

Sierra Leone Q3 Impact Report

20
18



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Foreword

Innovative Problem Solving is one of eHealth Africa's core values.

We maintain a world view driven by possibilities, not limitations. We build smart systems that will sustain beyond our tenures. We challenge prevailing assumptions, respect the urgency of the environments we operate in, and take smart risks to search for the best solution.

Our dedicated team of experts is providing the requisite technological solutions with a view to addressing some of the complex health challenges Sierra Leone faces.

eHealth Africa Sierra Leone's Quarter 3 report highlights eHA's impact in Sierra Leone's health sector with a targeted focus on innovative problem solving.



Our Mission

Our mission is to build stronger health systems through the design and implementation of data-driven solutions that respond to local needs and provide underserved communities with tools to lead healthier lives.

Our Expertise in Sierra Leone

We believe that stronger systems are best achieved through systems-level, integrated approaches. We work on the following technical pillars:



Health Delivery Systems

We develop people-centric and data-driven, technological solutions to improve health delivery systems for vulnerable communities.



Public Health Emergency Management Systems

We provide infrastructure and human capacity support to improve governments' abilities to detect, investigate, and respond to public health threats, including the most remote areas.



Disease Surveillance Systems

We provide the technological tools and operational support to collect and analyze data. Our teams contribute to the detection and ultimate prevention of disease outbreaks throughout West Africa.

Where We Work



PROJECTS

- 117
- SLED
- CHO MLTP
- EMP
- STRIVE
- eIDSR
- VaxTrac
- Malaria Research
- CHAMPS
- FETP
- AVADAR
- Njala University Training Laboratory

eHealth Africa's Q3 Key Achievements

AT A GLANCE



103
**PUBLIC HEALTH
PROFESSIONALS**

have completed FETP-Frontline program



364
HEALTH FACILITIES

from Port Loko, Western Area rural and urban and Kenema districts capture and submit their weekly integrated Disease Surveillance Response (IDSR) report electronically



27
TRUE AFP CASES

found through the AVADAR program



90%
OF CHOs

in cohort 4 received a minimum of 6 mentorship visits



29
**COMMUNITY
HEALTH OFFICERS**

graduated from Kenema and Kailahun districts (cohort 4)



100%
OF 1ST COHORT

of FETP-Intermediate graduates from the program



20
**PHLEBOTOMISTS
AND RESEARCHERS**

trained on the processes and protocols of the Hepatitis B. Sero Survey



29
**COMMUNITY
HEALTH OFFICERS**

recruited from Moyamba and Portloko districts for Cohort 5

Disease Surveillance Systems

117 Call Center

The 117 Call Center was born out of Sierra Leone's Free Health Care Initiative (FHCI) in 2012, as a quality assurance mechanism. In 2014, 117 Call Center was repurposed and expanded to function as an Ebola response hotline.

In post-Ebola Sierra Leone, it functions as a surveillance tool with the capability to fill in major gaps in national death reporting and disease surveillance.

The 117 Call Center captures deaths that occur outside of health facilities. Sierra Leone ranks among the countries with highest maternal deaths in the world. The 117 Call Center is currently being used in maternal death surveillance reporting (MDSR). With the MDSR, maternal deaths that occur outside the health facilities are reported in real time. The 117 software developed by eHA receives and dispatches cases from the communities to district/field teams for further follow up. Data is shared in real time to the relevant partners. This is crucial to effective maternal death surveillance.

In the third quarter of 2018, eHA introduced a new SMS feature to the 117 Call Center, which now dispatches information on the patient ID. This was how the patient's ID system came into being. Callers can use patient ID specifically for the creation and collection of death and burial certificates.

Also, with the SMS feature, medical details are sent to appropriate Ministry of Health and Sanitation (MoHS) officials, and the sensitivities and dignity of the deceased are respected.

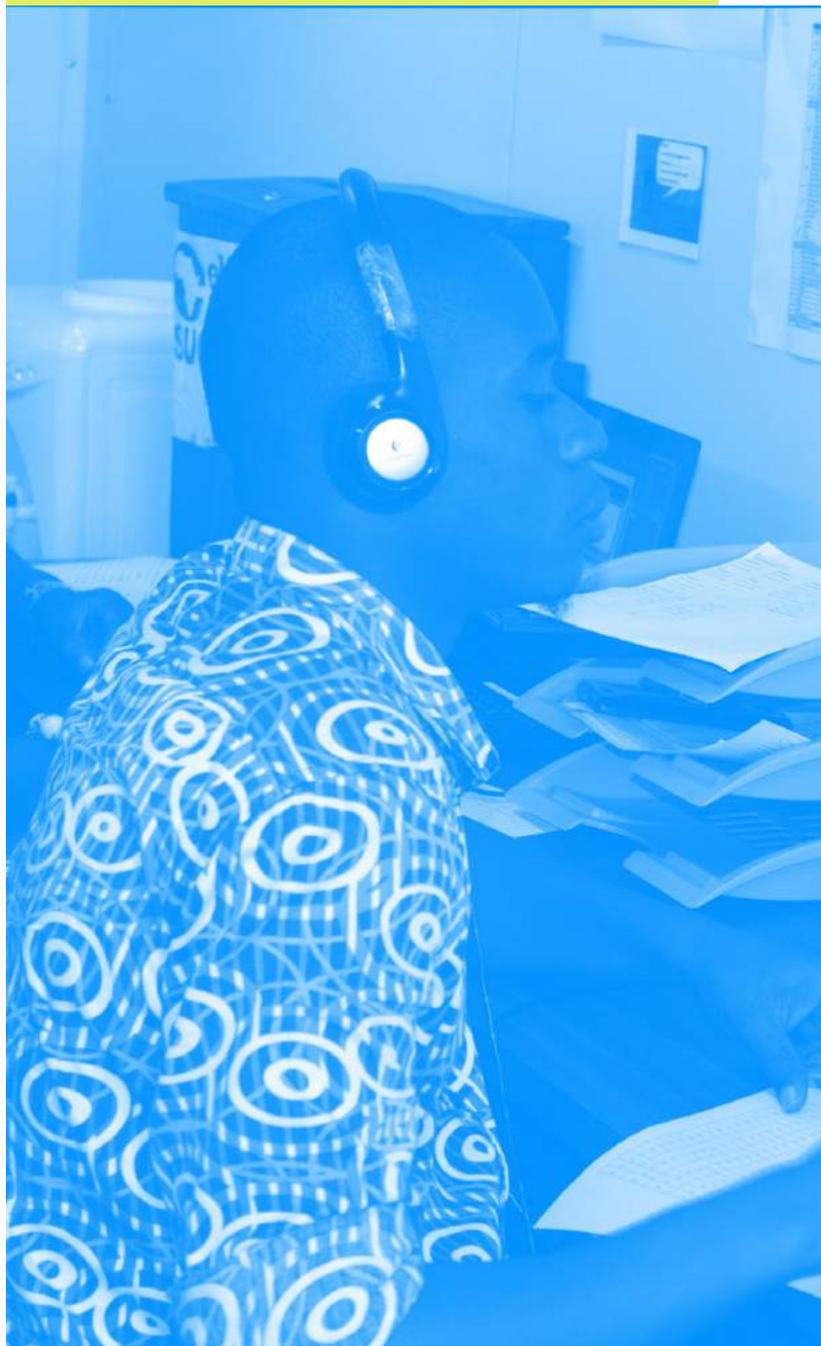
Metrics

37 maternal mortality cases:
- 4 from Residence
- 1 Public
- 22 from Health Facility
received from July to September 2018

//

117 has enhanced the surveillance activity by providing real time data from communities. With this data, the district can swiftly respond to alerts and give feedback within the hour. With these cases being responded to, communities are reassured that they can get help when they call 117.

Gibrilla Fella Kamara
Western Area District Coordinator



Auto-Visual AFP Detection and Reporting (AVADAR)



Auto-Visual Acute Flaccid Paralysis AFP Detection and Reporting (AVADAR)

Acute Flaccid Paralysis (AFP) is the main symptom of polio, and it is visually recognizable. AVADAR enhances the existing AFP surveillance system by introducing an innovation that improves AFP case sensitivity, detection, and reporting timeliness.

The AVADAR app plays a video on a weekly basis that shows children who have symptoms of AFP, with an audio overlay of the AFP case definition. This improves informants' ability to correctly identify cases of AFP, and it also prompts informants to send their weekly report: either a "no" report, indicating they have not found any cases that week, or a "yes" report with AFP case details such as the onset of the symptoms, child's name and GPS location.

It also provides valuable data in near real-time, which is used to make frequent adjustments to improve project outcomes. As a result, the quality of AFP detection has increased in AVADAR districts. This has a lasting impact on the communities and people that live there, and it is one important part of a global polio endgame strategy.

We are now more proactive rather than reactive to AFP surveillance. AVADAR has helped us detect new cases of AFP that before now were missed because the focus was only at the facility level. With the AVADAR reporting system, all those undetected cases can now be reported to us by community informants.

Luseni M Kamara
DSO2 and AVADAR Focal Person,
Western Rural District

Q3 IMPACT: Key Highlights

13 suspected AFP cases submitted by informants

3 true AFP cases detected

452 informants in the Sierra Leone AVADAR network

80% average weekly reporting rate

95% of the time each week, reports were timely (within 48 hours of the video reminder)

191 AVADAR technical issues were resolved by eHA technical officers

AVADAR improves active polio surveillance in Sierra Leone

Polio eradication is a global priority. With three countries left to be certified "polio free", public health stakeholders are putting extra effort into the development of innovative strategies to find and banish polio once and for all.

Traditional surveillance systems use a paper-based reporting structure. For diseases that require an immediate response - such as acute flaccid paralysis (AFP), the main indicator of polio - health workers are required to call the case in immediately for follow up. However, cases are not always tracked or responded to quickly, the data is not always complete or readily available, and only those cases that have been referred to health clinics are identified and reported.

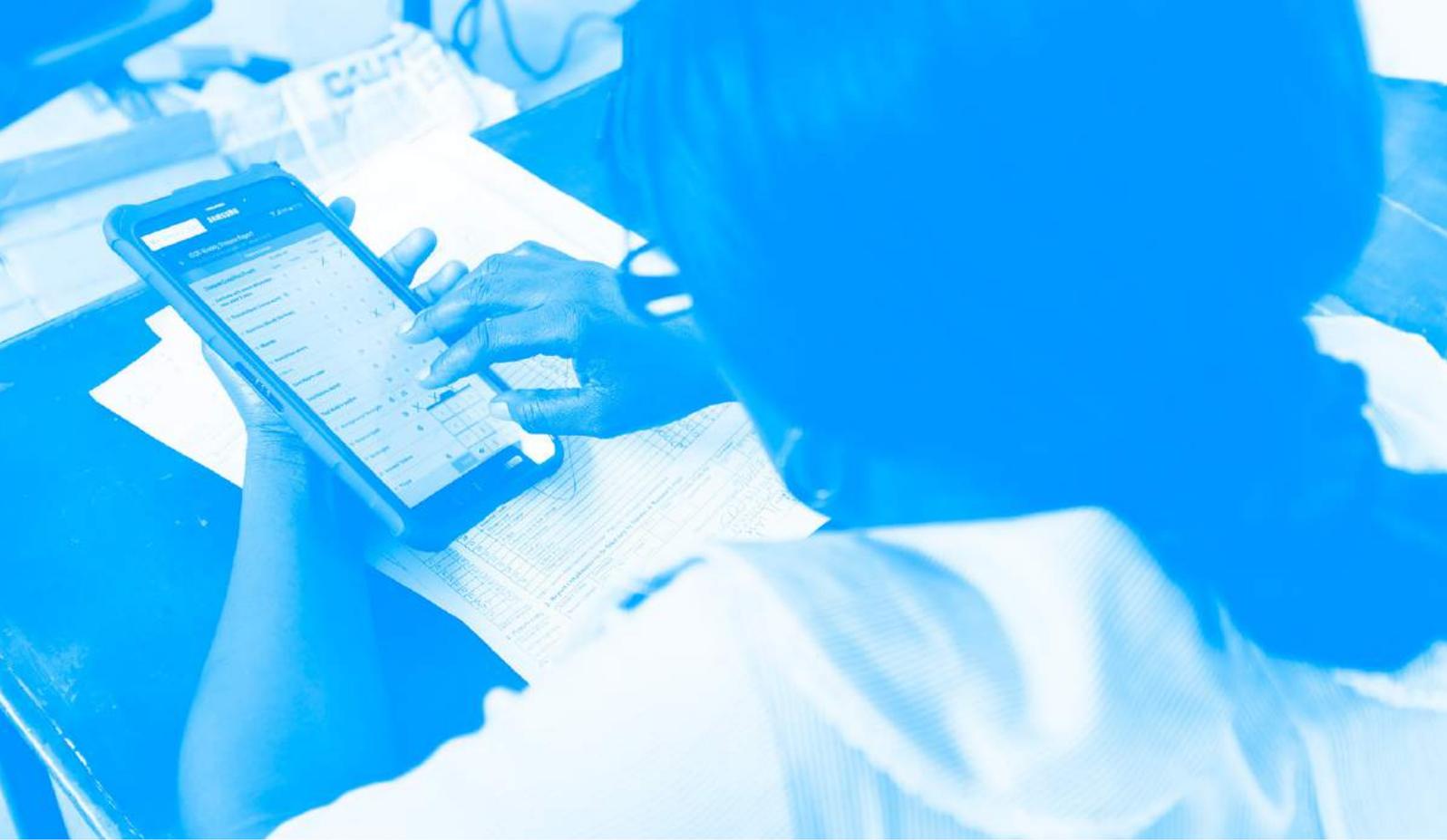
Luseni Kamara is a DSO in Western Urban district, which is one of the pilot districts for AVADAR in Sierra Leone. He has experienced first-hand how AVADAR has improved his ability to detect and respond to potential cases of AFP in his communities.

Since the program launched in March of 2017, AVADAR has found a total of 27 true AFP cases, many of which were not identified using the traditional surveillance system. Thankfully, none were polio. With the success of the innovation, some health professionals are now looking to how the AVADAR model of active, technology-assisted, community-based surveillance could be applied to other priority diseases.

The introduction of mobile-based technology into surveillance has helped us greatly by not only improving the early detection of diseases but also improving on the timeliness and completeness of reports coming from health facilities. As a DSO, it makes my work much easier as I can do investigations of reported cases in a timely manner, it reduces the workload and time spent on inputting data into an excel database, it helps me get more accurate and relevant data in terms of patient details, geographical location etc, and it has helped me track reported cases from the community and health facilities, thereby giving an insight into where I need to strengthen active case search. The system has worked so well that all the reported four AFP cases in the Western Rural district were investigated within the required timeframe and out of these two were true AFP cases.

**Luseni M. Kamara, DSO2 and AVADAR
Focal Person, Western Rural District**





Electronic Integrated Disease Surveillance and Response System (eIDSR): creating the digital space for health data collection

eHA has been taking a lead to help eradicate paper-based reporting of Integrated Disease Surveillance Response (IDSR) priority diseases in Sierra Leone, with the introduction of electronic Integrated Disease Surveillance Response (eIDSR). Health facility staff in the four districts (Port Loko, Western Area Urban, Western Area Rural and Kenema) where facility level eIDSR has been rolled out are now able to complete and submit their weekly IDSR reporting form electronically to District Health Management Teams via voice call, SMS, WhatsApp.

To ensure sustainability of the eIDSR system, eHA is gradually transitioning responsibility for the roll out processes to national and district staff.

A training of trainers (ToT) was instituted by eHA, as a way of empowering healthcare workers and solving some training needs. A total of 10 district team members were trained to also help deliver health facility training to their colleagues. With this training, district and national staff are provided the requisite support to resolve challenges that may be experienced in the capture and digital submission of their weekly IDSR reports.

Kenema district is the latest to transition to digital reporting at facility level. In the third quarter of 2018, the district staff identified strong facility staff, mainly chiefdom coordinators, to support them in the training of their colleagues in Kenema.

Plans are underway to roll out eIDSR to two additional districts (Moyamba/Bonthe) in the final stages in Q4.



Hepatitis B Community-based Serosurvey

There is no accurate data on Hepatitis B Virus (HBV) infection among children and women of childbearing age in Sierra Leone. Hence, the need for a survey on HBV infection among infants, children and women of childbearing age to inform the Hepatitis B vaccination policy in Sierra Leone.

eHA is working with Statistics Sierra Leone to implement the Hep B Community-based Serosurvey project funded by U.S. Centers for Disease Prevention and Control (CDC). Technical leadership for the survey is being provided by CDC and the Ministry of Health and Sanitation of Sierra Leone through the Child Health Program. The purpose of the survey is to:

- assess the impact of the current childhood Hepatitis B immunization program in Sierra Leone on the prevalence of chronic hepatitis B infections among children
- evaluate the need for the Hepatitis B- birth dose in Sierra Leone by determining the burden of chronic hepatitis B virus among mother/child pairs.

eHA provided phones and internet data for the survey, developed and installed the open data kit (ODK) application which is used for data collection in the field. eHA's provision of the Android phones for the survey discourages potential errors via paper-based methods by presenting an automated approach to health data collection. With ODK, data collection will be done easily and survey activities monitored in near real time.

20 Phlebotomists and researchers trained on the processes and protocols of the Hepatitis B. Survey

49 Phlebotomists, surveyors, supervisor and coordinators undertook a two-day practical field exercise on the processes and protocols on the survey.



Health Delivery Systems



NCH AID



Community Health Officers Leadership & Management Training Program (CHO-MLTP)

Prior to the launch of the CHO-MLTP in 2016, there was no formal training in public health management and leadership for health professionals in Sierra Leone.

The U.S. Center for Disease Control (CDC) collaborated with the Ministry of Health and Sanitation, Njala University, Emory University, ICAP of Columbia University, and eHealth Africa to develop a novel training program to address this need and ultimately to improve health service delivery and health outcomes in Sierra Leone.

CHOs working at Community Health Centers were targeted to be the first cadre to receive this public health management and leadership training given their key role as first-line health service providers as well as chiefdom leaders.

The training program is run in cohorts and each cohort is comprised of CHOs from two different districts. In July 2018, Cohort 4, made up of 29 CHOs from Kenema and Kailahun districts graduated from the program. The dropout rate for this cohort was 6%. 29 CHOs from Moyamba and Port Loko districts were recruited into Cohort 5 and training commenced in August.

Follow up visits by mentors on Human resource management, use of Health Management Information system (HMIS) data for decision making and assessment of facilities on miniSARA started soon after completion of the first workshop

Metrics

90% of CHOs received a minimum of 6 mentorship visits during cohort 4

58% of CHOs trained in cohorts 1-4 and graduated through the Management and Leadership Training Program to date

2 more cohorts to undergo training



The MLTP Experience: Through the Eyes of a CHO

I was posted to my Community Health Center (CHC) in July 2018. Conducting a familiarization project in my catchment was a bit of a challenge, but that was made possible within a week thanks to the Management Leadership and Training Program (MLTP). After attending the first workshop, we were tasked to conduct a mini Service Availability Readiness Assessment (SARA) of our Peripheral Health Units (PHUs). The aim was to collect data which could be analyzed to address lapses in these facilities, even at policy-making levels.

Additionally, the mini SARA allows for the electronic collection and analysis of data across various health services to give insight into the basic services expected at PHU level.

Prior to now, reviewing records with the aim of performing statistical analyses was not a priority. However, with MLTP, I have conducted several analyses to identify gaps in health service delivery and to proffer solutions. Using the data analysis skills that I have gained from MLTP, I have been able to review and analyze the data in my reports to identify the health conditions that present most frequently at the health facility. This helps us to be better informed about and prepared for what we are dealing with.

MLTP has also taught me how to delegate roles, responsibilities, and tasks to make my work more efficient.

Displaying collected data on wall charts in the facility helps us to analyze various conditions. It has aided us to adopt strategic approaches to conditions that may be of public health concern. For instance, when our wall chart shows that malaria and diarrhea cases increase during the rainy season, it helps us to build an approach to mitigate that number in the next season. Also, another important contribution is the visit of MLTP assigned mentor to my facility, which has helped to gain more additional skills.

The electronic reporting system has made data analysis more effective and efficient. However, with the introduction of MLTP, data analysis can now take place at the health facility level before the district and ministry levels. My facility and other facilities that benefit from the MLTP will have the opportunity to address various gaps even before the intervention of the DHMT or the ministry, leading to an improvement in the health sector of the country.

We hope eHA and MOHS will continue to give more technical and logistical support in the future for sustainability gain.



Francis Kpaka Junior
CHO, Babara CHC
Port Loko District

CHO- MLTP Mentor Quote



Allieu J. Sheriff
CHO Mentor



My experience as a mentor with the CHO-MLTP has been great so far

"Being part of the innovative intervention at local level of service delivery in Sierra Leone. The CHO-MLTP has a unique feature of modules covered and tailored in such a way that CHOs develop leadership and management competencies with emphasis on wide strategic issues and the impact that these influences have on practice development can't be underrated.

Through these modules, CHOs have been able to critically analyze facility data with tablets provided and implement quality improvement projects on HTN and HIV is a good evidence to show case that our health sector can be improve and develop through good leadership and management. The CHO-MLTP approach in Sierra Leone is good evidence on how health workers practice can be improved using resources within reach as seen with projects implemented that result in better health outcomes and the widespread adoption of new technology and innovations based on knowledge gained has tremendously improve quality of care at chiefdom level

Field Epidemiology Training Program (FETP)

The main objective of the Field Epidemiology Training Program (FETP) is to strengthen Sierra Leone's public health system by increasing the skills of public health workers at the district and national level in ensuring quality surveillance, capacity for case/outbreak investigations, data analysis, and making data-informed decisions.

eHA's role is to provide programmatic, administrative and logistics support to the training and field work experience.

To fulfill the Global Health Security Agenda (GHSA) of 1 epidemiologist per 200,000 population, FETP aims to increase the number of public health workers who are trained and practicing basic epidemiological principles of disease surveillance. eHA and the MoHS delivered 2 training programs (FETP-Frontline & FETP-Intermediate) for key individuals involved in surveillance and data collection/analysis from January to June 2018.

103 public health professionals have completed FETP-Frontline

11 trainees graduated from the 1st cohort of FETP-Intermediate in July 2018

22 case or outbreak investigations conducted between July-Sept 2018

DSOs can now systematically write reports on every single case that is reported, in an organized and consistent manner and format. Previously, we rarely wrote case investigation reports and even when we did, they were not consistent not in standard formats.

Gbessay Saffa
District Surveillance Officer I
District Health Management Team, Bo District



Field Epidemiology Training Program (FETP)

15 trainees selected for the 2nd cohort of FETP-Intermediate training

70% closer to meeting GHS goal of 1 epidemiologist per 200,000 population

100% of 1st cohort of FETP-Intermediate graduated from the program

91% of Intermediate graduates' abstracts were accepted into 2018 AFENET Conference from 12-16 November

2 Intermediate graduates presented their epidemiologic work at the 4th African Conference on Emerging Infectious Diseases and Biosecurity

In September 2017, FETP-Intermediate was introduced with the aim of strengthening public health surveillance, outbreak investigation and response, and survey data to use for decision making at the middle level of the health system. As part of their Intermediate competencies, trainees complete a surveillance data analysis, surveillance system evaluation, written abstract, and participate in a group project addressing one of Sierra Leone's public health concerns.

In July 2018, the 1st cohort of FETP-Intermediate graduated 11 trainees, including staff from Ministry of Health and Sanitation, Ministry of Agriculture and Forestry, and Republic of Sierra Leone Armed Forces. 91% of these graduates have recently had their written abstracts accepted into the 2018 Africa Field Epidemiology Network (AFENET) Conference in Mozambique.



eHealth Africa's Q3 Impact in Emergency Management and Preparedness (EMP) Systems

The goal of this project is to enhance the capacity of the Ministry of Health and Sanitation in terms of preparedness, prevention and response to current and future outbreaks of public health related threats/diseases, including Ebola.

eHA has provided logistical support to successful Foundational Incident Management Systems training and Cholera simulation exercises in Bombali and Kambia Districts with a total of 88 participants from the Ministry of Health and Sanitation and other Ministry, Departments and Agencies (MDA's).

Also, Terms of Reference for Emergency Preparedness and Response Technical Working Group have been validated and finalized.

eHA also provided technical support to the Ministry of Health and Sanitation in developing messages and the media communication strategy on Bombali Ebola strain and Measles.

Bombali ebolavirus is a newly discovered strain of Ebolavirus, first reported on 27 July 2018. It was discovered by a research team from the U.S. in the western Africa country of Sierra Leone. The virus was found in the Angolan free-tailed bat and the Little free-tailed bat. Bombali ebolavirus has the capacity to infect human cells, although it had not yet been shown to be pathogenic.



Our Solutions

Gather

Gather is a versatile data collection and curation tool built on top of Aether. Gather enables people to securely collect data in the field and quickly share it anywhere where it is needed.

THE CHALLENGE

Often times different data collected in the field need to be aggregated and transformed before being published. Most of the existing data collection tools, however, do not support the data interoperability and curation needed to perform these tasks and have to go through the expensive process of exporting and restructuring data before publishing them.

THE SOLUTION

Being built on Aether, Gather can interoperate differently structured data collected in the field, integrate them with other systems and workflows for data management, transformation and analysis, and securely deploy them using cloud environments or on-premises deployments. In Sierra Leone, Gather has been used in the CHAMPS project to solve problems relating to data collection.

Aether

Effective health interventions require medical data to be fast and easily shared between health organizations and their partners. To guarantee a smooth and timely flow of data, ehealth solutions need to be easily integrated with each other and built with the highest standards for security and privacy protection.

Aether is a **reliable and secure development platform** created by eHealth Africa which enable organizations to build solutions that curate and exchange live information. It utilizes “data contracts” between systems, simplifies the movement of data between applications, and provides developers with a framework of best practices for ehealth system design.

Meet the Team: Innovative Problem solving from the ICT Perspective



eHealth Africa (eHA) like every other organization, benefits from the digital revolution. The organization has Innovative Problem Solving as one of its core values. Information and Communications Technology (ICT) is one of the vehicles it uses to drive change as a technology-driven organization.

Aiah Kortequee is eHA's ICT Manager. He has been with the organization for 1 year and 6 months. Aiah manages both a team of 6 ICT staff and the entire ICT infrastructure in Sierra Leone. He gives his impression on how eHA drives innovation, and how his department is contributing:

"eHA gives its managers the free hand to come up with solutions to the day-to-day challenges and also provide solutions for the projects we support. This has led to the provision of innovative solutions.

Initially when we started giving out tablets to informants, surveillance officers, there were serious issues of device and data abuse by the officers. We had agreements with telecommunications operators to provide us with special services such as URL whitelisting, special access Point Name (APN). However, this arrangement made us depend on them to make changes on our behalf. This in some cases resulted in delays in responding to the changes that are required in the field.

Also, whenever there was an issue with these special services, the priority given to them by the operators was minor especially when at the same time a higher revenue generating service is also affected.

This prompted the team to continue research into better ways of managing the usage of our field devices and data. We then transitioned to the use of Mobile Device Management (MDM) servers which eventually were cheaper to maintain and operate than the special service from operators; and we had total control of the system. Since we started using the new system, we have had 2 of our devices returned after they were reported missing. This means the device becomes unusable to whoever might have taken it. This was not the case prior to the use of the system.

In quarter 3 of 2018, eHA upgraded the ICT infrastructure at the Public Health Emergency Operations Center (PHEOC). This upgrade was due to degrading internet quality at the center, prompted by internet bandwidth abuse. An assessment of the ICT infrastructure identified security and accounting gaps such as:

- No policies for the use of the ICT infrastructure
- Single password for users to access the WLAN
- Inadequate equipment to properly monitor and police usage of network resources

These required immediate fix. Based on this assessment, the U.S. Centers for Disease Prevention and Control (CDC) approved the budget for the network upgrade which eHA's ICT team implemented. After implementation, each user now has to access the network with their credentials instead of the password sharing system. This makes it easy for network administrators to identify sources of breach or abuse.

"Since implementation, we have seen a 20% drop in internet bandwidth utilization due to effective monitoring and policing of the internet by the security appliance that was installed. Users perception of the service is now generally more positive than before. One feels a sense of accomplishment when you provide a sustainable solution to problems. It makes you know that you are contributing to improve health services in the nation as a whole. We feel proud and fulfilled to be contributing to national development. In all of this, I appreciate my team's effort and continued support in contributing to one of eHA's core values: Innovative Problem Solving."

Meet the Team: Innovative Problem solving in Information Systems



Les de Wit is eHA's Information Systems (IS) Manager in Sierra Leone. He joined eHA in March 2017. Les has 5 members (3 software developers and 2 project managers) in his team. His role, along with that of his team, is to support the development and maintenance of software solutions for eHA projects within Sierra Leone. They work closely with the Ministry of Health and Sanitation (MoHS) and stakeholders, U.S. Center for Disease Control and Prevention (CDC) and the World Health Organization (WHO) to understand project requirements and the problem they are needing to solve through technology.

"We often analyze existing processes and observe end users to learn the context in which they work and challenges they face to ensure that solutions are practical and effective." - Les De Witt

Information System is another vehicle eHA uses to drive innovation. Les has his take on Innovative problem solving at eHA:

"Problem solving is a core value add eHA is bringing to projects. We are specialists in various areas and can draw on our skills and experience to develop creative solutions to fulfil a need not readily available.

During Quarter 3, we developed a real-time dashboard to support a malaria data collection project using open source tools, including an ODK app for data capture, a Gather database for data curation and Kibana for data visualization which collectively allowed project stakeholders to see the data via charts and graphs in real-time online dashboards. Gather is an eHA product which allows for rapid, secure and flexible integration with Elastic supported tools such as Kibana.

As is common with projects, it was an iterative process working with a partner NGO to enrich the dashboards over a period of few weeks and then present the analysis to a workshop of data collectors.

An important part of our role working within Sierra Leone is also to ensure solutions are sustainable and can ultimately be handed over as package resources to local MoHS.

During this quarter, considerable time and effort has been directed towards documenting the technical set-up of one of our key projects, eIDSR, and sharing details with various MoHS counterparts. The process also includes ensuring that the technical set-up is structured in a way that it can be migrated and maintained to environments outside of the eHA ecosystem. This process takes time. However, capacity building and knowledge sharing is a critical component to ensure that solutions can live on with less or no involvement from the core eHA technical teams.

My team has a well-balanced combination of skills and experience with the majority staff recruited locally. They work across various technologies, mainly coding in Java, JavaScript and Python and the technical guys are all 'full-stack' developers. This means that they can work on front-end and back-end systems.

My team utilizes tools and processes generally seen as industry best practices, for example Jira for issue tracking, Confluence for documentation, Slack for communication, GitHub for version control and Travis CI and Firebase for automated system tests. The IS team is very interested in supporting eHA projects. However, they also enjoy sharing their knowledge through various outreach programs such as meet-ups and presentations at tech events and education institutions in Sierra Leone's capital, Freetown.

Even if not actively involved in software development for a project we may often give some feedback or advice, i.e. there are simple solutions that would not require anything specific from the IS team. However many projects include a technical software deliverable and we work closely with the relevant eHA project manager from the programs department to collaborate directly with a given directorate in the MoHS. Generally larger projects include a technical working group which consists of eHA, MOHS, CDC, WHO and other NGO partners. The IS team also supports onboarding (registration) of users onto new systems, training users on the use of the tool and supporting them in ability to understand data and develop related reports."

Our Partners



Bill and Melinda Gates Foundation



CDC Foundation



College of Medicine and Allied Health Sciences (COMAHS)



Concern Worldwide



Emory University



Focus 1000



Group (pharmaceutical manufacturer)



ICAP



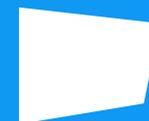
Novel T



Restless Development



Sierra Leone Ministry of Health and Sanitation



Taisland Pharmaceuticals (distributor)



The Department for International Development (DFID)



University of California, Los Angeles



University of Nebraska Medical Center



U.S. Centers for Disease Control and Prevention (CDC) Sierra Leone



World Bank



World Health Organization (WHO)



World Hope International



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