



2019

ANNUAL **IMPACT** REPORT

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Clients, Donors & Partners

This report is possible because of our team!

Contributors: Emerald Awa-Agwu, Uche Ajene, Chinedu Anarado, Tope Falodun, Fatima Adamu, Abdullahi Katuka, John Momoh, Bilyaminu Umar, Abubakar Shehu, Rabiya Ojeifo, Tolulope Oginni, Mohammed-Faosal Adeniran, Doug Moran, Tosin Williams, Sahr Ngajuah, Mohammed Bello, Les de Wit, Dena Lu, Anupma Sud and Lanshima Phillip.

Editing & Review: Emerald Awa-Agwu, Uche Ajene, Johanna Roegele, Juliet Odogwu, Hawa Kombian and Evelyn Castle.

Design and Graphics: Sophie Abache

WHO WE ARE

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 the tools to lead healthier lives.

Our Vision

Based in Africa, we establish new standards in health delivery and emergency response through the integration of information, technology, and logistics.

Our Values

- **Impact and Quality:** We push ourselves to maintain high standards ensuring that we produce the most meaningful results in everything we do, no matter how big or small.
- **Innovative Problem Solving:** We maintain a worldview driven by possibilities, not limitations. We take smart risks and foster an environment where creativity and innovation thrive.
- **Integrity:** We are honest and truthful in our work. We always do what is right, even when it is not easy. We put our values into practice and hold each other accountable.

Where we work

We are a team of over 500 people working across West Africa, the United States and Germany with headquarters in Northern Nigeria. We also execute projects in other countries across Africa.



386

LGAs in Nigeria tracked during IPD and OBR campaigns. This represents 49% of all LGAs in Nigeria and exceeded the annual goal of targeted LGAs by 10%

4,571

communities across West & Central Africa where we supported disease surveillance activities (AVADAR+ eIDSR)

25,270

missed settlements identified during polio vaccinations campaigns in order to reach every last child

4,613

health care workers trained to provide health services and respond to public health emergencies across West & Central Africa

3,612

settlements named with confirmed habitation status added to the geodatabase

OUR IMPACT
IN 2019



9,245

hours spent on
capacity building
activities in 2019

CAPACITY BUILDING

Kano Laboratory and Sokoto Meningitis Laboratory

A sound laboratory and diagnostic system is essential for optimal health service delivery. It helps to guide clinical and public health interventions and to ensure that health systems are better prepared to detect and respond to epidemic-prone diseases and other public health emergencies. The Sokoto Meningitis Laboratory was built and deployed by eHealth Africa in partnership with the International Foundation Against Infectious Diseases in Nigeria (IFAIN) and the Sokoto State Ministry of Health to respond to the Meningitis outbreak of 2016. The eHA-IFAIN team regularly builds the capacity of medical officers on proper techniques of sample collection including lumbar puncture, aseptic blood collection, and media inoculation techniques. In addition, periodic sensitization activities are conducted to ensure that medical officers inculcate the habit of disease investigation before administering appropriate treatment. Through our Kano Laboratory, we built the capacity of medical laboratory scientists in the state to correctly confirm Malaria infections through microscopy and to safely store and transport infectious specimens to the lab for investigations.

- 769 hours spent on capacity building activities for medical personnel to fight Malaria and Meningitis by the Sokoto Meningitis Lab and the Kano Lab
- 95 health personnel trained on Malaria microscopy and safe collection and transport of infectious specimens

Farm Management Tool

One of the biggest challenges that smallholder farmers face is inadequate access to information about good agricultural practices (GAP) like soil testing, comprehensive pest management, plant spacing, and weather assessments, which can increase their crop yield and earnings. Farm Management Tool (FMT) is the expansion of CornBot, an application created and submitted by eHealth Africa and Washington State University (WSU) for the Fall Armyworm (FAW) Tech Prize in 2018. The platform provides helpful information on GAP that can be aggregated and made available to farmers. We designed a three-pathway approach to deliver the information to the farmers: a mobile app aligned with a web-based dashboard to aggregate data, face to face training and practical hand-holding sessions. The farmers each set aside 25 square meters of farmland to test the effectiveness of the GAP theories. They were then paired with a team of professional agriculturalists who supervised and guided them to implement good agricultural practices—soil testing, pest management, fertilizer application, plant spacing—on the dedicated farmlands from the pre-planting stage to harvest. The agriculturalists also recommended mitigation strategies when their soil test results showed high soil acidity or alkalinity.

- 116% increase in the average Maize yield of test farms (compared with the Kano State average of 2,750 kg/hectare)
- 195% increase in the average Maize yield of test farms (compared with the national average of 2,020 kg/hectare)

Kano Connect

The Connect platform is a mobile-based system strengthening tool for government partners that has information dissemination and real-time monitoring capabilities that allow for better supervision of activities and uniform communication with teams. In Kano state, the Connect platform has been deployed by the Kano State Primary Health Care Management Board [KSPHCMB] to improve the Immunization programs within the state. State health care workers are better able to achieve expected immunization coverage through faster information dissemination, near-real-time visualizations, data management, and survey tools. The Connect Platform was enriched with a module for on-demand eLearning courses for continuing education for healthcare workers. The eLearning module also has additional resources that healthcare workers in Kano access from the field as a refresher that ultimately improves service delivery.

- 6,365 hours spent on building the capacity of health workers to deliver better Routine Immunization services and to collect and report data using electronic tools
- 1,032 health workers trained to deliver better RI services

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

Prior to the launch of the Community Health Officers Management and Leadership Program (CHO-MLTP), Community Health Officers (CHOs) in Sierra Leone had not been formally trained in public health management and leadership. The CDC collaborated closely with the Sierra Leone Ministry of Health and Sanitation (MoHS), Njala University, Emory University, ICAP at Columbia University, and eHealth Africa (eHA) to develop a context-specific, modular management and leadership training program. This program was designed to improve the public health management skills of CHOs to strengthen the existing health system in Sierra Leone at the Chiefdom level and increase the application of public health systems thinking and related management principles needed to effectively run health facilities and outreach services.

- 53 Community Health Officers trained in 2019
- 100% of CHOs supervised by mentors in 2019

Field Epidemiology Training Program (FETP)

The Field Epidemiology Training Program (FETP) is an in-service training program dedicated to training public health workers in the principles and practices of field epidemiology in several countries. eHA in partnership with Sierra Leone's Ministry of Health and Sanitation, CDC, and AFENET, implemented FETP in Sierra Leone from June 2016 through June 2019. The program integrated 25% didactic learning with 75% fieldwork and health professionals who joined FETP were trained to be expert practitioners of field or applied epidemiology. The country's public health system has been strengthened by increasing the skills of district and national level public health workers in ensuring quality surveillance, capacity for case/outbreak investigations, data analysis, and making data-informed decisions for public health actions and building workforce capacity. Since FETP was implemented, there has been a 127% increase in epidemiological capacity nationwide in three years.

- 36 field epidemiologists trained in 2019
- 68% 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.

Polio Interventions in Security-Compromised Areas (RES/RIC)

The Borno State Government partnered with organizations like the World Health Organization (WHO), the United Nations Children's Emergency Fund (UNICEF), Solina Health, and eHealth Africa to launch several initiatives that expand the reach of polio vaccination and coverage in hard to reach/ security-challenges areas in Borno State. The goal is to ensure that all eligible children under the age of five are immunized. To achieve this, eHA has trained select staff of the Borno State Primary Health Care Development Agency to produce and read maps using Geographic Information Systems (GIS) technology, run reports on missed settlements and develop micro plans for supplementary and routine immunization activities. The training methods combined classroom sessions with practical field sessions; and a digitized, mobile learning platform for further learning. 56% of the health workers trained were women to allow access to more households for delivering immunization services in conservative northern Nigeria.

- 463 hours of capacity building activities to support polio and routine immunization activities in Borno State
- 3,530 employment opportunities created in Borno State through our Polio interventions
- 2,662 health workers trained to develop micro-plans for supplementary and routine immunization activities

Electronic Integrated Disease Surveillance and Reporting (eIDSR) System

Paper-based methods present challenges that make health and disease data reporting time-consuming and error sensitive, resulting in questionable credibility and completeness of the information. The eIDSR application, developed by eHealth Africa, facilitates near real-time disease surveillance through electronic data capture and submission. The solution is designed to systematically increase reporting rates and enhance the quality of data in the system while accounting for data entry errors and contextual limitations such as poor internet/phone connectivity and inconsistent power supply. eIDSR was implemented in collaboration with Sierra Leone's Ministry of Health and Sanitation, World Health Organization (WHO), and Focus 1000. The solution was initially piloted in six health facilities and in 2019 the scale up to all 14

14 districts in Sierra Leone was completed. District staff were trained by members of the eIDSR Technical Working Group (TWG) to deliver the training for health facility staff to electronically capture and submit their weekly IDSR reports. The scale-up was completed in the second quarter of 2019. On June 6, 2019, the WHO announced that Sierra Leone had become the first country in the WHO Africa region to fully transform its national disease surveillance system from paper-based to a web-based electronic platform; routine weekly public health reporting from health facilities has now increased from 89% in 2016 to 99% in May 2019 countrywide. This was achieved using eIDSR.

- 856 health workers across Sierra Leone trained to report on 26 priority diseases using eIDSR

Auto-Visual AFP Detection and Reporting (AVADAR)

Surveillance is a pillar of the Global Polio Eradication Initiative's endgame strategy. This means that the acute flaccid paralysis (AFP) surveillance system must be sensitive enough to detect all cases of AFP, and that suspected AFP cases are promptly reported and investigated. Auto-Visual AFP Detection and Reporting (AVADAR) is a multi-country project operational in 7 polio high-risk countries in Africa that relies on community informants to report suspected cases of AFP on a weekly basis using a custom-built SMS-based mobile app. We recruited and trained local facilitators, who built the capacity of the community informants to accurately identify children with AFP using the video and send weekly reports using the app. In 2019, we began transitioning the project to government stakeholders as part of the sustainability strategy. We identified high performing informants and trained them to serve as investigators or as technical officers.

- 783 hours spent on capacity building activities to strengthen AFP surveillance and reporting systems in Cameroon, Chad, DRC, Niger, Sierra Leone, and South Sudan
- 61% increase in knowledge of technical support provision among participants of our training sessions
- 236 participants trained to serve as first and second level support officers in six countries
- 29,117 suspected AFP cases reported in 2019
- 5,591,753 number of people being observed for AFP in six countries



Building Local AFP Surveillance Capacity in the Democratic Republic of Congo

In 2017, Auto-Visual AFP Detection and Reporting (AVADAR) was launched in two pilot districts in the Democratic Republic of Congo (DRC)— Haut Katanga and Kasai Oriental districts— and expanded to three other districts in December 2018. eHealth Africa trained a total of 788 community informants in all five districts to improve polio surveillance by leveraging technology and relying on community dwellers to report suspected cases of Acute Flaccid Paralysis (AFP), the defining symptom of Polio. The project significantly increased the rate of AFP detection and reporting and put DRC and other implementing countries in a better position to meet the World Health Organization's targets for AFP surveillance. Through AVADAR, a total of 499 true AFP cases have been reported by community informants in DRC, a significant improvement over traditional paper-based surveillance systems which yielded 38 cases in the same period.

As the global investment in polio declined and it became evident that the AVADAR model was effective, it became imperative for health systems to begin to take ownership and lead the implementation and expansion of the AVADAR model in DRC, and possibly replicate it for the surveillance, reporting, and investigation of other diseases of public health concern. However, without the requisite skills, most countries will fail at effectively managing the system including reporting and managing the investigation of cases, tracking and resolving technical issues.

"The investigators are not yet at the level of skill required for them to effectively manage the project."

- Dr. Dieudonne Montemakele
AVADAR National Coordinator

This inspired the AVADAR transition phase. The objective of the transition is to guarantee the sustainability of the initiative, ensure ownership and leadership of surveillance efforts by the state partners in DRC and build their capacity to carry out the operations necessary for sustaining the successes recorded from AVADAR. These include resolving technical issues, sustaining the investigation of suspected cases, monitoring and eliminating silent reporting cases among the network of informants. Higher-level issues like dashboard/data management will be handled by the World Health

Organization (WHO) and field activities will be overseen by officials of the Ministry of Health (MOH). eHealth Africa trained first and second level support officers using a two-step approach: a theoretical aspect which took place in a classroom setting, and field practical sessions which gave trainees the opportunity to investigate and resolve real-life technical issues and report them in the field. The sessions commenced in June 2019 and a total of 17 people were trained (fourteen first-level and three second-level support for the pilot districts in DRC).

"eHA trained these technicians and they have seamlessly integrated into the surveillance system, especially as some of them are nurses overseeing health centers here. Their support is more than commendable, and we really need it."

- Dr. M'Bonda Ambunga Pamphile,
WHO Coordinator, AVADAR
Mpokolo Health Zone, Kasai Oriental District

Frederick Sakanji Sombo, previously a community informant from the Ruashi health zone in Haut Katanga district, was trained as a first-level officer last June. , he and other first-level support officers are carrying on the responsibility of sustaining AVADAR in their districts and even supporting ongoing AFP case research.

"After the transition training I received, I was able to respond immediately to information that had not been reported, ensure that all reported cases are resolved in time, detect technical problems, and participate in planning meetings in health areas. I even trained and supervised informants for ongoing case research. To handle cases of silent reporting, I have learned how to follow Standard Operating Procedures. I also know how to install and configure AVADAR and ODK applications on mobile phones and how to debug the phone."

With the new capacities that Fredrick and other first-level support officers have received, DRC is in a better position to sustain the impact from AVADAR and to apply the learnings from the project to address other public health issues.



3,000,000+
records that contain both
spatial and non-spatial
attributes

ENABLING DATA-DRIVEN DECISION MAKING

The eHA Geodatabase

The eHA Geodatabase houses all the datasets collected in the course of our work across West and Central Africa since 2012. It includes spatial and non-spatial data which can aid decision-makers and partners with the source data they need in designing and executing programs and interventions. In 2019, data from the database was used to plan and implement several interventions across our focus areas, including the Mapping of Hard-to-Reach (HTR) settlements for Integrated Childhood Case Management (iCCM) for Malaria Consortium and to design the 2020 Nigeria micronutrient survey that will assess the nutritional needs and deficiencies of Nigerians. The spatial data in the database is most useful to support IPD tracking activities, as the most recent records are available across interventions. Also in 2019, the data was made more robust by the expansion of the Nigerian health facility dataset to include more relevant information, including amenities and services available, and a ward administrative boundary creation, refinement, and alignment exercise for seven states within Nigeria.

Currently, there are 39 tables or layers which reside within the eHA's geodatabase and they cumulatively contain 3,000,000+ records that contain both spatial (location-based information) and non-spatial attributes.

 **346,359**
total POIs

 **107,902**
schools

 **11,129**
markets

 **48,556**
hospitals

 **1,789**
pharmacies

Kano Connect

Accurate data is critical for health system administrators and health program planners to develop policies and operational plans that can guide the delivery of quality health services. However, collecting and processing such large amounts of data using paper-based methods is prone to error and does not allow for real-time decision making and analysis. The Kano Connect projects supports the Kano State Primary Health Care Management board by providing mobile phones, closed user group platforms to the Routine Immunization Supportive Supervision (RISS) officers who conduct routine visits to all the health facilities to assess the quality of health services being provided and to note action points for urgent action using electronic data collection tools like Open Data Kit (ODK).

This year, eHA supported the Kano State Primary Health Care Management Board (KSPHCMB) to conduct an audit of all the health facilities in Kano State. The goal of this audit was to determine the availability/ lack and status of health equipment at the facilities, the capacity of the human resources and the land space at the health facility. Kano connect provided mobile phones for electronic data collection, converted the paper checklist to an electronic format, trained state supervisors to utilize the electronic forms and analyzed the data collected. All the data collected using the Kano Connect mobile phones is uploaded onto a dashboard that can be accessed by supervisors and decision-makers in near-real-time. This allows actions to be taken promptly so that challenges can be resolved immediately and health services can be delivered optimally.

- 1,356 mobile phones provided to support health reporting and data collection in Kano State
- 720 data collectors trained to collect data for the Health Audit exercise using ODK
- 75,543 outreaches by healthcare workers recorded using the Kano Connect Platform

Fighting Malaria, Improving Health

Fighting Malaria, Improving Health was a research project that surveyed the knowledge, attitudes, and behavior of youth towards Malaria in 3 districts in Sierra Leone. eHA was the data collection and management partner for this project. We partnered with Statistics Sierra Leone to create the sampling methodology for the survey, digitize the data collection tool in ODK, visualize the data in real-time using Aether. The data gathered from the survey was then used to train young researchers, on how to interpret data collected and share the key insights to their communities and also give them the confidence to use this information to influence decision-makers.

- 2,422 survey responses collected in 2019 to provide the insights to develop new youth-friendly approaches to raise awareness of malaria

Logistics Management Information Suite (LoMIS)

The Logistics Management Information System (LoMIS) Stock is eHealth Africa's solution to supply chain and logistics challenges for health commodities, including vaccines. The solution enables health workers to record and submit real-time reports of health commodity stock levels, utilization and wastage rates, which health supervisors can access from a dashboard. This allows for prompt decision making. LoMIS Stock is the official logistics management tool for the Kano State Primary Health Care Management Board (KSPHCMB) and is used by all 484 apex health facilities.

- 9,714 successful deliveries with LoMIS Deliver
- 30 health facilities use LoMIS Stock to report pharmaceutical commodity stock levels

Open-Source Data Solutions: Aether & Gather

Aether is a reliable and secure development platform that we developed to enable organizations to quickly build solutions that curate and securely exchange live information. It utilizes "data contracts" between systems, simplifies the movement of data between applications, and helps developers adhere to best practices for e-health system design. After many years of developing data-driven solutions for health systems, we found that we faced recurring challenges when building tailored solutions and developed the platform to address these

challenges. The unique application enables us to speed up the way effective health intervention and emergency services decisions are made. Gather is a versatile, secure and performant platform for data collection. It can be used with existing data collection tools and can be extended with a wide range of functionality to ensure data integrity and interoperability. Gather is built on the Aether platform and can publish survey data directly into any Aether publishing endpoint. In 2019, we used Gather to deploy data collection for 12 different interventions.

- 15 minutes, average time to deploy new data collection project, reduced from average of 24 hours

NCDC Data Portal

The Nigeria Centre for Disease Control (NCDC) enhances Nigeria's preparedness and response to disease outbreaks and epidemics through prevention, detection, and control of communicable and non-communicable diseases. Teams within NCDC collect, collate and analyze data to glean actionable insights that drive informed decision making and response activities, however, this was often done in silos and there were delayed or missed opportunities for further use of the data. We worked with the NCDC to build a centralized, web-based data portal for storing, processing and sharing data. With the portal, users have real-time access to data across all thematic areas which is useful for research or response activities to support the NCDC mandate and continue to increase the capacity of the organization to predict, detect and respond to outbreaks and epidemics.

- Supported the Lassa Fever, Monkeypox, Measles/Rubella, Yellow Fever and Cholera Technical Working Groups with operational data analysis and visualizations biweekly throughout the year

Malaria Mapping

Every two minutes, a child under the age of 5 dies of Malaria and the greatest proportion of these deaths occurs in Africa. According to the World Health Organization's (WHO's) latest World Malaria Report, eleven countries (ten countries in sub-Saharan Africa and India) accounted for over 70% of the global malaria burden in 2017. Nigeria alone accounted for 25% of the total number of malaria cases and had an additional 1.3 million cases. eHealth Africa supported Malaria

Consortium (MC) to map nine hard-to-reach local government areas of Kaduna State and eleven hard-to-reach local government areas of Kano State by collecting geospatial data relating to settlement names and locations, and the nearest functional primary and secondary health facilities to the settlements. eHealth Africa trained 20 field officers to identify hard to reach settlements using laid-down criteria and provided them with accurate maps and tools to capture the geo-coordinates of settlements and health facilities electronically. The data from this mapping exercise provided MC with the insight that they need to select intervention communities and health facilities; and thus, increase access to malaria prevention, diagnosis, and treatment services for all populations, especially children under the age of 5 and marginalized populations.

- 2,047 settlements in total were mapped
- 52.5% (1075 settlements) of the mapped settlements were inaccessible
- 457 health facilities closest to the hard-to-reach settlements were identified

Electronic Integrated Disease Surveillance and Reporting system (eIDSR)

The electronic Integrated Disease Surveillance and Response System (eIDSR) was created to improve the flow of information within health systems. We developed a purpose-built digital data collecting and reporting tool with mobile and desktop components that integrated with DHIS2, a health information system used in over 45 countries. Health care workers at the facility level submitted validated data at the facility level that was immediately available at the district and national levels. The data can be visualized and provide additional insights that can inform near real-time decision making about any potential disease outbreak. Through the eIDSR solution, disease prevention and control has been enhanced through the timely electronic capture and submission of data on epidemiologically important diseases. The solution is tackling the problems of low weekly priority disease reporting rates, low quality of data, poor internet and phone connectivity hindrances and reducing errors in reporting.

- 100% of facilities in Sierra Leone use eIDSR to report priority diseases

Data recording and reporting made simple with the Electronic Integrated Disease Surveillance and Response (eIDSR) System in Sierra Leone

During the 2014 Ebola Virus disease (EVD) outbreak in Sierra Leone, public health surveillance was needed to boost the country's capacity to respond. Public health surveillance is the systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality, and to improve health. Sierra Leone recorded the highest number of fatal cases of EVD because of the country's poor response capacity including the lack of an effective disease surveillance mechanism.

The existing disease surveillance system was paper-based resulting in slow and error-prone reporting of epidemiological data which hindered effective disease surveillance and outbreak response. To overcome the challenge of paper-based reporting, eHealth Africa provided the technical expertise in the development and roll-out of district and health facility level electronic Integrated Disease Surveillance and Response (eIDSR) system, a prompt and efficient system for data collection, reporting and response.

The transition to eIDSR was conducted through a phased approach at the district level and health facility level. eHA trained surveillance officers and data clerks at the national level and health facility staff, focusing on the transition process to electronic reporting while building user capacity to navigate the software and hardware. Health facility staff across all 14 districts in Sierra Leone have been trained and are now submitting weekly disease surveillance reports electronically. Data from the districts are used for decision making by the Directorate of Health Security and Emergencies (DHSE) and its partners.

David .K. Kargbo, the Data Lead for the Directorate of Health Security and Emergency (DHSE) is one of the beneficiaries of the eIDSR system in Sierra Leone. Before now, David and other healthcare workers at the DHSE could hardly access the disease surveillance summary data from health facilities in real-time.

"We had serious issues with timeliness and completeness of disease data. Since eIDSR was introduced, we have experienced an improvement in timeliness and completeness. Before eIDSR, primary health data was provided in written hard copy with all the disadvantages of damage during transmission and error during data input. eIDSR has improved the quality of health information. Staff across the 14 districts where eIDSR has been rolled out, no longer have to deliver reports to the districts

physically on Mondays. The eIDSR system has made recording and reporting data simple and easy, there is an improvement in the number of facilities that are able to successfully report by the deadline. All districts now exceed the World Health Organization (WHO) Afro and National Completeness targets."

- David K Kargbo

The eIDSR system increases access to timely and quality data for decision-making and timely response to prevent and minimize the impact of disease outbreaks. First, all data submitted through the system is automatically stored using a cloud storage system. This eliminates the possibility of loss and damage, which could occur with paper-based systems. It also ensures that decision-makers have indefinite access to historical reports and data. eIDSR also allows for images of patterns and trends in data by leveraging the data visualization facility within DHIS2.

"With the eIDSR mobile application, healthcare workers testify that value has been added to their work given the improvement in data. The improvement in the data quality can be attributed to the District Data Approval feature embedded in the eIDSR system and the mail and SMS reminders to facility and district staff. Data Approval ensures that districts take responsibility for the quality of data shared via the system. Until this step is taken, unapproved data cannot be seen by other users. The national level now receives complete and actionable data, is able to follow-up at the facility and district levels."

- Solomon Sogbeh
HSE Data Support staff

The improved capacity of the facility and district staff has better positioned the teams to respond to potential or actual outbreaks. During an outbreak, data from various locations can be visualized as heat maps that show spread and/or containment of the emergency, allowing the outcomes of response activities to be seen in near-real-time. With the integration of the eIDSR system with DHIS 2, a health information system that is used in over 45 countries, surveillance partners have greater access to district and national data.

The eIDSR system benefits the people of Sierra Leone in terms of providing a more accurate and reliable system for monitoring disease occurrences and minimizing disease outbreaks and it also allows for healthcare workers to capture and disseminate surveillance data faster, doing more with less time.

"The proportion of districts with complete health facility weekly reports increased from 78% before introduction of e-IDSR to 96% after migration to e-IDSR."

- (CDC)



LOGISTICS AND OPERATIONAL SUPPORT

117 Call Center

The 117 Call Center was established by the Ministry of Health and Sanitation (MoHS) in 2012, as part of a wider support system to improve maternal and child health. It enabled the public to register concerns, inquiries, and observations on free health care services for pregnant women, lactating mothers, and children under the age of five. Five months into the Ebola Virus Disease (EVD) outbreak, the Public Health National Emergency Operations Center (PHNEOC) system was established, and it included scaling up and integrating the 117 Call Center into its operations. eHA also supported the MoHS to operationalize a 24-hour national call center with a decentralized alert management system across 13 of Sierra Leone's 14 districts which are manned by district coordinators and operators. eHA developed an automated, user-friendly software system that collects syndromic information pivotal to surveillance as well as remote sync abilities that enables referral and emergency response coordination. The call center has transitioned into a strong disease surveillance mechanism in support of the government's One Health Initiative, a multi-sectoral partnership to prevent, prepare and respond to disease threats.

- 4,495 calls were recorded via the 117 Call Center in H1, 2019

Emergency Operations Centers (EOCs)

The National Emergency Operations Center in Nigeria's capital, Abuja, provides guidance, regulations, and policy directives for the implementation of emergency response activities across Nigeria. eHealth Africa received funding from the Bill and Melinda Gates Foundation to build and deploy the National EOC and seven state-level EOCs located in Bauchi, Borno, Kaduna, Kano, Katsina, Sokoto, and Yobe states. The EOCs across Nigeria serve as command centers for national and state government stakeholders, and partner organizations to review and monitor data, strategize and take immediate actions in emergency situations.

The Public Health National Emergency Operations Center (PHNEOC) in Freetown, Sierra Leone was set up in 2014 at the height of the Ebola virus outbreak to coordinate response activities to the outbreak. Currently, the PHNEOC provides a coordination mechanism for national, state and local departments and partners to collaborate and support the provision of preventive and emergency health services more efficiently. eHA supports the operations of all eight EOCs in Nigeria and the PHNEOC in Sierra Leone, providing constant electricity, internet access, and data management infrastructure so that decision-makers can convene, discuss, and plan based on insights from the data.

World Food Programme Warehouses

The World Food Programme (WFP) provides food aid to support an estimated 1 million vulnerable people who are affected by the conflict in Northeast Nigeria monthly. The WFP Kano Warehouse project is an essential part of the supply chain which enables the provision of the required food commodities to those in need. eHA manages the operations of the warehouse in Kano State, ensuring that food commodities are handled and stored in a safe and efficient way. Earlier this year, eHA also managed the WFP Borno warehouse, and common storage space for the Logistics Sector, Nigeria. The storage space is provided to ease the operations of humanitarian organizations working in Borno State.

- 2,614,901 packages of food handled by the WFP warehouses in Kano and Borno
- 204 people employed from the host communities

STRIVE

During the Ebola Virus Disease (EVD) outbreak in 2014, the CDC engaged eHA to assist in the implementation of the first-ever clinical trial in Sierra Leone. The clinical trial was to test a vaccine against the Ebola Virus. eHA facilitated the construction and maintenance of a climate-controlled warehouse to maintain the physical records of participants of STRIVE. We provided logistics and operational support to the seven enrollment and vaccination sites. eHA's ICT technicians also provided technical assistance to the Ministry of Health and Sanitation and College of Medicine and Allied Health Sciences (COMAHS) and worked with Technical Resources International Inc (TRI) to maintain electronic clinical data. eHA continued to work with the COMAHS to prepare for a United States Federal Drug Administration (FDA) audit of the participants, as required for licensure of the Ebola Vaccine used in STRIVE.

— 595 square meters of space managed

Sierra Leone Ebola Database (SLED)

The Sierra Leone Ebola Database (SLED) project is a consolidated database to store EVD outbreak-related data. Housed and managed at the PHNEOC, eHA implemented the SLED project in close collaboration with the CDC the Government of Sierra Leone and CONCERN Worldwide. For four years, the project ensured the development and maintenance of a consolidated database of EVD related records. Data managers were trained to effectively ensure proper data storage, security, and linkages across the collected records. Access to this database equips researchers with the information needed to better understand risk factors for potential future disease outbreaks. In addition, the SLED project in partnership with CONCERN Worldwide is successfully providing families who have lost loved ones during the Ebola outbreak with the location of their burial/gravesites via a dedicated reunification program. eHA provided operational support.

— 538,082 collected records from five distinct sources to create a comprehensive database of information of the 2014 EVD crisis and response



National Primary Health Care Development Agency (NPHCDA) Annex Renovations

Reliable infrastructure is pivotal to the success of any health project. A conducive work environment and the availability of work tools such as internet and communication systems can boost employee performance and productivity. eHealth Africa received funding from the Bill and Melinda Gates Foundation (BMGF) to renovate the annex offices of the National Primary Health Care Development Agency (NPHCDA) in Abuja Federal Capital Territory (FCT). The renovation involved the correction of structural defects, renovation of office spaces, electrical and information technology installations and office furnishings. eHA also trained relevant staff of NPHCDA's Technical Support Unit and provided resources and guides to enable them to maintain the office infrastructure. This renovation will enhance the agency's ability to better deliver on its mandate.



HEALTH DELIVERY

Sokoto Meningitis Laboratory

After the 2016 Meningitis outbreak which claimed 1,166 lives in Nigeria, the Sokoto State Ministry of Health partnered with the International Foundation Against Infectious Diseases in Nigeria (IFAIN) and eHealth Africa to deploy the Sokoto Meningitis laboratory. The lab handles the testing of cerebrospinal fluid (CSF) samples collected from patients with suspected cases of CSM in Kebbi, Sokoto and Zamfara states. eHA constructed the lab, currently manages the facility and coordinates sample transportation from health facilities across local government areas in the Sokoto metropolis. The laboratory supports the management of Cerebrospinal Meningitis (CSM) by providing world-class laboratory investigations that isolate the causative organisms and determine antibiotic sensitivity. The results of these tests are then directly reported to the medical officers in order to direct the course of treatment.

- 122 Meningitis samples collected and processed by the Sokoto Meningitis Lab

Sickle Scan

The Sickle SCAN is a rapid diagnostic test kit that provides a low-cost solution to newborn screening, genetic counseling and diagnosing patients with acute anemia. It does not need supporting equipment or rigorous training and reduces patient wait times for feedback on their SCD status. The device works with dry blood spots and gives a real-time result in less than 5 minutes which is greater 99% accuracy. It comes with a pre-treatment module (containing buffer). It can be used in a low resource area and does not require electricity to function. We are exclusive distributors of the test kit in Nigeria and have partnered with state governments of Bauchi, Gombe and other Northern states to provide free sickle cell testing as part of free medical outreach events.

- 1,630 people reached with Sickle Cell Disease testing services

Vaccine Direct Delivery

Vaccine Direct Delivery (VDD) is a third-party logistics service provided to the State Primary Healthcare Development Agencies, to ensure that vaccines and dry goods are delivered safely and in a timely manner to health facilities. The service provides quality data and reporting to aid decision making regarding planning, scheduling and routing optimization which improves general vaccine management and reporting. The service has freed up an additional 1- 6 hours each week for health workers - time previously spent by health workers in transit to obtain vaccines, that can now be dedicated to seeing more patients and improving health delivery.

- 2,785,484 children vaccinated in Bauchi, Sokoto and Zamfara States



Getting Vaccines to the Last Mile in Sokoto State

Sufyanu Abdullahi is the Assistant State Cold Chain officer at the State Cold Store in Sokoto State. He is no stranger to the challenges of the vaccine cold chain system in Sokoto state, having served as the Assistant Local Government Cold Chain Officer (LCCO) for Sokoto South LGA prior to his current role. The state cold store receives its supply of vaccines from the zonal cold store in Kano State for Routine Immunization (RI) or from the National Primary Health Care Development Agency (NPHCDA) in Abuja for Supplementary Immunization Activities (SIAs). He is directly responsible for maintaining the vaccine records at the cold stores and keeping track of how much vaccines are received and dispatched to health facilities or to vaccination teams during SIAs.

Currently, Sokoto state utilizes the Push-plus system of vaccine logistics in which vaccines and dry goods are delivered directly from the state cold store to last-mile health facilities. Before the commencement of Push-Plus and when Sufyanu was still the LCCO at Sokoto South LGA, health facilities needed to visit the Local Government (LG) cold store to collect their vaccines. Smaller health facilities that did not have cold chain equipment—called cascade facilities—would have to visit the apex facilities on a daily basis to get the vaccines that they need for their RI sessions. This was called the Pull system.

This system was inefficient as it often led to stockouts of vaccines at the health facilities. Cascade facilities often could not get their vaccines in time because of the distance from the nearest apex facility. The apex facilities, in turn, encountered the same challenge. On many occasions, health facility officers would visit the LGA cold store to get vaccines but would be unsuccessful because LCCOs had not collected vaccines from the State cold store. In addition to the loss of time spent traveling to pick up vaccines, there was a high risk of vaccine damage or loss of potency because of the inability to keep the vaccines in at the right temperatures while in transit.

In 2016, Sokoto State adopted the Push-Plus system and engaged eHealth Africa to provide third party logistics services through the Vaccine Direct Delivery (VDD) Project. Using an application called LoMIS Deliver solution, eHA plans, schedules, and routes deliveries to enable health delivery officers to choose the correct quantity of vaccines and dry goods from the state cold stores and deliver them to health facilities equipped with cold chain equipment. Sufyanu, in his current role as the Assistant State Cold Chain Officer, packages the vaccines for the health facilities and LGA cold stores in the correct amounts and releases them to eHA's health delivery officers who deliver them at the appropriate temperatures to the cold stores and health facilities.

The process of determining what quantities to deliver at the cold stores and health facilities is fully automated to avoid manual errors. eHA also provides reverse logistics services—returning balance stock or waste, if any to the state cold store.

Thanks to VDD, LGA cold chain officers no longer need to visit the State cold store because eHA delivers vaccines directly to the LG cold stores, and to the apex health facilities in sufficient quantities to also accommodate the needs of the cascade facilities. The data from VDD provides decision-makers and other stakeholders like Sufyanu with accurate, near real-time data for decision making and forecasting using LoMIS Deliver. Now, he is better able to focus on supporting the planning and monitoring of vaccination activities in the state using accurate data.

"For good practice, the vaccine push system is the best. It has helped to ensure the potency and the availability of vaccines during delivery in all the LGAs."

- Sufyanu Abdullahi



IMMUNIZATION

Vaccine Audit

The Department of Logistics and Health Commodities (DLHC) is an arm of the National Primary Healthcare Development Agency (NPHCDA) that coordinates immunization supply chain activities in the country to ensure that potent vaccines are available for immunization at all times. As part of the drive to improve vaccine accountability and stock management, the agency in collaboration with the United Nations Children's Fund (UNICEF) and other partners within the National Logistics Working Group (NLWG) engaged the eHealth Africa-KPMG consortium to conduct a nationwide physical stock count of vaccines and related commodities and a qualitative assessment of the inventory management practices at cold stores and health facilities in the seven northwestern states of Nigeria (Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto, and Zamfara). The results of the exercise yielded vital information about the performance of the vaccine supply chain which could aid vaccine procurement planning for 2020, and thus prevent vaccine stock-outs at health facilities in the region.

- 1,588 health facilities and cold stores audited in NW, Nigeria
- 28,354,469 doses of vaccines counted

Kano Connect

The Kano Connect project supports the Routine Immunization Supportive Supervision program (RISS) in Kano State by ensuring that health workers receive hands-on supervision to deliver quality immunization services and comply with global standards. Using Kano Connect-encoded mobile phones, RISS officers visit health facilities all over Kano and ask questions relating to RI service delivery from digitized checklists. Their observations, identified gaps as well as the geo-coordinates of the health facilities are submitted and stored on a dashboard which can easily be accessed and reviewed by managers for decision making.

This year, eHA supported the Kano State Primary Health Care Management Board (KSPHCMB) to develop the Standard Operating Procedures (SOPs) for conducting RISS activities. This will improve the quality of RI services delivered at health facilities within the state.

- 14,250 Routine Immunization Supportive Supervision sessions conducted in 2019
- 312 Local Government Area level supervisors trained on the new RISS SOPs
- 100% of RISS reporting compliance across 44 LGAs in Kano State

Vaccine Direct Delivery

The Nigerian government adopted a direct delivery model called Push Plus in 2013, to transform its supply chain at the state level. A direct delivery model is one that delivers vaccines and dry goods directly from the state cold store to the last mile health facilities according to customized schedules, bypassing the LGA warehouses completely and preventing stock-outs. Our VDD service is based on this direct delivery model. VDD uses the LoMIS Deliver solution and plans, schedules, and routes deliveries and shares this information with health delivery officers, to allow them to make selections on the number of vaccines and dry goods from state cold stores to health facilities equipped with cold chain equipment. VDD has reduced the stock out level at the health facilities it has been implemented in, ensuring that vaccines are available when they are needed.

- 9,642,576 vaccines delivered to health facilities in Bauchi, Sokoto and Zamfara states
- 5,462,979 dry goods delivered to health facilities in Bauchi, Sokoto and Zamfara states
- 67% of stakeholders using VDD data for RI decision-making

LoMIS Suite

Logistics Management Information Systems (LoMIS) Suite is a package of offline-capable web and mobile applications, LoMIS Stock and LoMIS Deliver. LoMIS Suite is eHealth Africa's response to the challenges of poor accountability and visibility in vaccine management. LoMIS Stock is an inventory management tool that allows health workers to report in near-real-time, the status of cold chain equipment and vaccine stock levels, using mobile devices. The data from LoMIS Stock is accessed by decision-makers through the web dashboard, and is used to estimate optimal stock levels, plan restocks of health commodities and schedule cold chain maintenance for the health facilities. LoMIS Deliver is a supply chain management tool that automates the process of paper-based vaccine ledger entry aiding drivers and health delivery officers to capture the quantity of vaccines on-hand at the health facilities and the quantity of vaccines delivered. In this manner, LoMIS Suite reduces wastage of vaccines and stockouts and ensures that health facilities are always able to provide immunization services to those who need it.

- 4,315,523 dry goods monitored through LoMIS Deliver
- 561 health facilities in Bauchi, Sokoto and Zamfara States supplied vaccines through LoMIS Deliver
- 91% uptime on cold chain equipment in facilities using LoMIS Stock
- >80% of facilities reporting stock sufficiency

Vaccinator Tracking System/ IPD Tracking

Supplementary Immunization Activities (SIAs)—Immunization Plus Days (IPDs) and Outbreak Responses (OBRs)—are one of the four strategies put forward by the Global Polio Eradication Initiative (GPEI) to halt the transmission of the poliovirus and thus, eradicate the disease. SIAs are intended to complement Routine Immunization but in some areas, they are the major means of reaching unimmunized children and ensuring that they are vaccinated against polio and other vaccine-preventable diseases. SIAs take immunization services directly to children at their doorsteps, thereby bridging any gaps that may result from an inability to access vaccines at the health facilities. The Vaccinator Tracking System is implemented by eHealth Africa, in partnership with other polio eradication partners to improve vaccination coverage, increase accountability and ensure that the vaccination teams visit all the target settlements during SIAs.

eHA provides healthcare administrators and partners in the polio eradication space with daily insight into the activities of vaccination teams during SIAs by collecting passive tracks of the vaccination teams using Geographic Information Systems (GIS) technology-enabled android phones and uploading them onto a dashboard for visualization. This provides stakeholders with near-live data about the geo-coverage of the vaccination campaign. The system also identifies missed settlements on a daily basis so that immediate action can be taken and the settlements can be included in the ongoing campaign. The end effect of this that more eligible children are reached and herd immunity to the poliovirus is increased.

- 24,077 vaccination teams tracked in 2019
- 72,321 communities tracked in 2019

Polio Interventions in Security-Compromised Areas

The decade-long conflict in Northeast Nigeria reduced the coverage of routine and supplementary immunization interventions leading to a reduction in herd immunity and an increased susceptibility of children under the age of five to polio, especially in security-compromised parts of Borno State. The Borno State Government and polio eradication partners therefore launched several strategies targeted at security-compromised areas to complement the already existing routine and supplementary polio immunization activities. The goal of these initiatives is to expand polio vaccination and surveillance coverage in hard to reach settlements (i.e. security challenged areas) in the state and to ensure that all eligible children under the age of five are immunized.

eHealth Africa provides the Geographic Information Systems (GIS) data that is used to plan and track these interventions for monitoring and reporting purposes.

- 474,000 children vaccinated in both security-compromised and non-security compromised areas
- 86 new settlements identified and named



The Everyday Heroes of Polio Eradication

"We heard gunshots coming from the center of town in Gaboru around midnight. As they got closer to the Maternal and Child Health Center (MCH) where we were spending the night with the Local Government Area (LGA) team, we decided to escape and hide in a gutter just outside of town. Since we didn't know what was happening, we lay there for over four hours till the day broke."

This is not a scene from a crime thriller but an account of what happened during a Polio campaign to Aliyu Kerme Mahmud, an eHealth Africa field consultant for Ngala LGA of Borno.

Since the discovery of the wild poliovirus in July 2016 in the State of Borno, the Global Polio Eradication Initiative (GPEI) partners i.e. the World Health Organization (WHO), United Nations Children's Fund (UNICEF), Bill and Melinda Gates Foundation (BMGF), Rotary International, eHealth Africa (eHA), Solina Health, and the U.S. Centers for Disease Control (CDC), collaborated with the government of Nigeria to launch robust response strategies to expand the reach of polio vaccination in the State. eHA provides technical support to the State with the provision of GIS-enabled devices used for evidence of vaccination team visits and with informative maps used at every phase of the Polio campaigns towards their planning, delivery, and monitoring.

But it is not technology that alone caused tremendous progress in Polio eradication efforts in Borno since 2016. It is the human factor combined with technology i.e. an environment of trust, collaboration, and cohesiveness between all stakeholders, and contextual insight and cooperation of local partners at the LGA level that played a critical role in increasing coverage and accountability.

For eHA, it is our field staff that are the eyes and ears for the Polio program and who have been instrumental in providing valuable insight and enabling people-centric, data-driven decision making. eHA has 28 field staff in Borno, each assigned to support a particular LGA. They form an integral part of these LGA teams and work with them through the entire lifecycle of a campaign from the micro-planning to the post-campaign feedback, thereby contributing towards continuous improvement of the process. The field teams are also the first-level technical support for the campaign equipment e.g. phones and Indigo vaccine carriers and ensure their judicious usage, preparation, and deployment. The presence of LGA consultants has made it possible for introduction, acceptance, and adoption of new technologies at the LGA level e.g. the Missed Settlement Tracking and Analysis (MISTA) tool first implemented in Borno in November 2017. Due to MISTA, it

became possible to provide daily feedback on settlements to the vaccination teams during the campaigns at the LGAs, rather than wait till the mop-up day, a practice which has significantly increased coverage during Immunization Plus Days (IPDs) from 80.7% in November 2017 to 99.4% in October 2019. The missed settlements that were visited before the mop-up day went up from 11% in November 2017 to about 44% in October 2019. Due to the significant impact they have made in Polio interventions, the consultants are now providing similar support to Routine Immunization in security-challenged environments in Borno.

However, this impact comes at the cost of uncomfortable and often unsafe situations due to operations in an insecure environment. *"Fear has always been the storyline during activities"* as Anthony Onoja, our Kaga LGA consultant put it, after narrowly escaping an armed opposition group (AOG) attack during the July 2019 IPD campaign. When the field staff doesn't have the luxury of taking choppy trips on United Nations (UN) helicopters to their hard-to-reach LGAs, they face challenges of difficult terrain, made worse with the rains. It is in these insecure and uncomfortable situations that their established community networks provide them with shelter and protection. All of the eHA field teams are Borno residents and are well-accepted and respected in their communities. Aliyu Mohammed, our consultant for Magumeri described an incident where the Magumeri Local Immunization Officer (LIO) opened his home for all partners to hibernate as the community came under attack during a campaign. The hiring of Borno residents as consultants also aligns with the eHA's core values of Growth and Learning and Ownership. It contributes towards building the capacity of the State as well as ensures the sustainability of systems and processes put in place for Polio eradication towards other interventions, which is critical considering it is the last mile for the Polio program in Nigeria.

With Nigeria on the verge of being declared Polio free, it is important to recognize the immense and valuable contribution of the Polio foot soldiers, the health workers and field teams who continue to tirelessly work at the frontlines, sometimes in perilous environments as in Borno, with quiet and inspiring determination and with the sole purpose of eradicating the disease. Without them, this milestone would not be possible and for this reason, the field teams are everyday heroes of Polio Eradication- whether they work in Kano, Bauchi or Borno. As Dr. Adeshina Aladeshawe, Program Officer at BMGF, who regularly meets with the field teams in Borno and beyond, said to them in a recent meeting, *"When you are looking at the mirror, remember you are looking at a national hero. You are doing this for the whole country. You will be a part of history- it is a story to tell your kids."*



IMPROVING EMERGENCY RESPONSE

Emergency Management and Preparedness (EMP)

The Emergency Management Preparedness (EMP) program was implemented in Sierra Leone to provide operational support for emergency management coordination at the Public Health National Emergency Operations Center (PHNEOC) and to train Sierra Leone's Ministry of Health and Sanitation (MoHS) staff in emergency preparedness and management processes to increase their capacity to prepare and respond to public health-related threats. This multi-year program was initially implemented at the PHNEOC in Freetown and was successfully scaled up to all 14 districts in Sierra Leone, providing combined in-person and hands-on workshops with virtual training elements and simulation exercises.

- 330 health care workers trained in emergency management and ready to respond to public health emergencies
- 105 healthcare workers trained in disease outbreak response via simulation exercises

Golden Egg Success Story: 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 (GHS), 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 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, 5 reports of measles were channelled 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, and 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 sent 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 Vandj, 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.”

- Isha Kamara

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 25 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.



As of July 2019, there are 25 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.



RESEARCH

Schistosomiasis Study

Schistosomiasis and nineteen other diseases are classified by the World Health Organization as Neglected Tropical Diseases. The disease is endemic to Nigeria and existing data places Nigeria as home to the highest number of recorded cases in the world. eHealth Africa partnered with Emory University to conduct research that compared three diagnostic methods to determine their effectiveness in detecting acute and chronic schistosomiasis in low-resource settings. The study also assessed the knowledge, attitudes, and perceptions about *Schistosoma haematobium* infection (urinary schistosomiasis) among communities in five Local Government Areas in Kano State. The responses from the survey yielded local myths surrounding the symptoms of urinary schistosomiasis. Some communities believed that red urine (haematuria or blood in the urine) was a normal and rather harmless phenomenon—a rite of passage or a sign of manhood for young boys. It was also linked to the menstrual cycle for girls or women. Yet another misconception was that it could be caused by staying long hours under the sun. Among women especially, underreporting of the disease was exacerbated by socio-cultural norms and beliefs that prevent them from handling urine samples in public. With these insights gained from the study, eHA and Emory University hope to influence policies, strategies and plans relating to the diagnosis and control of Schistosomiasis in Nigeria.



The research team: (L-R) Chibuzo Babalola (Emory University), Tolulope Oginni (eHealth Africa) and Angela Udongwo (Emory University)



Training of Community Health Workers to administer questionnaires

"The support that eHealth Africa has been giving the state and the SERICC team has been fantastic over the years, in terms of technology and data. It has transformed our reporting system and we now use a digital tool to conduct our surveys in the state. This has improved the quality of data coming into the state."

- Dr. Bashir Sanusi
Program Manager, Kano State Emergency Routine Immunization Coordination Center (SERICC)

"The AVADAR project has greatly improved the quality of surveillance in Kousseri district. The informants send alerts for any cases of paralysis encountered, which broadens the scope of the real cases of AFP. They were also educated about other vaccine-preventable diseases so that active surveillance can be more holistic. They also notify us of cases of other priority vaccine-preventable diseases using the AVADAR phones, at zero cost."

- Nayang Costel
Health Office head,
Kousseri District, Cameroon.

"The training on Map production and microplan generation given by eHealth Africa have been most useful to me in my work. I have generated more than 200 maps thanks to the skills that I acquired during the map automation training"

- Yusuf L. Dauda
Higher Statistical Officer,
Kaduna State Bureau of Statistics (KDBS)

"What LoMIS Stock has done for vaccines is phenomenal and we hope to emulate this for the Drug Revolving Fund (DRF)."

- Pharmacist Abdulazeez Hamisu
Director, Pharmaceutical Services
Kano State Primary Health Care
Management Board

"Now, there is no need for any apex facility to visit the LGA cold store, because eHealth Africa delivers their vaccines twice every month. There is a great transformation from the old vaccine pull system, and the new push system which eHA is implementing."

- Nura Muazu
Cold Chain Officer, Sokoto State

"The 117 toll free hotline has been one of our greatest achievements in the Ministry of Health, with dedicated staff thinking fast, multi-tasking and using their initiative for best results. Call handlers often work under great pressure but they overcome the challenges"

- Mr. Harold Thomas
Communication Lead, Directorate of Health Security and Emergencies Ministry of Health and Sanitation

"First, I learned how to get viable seeds. Then I learned how to prepare my land for planting and how to detect and prevent pests like Fall Armyworm using biological methods like neem seeds. In addition to this, I interacted with other farmers from different local government areas in Kano state and we shared our experiences."

- Sanusi Abdullahi
Farmer, Doguwa LGA, Kano State

"eHealth Africa's presence in Sokoto state and the benefits to the state cannot be overemphasized. Several patients have had access to free Cerebrospinal Fluid and blood diagnostic tests leading to several diagnoses which may have been missed. Considering the teeming number of financially-constrained patients, these free investigations have eased the burden of cost on the patients and have helped us to provide accurate treatment."

- Dr. J. A. Edimek
Medical Officer of Health,
Military Hospital, Sokoto

WHAT OUR PARTNERS SAY ABOUT US

"We have been working closely with eHealth Africa on the Polio program in Borno for some years now. Their invaluable technical support in Geographic Information Systems (GIS) mapping and data analysis has helped to expand the polio vaccination coverage in the state."

- Yerwama Tijjani
Borno State Monitoring & Evaluation Officer

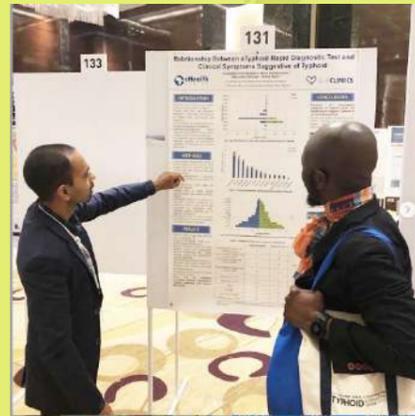
"Due to the training of front-line personnel in the Sierra Leone Ministry of Health and Sanitation (MoHS), there has been an improvement in the timeliness of responses to disease outbreaks"

- Dr. Mohamed A. Vandi
Director, Directorate of Health Security and Emergencies Sierra Leone

THIS YEAR AT eHA



Berlin Meetups: Meet Your Neighbours



11th Conference on Typhoid and other Invasive Salmonellosis



World Sickle Cell Day in Kano State



The Futures of eHealth Conference in Berlin



Humanitarian and Logistics Conference



Young Leaders for Health Conference



GIS/Data Science Hackathon



Sierra Leone Success Celebration



Kano Software Meetups



NCDC Pre-Conference Workshop



African Shared Value Conference



World Sickle Cell Day in Edo state



FutureHack 2019

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Kano State Primary Health Care Development Board
Klynveld Peat Marwick Goerdeler (KPMG)
Malaria Consortium
Nigeria Centre for Disease Control (NCDC)
Restless Development
Sierra Leone Ministry of Health and Sanitation
Sokoto State Primary Health Care Development Agency
Solina Health Limited
U.S. Centers for Disease Control and Prevention (CDC)
University of Nebraska Medical Center (UNMC)
World Food Programme (WFP)
World Health Organisation - Cameroon
World Health Organisation - Chad
World Health Organization (WHO)
Zamfara State Primary Health Care Development Board





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