHSA. The program **has ensured systematic, nationwide capacity building in emergency management and disease outbreak response** for the public health workforce and other key stakeholders in Sierra Leone. eHA provided optimized facility management services to ensure **uninterrupted emergency operations** at the national level through the National Emergency Operations Center (EOC) in Freetown. In a bid to align programs to the workforce development action package of the GHSA, **FETP has increased the number of public health workers who are systematically trained in and practicing basic epidemiological principles of disease surveillance** through the three-tiered service-based training program. eHA worked closely with the CDC and the African Field Epidemiology Network (AFENET) to implement the training program and ensure that program activities aligned with the Ministry of Health and Sanitation's (MoHS) strategy.

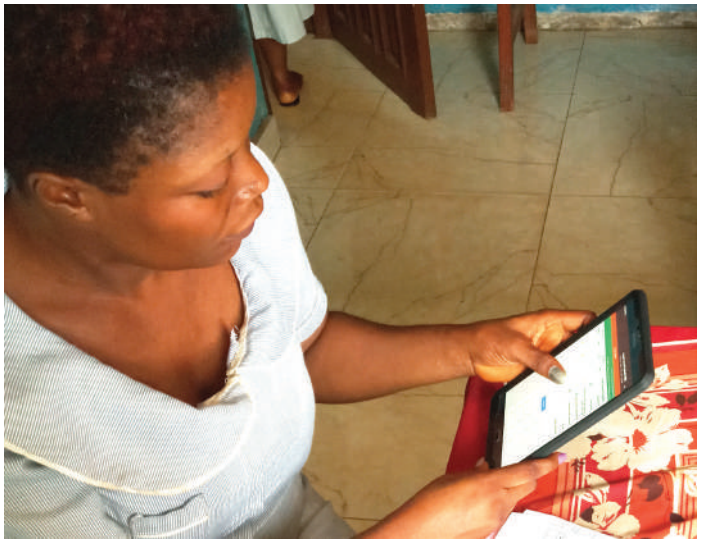
Digital reporting provides near Real-Time Surveillance

In early June 2018, there were 5 reports of measles reported through the eIDSR application at health facilities in Mongo, Sulima, and Wara-Wara Bafodia chiefdoms, all in Koinadugu and Falaba districts. Falaba district is one of two new districts that was created in 2016, it was carved out of Koinadugu district, these districts are located in the Northern Province in the rural areas near the border of Guinea.

Coordination at the EOC

These reports were immediately reported to the National Directorate of Health Security and Emergency (DHSE). The office of the directorate is located in the National Emergency Operations Center, which allows for better coordination of emergency responses. Dr. Mohamed Vandi, the Director, DHSE, then set up a Rapid Response Team, including surveillance officers who went out to identify the cases within 48 hours of these reports.

Mohamed Barber Jalloh is a Senior Public Health Officer attached to the Surveillance section of the Emergency Operations Center. He is part of the team that identified and investigated the Measles cases. He is also an FETP graduate.



We got an alert from the District Health Management Team via the DHSE structure of a suspected case of Measles. Following this notification, an 18-man team comprising of staff of the World Health Organization (WHO) and other key Ministry of Health and Sanitation (MoHS) staff was dispatched from the EOC on a joint investigation. The cases later appeared in the EOC Dashboard for further investigation."

Workforce Development in Action

After the cases appeared in the dashboard, newly trained epidemiologists went out to the field to check and confirm the outbreak. Isha Kamara is one of 11 FETP graduates (at the time) who participated in the Measles outbreak investigation in the Koinadugu district in June 2018. At the time of this investigation, Isha was in her final weeks of the intensive ten-month FETP-Intermediate training, and this investigation was considered a part of field training activities.

"As an intermediate FETP graduate, one of my roles include conducting outbreak investigations. The Measles outbreak gave me a unique opportunity to investigate cases, document findings for onward response. We held a series of meetings with the DHMT who showed us affected communities. We started collecting data through Epi-info app, a digital application used for recording epidemic information. Specimens were taken for laboratory confirmation. We also collected and analyzed data in terms of person, place and time."

Isha Kamara

Specific to Sierra Leone, a measles outbreak is defined (in our surveillance and epidemiology standards) as 3 or more laboratory-confirmed cases in a community or district in one month. Isha and team recorded over 20 confirmed cases reported in the week of 12 June 2018, in the Sulima and Mongor chiefdoms.

Our team recorded over 20 cases of Measles. We also found out that there was no vaccination coverage in the affected areas. We reported our findings through the FETP structures at the EOC. Based on our findings, there was a need for mass vaccination.

Isha Kamara

A total of 29 cases were recorded for Falaba district during the outbreak period. On June 14, 2018, just a few days after the initial reports of the measles cases, the MoHS declared a Measles outbreak in Falaba, based on findings reported. This was a call to action. Harold Thomas, EOC Communications Lead was part of the response team set up by the MoHS.

"Measles is one of the priority diseases catered for in our surveillance system. So, when cases of Measles began to rise, appropriate actions were taken in order to address the situation. Responding to the outbreak in time was very key. Some of these actions include community engagement and sensitization, case management, isolation within affected communities and administering ring vaccinations. We heightened our surveillance efforts and strengthened routine immunization in the affected areas."

Harold Thomas

Immunization to prevent future outbreaks

Isha and team did not only investigate Measles outbreak, but they were also involved in a series of targeted immunization campaigns as next steps to increase herd immunity in the vulnerable populations.

"We in the FETP did a mass vaccination campaign in collaboration with the surveillance and EMP structures, targeting the most vulnerable age group (0-15 year-olds). I was one of the national supervisors for the campaign, after undergoing a Training of Trainers (ToT) session. I further cascaded what I had learned to Community Health Officers who were vaccination champions. We also provided them with the necessary logistics in order to respond to the disease."

Repeating the cycle

In December 2018, when 4 new cases of measles were reported via eIDSR in Kambia district, the same process was repeated. A total of 34 cases were identified and investigated by public healthcare workers in December through coordinated efforts at the EOC. Sierra Leone was once again able to quickly detect and respond to the disease outbreak, stemming its spread.

The response to the two separate measles outbreaks in 2018 is proof of Sierra Leone's strengthened health system. The joint effort by the CDC, MoHS, eHA, and other partners coupled with a systemic approach focused on strengthening the country's capacity to manage outbreaks and other public health emergencies has been effective in preventing the spread of diseases and improving Sierra Leone's public health sector. Diseases outbreaks are identified near real-time which allows for a faster emergency response effort. Central coordination through an EOC allows for better collaboration across agencies and continuing education further strengthens the capacity of health care workers to respond to public health emergencies.

Since the last outbreak of Measles in December 2018, Sierra Leone has not recorded any new cases. On June 17, 2019, there was a full-scale simulation to further test the country's readiness to respond to disease outbreaks. *"With our surveillance system gone digital, and all other structures in place, Sierra Leone is more ready now to respond to public health emergencies. The simulation exercise is also helping us to identify gaps within the Sierra Leone health system."*

Dr Mohamed Vandi,
Director, DHSE

Key Successes

- On June 6, 2019, the WHO announced that Sierra Leone has become the first country in the WHO Africa region to fully transform its national disease surveillance system from paper-based to web-based electronic platform; routine weekly public health reporting from health facilities has now increased from 89% in 2016 to 99% May 2019 from health facilities countrywide. This was achieved using eIDSR.
- As of July 2019, there are 26 qualified epidemiologists in Sierra Leone to provide coverage nationwide. This represents a 67.57% of the national goal of 1 field epidemiologist/200,000 population as defined by the GHSA from a baseline of zero epidemiologists at the start of the program in 2016.
- A total of 105, representing 87.5% of targeted public health emergency responders have been trained through the EMP to be able to activate a coordinated emergency response within 120 minutes of the identification of a public health emergency.