NEW MODELS FOR BUILDING HEALTH INFORMATICS TECHNICAL CAPACITY:
ESTABLISHING THE WEST AFRICA HEALTH INFORMATICS TEAM (WAHIT)
MARCH 2020

This publication was prepared by Liz Nerad and Anaïse Kanimba of Palladium for the Health Policy Plus project.

All photos were taken by HP+, with the exception of page 6, which was taken by USAID/Morgana Wingard.


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## Abbreviations

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<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>API</td>
<td>application programming interface</td>
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<tr>
<td>CAPS</td>
<td>Leadership Capacity Strengthening</td>
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<td>DHIS2</td>
<td>District Health Information Software 2</td>
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<td>DQR</td>
<td>Data Quality Review</td>
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<td>E4D</td>
<td>Evidence for Development</td>
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<tr>
<td>ECOWAS</td>
<td>Economic Community of West African States</td>
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<tr>
<td>ETL</td>
<td>extract, transform, load</td>
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<tr>
<td>FY</td>
<td>fiscal year</td>
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<td>HIS</td>
<td>health information system</td>
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<td>HISP</td>
<td>Health Information Systems Program</td>
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<td>HMIS</td>
<td>health management information system</td>
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<td>HP+</td>
<td>Health Policy Plus</td>
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<tr>
<td>ICT</td>
<td>information and communication technology</td>
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<tr>
<td>IDSR</td>
<td>Integrated Disease Surveillance and Response</td>
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<tr>
<td>IT</td>
<td>information technology</td>
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<td>MOH</td>
<td>Ministry of Health</td>
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<td>NTD</td>
<td>neglected tropical diseases</td>
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<tr>
<td>REDISSE</td>
<td>Regional Disease Surveillance Systems Enhancement</td>
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<td>USAID</td>
<td>U.S. Agency for International Development</td>
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<td>WAHIT</td>
<td>West Africa Health Informatics Team</td>
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<td>WAHO</td>
<td>West African Health Organization</td>
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1. Introduction
The West Africa Health Informatics Team (WAHIT), based at the West African Health Organization (WAHO), is a team of software developers and health information system (HIS) experts that provide on-demand technical assistance to countries while building local capacity in the region. Originally founded in the wake of the Ebola outbreak as a proof of concept to test innovative models for building local health informatics capacity, WAHIT evolved into a foundational component of WAHO’s leadership in health information strengthening, building capacity at national and regional levels.

After many months of research, WAHIT officially commenced as a U.S. Agency for International Development (USAID)-funded and managed activity in 2016. Over the following three years, WAHIT trained over 250 HIS experts in West Africa through 26 country missions. Activities ranged from training on server management at the country level, consolidation of weekly Integrated Disease Surveillance and Response (IDSR) data at the regional level, and business process improvement at WAHO.

By the end of 2019, WAHO committed to fully incorporating the team into its permanent organizational structure, however the institutionalization process was not easy and is still not complete. This report shares the journey of establishing WAHIT, including the many proposed models, adaptations, negotiations, and changes along the way.

2. Background
The need
The 2013–2015 Ebola outbreak in West Africa exposed severe weaknesses in health information systems in the region. The outbreak went undetected by the regional and global community for months, infecting nearly 28,000 and claiming the lives of more than 11,000 people. Responders lacked critical information—such as case notification, transmission rates, geographic spread, and health service availability—needed to monitor and manage the situation comprehensively and in real-time. If this information had been readily available, large-scale human and economic losses could have been avoided.

The Response
During the 2015 National HIS Summit in Accra, hosted by WAHO and USAID after the outbreak, all 15 members of the Economic Community of West African States (ECOWAS) cited a lack of technical capacity to maintain and adapt critical digital health platforms as contributing to challenges faced during the Ebola outbreak in West Africa. Many ministries of health within ECOWAS rely heavily on international support because many countries lack a critical mass of local experts needed to build and maintain an HIS. This reliance on external international support jeopardizes the successful implementation of digital tools for health and can be a critical impediment to further progress in public health systems development.

A key recommendation from the 2015 National HIS Summit was for technical and financial partners to contribute to efforts to create a regional center of excellence for health information systems, aligning with recommendations from

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the 2012 regional HIS policy and strategy developed by WAHO and ECOWAS with support from the USAID/West Africa Mission. While the center would build long-term strategic HIS resources in the region, USAID also recognized the need to immediately strengthen local technical capacity within the region.

Following the epidemic, the USAID Global Development Lab’s Ebola Team conducted research to understand current models for providing HIS technical assistance to ministries of health within the region and options for moving short-term technical assistance to long-term sustained capacity. Specifically, advanced health informaticians and software engineers were identified as lacking, contributing to the inability to integrate disparate data systems at the pace required during the Ebola epidemic. Findings from the 2016 USAID report *Fighting Ebola with Information* included a specific recommendation to “build staff technical capacity and data literacy” in order to “leverage digital systems and real-time data in support of operations, programs, and decision-making” (p. 12).²

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As part of the Ebola response and recovery efforts by USAID, the Global Development Lab’s Ebola Team received emergency supplemental funding from Congress for recovery and resilience programs in West Africa. Accordingly, the Global Development Lab provided initial funding for the launch of a regional team of health informatics experts to be based within WAHO, the team now referred to as WAHIT. WAHIT was initially conceived as a team of five health informatics experts from the region, implementing a model to provide urgent technical assistance to ministries of health within the region, while building long-term technical capacity of local informatics experts in support of the regional HIS center of excellence.

### 3. Designing WAHIT

Research conducted by the Global Development Lab’s Ebola Team recognized strategic partnerships would be critical in successfully establishing, operationalizing, adapting, and sustaining the proof-of-concept WAHIT model. Aligned with recommendations from the 2012 and 2015 national HIS summits to establish a regional HIS center of excellence and urgently build local capacity within the region, the Global Development Lab’s Ebola Team partnered with USAID/West Africa to provide initial funding to WAHO under the Leadership Capacity Strengthening (CAPS) project. Placing WAHIT—pillar of the center of excellence—within WAHO aligned with findings that capacity building approaches should be regional, based on the cross-border nature of the epidemic and also the limited availability of existing skilled professionals within the region. Further, the decision aligned with USAID’s long-standing partnership with WAHO, WAHO’s existing leadership in HIS, and WAHO’s regional mandate and operating model serving ministries of health within the region.

To supplement WAHO’s leadership and regional mandate to work across ministries of health in West Africa, a technical partner was needed to build capacity and provide technical leadership in setting up WAHIT. In 2015, Palladium participated in USAID’s West Africa Ebola Response, Recovery and Resilience Call for Partner Concept Papers proposing to integrate data systems and strengthen surveillance systems in Liberia. Following conversations with USAID, the original concept presented by Palladium evolved into a broader technical role to support WAHO in establishing WAHIT. Funding was provided through USAID’s Health Policy Plus (HP+) project, on which Palladium is the prime implementing partner. This leveraged Palladium’s long-standing experience strengthening health systems through policy and data, coupled with practical experience implementing regional informatics teams within Africa, in order to support WAHO in the formation, training, and operationalizing of WAHIT.

Ideas for innovative partnerships and funding models to support WAHIT were discussed early on. The lack of health informatics capacity was driven in part by the fact that, regionally, the limited number of workers skilled in software engineering were already employed by private-sector companies. USAID explored partnerships with Silicon Valley technology companies to leverage corporate social responsibility programs to train West African experts, however it was difficult to align the value propositions and strategies for sustainability and therefore they did not come to fruition.

To infuse a learning component within the model, the Evidence for Development (E4D) project managed by USAID/West Africa joined the initiative. As a new model providing support and capacity building to countries, USAID was committed to learning throughout the process to assess trends in awareness of, demand for, and satisfaction with WAHIT. E4D conducted operations research to obtain objective feedback from the regions regarding implementation of WAHIT. Baseline, midline, and endline studies were conducted, which provided feedback on the activity and were used to adapt WAHIT’s delivery model.

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4. Operationalizing the Team

In September 2016, all WAHIT partners were on board and ready to begin setting up the team. WAHIT officially kicked-off at the 2016 National HIS Summit in Cape Verde and was met with excitement in the region. With a public commitment at the meeting and the funding in place, the WAHIT partnership hit the ground running.

Location

The first step was to determine where the team would be located based on a variety of factors including ease of deployment, quality of digital connectivity, affordability, local talent pipeline, language, and desirability of living conditions. After analyzing the criteria against major hub cities in West Africa—including Abuja, Accra, and Dakar—and discussion on the feasibility of each, Accra was recommended. However, after careful review, WAHO advocated that the team be based at its headquarters in Bobo Dioulasso, Burkina Faso in order to integrate within WAHO. While this was initially met with reluctance from USAID, given concerns about the ability to attract expert talent, it was recognized that sustainability of the team relied on institutionalizing within WAHO. Co-location allowed WAHIT to take advantage of WAHO’s operating procedures and ultimately leverage funding from other WAHO projects. Further, placement at WAHO headquarters saved resources that would have been spent on office space and administration.

Hiring

The team was designed to be comprised of two to three software developers and a business analyst, led by a technical team lead. WAHO was expected to hire the software developers and business analyst, with HP+ hiring the technical team lead. HP+ refined job descriptions provided by USAID and began the process to recruit the technical team lead in October 2016. HP+ received a wide range of applicants, ranging from those with experience in the private sector to academia, and several with experience within health informatics. While external candidates were sought and
interviewed, HP+ ultimately identified a Palladium staff member from Nigeria with extensive health informatics experience. The technical team lead officially started in February 2017, working remotely from Abuja until October 2017 when he relocated to Bobo Dioulasso.

Given the technical nature of the positions required, HP+ provided support to WAHO to hire the remaining team members. While WAHO is a leader in health information systems regionally, this was one of the first times WAHO was hiring technologists, including software engineers. HP+ shortlisted candidates and jointly conducted interviews with staff from WAHO’s Information Technology Unit. A practical exercise was provided to each potential team member to evaluate their technical capabilities. It was important to ensure that each candidate had the foundational skills that could be applied in different sectors, since not all candidates had experience within the public health sector.

Jointly, HP+ and WAHO determined two candidates suited to serve as software developers and one to serve the business analyst role. The third software developer position was not filled, due to a lack of qualified candidates. WAHO and USAID agreed to postpone hiring until there was a clearer understanding of the specific skillset that would be required to supplement the current team.

When it was time to make the offers, delays occurred given that the proper WAHO hiring procedures were not followed. In the process of trying to expedite hiring, critical approvals were not received, hindering WAHO’s ability to extend contracts. While initially intended to be staff roles, limited-term funding prevented WAHIT positions from becoming permanent roles and exceptional approval was provided by WAHO management to extend one-year consulting agreements to the selected WAHIT members.

In October 2017, all WAHIT members were finally on board and the official kick-off of WAHIT took place at the 2017 HIS and IDSR Manager’s Meeting in Niamey, Niger. The U.S. Ambassador to Niger, Eunice Reddick, opened the meeting, recognizing WAHIT as a new, innovative model to improve HIS capacity in the region. The launch of WAHIT was well received by country representatives and the team began to make connections with national HIS managers to identify priority areas for WAHIT to provide training and support.

5. Training, Strategy, and Planning

With the team finally in place, the four WAHIT members settled into Bobo Dioulasso, joined by HP+ headquarters advisors, USAID Global Development Lab learning specialists, and WAHO HIS leaders to provide initial training and strategy sessions on how WAHIT would operate.

Training

An initial hypothesis driving the formation of WAHIT was that local technical expertise was available in the region, however, it was not necessarily being tapped within the public health sector. When hiring the initial WAHIT members,
candidates without experience working with health informatics were considered, therefore, evaluation of technical skillsets was important to ensure that each candidate had a strong technical foundation that could be supplemented with training specific to public health informatics. Ultimately, of the WAHIT members hired, two had experience working within health information systems and the other two had strong technical skills and experience working with WAHO, but not necessarily within HIS global goods or technologies. This reinforced the need for a diverse training curriculum spanning both hard and soft skills, in addition to a primer on the operating environment for health information systems.

During the inception period from 2016 through the time of the launch, HP+ developed a training curriculum and materials to be provided once the team was on board. The training curriculum was developed based on decades of experience in implementing health informatics in low-income settings. It incorporated content from a wide range of areas, spanning the basics of how public health systems operate within the region to how to configure servers, both Linux and Microsoft.

While in Bobo Dioulasso, training was conducted by the WAHIT technical team lead, a technical expert from Palladium’s informatics team based in South Africa, and the WAHIT activity manager. Training materials were then adapted and used for future training provided by WAHIT to country HIS experts.

**Strategy and Planning**

As the team set out to provide an innovative model for developing HIS technical leadership within the West Africa region, much was still to be determined for how the team would actually operate. Questions included:

- How would WAHIT generate demand for services while also fulfilling country requests?
- How would WAHIT prioritize requests from countries?
- How could WAHIT best work with existing partners and/or initiatives in the region in order to complement efforts, while avoiding duplication of efforts?

HP+ led a series of strategy sessions alongside WAHIT and WAHO leadership to agree upon an aligned vision for WAHIT, determine a basic operating framework to be tested, prioritize country challenges, and begin forming a team.

Given that the strategy meeting followed the annual conference, country priorities and challenges were recently presented and provided the basis for discussing how to prioritize technical assistance to countries and also balance the overarching objectives of WAHIT. During the strategy sessions, WAHIT itemized all country needs, breaking
them down into a framework to assess the priority, complexity of solution, length of time required for the solution, and likelihood of success. Ultimately, this formed a set of priority characteristics for how each request would be reviewed and helped set specific priorities for the first quarter of WAHIT’s implementation. The following criteria were developed to help prioritize country requests:

- Supporting the country request directly helps WAHO achieve its regional mission
- Outcomes and results are achieved in the short or medium term (or local resources are available to support ongoing or provide remote support)
- The solution or approach can be replicated and useful in other country contexts
- The solution is cost-effective and there are efficient resources available within WAHIT to implement it
- The request is achievable and there is a clear endpoint to the activity
- There are few or no partners already working on the activity
- There is a low risk of delay/dependency on approvals, processes, and internal politics

When WAHIT was conceived, possible areas for technical assistance were proposed based on need identified during the Ebola epidemic, but now, real opportunities for capacity building were being identified by countries. Initially, priority had been given to the Ebola-effected countries of Guinea, Sierra Leone, and Liberia. However, after understanding the high demands across other ECOWAS countries and existing engagements in these three countries, the partnership decided to expand WAHIT support to all ECOWAS countries. By reviewing country requests identified during the annual meeting, key priorities emerged across countries and in line with WAHO goals. Specifically, WAHIT agreed on prioritizing the following types of country support for the year:

- Training country teams on server management and administration
- Developing DHIS2 web applications that run within the countries’ DHIS2 instances
- Integrating disease-specific forms into the national DHIS2 instance
- Automating reporting of national health management information system (HMIS) data into WAHO’s DHIS2 instance
- Developing a reproductive, maternal, newborn, and child health dashboard based on existing indicators

6. Capacity Building and Technical Assistance Activities

After the initial kick-off, from October 2017 to October 2019, WAHIT refined its implementation model while building local Ministry of Health (MOH) capacity. Over the two years of implementation, the model was adapted based on experience implementing support, feedback from countries, and new priorities from WAHO leadership.
Implementation Model

Finding the right operating model was critical to delivering high-quality support while generating new demand for WAHIT. As described in section 8 of this report, many models were proposed for how WAHIT would provide support, however, ultimately WAHIT’s delivery model was divided into four categories to align with WAHO’s operating procedures:

1. **Short-term missions to resolve urgent technical issues**
2. **Medium-term support to resolve a technical issue while facilitating a training component with local HIS staff**
3. **Regional or country-level training**
4. **Remote ad hoc assistance**

The technical assistance and capacity building provided to country implementors was technology and platform agnostic, meaning that WAHIT worked across all platforms and technologies within a country’s HIS. For example, while many requests centered around DHIS2 (as it was used in all ECOWAS countries), advice was also provided on logistics management information systems and systems infrastructure, among other areas. Accordingly, WAHIT’s services are best described as providing ad hoc on-demand technical informatics assistance to a country’s HIS across the following areas:

- **Advisory:** Provide technical recommendations or advisory support to country teams
- **Diagnostic:** Troubleshoot and resolve technical issues while collaborating with country teams
- **Software Development:** Create software to respond to a specific need
- **Implementation:** Support country teams to deploy solutions while building capacity
- **Training:** Build country capacity on specific topics
- **Workshop:** Convene country teams to share ideas, experiences, and best practices

With the long-term vision of sustaining WAHIT within WAHO, it become fundamental to align WAHIT’s operating model with WAHO’s operating procedures. While this often meant taking more time to respond to a country request or limiting the scope or duration of the country mission, it helped to embed a model that could be continued without outside assistance from USAID or another technical project. Accordingly, WAHIT developed an implementation model that was aligned with WAHO’s operating procedures, which relies on country requests to WAHO leadership. A formal process, outlined on the following page, was established by WAHIT in order for WAHIT to carry-out technical assistance missions in each country.
WAHIT Technical Assistance Process

1. Request Submission: The MOH submits a technical assistance or capacity building request to WAHO through the ministry’s cabinet or the in-country WAHO focal point. This formal request can be a direct unsolicited request or a result of ongoing discussions and communication with the MOH HIS teams. The request is sent to WAHO management and forwarded to the HIS unit in WAHO where WAHIT is domiciled.

2. Request Confirmation and Review: Upon receipt of a technical assistance request, the request is reviewed and a confirmation is sent back to the country detailing a proposal for how WAHO, through WAHIT, can proceed with the support.

3. Requirements Gathering: If a request is within scope, WAHIT communicates with the MOH team to elicit specific requirements, which can be done remotely or in some cases requires a visit to the country.

4. Proposed Solution: If there are multiple solutions available to address the technical assistance request, WAHIT engages with WAHO and the MOH team to agree on the optimum solution given a variety of factors including the timeline, financial resources, and human resources available.

5. Technical Implementation and Capacity Building: Implementation of the solution depends on the type of support requested by the country. If the solution required is a software tool, specifications are gathered and the work is done through a combination of remote development and direct engagement in country. Throughout software development, country MOH staff are continuously engaged to learn from the process. If the request requires only capacity building, a capacity building mission or training workshop is organized with the MOH. In cases where other countries face similar challenges (for example, server management and administration), multiple countries may be invited to attend.

6. Feedback: At the end of each mission or workshop, a client satisfaction survey is completed by the recipient of the support to measure the satisfaction of the MOH to ensure that WAHIT services are meeting the needs of MOH stakeholders. Feedback from the client satisfaction survey is reviewed and incorporated into WAHIT’s future work.

Given that the request or need for WAHIT services generally initiated from technicians within the HIS or information and communication technology (ICT) unit within the MOH, the formal request process was complemented with informal engagement to determine if the request could be supported by WAHIT. Over time, WAHIT established relationships with MOH technical staff and maintained regular engagement through phone calls, emails, and in-person assessments.
Internal WAHO Activities

In addition to WAHIT’s primary directive to provide technical assistance and capacity building support within the region, WAHIT also provided software development services and information technology (IT) support to stakeholders within WAHO in order to help improve and streamline WAHO administrative processes. While this was not the original intent of WAHIT’s services, when WAHIT support to internal initiatives improved administrative processes, it inherently improved WAHO and WAHIT’s ability to provide support to countries. For instance, WAHIT built a software application to facilitate data collection to authorize travel and financial support to ECOWAS countries. This expedited WAHO’s travel approval process, allowing WAHIT to get the approval and financial resources needed to better serve countries.

WAHIT also provided health informatics and software development services for other departments and projects within WAHO, such as the Regional Disease Surveillance Systems Enhancement (REDISSE) project. WAHIT developed an application to exchange malaria and neglected tropical diseases (NTD) data between national and regional information systems. In addition to software development, WAHIT also provided training to WAHO staff on digital tools ranging from Excel to DHIS2. By supporting WAHO to improve their own organizational digital capacity, WAHIT helped enable WAHO as a digital leader in the region, instilling confidence in WAHO HIS initiatives and goals. Furthermore, WAHIT’s internal support generated more demand for technical assistance, which ultimately unlocked additional funding sources allowing for sustainability of WAHIT.

7. Implementation Results

Within the first two years of WAHIT’s operation, the team received 33 formal technical assistance requests, of which 24 were accepted and completed. All technical assistance requests with a completed satisfaction survey were reported to be completed in a satisfactory way. In this period, WAHIT trained 254 health information system experts on various topics related to health information systems.

Selecting the right indicators to measure the demand for WAHIT’s services and WAHIT’s ability to fulfill demand with quality services was an essential element to understand and learn from implementation of WAHIT’s proof of concept model. HP+ worked carefully with USAID to design indicators that provided insights to adapt the model and understand factors related to sustainability. Over the two years of implementation, four indicators were routinely measured to track progress, however, these indicators required adaptation as the model for WAHIT’s operations also adapted. In addition, a target for the first year of implementation was set based on initial assumptions on how the model would operate. The following section gives insight into the indicators—including how they were designed and adapted over the course of establishing the team—and a summary of results from fiscal years (FYs) 2017–2019, when HP+ supported the activity.
Measuring Awareness and Demand for WAHIT Services

Indicator design and evolution: To measure awareness of WAHIT and demand for WAHIT services, the number of HIS technical assistance assignments requested was tracked based on official requests received for WAHIT services. Initially, this indicator only tracked official requests by an MOH, which did not take into account any support that WAHIT provided to stakeholders other than an MOH. Given that the HIS is a foundational component crosscutting many technical health areas, WAHIT was often requested to provide support to other WAHO departments and projects. For example, WAHIT supported several trainings for animal health data managers as part of the World Bank-funded REDISSE project, which focuses on strengthening One Health activities in the region. Ultimately, this support was still aligned with WAHIT’s overall goal of supporting HIS capacity within the region, however the original indicators would not have measured it, effectively underestimating the demand for WAHIT’s services and not fully capturing the work conducted. Therefore, this indicator was modified to take into account requests received by other stakeholders outside of a national MOH and was documented by terms of reference provided by the requestor.

Indicator results: A target of three requests was set for the first year of WAHIT’s implementation, however, given the slow start-up to setting up the team, only one request from the Ministry of Health in Guinea was received, following a scoping visit to Guinea. At this time, WAHIT was carefully trying to generate demand but also cognizant of potentially not being able to deliver on it, given that the team was not fully in place. Following onboarding of the full WAHIT team and the launch at the 2017 Regional HIS and IDSR Manager’s Meeting, demand for WAHIT services increased. Simultaneously, WAHO, USAID, and HP+ agreed to open WAHIT services to non-Ebola affected countries. Over the course of FY2018, requests for technical assistance increased to 22 when applying the new definition allowing for non-MOH requests to be counted. In FY2019, WAHIT received 10 requests. In total, 33 requests were received over the course of HP+’s direct support to WAHIT. As awareness of WAHIT grew, the nature of the requests evolved in complexity, requiring more time and resources to be completed effectively. Toward the end of HP+’s time supporting WAHIT, this complexity led to an increase in the length of support and travel required, decreasing WAHIT’s ability to extensively engage with countries and therefore reducing the number of new requests submitted.

Measuring WAHIT’s Ability to Match Supply with Demand

Indicator design and evolution: To measure the supply of WAHIT’s services compared with the demand from country counterparts, the percentage of HIS technical assistance assignments completed by a regional technical expert was measured. This indicator was calculated from the number of assignments completed and documented by WAHIT.
compared to the number of technical assignments requested and accepted. An assignment was marked completed when all issues had been solved and a report was submitted to WAHO. Originally, this indicator accounted for all activities that had been requested by stakeholders, however in some cases, requests were not feasible given that they did not fall within the technical scope of the team. For example, Cape Verde requested support from WAHIT to transition its national HMIS platform to DHIS2. Given the long-term nature to complete this request, compounded by the fact that the team did not have a Lusophone member, WAHIT did not accept the request. Instead, WAHO partnered with the Health Information Systems Program (HISP) for long-term implementation support, while WAHIT continued to provide advisory services.

**Indicator results:** The target for this indicator was to complete all accepted requests. From FY2017 through FY2019, WAHIT accepted 26 requests, completing 24 or 92 percent of requests. One request that was accepted and not completed was to provide training to the MOH in Mali on the World Health Organization’s DHIS2 Data Quality Review (DQR) Toolkit. The training was not conducted by WAHIT because HISP had already been engaged by Mali. The other accepted request that was not completed was to establish interoperability between the logistics management and information system and DHIS2 in Senegal. This activity was not completed as the funding for WAHIT from both the HP+ and CAPS mechanisms had ended.

### Measuring Satisfaction of WAHIT’s Services

**Indicator design and evolution:** In order to measure the quality of services provided by WAHIT, an indicator was developed to measure the satisfaction of stakeholders receiving WAHIT services. Specifically, the indicator measured the percentage of HIS technical assistance assignments that were completed by regional technical experts in a satisfactory way. This was collected through a standardized satisfaction survey provided to clients upon WAHIT’s completion of the requested technical assistance assignment to understand the quality of services provided. Designing an indicator to rapidly and repeatedly measure the quality of services delivered by WAHIT was challenging, given that a true measure of quality would require a technical evaluation, which recipients of WAHIT services may not always be equipped to provide. Accordingly, this indicator was designed to measure satisfaction using a follow-up survey provided to each technical assistance recipient asking about timeliness, client management skills, technical skills, participatory approach, and final solution with an overall quality rating. Scores from multiple respondents for one technical assistance assignment were averaged and then all questions were averaged to produce one score denoting overall satisfaction.

**Indicator results:** The initial target for this indicator was 100 percent of technical assistance assignments completed in a satisfactory way. This indicator was measured cumulatively over the course of HP+’s support to WAHIT implementation given that the follow-up survey was not always completed during the same reporting period as the technical assistance assignment. At the end of FY2019, 10 surveys were completed, of which the average score was 4.5 out of 5, denoting 100 percent satisfaction (a score of 4 or higher). However, 14 completed assignments did not receive completed satisfaction surveys and therefore did not receive a satisfactory response (a response of 0 percent). Accordingly, overall satisfaction according to survey results over the life of the project indicate that only 48 percent of assignments were completed satisfactorily. However, this does not indicate that the remaining 52 percent of assignments were completed unsatisfactorily; rather it indicates that 52 percent of assignments did not complete a satisfaction survey.
Average Scores for Select Questions from the Satisfaction Survey

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<th>Question</th>
<th>Average Score*</th>
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<tr>
<td>Did the WAHIT consultants use a participatory approach to the planning of the assignment?</td>
<td>4.3</td>
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<tr>
<td>Did the WAHIT consultants have the knowledge to address the issues? (technical, contextual)</td>
<td>5</td>
</tr>
<tr>
<td>Did the WAHIT consultants have the skills to address the issues? (communication, presentation, diplomatic)</td>
<td>4.6</td>
</tr>
<tr>
<td>Did the WAHIT consultants use a participatory approach to the implementation of the assignment?</td>
<td>4.2</td>
</tr>
<tr>
<td>Did the WAHIT consultants present multiple options for resolving your priority issues? If yes, was the set of options relevant to the issues?</td>
<td>4</td>
</tr>
<tr>
<td>Did the WAHIT consultants produce the agreed products?</td>
<td>5</td>
</tr>
<tr>
<td>How would you rate the quality of the work done by the WAHIT consultants?</td>
<td>4.6</td>
</tr>
<tr>
<td>Total average score</td>
<td>4.5</td>
</tr>
</tbody>
</table>

* Scoring key: 5 = to a full extent, 4 = to a great extent, 3 = to a certain extent, 2 = to a limited extent, and 1 = not at all.

The results of this indicator were discussed regularly throughout implementation and HP+ engaged with WAHIT and WAHO to understand how satisfaction survey response rates could be improved. The underlying cause of the low completion of the survey was related to the organizational hierarchies of the technical assistance recipients. For example, MOH technicians who had the interaction with WAHIT and where therefore best placed to provide feedback, were unable to provide official feedback on behalf of the ministry. Conversely, those who were able to provide the feedback did not have the direct exposure with WAHIT to evaluate their services with confidence. In an effort to bridge the technicians and decision-makers, WAHIT printed the electronic web survey so that it could be completed by the technician and approved by the decision-maker, however this did not resolve the response rate. Ultimately, results of this indicator are best understood when accompanied by the prior explanation as the reported result alone does not accurately reflect satisfaction. The increase in demand for WAHIT services over time can infer that countries were satisfied with WAHIT services.

Measuring WAHIT Technical Assistance

Indicator design and evolution: To measure WAHIT’s contribution in building technical health informatics capacity, an indicator was developed to measure the number of regional technical experts mentored and/or trained to support HIS development. This indicator measured both WAHIT members that were trained as well as animal and health informatics experts trained from country governments or USAID implementing partners. This indicator was the only indicator that was not changed over the course of implementation.

Indicator results: The target for this indicator was initially 12 and intended to include the five WAHIT members and six additional MOH staff. However, as WAHIT’s implementation model evolved to undertake large regional trainings given overlapping needs across the region, WAHIT far succeeded this target by training 254 HIS experts through a combination of regional workshops, country-level training, and hands-on capacity building activities.
8. Learning from and Adapting the WAHIT Model

Ongoing Operations Research

As a proof of concept model, receiving and integrating feedback was an integral part to defining a service model that would effectively meet the needs of regional stakeholders. The USAID Global Development Lab partnered with the E4D project, contracted through USAID/West Africa, to design an external operations research study to assess trends in awareness of, demand for, and satisfaction with WAHIT and its services across the ECOWAS region. The primary objectives of the study were:

1. To identify factors influencing MOH’s decisions to engage WAHIT technical support (versus the support of alternative service providers)
2. To assess satisfaction with WAHIT services and to generate data to inform program adaptation
3. To identify challenges and barriers faced by health stakeholders (health workers and MOH officials) in adopting and managing the WAHIT model

The methodology of the study was designed by the E4D team with key inputs from HP+, WAHIT, and USAID. The study was conducted in three phases in five countries:

1. Baseline (May–June 2017): Ghana, Guinea, and Sierra Leone
3. Endline (June–August 2019): Burkina Faso, Ghana, Guinea, Sierra Leone, and Togo

The study was originally intended to be conducted within the one-year proof of concept period of WAHIT and only in Ebola-affected countries. Given WAHIT’s slow operational start, the operations research was extended to align with WAHIT’s implementation timeline of 2016 to 2019.

In designing each of the study phases, E4D engaged with HP+, USAID, and WAHIT to understand WAHIT’s implementation priorities and gather a list of key informants to be interviewed in each country during the study. Following the data
collection period, E4D shared high-level findings with HP+, USAID, and WAHIT, enabling E4D to tease out meaningful findings relevant to WAHIT’s current priorities, while also enabling WAHIT to rapidly adapt its model based on findings from the research. Key findings from the E4D study that informed adjustment to WAHIT’s implementation are summarized next. The full E4D reports can be found on the USAID Development Experience Clearinghouse.

Factors Influencing Country Decisions to Engage WAHIT

Throughout implementation of WAHIT, the awareness and relevance of WAHIT grew according to key informant accounts, however, marketing or communicating about missions and services was a recommendation from several participating in the endline study. At first, WAHIT was not well known in the region as indicated through findings from the baseline and midline studies. Ministries of Health in West Africa were accustomed to implementing partners or international consultants providing HIS support, rather than WAHO providing it directly. With these findings, HP+, USAID, and WAHIT emphasized strategies to create demand and awareness for WAHIT services. WAHIT leveraged WAHO country focal points and early regional workshops to highlight its technical services and proposed model for providing technical assistance. The endline report concluded that WAHIT used its differentiating element of providing “on demand” and “platform agnostic” support, while providing hands-on capacity building, to generate demand. Further, WAHIT’s model of providing a “help desk” as a regional resource that could respond to countries’ immediate and specific needs, while teaching country MOH staff along the way, was unique. Additionally, being a part of WAHO allowed WAHIT to benefit from WAHO’s highly respected status in the region, providing legitimacy and opportunity for the sustainability of WAHIT’s interventions. The flexible and responsive WAHIT model, coupled with WAHO’s regional status, prompted many MOHs to engage with WAHIT.

Satisfaction of the WAHIT Model and Services

As measured through the satisfaction surveys, the E4D findings showed that WAHIT services were well received by key informants. Key informants were especially satisfied with the participatory approach brought by WAHIT, especially the capacity building model that supports country autonomy for future troubleshooting. Key informants specifically highlighted their satisfaction with the model compared to other models:

“WAHIT is a breath of fresh air for the health system because they are addressing a need that was left behind ... When we identify a need, we call for local/international consultants. The consultant arrives, does the work, and leaves ... WAHIT plays a different role, which is to build the technical capacity to solve the technical problems that arise with the HIS.”

– Key informant, Togo

“With WAHIT... you know that your problem is solved and then you have the capacity for the next time to solve it, without their support.”

– Key informant, Burkina Faso
Input from key informants reflect satisfaction with the model based on the unique gap that WAHIT filled in the region. Namely, while other implementing partners provide health informatics support, often it is not conducted alongside MOH staff, leaving critical skills unbuilt in the country.

**Challenges and Barriers in Adopting and Managing the WAHIT Model**

The main challenges expressed by key informants was the insufficient length of WAHIT’s technical assistance and uncertainty regarding sustainability of the team. According to study findings, many respondents felt that WAHIT never had enough time to fully and deeply cover the training topics and/or to stay in the countries until all the technical issues raised were fully and completely addressed. A reoccurring piece of feedback early on was that the “fly in, fly out” model typically used for technical assistance did not foster sustainable HIS capacity at the MOH level. Rather, countries preferred longer-term placements and sustained contact with WAHIT members.

The duration of WAHIT technical assistance missions and training was limited due to WAHO internal policies, which limited the days WAHO was allowed to travel. Over the duration of implementation, the complexity of requests increased, increasing the duration required, however, WAHIT members were limited in the amount of time they were able to travel. To adapt, WAHIT phased country missions into separate trips and provided remote engagement via email and WhatsApp while they were back in Bobo Dioulasso. Informant feedback indicated that in-person support was generally preferred, however, WAHO policies and financial resources for travel had to be adhered to. All key informants indicated that placement of WAHIT within WAHO was the right place, providing WAHIT with more visibility and legitimacy.

Despite operational challenges related to travel authorization processes and limited duration of mission, the project team concluded that the benefits surpassed the challenges, which could be overcome through other cost-effective solutions such as remote support. The other challenge expressed by many respondents was the question of WAHIT’s sustainability. Key informants strongly advocated for WAHO to have real ownership demonstrated through financial commitment for WAHIT activities within the ECOWAS/WAHO operating budget. In some cases, the lack of funding decreased WAHIT’s relevance and influence in the region because country respondents were unsure of WAHIT’s future availability.

**Continuous Learning and Adaptation**

Given that the WAHIT model was a proof of concept to test new models for health informatics technical assistance and capacity building, learning and adaptation was inherently embedded in the project design. From its inception, WAHIT team members and members of the WAHIT partnership fostered a culture of openness and sense of collegiality that enabled free communication independent of hierarchy. The design of the project emphasized the importance of partnerships and stakeholder collaboration across USAID (both the West African Regional Mission and the Global Development Lab), WAHO, HP+, and ministries of health. Without a previous precedent to compare against, the WAHIT partnership developed an adaptive management style that reflected an agile start-up company more than a traditional development project. An overview of approaches for learning and adaptation are summarized on the following page.

“WAHO is the real gateway to the countries. If we leave WAHIT out [on its own], they will have a hard time making themselves known or having easy access to the countries.”

– Key informant, Togo
Regular meetings: During the first two years of implementation, HP+ and USAID met weekly to discuss progress and troubleshoot issues, especially related to the delays in starting up the team. Weekly meetings allowed for HP+ and USAID to fully understand the issues and strategize on solutions in real time. Routine meetings were also established with WAHO and WAHIT in addition to with USAID/West Africa.

Stop, start, continue: During the initial WAHIT strategy session, HP+ instated a simple process to obtain feedback during its daily sessions. Session participants were asked to give quick feedback on what the group could stop doing, start doing, and continue doing. This survey was conducted at the end of every day and quickly reviewed by the team to make immediate corrective actions. This approach was then implemented by WAHIT during their regional training workshops to address any immediate feedback training participants had.

After-action reviews: WAHIT was trained on the process of conducting rapid after-action reviews after each mission. This gave the team an opportunity at the end of the mission to reflect on how mission outcomes compared to mission objectives.

Client satisfaction surveys: The client satisfaction survey was intended to be completed after every country mission by the recipient of WAHIT support to provide feedback on the team’s performance. After each submission, WAHIT paused and reflected on survey results, taking into consideration how feedback could be addressed. In one survey, a respondent from the MOH in Benin suggested that WAHIT initiate a community of practice so that others across the region receiving WAHIT support could be connected to share ideas and help each other solve ICT challenges. A WhatsApp group was then formed that connected health informatics experts across the region.

Learning log: In the first year of implementation, WAHIT members kept an online spreadsheet tracking key lessons learned. This simple format allowed team members to share experiences and learn from each other, given experience with operational processes and technical implementation.

Quarterly workplanning: WAHO’s routine process to develop quarterly workplans provided flexibility for WAHIT to adapt a workplan as needed based on a country request. Compared to a yearly process, this allowed WAHIT to take stock of learning from past missions and plan incrementally.

Operations research: As part of the operations research that was conducted by E4D, the WAHIT partnership would review findings with the study team and probe further on input provided by key informants. Following the session, E4D would finalize the study report, which was then presented to WAHIT and WAHO management.
9. Current State and Sustainability

Given WAHIT’s design as a one-year proof of concept initiative, understanding if and how WAHIT could be sustained beyond the initial year was a priority from the start. Findings from the operations research conducted by E4D and routine reflections during implementation continuously advanced conversations around sustainability. It was clear to both WAHO and HP+ that additional funding to sustain WAHIT did not exist and that new funding sources would need to be identified once the initial funding was spent. Fortunately, given the slow start-up to hire the team and cost savings by reducing the team size and not incurring office costs, funding from both WAHO and HP+ extended beyond the initial year. In 2018, USAID advocated for a small amount of additional funds to be allocated toward WAHIT. The HP+ West Africa regional program also allocated a portion of funds. WAHO’s CAPS mechanism received two no-cost extensions during this period, allowing for WAHO and HP+ to align their implementation periods. After several extensions, it became clear that by September 2019, funding to maintain the four team members would no longer be available. In preparation, WAHO and HP+ worked on several approaches, described next, to sustain the model.

After failing to secure positions within the WAHO organizational structure from the onset, understanding the process for doing so in the future became a priority for sustaining WAHIT. In order to officially create a post within WAHO, approval from the ECOWAS Commission at least two years prior is required with a demonstrated funding source to sustain the position. With member states funding WAHO via the ECOWAS Commission, USAID, HP+, and WAHIT encouraged member states to advocate to ECOWAS for continued support through WAHIT. The advocacy proved successful. The new director general of WAHO, Professor Stanley Okolo, heard about support that WAHIT had been providing through the Annual Health Ministers Council Meeting. The director general took a keen interest in WAHIT and began exploring how WAHIT could be leveraged to advance internal business process improvements and a vision for becoming a more data-forward organization.

Throughout implementation, USAID, HP+, and WAHIT regularly discussed options for how WAHIT could be sustained. Some ideas discussed, but ultimately not tested, were:

- Establishing a fee for WAHIT services that could sustain staff salaries, however, this was not aligned with WAHO’s operating model whereby member states contribute annually through the ECOWAS Commission
- Establishing WAHIT as an independent organization that could accept funding from different sources, however, the administrative requirements made this unfeasible
- Providing WAHIT-like services through private sector technology service companies like Andela, however, this did not provide opportunities for capacity building

In 2019, progress was made in creating new HIS posts with an organizational restructuring of WAHO departments. In the restructuring, the original department housing WAHIT, the Department of Planning, Research and Health Information Systems, was split into the Department of Planning, the Department of Health Information, and the Department of Public Health and Research, in addition to a Regional Centers for Disease Control being established.
in Nigeria. During the restructure, two new permanent positions for health information were included in the organizational chart, indicating that future and long-term funding would be available to support HIS activities.

Initially, ideas for establishing WAHIT as a foundational part of the center for excellence for sustainability evolved as the vision for the center also evolved. While many proposals for operationalizing and governing the center were developed, due to various reasons, including a leadership change within WAHO, restructuring of the organization and establishment of the Regional Centers for Disease Control—the center of excellence—did not take form. However, in 2018, the WAHO director general launched a new initiative to establish a regional health observatory as a centralized resource for health data. The concept deviated slightly from that of the center of excellence, focusing more on the generation of insights from aggregated and synthesized data. The regional health observatory, however, became a critical way to ground the role of WAHIT within a management priority.

In June 2019, with WAHIT funding from both CAPS and HP+ set to end, HP+ supported WAHO and WAHIT to conduct a sustainability workshop to identify strategies to maintain WAHIT beyond September 2019. Given the push to operationalize the regional health observatory and the director general’s desire to involve WAHIT, the team was positioned as a key aspect of the regional health observatory and identified areas to build on current work in systems integration and approaches for data science. In the new thinking around the regional health observatory, WAHIT framed its support as enabling improved access to and use of country-level data. HP+ supported WAHIT to identify new skills and resources required and also strategized on partnerships that could be explored by WAHO for additional support.

To fill the transition gap between the end of CAPS and the follow-on project, WAHO was able to secure funding from other partners—including REDISSE in Western Africa and the Regional Action Through Data (RAD) project funded by USAID. These mechanisms would support three out of the four WAHIT members until a new and sustainable mechanism became available. In September 2019, when CAPS and HP+ ended support to WAHIT, the technical team lead was re-hired by WAHO with funding from the RAD project. Between October and December 2019, HP+ continued to collaborate with WAHO to develop presentation and communication material on WAHIT’s accomplishments for the team’s participation at the 2019 Annual HIS Meeting in Banjul, The Gambia and at the 2019 Global Digital Health Forum in Washington, DC.

As of January 2019, two additional WAHIT team members were re-hired by WAHO through RAD and REDISSE. Through these projects, WAHIT’s work is primarily aligned with supporting the regional health observatory initiative while also providing technical support to meet the needs of RAD and REDISSE, both of which maintain a country focus. In January 2019, for the first time, the director general of WAHO attended the Annual HIS Meeting held in Banjul. The presence of WAHO’s leadership at the meeting demonstrates WAHO’s commit in strengthening health information systems and the use of data for decision-making in the region.

10. Lessons Learned and Future Considerations

The journey to establish WAHIT shows that new models to support countries in health information system improvements and building local capacity are possible with the right combination of partnership, flexibility, and alignment. Infused throughout this story are lessons learned along the way. The following section provides a summary of key lessons that the digital health community can learn from for future activities aimed to strengthen digital health capacity at both individual and country levels.
Balancing Sustainability with Results

During the Ebola epidemic, commonly acknowledged weaknesses within health information systems, such as fragmented information silos and lack of local capacity, were exacerbated given the urgent need for timely, accurate, and comprehensive data. Following the epidemic, this spurred new momentum and resources for creative solutions to address these persistent challenges, including innovative and ambitious concepts like WAHIT. While establishing WAHIT, a balance was needed between achieving immediate results and building resilient and sustainable capacity.

Within the first year, it was expected that WAHIT would be established with team members trained and providing needed technical assistance within the region. However, within the first six months, only one team member had been hired and no technical assistance had yet been provided. Details of the hiring process and lessons learned, included in section 4 of this report, were mostly driven by the different structures, cultures, and operating models driving each organization. During these delays, the partnership remained cognizant of the rapid timeline to set up the team, however, it also balanced the long-term objective to sustain the team. Accordingly, the partnership spent time building an understanding across the different organizations in order to not jeopardize sustainability for rapidity of results. For example, one solution to the delay in hiring was for HP+ to hire all the team members. While this would have allowed the team to be hired more quickly, it likely would have decreased WAHIT’s integration within WAHO. This integration helped the partnership understand how WAHIT positions could someday be institutionalized within the organization.

Even after the team was hired, it took time for WAHO and countries to fully understand WAHIT’s service offerings and exactly how WAHIT, a team perceived to be serving an IT function, could contribute to improved health within the region. Not only did WAHIT spend much of the first year building awareness within countries about WAHIT’s services, but also building trust and understanding within WAHO. Fortunately, the delays in start-up were not met with reprimand, but rather with a learning lens to understand what was happening and how activities could pivot. This flexibility allowed implementation to extend beyond the first year and ultimately to three full years of the activity. Taking the time to align with organizational processes and culture while building trust was worth the wait—WAHO management ultimately advocated for WAHIT’s continuation, mobilizing funds for short-term support while awaiting the approval of long-term positions within the organization.

Harnessing the Power of Partnerships

As organizations and countries undergo digital transformation, partnerships bring diversity in the skillset, experience, and positioning needed for systemic change. The partnership structure of WAHIT was intentionally curated and leveraged throughout the implementation of WAHIT. USAID led the overarching strategy and design of the program while building on lessons learned from the Ebola outbreak and implementation of HIS strengthening activities. WAHO brought long-standing regional presence, reach, and technical leadership within health, policy, and governance. Finally, HP+ complemented the partnership with technical health informatics capability combined with operational know-how.

Key to harnessing the power of partnerships was alignment toward a common vision, followed by establishing clear roles and responsibilities to deliver. From the initial WAHIT workplan, the role of each partner was clearly laid out with the expected activities and timelines for each. During the initial kick-off, strategy setting and team building contributed to a unified vision. During implementation, having common metrics for success created

The journey to establish WAHIT shows that new models to support countries in health information system improvements and building local capacity are possible with the right combination of partnership, flexibility, and alignment.
alignment and encouraged accountability. Despite differences in working styles and operating models, working together, the WAHIT proof of concept evolved into a proven implementation model to continue building local technical capacity within the region.

Building Gender-Inclusive Local Capacity

The initial WAHIT design called for one member of WAHIT to be female, however, during the hiring process, no female applicants applied. This doesn’t come as a surprise, given the lack of females in the ICT field with highly technical skills and experience required for the job, furthered by the finding that these skillsets were already in lower quantity within the West Africa region. Given the delays during the hiring process and the dwindling time frame to test the proof of concept, ultimately, the partnership decided to move forward without selecting a female candidate. Rather than hiring a team of all men, the decision was made not to hire the fifth WAHIT team member, leaving a position available for a future female WAHIT member. Through the CAPS project, WAHO hired a female data management specialist who worked closely with WAHIT; however, the fifth female WAHIT candidate was never hired.

Over the course of implementation, the WAHIT partnership reflected heavily on how gender could have been better incorporated into the design of the project, acknowledging that it wasn’t just the technical job requirements and experience that likely limited the pool of qualified female candidates. For example, the requirement for relocation to WAHO headquarters, the ability to travel at least 50 percent to countries within West Africa, and the uncertainty of a long-term job prospect were likely compounding factors discouraging female applicants. Additionally, recruitment for the positions was done remotely from abroad, relying on international online job boards that may not be highly trafficked by those not in the development sector, which has a limited female candidate pool.

In the design of future informatics capacity building initiatives, and as WAHIT grows, gender inclusion should be considered from the onset. For example, when there is flexibility in team location, analyzing the availability of the local talent pipeline disaggregated by gender (if available) can help to identify a location with a larger female applicant pool, avoiding issues related to relocation. Alternatively, considering short-term consulting assignments or allowing remote work may provide more flexibility with limitations related to work schedules and location. Considering these factors could have helped the team be more inclusive of women with the requisite skillset, however, more is ultimately needed to build the pipeline of female technology experts in West Africa in general.

Cultivating Capacity at All Levels

WAHIT’s capacity building activities were specifically targeted to build individual-level technical capacity so that individuals within ministries of health have the necessary skills to improve health information systems regionally. While individual capacity building activities were targeted through WAHIT’s implementation activities, establishing WAHIT as a new model and a team within WAHO had resonating effects that improved organizational and digital ecosystem capabilities.

At the organizational level, the process of establishing WAHIT within WAHO facilitated improvements to structures, processes, and management systems both facilitating WAHIT’s ability to deliver but also WAHO’s ability. For example, to improve the process for travel authorization that often impeded WAHIT’s ability to quickly support countries, WAHIT built an application to automate some processes. Additionally, through the hiring
process to establish WAHIT, HP+ guided WAHO to define and evaluate the necessary skillsets for health informatics experts.

At the system level, establishing WAHIT as a new regional technical support model provided a framework that strengthened interactions between individuals and between institutions, like WAHO and MOHs. Establishing the model within WAHO as a long-term regional institution strengthened the local ecosystem and reduced dependency on external financial or technical support. Establishing the model required a broker like USAID and HP+ to convene and align actors within the ecosystem. As USAID and implementing partners support countries as they undergo digital transformation, strengthening capacity at individual, organizational, and systems levels is needed for true transformation.

**Conclusion**

WAHIT is proof that new ways of providing technical assistance while building capacity are possible with the right approach, partnership, and motivation. As USAID continues to support countries on their journey to self-reliance, strengthening country-level digital capability, including equipping the next generation workforce, will be critical. Digital capacity building projects can learn from WAHIT’s innovative model, implementing through adaptive management approaches and collaborative partnership models.
**Annex: WAHIT Missions, October 2017–September 2019**

The following tables detail WAHIT’s technical assistance during the implementation period. The type of activity and number of activities in each country are indicated by the colored dots. For instance, a country with three assignments has three dots and the color shows the type of activity.

- Implementation  ➢  Training  ➢  Advisory  ➢  Diagnostic  ➢  Workshop  ➢  Software Development

### WAHIT Country-Level Support

<table>
<thead>
<tr>
<th>Country</th>
<th>Activity</th>
<th>Results and Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benin</strong></td>
<td>Installation and configuration of the World Health Organization's DQR module of the national DHIS2 instance</td>
<td>The national DQR deployment was successfully installed after several failed attempts prior to WAHIT’s involvement. The country team gained the knowledge and skills needed to fix the issue themselves moving forward. A case study detailing this support in more detail is available on the Health Policy Plus website.</td>
</tr>
<tr>
<td></td>
<td>Capacity building to relocate the HMIS database on physical servers</td>
<td>Hands-on technical capacity building of the MOH enabled transfer of the HMIS database from a cloud server to a physical local server within the MOH, following the country's data privacy policies.</td>
</tr>
<tr>
<td></td>
<td>Consolidation of the weekly IDSR data integration into the national DHIS2 database</td>
<td>Surveillance data to be integrated into the national DHIS2 was identified by updating the level of surveillance data collection and configuring surveillance data management in the national DHIS2. Technical assistance led to improved reporting for better decision-making.</td>
</tr>
<tr>
<td><strong>Burkina Faso</strong></td>
<td>Training on Windows Server 2012</td>
<td>The MOH HMIS team was trained on server management, enabling them to autonomously manage the server hosting their HMIS.</td>
</tr>
<tr>
<td></td>
<td>Training on web development, mobile development, and web API</td>
<td>The MOH HMIS team was trained to develop a web and mobile app in JavaScript and to use web API for DHIS2 integration with other applications.</td>
</tr>
<tr>
<td></td>
<td>Operationalization of routine data collection and mass campaigns via the DHIS2 regional platform</td>
<td>NTD and malaria data managers were trained on the use of the regional platform (data entry, import, quality control, and data analysis).</td>
</tr>
<tr>
<td></td>
<td>Interoperability system implementation for the national DHIS2</td>
<td>An interoperability system between different applications and the DHIS2 through web APIs was implemented.</td>
</tr>
<tr>
<td><strong>Cape Verde</strong></td>
<td>Assessment of the national HIS migration to DHIS2</td>
<td>A rapid assessment was conducted of the national HIS and a roadmap proposed for migration to the DHIS2 platform.</td>
</tr>
<tr>
<td></td>
<td>Onsite supervision visit for DHIS2 implementation</td>
<td>Onsite supervision was provided to support migration to the DHIS2. Due to the language barrier, a Lusophone HISP staff member provided support with the oversight of WAHIT.</td>
</tr>
<tr>
<td><strong>Guinea</strong></td>
<td>Training on the DQR Toolkit for the DHIS2</td>
<td>A training of trainers was conducted on the DQR Toolkit. By the end of the activity, managers could pass the DQR Toolkit test, develop a report on data quality, and provide a recommendation to decision-makers on how to improve data quality.</td>
</tr>
<tr>
<td></td>
<td>Restructuring the national DHIS2 database</td>
<td>With WAHIT assistance, the MOH restructured the national DHIS2 by updating indicator definitions, removing all duplicates, and developing an updated metadata dictionary. By the end of the technical assistance, the MOH had developed a roadmap to improve the synchronization of surveillance data.</td>
</tr>
<tr>
<td>Country</td>
<td>Activity</td>
<td>Results and Impacts</td>
</tr>
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<td>--------------</td>
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<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Guinea Bissau</td>
<td>Training on the DQR Toolkit for the DHIS2</td>
<td>A training of trainers was conducted on the DQR Toolkit. By the end of the activity, managers could pass the DQR Toolkit test, develop a report on data quality, and provide a recommendation to decision-makers on how to improve data quality.</td>
</tr>
<tr>
<td>Mali</td>
<td>Operationalize routine data collection and mass campaigns via the DHIS2 regional platform</td>
<td>NTD and malaria data managers were trained on the use of the regional platform (data entry, import, quality control, and data analysis).</td>
</tr>
<tr>
<td>Niger</td>
<td>Operationalize routine data collection and mass campaigns via the DHIS2 regional platform</td>
<td>NTD and malaria data managers were trained on the use of the regional platform (data entry, import, quality control, and data analysis).</td>
</tr>
<tr>
<td>Nigeria</td>
<td>Diagnostic and working session to identify problems with DHIS2 data collection tools</td>
<td>An analysis was conducted on the organizational and operational structure of the national HMIS. This included analysis of national data warehouse diagnostics and the process of integrating the country’s surveillance data into its national data warehouse and ECOWAS regional data warehouse.</td>
</tr>
<tr>
<td></td>
<td>Training on IDSR tools</td>
<td>A training of trainers was conducted on the new IDSR tools in the national HMIS platform.</td>
</tr>
<tr>
<td>Senegal</td>
<td>Interoperability system implementation for the national DHIS2</td>
<td>National DHIS2 issues were diagnosed and fixed. In addition, an interoperability system between different applications and the DHIS2 through web APIs was implemented.</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>Training on Data Quality Review (DQR) Toolkit for the DHIS2</td>
<td>A training of trainers was conducted on the DQR Toolkit. By the end of the activity, managers could pass the DQR Toolkit test, develop a report on data quality, and provide a recommendation to decision-makers on how to improve data quality.</td>
</tr>
<tr>
<td>The Gambia</td>
<td>Technical assistance for national database clean-up</td>
<td>The national DHIS2 was cleaned-up by updating indicator definitions, removing all duplicates, and developing an updated metadata dictionary.</td>
</tr>
<tr>
<td></td>
<td>Implementation of geospatial coordinates system and database restructuring</td>
<td>Geospatial coordinates within the national DHIS2 instance were updated, enabling more accurate data for planning.</td>
</tr>
<tr>
<td>Togo</td>
<td>Server deployment</td>
<td>Two servers for the MOH were deployed, one as a local copy of the remote national instance of DHIS2 and the other to host email services. In addition, capacity was built of the MOH’s IT team to develop and validate the deployment scenarios, deploy and configure the servers, and optimize the computer network.</td>
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WAHIT Regional Support

<table>
<thead>
<tr>
<th>Country</th>
<th>Activity</th>
<th>Results and Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Burkina Faso</strong></td>
<td>Training on server management with University of Oslo DHIS2 experts</td>
<td>Through combined theoretical presentations and practice-based learning exercises, participants learned how to configure and manage Linux-based systems, install a DHIS2 instance, configure a PostgreSQL database and perform backups, and identify bugs when accessing the server and DHIS2 instance.</td>
</tr>
<tr>
<td><strong>Ghana</strong></td>
<td>Advanced training on DHIS2</td>
<td>HMIS experts from all 15 ECOWAS country ministries of health were trained on the DHIS2 and introduced to the DHIS2 tracker. By the end, participants were able to design DHIS2 entry forms, manage system users, configure DHIS2 Android clients, and create tracker-type forms.</td>
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<tr>
<td><strong>Ivory Coast</strong></td>
<td>9th Annual Meeting of HMIS/IDSR Managers with HIS Partners</td>
<td>WAHO results were presented at the annual joint meeting, which had the objective of promoting production, sharing, and use of quality health information throughout the ECOWAS region.</td>
</tr>
<tr>
<td></td>
<td>Annual Meeting of Data Managers and One Health Managers</td>
<td>Participating as facilitators representing WAHO, WAHIT provided updates from countries on their data/hierarchies and trained data managers on how to use the new One Health form and its regional extract, transform, load (ETL) functions. A case study detailing this support in more detail is available on the Health Policy Plus website.</td>
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WAHIT Regional Support (from Bobo Dioulasso)

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<tr>
<th>Activity Type</th>
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<tbody>
<tr>
<td>Internal review of the DHIS2 and manuals with WAHO program officers</td>
<td>WAHO staff were trained on the use of the regional DHIS2 and assisted with validating the translation of the French user manual.</td>
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<tr>
<td>Software development for WAHO operations</td>
<td>An application was built to facilitate data collection for travel authorization and financial support to WAHO member states. In addition, a data export feature enabled sharing of data for analytical purposes.</td>
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<tr>
<td>Transfer of regional platform to a new server</td>
<td>Technical assistance was provided to transfer WAHO’s regional platform to a new cloud space. WAHIT set up a new hosting environment to provide on-demand hosting with increased security, high availability, replication, and automated backups.</td>
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<tr>
<td>Application development to support data collection for the World Bank’s malaria/NTD project</td>
<td>An ETL application was developed for campaign data collection and synchronization between national and regional platforms on malaria and NTD data. A case study detailing this support in more detail is available on the Health Policy Plus website.</td>
<td></td>
</tr>
<tr>
<td>Ongoing support to WAHO’s IT unit on IT infrastructure and security</td>
<td>Several areas were strengthened, including replication, automatic backup, active directory, enhanced network security, local cloud environment, and Microsoft Project Server.</td>
<td></td>
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<tr>
<td>Training on productivity tools for WAHO staff</td>
<td>Working with the Department of Administration and Finance, training was developed and conducted on internal productivity tools such as Microsoft Project, Microsoft Office, Google Drive, etc.</td>
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<tr>
<td>Regional data warehouse ETL application for IDSR data</td>
<td>An application was developed for automatic data transfer of IDSR data from a country system/template to the regional data warehouse.</td>
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<tr>
<td>Mission control application development</td>
<td>WAHO management was supported to track and manage staff travel.</td>
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For more information, contact:

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