SIAPS Sierra Leone End of Project Report GHET Final Project Report SIAPS Sierra Leone (Pillar II) September 2015–December 2017

February 2018





This report is made possible by the generous support of the American people through the US Agency for International Development (USAID), under the terms of cooperative agreement number AID-OAA-A-11-00021. The contents are the responsibility of Management Sciences for Health and do not necessarily reflect the views of USAID or the United States Government.

About SIAPS

The goal of the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program is to ensure the availability of quality pharmaceutical products and effective pharmaceutical services to achieve desired health outcomes. Toward this end, the SIAPS result areas include improving governance, building capacity for pharmaceutical management and services, addressing information needed for decision-making in the pharmaceutical sector, strengthening financing strategies and mechanisms to improve access to medicines, and increasing quality pharmaceutical services.

Recommended Citation

This report may be reproduced if credit is given to SIAPS. Please use the following citation.

SIAPS Sierra Leone Ebola (Pillar II GHET) End of Project Report, February 2018. Submitted to the US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health.

Key Words

Ebola, GHET, supply planning, Sierra Leone, CRMS, Dashboard, Quantification, LDP, Treatment Register, free health care, DDMS, DDPI, PBSL

Systems for Improved Access to Pharmaceuticals and Services
Pharmaceuticals and Health Technologies Group
Management Sciences for Health
4301 North Fairfax Drive, Suite 400
Arlington, VA 22203 USA
Telephone: 703.524.6575

Fax: 703.524.7898 E-mail: siaps@msh.org Website: www.siapsprogram.org

CONTENTS

Acronyms	iii
Background	1
Problem Statement	
Portfolio Vision/Goal	3
Results Framework	4
Activities and Results	5
Quantification (Forecasting and Supply Planning)	7
Pharmaceutical/Logistics Management Information System	7
Dashboard	8
The Continuous Results Monitoring and Support System	11
Drug and Therapeutics Committees	14
Improved Storage, Handling and Disposal at District, PHU and Central Levels	
Other SIAPS/SL Interventions for Pharmaceutical System Strengthening	17
Knowledge Management	19
SIAPS Program Management	19
Lessons Learned and Follow Up	
Challenges and Proposed Solutions	20
Annex A: Selected Communications and Technical Publications	21
Annex B. Project Indicators	22
Annex C: Photo Gallery	23

ACRONYMS

AMR antimicrobial resistance

CAIPA Crown Agents-International Procurement Agency

CPD country project director

CRMS Continuous Results Monitoring and Support System

CHAI Clinton Health Access Initiative

DDMS Directorate of Drugs and Medical Supplies
DHIS2 District Health Information System Version 2

DHMT district health management team

DPPI Directorate of Policy, Planning and Information

DTC Drug and Therapeutics Committee eTR electronic treatment register

FHCI Free Health Care Initiative
GHET Global Health Ebola Team

LMIS logistics management information system

MOHS Ministry of Health and Sanitation MSH Management Sciences for Health

NAS National AIDS Secretariat

NMSA National Medical Supply Agency NQC National Quantification Committee

NPPU National Pharmaceutical Procurement Unit

PBSL Pharmacy Board of Sierra Leone

PHU peripheral health unit

PMIS pharmaceutical management information system

RR&IV Requisition, Receipt and Issue Voucher

SCM supply chain management

SIAPS Systems for Improved Access to Pharmaceuticals and Services

SOP standard operating procedure

TB tuberculosis

TOR terms of reference training of trainer

UNFPA United Nations Population Fund

USAID US Agency for International Development

WHO World Health Organization

BACKGROUND

Sierra Leone has an estimated population of 6.1 million people, 60% of whom reside in rural areas. The country has 14 districts. The Sierra Leone health system has 1,264 public and private health facilities, including 40 hospitals, 23 of which are public facilities. In addition to hospitals, there are three levels of peripheral health units (PHUs): community health centers, community health posts, and maternal and child health posts.

Sierra Leone has three pharmaceutical financing mechanisms: cost recovery, free health care, and donations of medicines from other partners. Prior to the civil war, which ended in 2002, all health care was provided on a cost recovery basis. Due to multiple challenges faced in implementing the cost recovery program, the government introduced the Free Health Care Initiative (FHCI) in 2010 to ensure free preventive and curative health services for pregnant women, lactating mothers, and children under the age of five in any government facility in Sierra Leone. The FHCI is designed to cover 20% of the population, while the cost recovery program is expected to cover approximately 80% of the population. Products are also provided for free under various programs, such as Global Fund HIV, malaria, and tuberculosis (TB) medicines and Ebola emergency procurements and donations. The private sector plays a large role in the health sector, providing approximately 70% of medicines and related supplies.

The Ministry of Health and Sanitation's (MOHS) key pharmaceutical entities include the Directorate of Drugs and Medical Supplies (DDMS), which is the MOHS department responsible for advising the Ministry on all pharmacy matters, including pharmacy policy and strategy development, implementation, and oversight and for coordinating and providing pharmaceutical services, including promoting rational medicine use; the Pharmacy Board of Sierra Leone (PBSL), which was established by an Act of Parliament in 1988 to ensure that appropriate and workable regulatory guidelines are implemented to achieve the highest standards of pharmaceutical practice by professionals in the areas of safety, efficacy, and quality of all drugs, medical devices, cosmetics, and nutritional agents as stipulated in the Sierra Leone Pharmacy and Drugs Act of 2001; and the National Medical Supplies Agency (NMSA), an independent statutory authority for the central management of pharmaceutical procurement, warehousing, distribution, and management of essential medicines and medical supplies for more than 1,200 public health facilities in Sierra Leone that was established by an Act of Parliament to replace the National Pharmaceutical Procurement Unit (NPPU).

The Systems for Improved Access to Pharmaceuticals and Services (SIAPS) program, implemented by Management Sciences for Health (MSH), received two years of funding in September 2015 from the US Agency for International Development (USAID) to provide technical assistance for rebuilding and strengthening the pharmaceutical supply chain management system in Sierra Leone post-Ebola. SIAPS established a country presence to ensure direct collaboration with and support stakeholders for meeting the two-year objectives with limited funding for the program. The program came to an end on December 31, 2017.

The project was implemented in all 13 districts and more than 1,300 PHUs. In addition, all 24 public hospitals and all health programs were beneficiaries of the project's technical assistance. The pharmacy training college, DDMS, PBSL, and the pharmacy society of Sierra Leone were also key beneficiaries of SIAPS technical assistance.



Figure 1. Sierra Leone districts where SIAPS has worked

The project worked with district health management teams (DHMTs); the DDMS: the Directorate of Hospital and Laboratory; the PBSL; and MOHS programs to cover all PHUs and hospitals in the 13 districts. SIAPS activities, including pharmaceutical management systems strengthening and supply chain management through capacity building and technical assistance to improve governance, management and leadership, selection and quantification, pharmaceutical management information system, rational medicine use, and continuous performance monitoring and supervision, were undertaken in close collaboration with country stakeholders and partners, including the Global Fund and members of the Free Health Care Forum, which comprises the United Nations Children's Fund (UNICEF), the Clinton Health Access Initiative (CHAI), United Nations Population Fund (UNFPA), and the UK Department for International Development (DFiD).

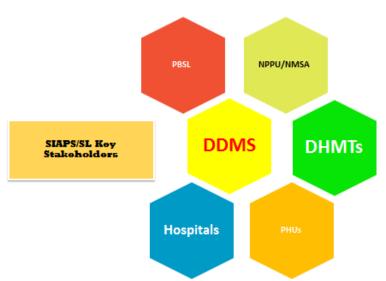


Figure 2. SIAPS key stakeholders: DDMS, DHMTs, PBSL, NPPU, NMSA, hospitals, and PHUs

Problem Statement

The outbreak of Ebola in Sierra Leone severely compromised an already fragile health system, including the pharmaceutical supply chain. The pharmaceutical sector faces several challenges, including a fragmented supply chain system, uncoordinated parallel procurement systems, and poor donation practices, which collectively have negative implications on harmonizing the supply chain system.

In May 2015, MSH conducted a rapid assessment of the pharmaceutical system of Sierra Leone and found storage conditions to be the biggest challenge in ensuring proper pharmaceutical management practices at all levels. Despite efforts by donors to provide medicines under the FHCI, essential medicines remain scarce, particularly at PHUs, and stock-outs of essential medicines occur frequently. The supply chain management system is based on a push system in which the quantities of drugs and supplies provided to facilities are determined by population-level disease burden projections and past health information system data (the quality of which is questionable). Written guidelines for the disposal of damaged, expired, and obsolete pharmaceuticals are incomplete and not followed properly. Disposal is done in an ad hoc manner and usually in open fields, which affects the health of the community and the environment.

Portfolio Vision/Goal

The purpose of SIAPS was to restore and recover essential pharmaceutical services that had standard operations disrupted due to Ebola crisis. The program targeted strengthening the capacity of district (DHMTs) and health facility (hospitals and PHUs) supply chain systems to ensure an uninterrupted supply of essential medicines and quality pharmaceutical services through proper implementation of supply chain activities, improved reporting and ordering systems, and rational medicine use for better health outcomes.

The strategy to contribute to the post-Ebola recovery as it relates to supply chain management (SCM) focused on a phased approach for addressing the challenges and gaps that are affected by Ebola and rebuilding the supply chain system to provide adequate commodity logistics management through capacity building interventions and system strengthening initiatives. Specifically, the project focused on strengthening pharmaceutical management systems, including supply chain governance and coordination; demand planning (quantification); capacity building through trainings, mentorship, and supportive supervision; storage and inventory control; stock status monitoring and reporting (pharmaceutical management information system (PMIS)/logistics management information system (LMIS)); and rational medicine use.

Results Framework

To achieve the goal of ensuring availability of quality pharmaceutical products and effective pharmaceutical services in post-Ebola Sierra Leone, SIAPS focused on key objectives that contribute to pharmaceutical system strengthening, including strengthening pharmaceutical governance and leadership, capacity building of individuals and institutions, and improving commodity management information systems to support planning and decision making. The first framework shown below (figure 3) depicts program objectives and sub-objectives, and the second (figure 4) illustrates the approach that guided the implementation of the project.

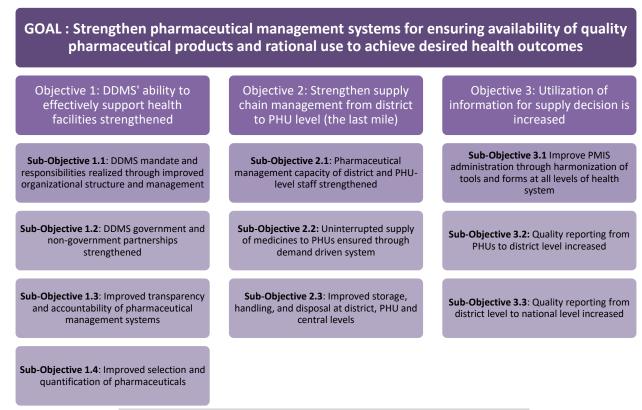


Figure 3. SIAPS Sierra Leone Ebola results framework

Approach: Pharmaceutical systems strengthening framework

A comprehensive set of dynamic relationships among five health systems building blocks, with the sixth, medical products, acting as an overlay to provide technical content and identify substantive areas of concern.

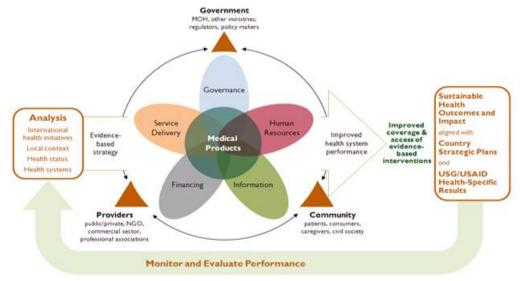


Figure 4. SIAPS pharmaceutical management system framework

Activities and Results

The following section illustrates the key SIAPS/Sierra Leone program interventions.

DDMS Leadership and Management Capacity Building: The DDMS is a relatively new addition to the MOHS pharmacy sector. In the past, the central medical stores, under the leadership of a chief pharmacist, served as the pharmacy department and procurement/warehousing/distribution entity. As a new directorate, the DDMS is accountable to the MOHS and responsible for providing oversight and support to the pharmaceutical sector and for addressing all structural and capacity challenges of the sector, which were further compounded by the Ebola crisis. The DDMS faces several challenges in shouldering the above responsibilities. SIAPS identified the DDMS as the MOHS entity well placed to be capacitated to implement and sustain the interventions SIAPS put in place.

SIAPS provided comprehensive technical assistance to the DDMS, including revising the organogram that defines the structural framework for implementing the DDMS mandate and terms of reference (TOR) for the newly established key functional units of governance, human resources management, products and technologies, and administrative and finance. To reinforce the organizational/structural change, SIAPS provided capacity building technical assistance with the training conducted in leadership development to help overcome the problems within the DDMS for promoting participatory management and decision making. This technical assistance included:

- Reviewing the original DDMS strategic plan
- Drafting an improved strategic plan with an organogram and TORs for each unit

- Holding a retreat to review and validate the proposed new structure, improved organogram, and updated TORs/job descriptions
- Holding one-on-one engagements of unit leaders to discuss the different elements of the units
- Managing the governance and coordination structures of the DDMS for the provision of comprehensive integrated health services
- Conducting joint field visits/implementations
- Designing pharmaceutical standard operating procedures (SOPs)/guides
- Contributing to resources to strengthen the DDMS
- Engaging partners and transitioning project activities to the DDMS
- Managing emerging challenges in the collaboration with the NPPU and PBSL
- Coordinating resource mobilization, selection, quantification, procurement, and distribution of medical supplies nationwide
- Managing structures that promote medicine polices and guidelines that ensure the safety, efficacy, quality, availability, affordability, accessibility, and rational use of medicines
- Managing monitoring, evaluation, and research mechanisms for improved service delivery in the pharmaceutical sector

As part of the DDMS restructuring and pharmaceutical system strengthening process, SIAPS conducted a two-week leadership development (LDP) training of trainers (TOT) course that built the capacity of 17 DDMS pharmacists to train other facility and district-level pharmacy staff in the principles of leadership, management, and governance practices. A stakeholder alignment meeting was conducted as an integral part of the LDP to align stakeholders and partners role in the sector with DDMS in its efforts to contribute to the achievement of national health goals and to solve key issues in the pharmaceutical sector. There were complementary sessions that were conducted by SIAPS during the workshop linking the LDP to implementation of other technical activities such as the Continuous Results Monitoring and Support System (CRMS) and the Drug and Therapeutics Committees (DTCs). In addition, participants were exposed to the MSH-developed monitoring, training, and planning approach that leaders could use for the design and implementation of continuous quality improvement interventions.

At the end of the TOT and cascade training, participants were given a 4 GB flash drive containing an extensive library of workshop materials and resources that they could use for future training in their respective districts and to further improve their skills and knowledge in the pharmaceutical sector.

Based on the SIAPS technical assistance provided in revising the organogram and drafting TORs for the different units of the DDMS, key progress was demonstrated as the directorate had more than doubled its staffing based on the revised organogram.

As a result of this technical assistance, which consisted of organizational and management improvements, the DDMS' ability to effectively support health facilities was strengthened and its mandate and responsibilities were better realized.

Quantification (Forecasting and Supply Planning)

Accurate health commodity quantification exercises are important in estimating pharmaceutical and budget requirements for future demand. Reliable and evidence-based selection and quantification will minimize overstock, stock-outs, and emergency orders that are costly and wasteful and ensure uninterrupted access to safe products and optimized pharmaceutical expenditures.

SIAPS provided technical assistance and support to establish a National Quantification Committee (NQC) and seven quantification technical working groups, one for each health program and for the FHCI. The establishment included training in the principles and practices of forecasting and supply planning and the introduction/installation of electronic quantification tools (Quantimed, PipeLine, QuanTB). The technical assistance included actual multiyear quantification for ARVs and related HIV/AIDS diagnostic agents, TB medicines, and key essential medicines.

The NQC and the technical working groups are coordination mechanisms for effective management of pharmaceuticals in the country. Relevant health sector stakeholders—including the health programs, the DDMS, DHMTs, other departments of the Ministry of Health, health facilities, and development partners—are represented in these coordination platforms.

SIAPS also supported the DDMS and the FHCI technical working group in conducting a multiyear quantification of pharmaceuticals. Data from multiple sources, including the SIAPS-supported CRMS, were used to support evidence-based decision making. SIAPS also trained all members of the tuberculosis quantification technical working group on the use of QuanTB, a quantification and early warning tool that SIAPS developed to improve quantification and procurement processes for TB medicines. This training was followed by an actual quantification exercise.

SIAPS provided technical assistance to the National HIV/AIDS Secretariat and the HIV quantification working group to develop a three-year (2018–2020) quantification that is to be used in a funding application to the Global Fund.

Pharmaceutical/Logistics Management Information System

Quality information for decision making serves as the backbone of any institution. The poor design of the primary data collection tools (treatment registers) at health facilities and consequent user-unfriendliness resulted in erroneous and poor quality health data. The absence of a reliable data collection and reporting system has been a major cause of poor procurement and supply decision making and, consequently, losses due to over- and under-stocking and

expiry. At many facilities, the dispensing/medication register is usually an exercise book that does not carry all the necessary data elements of diagnosis and treatment to make it useful for monitoring and reporting on pharmaceutical supply chain and medicine use. The implementation of an improved and user-friendly data collection and reporting tool is one intervention SIAPS identified to help the DDMS and DHMTs improve pharmaceutical information systems, including automation of tools. Health facility requisition, receipt, and issue vouchers (RR&IVs), stock cards, and medication/dispensing registers are the basic tools at the PHU level that are targeted to provide stock status, rational use, and trend in patient service uptake data, which are valuable indicators for ensuring accountability and tracking improvement in services.

A new user-friendly diagnosis and dispensing treatment and summary report register was introduced at approximately 1,300 health facilities to improve data capture and quality. The register replaced a system that has been in place for several years that did not provide reliable data due to design problems. This new register uses ticking boxes to minimize writing and expedite data recording and analysis, and it can accommodate a broad range of products and diagnoses. The register introduced at all health facilities to capture data on patient particulars, key conditions treated, and key products dispensed/consumed is an important tool to ensure accountability and produce summary reports for informing rational medicine use and timely stock status data information for quantification and redistribution.

SIAPS provided TOT to district pharmacists and district information and monitoring and evaluation officers on the use of the registers and reporting. This TOT cascaded the training to roll out the use of the tool in all districts so that PHUs and hospitals would be comfortable in using the new tools. A total of 1,755 health workers were trained on the use of the tools.

SIAPS printed and distributed sufficient copies of the registers to last all districts for one year. SIAPS succeeded in getting buy-in from the DDMS and the DPPI to put the registers to use as part of the official health management information system pharmaceutical tools going forward. The DPPI has given the go ahead to introduce the new registers and recall the old ones after trainings are conducted.

For hospitals, electronic treatment register (eTR) soft copy templates have been provided. The Excel-based eTR is designed to be used by hospitals, which use more medicines and diagnose more conditions than do PHUs and conduct more analyses of indicators related to rational use, including antimicrobial resistance (AMR).

Improvements in data capture and reporting have been observed in the continuous availability of the tools at all public facilities, the ease of use of the tools by health workers, regular recording of data using the tools, reporting of stock status and patient uptake to DHMTs, use of data to complete CRMS checklists, and capturing key indicators in the pharmaceutical dashboard.

Dashboard

To take systems strengthening support to the next level, SIAPS is introducing a web-based enhanced information graphic display platform. The dashboard, which can be found at

http://slpharmadb.org/, features data from each health facility and supply structure and will provide real-time access to patient and commodity information. It will serve as an early warning system that will contribute to averting stock-outs, avoiding emergency procurements, and ensuring an uninterrupted supply of all key products. It will also improve forecasting and timely procurement using national and donor resources.

The dashboard is currently programmed to handle data on essential medicines and HIV/AIDS-, malaria-, and TB-related products. A consultant engaged by SIAPS designed the architecture using basic national health system structures and data. Based on a memorandum of understanding between USAID/SIAPS and the NAS, technical assistance has been provided for the development and use of a HIV/AIDS commodity dashboard. The architecture was designed using basic national health system structures and data, and development is being extended beyond HIV/AIDS to include other health programs, such as malaria and TB.

The dashboard was demonstrated to key partners, including USAID/Sierra Leone. Preliminary steps in interoperability between the dashboard and the national District Health Information System Version 2 (DHIS2) platform have been worked out by the SIAPS consultant. Further discussions will be conducted with the DPPI to formalize the interface.

Flow of data and reports Flow of data and reports Flow of data and reports National Each State (Percent) National Each State (Percent) For the control of the sequential state (Percent) For the control of

Figure 5. Sierra Leone Pharmaceutical Dashboard

The dashboard provides real-time access to stock status and consumption information to improve forecasting and timely procurement of medicines using national and donor resources. It also serves as an early warning system that will contribute to averting stock-outs, avoiding emergency procurements, and ensuring an uninterrupted supply of all key products.

Originally programmed to handle data on essential medicines and HIV-, malaria-, and TB-related products, the dashboard data are also being expanded to include all monthly CRMS-related data. Data will be entered at the facility level and will feed into a central data dashboard. All reports have an option to summarize by the national, regional, and district levels and to sort by facility. The dashboard also allows for downloading an Excel template pre-filled with metadata, which staff can upload to a table for use in the field.

As a follow-on to the Sierra Leone Pharmaceutical Dashboard, the CRMS, a web-based early warning system that provides visual data on real-time patient and product information, has also been added to the dashboard features. The SIAPS consultant provided training to MOHS central and district personnel.

SIAPS conducted training for 58 central and district staff on the use of dashboard in March 2017. The goal of the training was to build the capacity of MOHS staff on the dashboard and to test the system from the user's perspective.

CRMS morbidity, stock, and system data integrated into the dashboard include:

- Number of visits by age and gender
- CRMS visit profile by age
- CRMS total visit profile
- CRMS stock status of product group
- CRMS stock availability by type of facility for product group
- CRMS treatment versus quantity of medicines dispensed
- Availability of medicines
- CRMS commodity expiry for select indicator products (artemisinin-based combination therapy, essential antibiotics), plus stock-out trends for each product
- Average number of medicines per prescription
- Count of selected variables: (expired, moved for disposal, disposed of)
- Discrepancy between physical count and stock card record
- First expired, first out practices
- Staff-level distribution (percentage of each designation)

The data from the improved treatment register, summary report, and RR&IV tools are fed into the dashboard on a regular basis. These data are then aggregated to provide structured information in tabular and graphic presentations. The dashboard is updated quarterly by all public health facilities in the 13 districts. Decision makers such as the DDMS, DHMTs, health programs, and partners are accessing the dashboard to monitor stock status, expiry conditions of medicines, storage conditions, and other indicators and are taking appropriate actions.

The Continuous Results Monitoring and Support System

The CRMS is a comprehensive, indicator-based performance tracking and improvement system used to ensure product availability, improve management, and promote rational medicine use. SIAPS helped the country institute a CRMS to assess baseline challenges in pharmaceutical management and regularly track and support improvements in key intervention areas. The CRMS uses a series of indicators to track and monitor factors that influence medicine availability and disease case management. The CRMS has been rolled out in all 13 districts in the country, including 1,055 of 1,241 health facilities (85%). The CRMS is conducted by the DDMS, DHMTs, health program focal persons, district council representatives, and chiefdom focal persons.

Review meetings and action plans have been held in seven districts.

Through the CRMS exercises, DHMTs are encouraged and supported to reorganize their stores and update their stock cards.

The CRMS data are collected from each health facility on a quarterly basis to inform:

- Forecasting
- Procurement
- Distribution planning
- Reverse logistics of expired and overstocked products
- Redistribution of excess products to avoid expiration

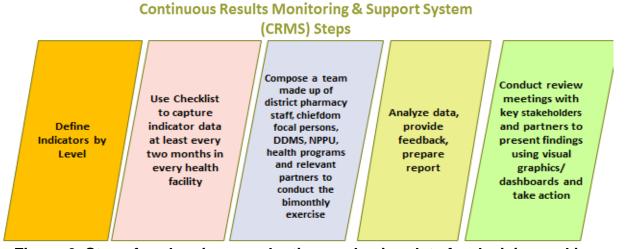
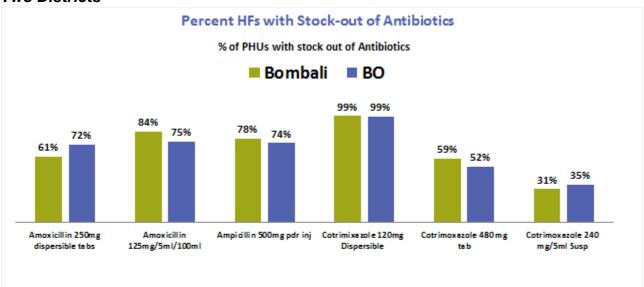
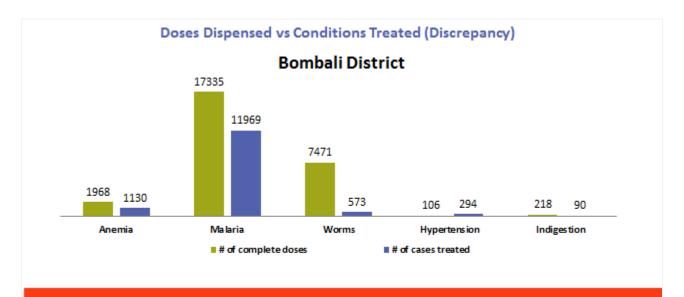


Figure 6. Steps for planning, conducting, and using data for decision making

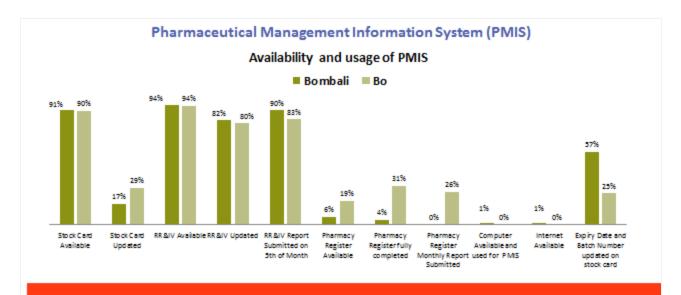
Examples of Data Collected and Analyzed as part of CRMS Tracked Indicators in Two Districts



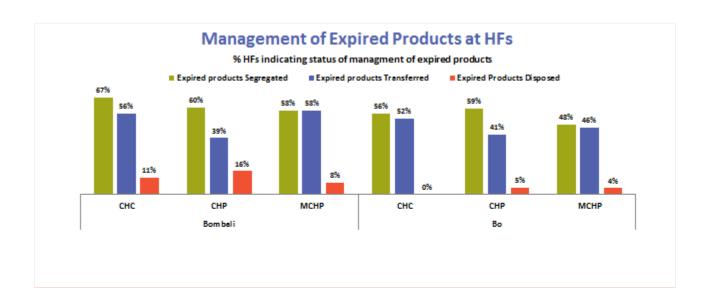
On the average a significant 68% of HFs in the two districts show stock-out of selected antibiotics, only CTM suspension showing 33% of HFs showing stock-out. ARI/Pneumonia being the second most frequent conditions in the HFs, this can be worrying.



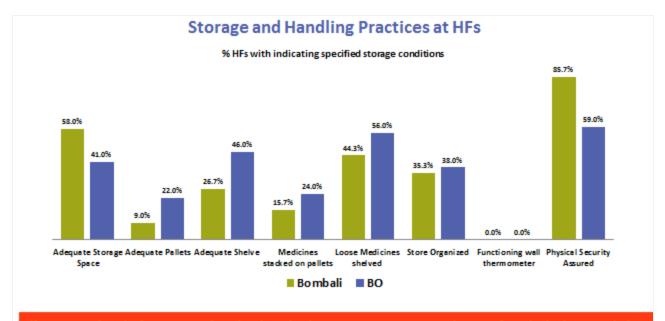
Analysis of five conditions comparing the total doses dispensed with the total number of patients treated indicated a large variance between the two variables that should have tallied, as the calculation is based on the assumption that one complete course of medicines is equal to one patient treated. In the case of malaria based on this analysis 5,364 complete doses of malaria medicines are not accounted for.



Information is key in supply chain accountability and transparency. The findings show although 90% of the HFs have stock cards, only 23% of them have updated the cards that makes any meaningful supply chain management impossible. The only LMIS tools that are reported to be updated at an 80% level are RR&IVs. However, the unreliable source data to complete them makes it also not a meaningful information for decision making.



Expired products are supposed to be separately kept from active products, transferred regularly for disposal by the appropriate higher levels. It is only 53% of HFs that expired products are separatly stored and transferred to district stores. The purpose of the CRMS exercise in this to identify the challanges and address then through mentorship and support.



Fifty percent (50%) of PHUs were found to have inadequate storage space. Only 36% of HFs had adequate shelves. Stores were in not organized in 64% of the HFs. This makes stock management, safe keeping and inventory contro practically impossible.

Drug and Therapeutics Committees

Irrational medicine use and poor pharmaceutical management are widespread throughout all levels of the health system in Sierra Leone. Misuse, underuse, and overuse of medicines are particularly worrying because they contribute to the rise of AMR and threaten the effective prevention and treatment of infections caused by bacteria, parasites, and viruses. DTCs are a proven way to strengthen health systems and reduce practices that lead to AMR by stemming inappropriate medicine use and promoting sound management among health care professionals. A DTC provides a forum for evidence-based practice reviews and transparent oversight of pharmaceutical management. This group manages medicine selection and procurement, promotes good prescribing and dispensing practices, and implements strategies to improve medicine use throughout a health care facility. DTCs also make necessary decisions on a health facility's reported adverse drug reactions and are a part of the capacity building cycle designed to inform national priority setting, target resources, and track progress.

Although there were attempts to establish DTCs in selected hospitals in Sierra Leone before SIAPS, they were short lived due to a lack of strategic planning. SIAPS supported the establishment of four DTCs at Connaught, Ola During Children's, Makeni Government, and PCM hospitals at an event in March 2017 in Freetown. SIAPS helped the DTCs develop their TORs and identify and track selected indicators related to appropriate prescribing and rational medical use. The program donated computers, printers, modems, projects and other office supplies and furniture to each hospital. It also procured medical information resources such as reference books for each DTC so that the hospitals will have a library where staff can access current medical information to improve their knowledge and better serve patients.

The lack of standardized, pre-printed prescription templates is a major challenge in many health facilities in Sierra Leone and hampers efficiency and effective data gathering. Prescriptions are critical official documents of the health system and require secure storage. They provide data that can be analyzed for key patient and product-related information as well as prescribing and dispensing data for rational medicine use initiatives. In consultation with the DDMS, the SIAPS-supported DTCs have taken the initiative to revise and use the standardized prescription template. Six hospitals have introduced new prescription forms to guide drug-use information gathering, including rational use.

Connaught Tertiary Hospital in Freetown has succeeded in revising and implementing the hospital treatment chart as part of its DTC function. The adoption of the improved treatment chart will harmonize patient recording and will be used as a data source for the pharmacy/treatment register.

A significant addition to DTC operations was the development of and orientation to an eTR. The eTR was developed to capture prescription information on patients (age, gender, pregnancy, lactation status, total number); diagnosis (condition, number of diagnoses per prescription, malaria test status); and treatment (number of medicines per prescription, number of antibiotics and injectable medicines per prescription, dispensing fulfillment). Its capabilities include aggregating, summarizing, and printing relevant data. The four DTC pioneer hospitals have used the SIAPS-donated computers to pilot eTRs and capture data from either in-patient treatment charts or out-patient prescriptions.

Regular DTC reviews help identify areas in need of improvement in rational medicine use, which the committees can address through prescriber, dispenser, and patient partnerships. The first two reviews measured antibiotic prescribing, injectable medicine use, brand versus generic medicines, number of medicines prescribed per encounter, and average rate of prescription forms that include all required information.

Table 1. Rapid Review Results from Connaught, Makeni, Ola During Children's, and Princes Christian Maternity Hospitals (July 2017)

Indicator	Result
Rate of prescription form completion	49%
Average number of medicines prescribed per encounter	3.7
% of prescriptions with antibiotics	66%
% of prescriptions for injectable medicines	25%
% of prescriptions for brand name products	47%

Hospital DTCs can become a focal point for planning on other areas of hospital improvement. Through its DTC, Makeni Government Hospital financed and established a cost recovery unit within its pharmacy department. Patients who fall outside the mandate of the government's FHCI, which offers medicines and related supplies only to pregnant women and children under the age of five, did not have access to medicines at the hospital's pharmacy. Instead, they filled their prescriptions at private pharmacies, where they faced a greater risk of problems with availability, quality, and affordability. Having a cost recovery pharmacy within the hospital not only helps ensure patient access to essential medicines but also helps guarantee that the

medicines are safe, effective, and dispensed accurately, completing the cycle of quality services, treatment, and case management. The income generated from the sale of medicines can also help the hospital further improve patient services.

SIAPS has taken advantage of the newly established DTCs to advocate for progress with the Government's AMR agenda.

Improved Storage, Handling and Disposal at District, PHU and Central Levels

The catastrophic Ebola epidemic that began in 2014 aggravated Sierra Leone's already weak pharmaceutical supply system, highlighting the fact that the country's pharmaceutical storage, handling, distribution, and waste disposal programs were in dire need of improvement.

One challenge has been inadequate storage space at all levels, which is due in part to the volume of expired and obsolete products taking up available space. Cluttered storage also makes stock management more difficult and dispensing less efficient. It raises the risk of prescribers using the wrong products or dispensing expired ones by mistake.

Data from the CRMS are used to continuously identify PHUs requiring infrastructure improvements, such as shelves, pallets, or storage cabinets and other quick-fix measures, such as fixing locks, windows, and doors to increase security. Fifty PHUs benefitted from storage improvements through the provision of shelves, pallets, and cupboards.

In Sierra Leone, individual health facilities and districts do not have appropriate and safe disposal equipment, such as incinerators. At the central level, when expired products were destroyed, they were sent to a private company that would burn them in the open without considering public safety and environmental concerns. In response, SIAPS, as a member of the MOHS' FHCI Forum, and its partners joined those involved in supply chain management in Sierra Leone—the DDMS, UNICEF, DFID, Crown Agents-International Procurement Agency (CAIPA), and Sierra Leone's National Pharmaceutical Procurement Unit/Central Medical Store—to collaborate on a plan to handle products for reverse logistics and proper disposal.

The turnkey activity of segregating, sorting, documenting, packing, and preparing for collection by district centers is part of the SIAPS technical assistance in the country; namely, establishing and using a CRMS in nearly all health facilities. The CRMS tracks a series of indicators for medicine availability and disease case management, including storage adequacy, overstocks of medicines, and expiry management. CRMS data are updated every two to three months.

For the disposal project, expired products were collected at the district level with a focus on those health facilities already participating in the CRMS. UNICEF, which uses trucks to deliver essential medicines to district stores every quarter, collected expired medicines for the return trip. If truck space was insufficient, products were stored in containers at the district level until they could be picked up. In collaboration with the PBSL, the expired products were then incinerated using CAIPA's five mini-incinerators on the outskirts of Freetown.

All health facilities using the CRMS (nearly 1,000 nationwide) participated in the pharmaceutical waste management initiative. Facility managers use a claim and return form to document the name, quantity, batch number, expiration date, and price of the products, thereby solidifying the process, practice, and auditability for efficient, safe reverse logistics and disposal.

Other SIAPS/SL Interventions for Pharmaceutical System Strengthening

Partners engagement, collaboration, and sustainability efforts

- Partnership was demonstrated through the implementation of SIAPS activities in a
 collaborative manner with all relevant MOHS agencies (the DDMS, NPPU, and PBSL) and
 other implementing partners (UNICEF, Department for International Development,
 Aecom/CAIPA, UNFPA, World Health Organization (WHO), CHAI, John Snow Inc.,
 JHPIEGO, and the Global Fund).
- As a key transitioning and sustainability effort, the project focused on conducting meetings with partners and the DDMS to engage them in plans to continue the activities that were initiated and demonstrate national-level acceptance. In this regard, meetings were held at which presentations were made to the World Bank, UNICEF, FHCI Forum, pharmaceutical supply management, and the Global Fund, among others. Several partners have already included activities in their respective plans to support the DDMS in continuing what has been initiated by SIAPS.
- As a result of SIAPS' holistic pharmaceutical sector approach and the involvement of stakeholders in project activities, the relevance and profile of the sector has gained recognition. This has resulted in acknowledgement of SIAPS as a contributor to post-Ebola recovery efforts. SIAPS conducted a number of project status briefings for key partners, including local USAID colleagues, that targeted key stakeholders, such as UNICEF, WHO, and UNFPA, to identify and take advantage of any opportunities for synergy and to support in the immediate future to ensure sustainability. We have already seen positive results with the Global Fund, which has agreed with its principal recipient to fund some ongoing SIAPS activities.
- SIAPS, in consultation with the Global Fund technical team, agreed to provide technical assistance to the NAS; that assistance was described in an MOU between SIAPS and the NAS. As a result of the continuous engagement with the NAS director and technical staff, the Global Fund agreed to support several activities that were initiated by SIAPS as part of the task of transitioning SIAPS work to the DDMS and districts. The following proposed items on the list submitted by SIAPS as part of an MOU were included in the Global Fund budget proposal:
 - o Quarterly CRMS orientation and exercise
 - o Post-CRMS review meetings
 - o Dashboard monitoring
 - o Procurement and supply chain management supervision (national and district levels)
 - o Quarterly coordination meetings with district pharmacists
 - o Printing of paper-based tools (treatment register, summary sheets, RR&IVs)
 - o Air time for Sierra Leone pharmaceutical dashboard modems

This inclusion of funding in ongoing Global Fund plans and negotiations is a major sustainability initiative that will keep the early successes of SIAPS technical assistance going forward.

As part of the system strengthening effort, the project finalized the procurement and
distribution of computers, printers, projectors, tables, and chairs to six hospital DTCs, 13
districts, the DDMS, and other entities that worked closely with the project. The list of
items was developed with the DDMS and shared with USAID/Sierra Leone to continue
the project activities initiated by SIAPS. In addition to these new supplies, equipment and
furniture used by SIAPS over the last two years were distributed to selected stakeholders
in consultation with USAID/Sierra Leone.

NMSA establishment

• USAID/SIAPS remained engaged and provided technical input into the process of transforming the NPPU into the National Medical Supplies Agency (NMSA), which was enacted into an Act by Parliament in November 2017. The NMSA is an autonomous body responsible for procurement, storage, distribution, and management of drugs and medical supplies for and on behalf of all public health facilities throughout Sierra Leone. It is located at the current Central Medical Store premises. As part of creating the NMSA, the MOHS is being supported by the Global Fund to establish a prefabricated warehouse measuring 6,000 square meters with its own high-volume incinerator to be located at Kerry Town on the outskirts of Freetown.

Close-out Event

• The SIAPS close-out event was held on December 13, 2017, at the MOHS. The event was well-attended by key personnel who will responsible for and involved in taking this important work forward. The close-out was ushered in with an event that brought the MOHS, USAID, partners, and other stakeholders together for a presentation of the project's achievements.

In addition, the event was an opportunity for USAID to formally present up-to-date reference books to the DDMS, PBSL, DPPI, NAS, NMCP, the Faculty of Pharmaceuticals Sciences, College of Medicines and Allied Health Sciences, and districts. The country project director (CPD) highlighted key SIAPS achievements to date, including the CRMS, quantification, PMIS/LMIS, DTCs, the dashboard, and DDMS reorganization and capacity building, and the ongoing efforts to have key partners buy into and support the pharmaceutical sector's strengthened infrastructure. The CPD further appealed to all present for their buy in and support to ensure that the gains are not lost because of a lack of support after SIAPS comes to an end, particularly as this is the first time that pharmaceutical-sector issues have been addressed in a coherent way.

The District Medical Officer, Kenema, who is one of the most experienced and highly regarded MOHS officials and a passionate voice on the value of SIAPS' work at the district level, could not attend but sent a video recording that was played at the event.

Following the event, the team received a number of complements from partners, including the following e-mail from UNICEF Sierra Leone, a key player in the sector:

"We want to thank you and your organization for your outstanding performance and the significant gains you made in strengthening the health supply chain system in Sierra Leone for the past two years. The presentation in the close out meeting explains it all. As one of the participants in the meeting, UNICEF is very much interested in some of the challenges you highlighted. In that regard, we will be grateful if you could share with us the challenges in your presentation for planning purpose from our side for 2018. Thank you very much and best wishes in your future endeavors".

Knowledge Management

• As part of knowledge management and capacity/resource building, SIAPS produced monthly and quarterly reports as part of the reporting requirement of USAID/Global Health Ebola Team (GHET). In addition, to keep the USAID health team informed, the country office submitted weekly updates to the USAID/Sierra Leone health advisor. In addition to these regular reports, different forms of information/communication and technical documents, including technical highlights and briefs, were produced under each of the key intervention areas implemented (annex a).

SIAPS Program Management

• SIAPS' work at headquarters played a key role in technical activity coordination, work plan development, monitoring and evaluation, budget monitoring, progress monitoring, reporting, meetings, and communications with partners and collaborators in country. The SIAPS headquarters country project managers (Dinah Tjipura/Michael Gabra) and the technical strategic lead/Ebola technical lead (Gabriel Daniel) provided key management and technical guidance and support to the country office to ensure technical, management and financial compliance to USAID and MSH protocols. SAIPS/Sierra Leone operated out of a small office base that housed the local technical and support staff. In addition, the DDMS provided SIAPS a larger office, which allowed for day-to-day engagement between the SIAPS and DDMS teams and promoted mentorship and skills transfer.

Lessons Learned and Follow Up

- The project has succeeded in doing a great deal in a short period and very challenging environment by identifying and working with receptive institutions, creating trust, getting staff commitment, taking an approach with less formal training and more mentorship/one-on-one engagement, focusing on a bottom up approach, fast-tracking interventions at all levels, practicing responsiveness/cutting red tape, inculcating a can-do attitude and thinking outside the box attitude, being flexible in implementing activities, jumping on implementation opportunities, and focusing on low-hanging problems/solutions that show immediate results.
- The third CRMS cycle could not be implemented in three of the 13 districts due to time and budgetary contraints. However, the CRMS has been earmarked for Global Fund support, and all districts will be taken care of going forward.

- Due to competing priorities, quantification of free health care products, which should have started at the beginging of the quarter, was postponed.
- With the new PMIS tools (treatment registers and RR&IVs) in place, there was no time to review the reporting status of health facilities and districts. SIAPS is expecting the DDMS to ensure close monitoring of reporting to reflect the value of the new tools.
- Technical/operational challenges to creating an interface between the pharmaceutical dashboard and DHIS2, including a need to match the health facility lists in the two systems, is pending. It is hoped that the DDMS and DDPI will continue their collaboration to address this.

Challenges and Proposed Solutions

- The original idea of leaving the data entry and analysis in the hands of district teams for
 purposes of sustainability, mentoring, and training appears to have slowed down timely data
 entry into the CRMS. Engaging district medical officers to ensure data entry and analysis by
 each district and assigning data clerks or district information officers during the CRMS
 period will be help address the challenge.
- Many PHUs are demanding quick fixes for storage-capacity problems. The project does not
 have the resources to address all needs. The way forward will be to engage other partners to
 be part of this support.
- The training of all districts in the use of treatment registers is becoming expensive. The project has conducted TOT and cascade training for 50% of the districts. SIAPS is actively engaging the DDMS, UNICEF, Global Fund, and other partners to share the cost burden of cascade training.
- Competing priorities of MOHS and health facility staff and intermittent power and Internet access are persistent challenges that are beyond the scope of the project. Advocating that government and partners pursue and coordinate these issues should eliminate duplication.
- The short project period to tackle all the interlinked challenges and the threat of nonsustenance if further support is not in the pipeline had a demoralizing effect on the stakeholders. Sharing best practices and engaging other partners to continue the good work accomplished to date is the way forward.
- Other challenges observed in the course of implementation of the project included high
 expectations for immediate results by the DDMS, DHMTS, and health facilities; a short
 period to address major areas of system rebooting/rebuilding/strengthening; uncertainty on
 continued funding after the end of the post-Ebola recovery project; low counterpart
 absorption capacity/preparedness; restructuring of the national supply chain agency and
 reliance on partners in the interim; and short-term commitments from partners.

ANNEX A. SELECTED COMMUNICATIONS AND TECHNICAL PUBLICATIONS

- SIAPS concludes work in Sierra Leone
- Promoting safe and appropriate medicine use in Sierra Leone
- Supporting drug and therapeutics committees in Sierra Leone to promote safe, appropriate medicine use
- <u>Leadership Development Program Training to Strengthen Pharmaceutical Management in</u> Sierra Leone
- A Rebirth of Sierra Leone's Pharmaceutical System
- Strengthening the Pharmaceutical System in Sierra Leone after Ebola
- Sierra Leone Project Update: Continuous Results Monitoring and Support System
- Sierra Leone Program Update: Strengthening quantification practices
- Rebuilding Sierra Leone's pharmaceutical system post-Ebola
- Sierra Leone Project Update: Developing a Commodity Dashboard to Track Medicine Stock and Related Health Data
- Introducing a more efficient and effective patient chart in Sierra Leone
- SIAPS Newsletter Volume 1, Issue 2: Post-Ebola Recovery in Sierra Leone
- Sierra Leone Project Update: A Preliminary Response to Controlled Disposal of Expired Products
- SIAPS launches four hospital DTCs in Sierra Leone
- Continuous Results Monitoring and Support System Tracks Post-Ebola Recovery in Sierra Leone
- Strengthening Post-Ebola Recovery and Resiliency in Four Countries

ANNEX B. PROJECT INDICATORS

			FY 2017						
INDICATORS THAT SUPPORT THE GHET RESULTS FRAMEWORK (on a per-country basis)	BASE LINE	Apr	May	Jun	Jul	Aug	Sep		
% of facilities experiencing stock-outs of key maternal and child health drugs and commodities	66%	47%	35%				32%		
% of health facilities that have properly remitted expired products to the district level in the last six months	37%			61%			72%		
# of health facilities using revised tools and guidelines related to pharmaceuticals				900			1,300		
# of districts practicing "pull" method of drug and commodity distribution				6			13		
# of MOHS DDMS personnel trained in new roles	NA			17			NA		
# of TORs for MOHS DDMS component units developed and approved	1 0 1			6			NA		
# of HFs that benefitted from one quick fix identified by CRMS	NA			26			24		
# of quarterly partner/stakeholder coordination meetings that have been held with minutes documented	NA			12			NA		
# of pharmaceutical management guidelines/SOPs developed/updated and submitted for adoption				4			NΑ		
# (and types) of documents used to improve transparency and accountability	NA			3			NΑ		
# of persons trained in quantification who have participated in at least one quantification exercise during the year	NA		25				NA		
# of meetings conducted by Quantification Committee	NA			3			NΑ		
% of HFs stocked according to appropriate min/max levels							56%		
% of HFs with stock-outs of a preselected group of medicines for three days or more in the last three months							32%		
# of HFs that have implemented a "pull system"				6			NΑ		
% of warehouses with accurate stock records (<10% discrepancy between physical inventory and stock cards, ledgers, or other inventory records) for preselected tracer commodities				NA			36%		
% of HFs with accurate stock records (<10% discrepancy between physical inventory and stock cards, ledgers, or other inventory records) for preselected tracer commodities	56%			40%			63%		
# of persons trained in pharmaceutical management (disaggregated by area of training and gender)				41			NA		
# of persons trained in pharmaceutical management that successfully complete a post-CRMS action plan				56			NΑ		
% of HFs that correctly applied SIAPS-provided transaction tools				199			NΑ		
# pf HFs provided mentorship in good supply chain management				199			NA		
% of HFs that returned expired/unusable products to the district in the preceding quarter	37%			61%			72%		
% of HFs using a standardized checklist to monitor and report on storage conditions				92%			NA		
# of facilities that correct storage bottlenecks through "quick-fix support" by SIAPS				26			24		
# of districts conducting CRMS at least once in a quarter							10		
# of HFs where CRMS has been conducted at least once in the last quarter							900		
% of HFs that completed and submitted an LMIS report for the most recent reporting period	53%	74%					NA		
# of HFs using new DDMS medication/dispensing register							1,300		
# of districts which use an online/web-based central hub linked system				NA			13		
# of districts submitting reports that meet or exceed minimum data quality standards (through any means, paper or electronic) by reporting deadline				NA			13		

HF = health facility

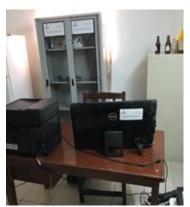
ANNEX C. PHOTO GALLERY



Participatory management with DTCs







DTC launch and input







Changes in inventory management and improved access through DTCs



Samples of up-to-date reference books donated to hospitals, the DDMS, districts, and teaching institutions



Automating hospital dispensing/treatment register



CRMS team explaining the purpose of CRMS/visit to a PHU in-charge



Busy reviewing inventory control forms to complete the check list





Building pallets for storing medicine



Expired products identified during CRMS are incinerated by CAIPA





The cleanup begins at PHU with the help of a CRMS team member; products sorted and ready for incineration



Assisting an in-charge in organizing a PHU store







Changes in storage and inventory management



Capacity Building — Key to success



Participants at the USAID/SIAPS close-out event at the MOHS, December 13, 2017



DDMS Director Mr. Bassie Turay receiving donated reference books from USAID Health Team Leader Maria Buscutt and Murtada Sesay, CPD of SIAPS





What it takes