

DEFEATING MALARIA

THROUGH PHARMACEUTICAL SYSTEMS STRENGTHENING

Results from the Systems for
Improved Access to Pharmaceuticals
and Services (SIAPS) Program



USAID
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President's Malaria Initiative

SIAPS 
Improved Access. Improved Services.
Better Health Outcomes.

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ABOUT SIAPS | The Systems for Improved Access to Pharmaceuticals and Services (SIAPS) program works to ensure access to quality pharmaceutical products and effective pharmaceutical services through systems-strengthening approaches to achieve positive and lasting health outcomes. SIAPS is funded by the US Agency for International Development (USAID) and implemented by Management Sciences for Health. For more information, visit www.SIAPSprogram.org.

The information provided in this document does not reflect or represent the position or views of the US Agency for International Development or the US Government.

ACRONYMS

ACT	artemisinin-based combination therapy
APTS	Auditable Pharmacy Transactions and Services
CRMS	Continuous Results Monitoring System
DNPL	Direction Nationale de la Pharmacie et des Laboratoires
DRC	Democratic Republic of the Congo
DTC	drug and therapeutics committee
EML	essential medicines list
EUV	End Use Verification
GFATM	Global Fund to Fight AIDS, TB, and Malaria
IPTp	intermittent preventive treatment in pregnancy
LMIS	logistics management information system
LMU	logistics management unit
MNCH	maternal, newborn, and child health
NMCP	national malaria control program
OSPSANTE	Outil de Suivi des Produits de la Santé
PCG	Pharmacie Centrale de Guinee
PMI	US President's Malaria Initiative
PPMRm	procurement planning and monitoring reports
RDT	rapid diagnostic test
SIAPS	Systems for Improved Access to Pharmaceutical and Services
SPS	Strengthening Pharmaceutical Systems
STG	standard treatment guideline
USAID	US Agency for International Development
WHO	World Health Organization



INTRODUCTION

One of the world's oldest diseases, malaria once was endemic across nearly every continent, and at its peak in 2004, claimed 1.2 million lives per year.¹ Today, with proven prevention and treatment strategies, 57 countries have reduced the number of new malaria cases by 75%, and in 2015, 33 countries had fewer than 1,000 cases of malaria.² However, malaria still claims more than 400,000 lives each year, mostly children under the age of five in sub-Saharan Africa. More than 3 billion people globally, or roughly one-third of the world's population, are at risk of malaria.³

Proven vector control and prophylaxis strategies; early diagnosis; and treatment with safe, effective, and quality-assured antimalarials have helped to turn the trajectory of the epidemic downward. However, for many countries working toward malaria elimination, ensuring that these hallmarks of malaria prevention and control are sustained requires that the systems that support them must be strengthened as well.

In 2011, the US Agency for International Development (USAID) awarded funding for the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program to Management Sciences for Health to improve access to and appropriate use of pharmaceuticals by strengthening the systems and services through which they are provided.

By applying a systems-strengthening approach, SIAPS helps to improve health outcomes and contributes to international health initiatives, including:

- Achieving an AIDS-free Generation
- Ending Preventable Child and Maternal Deaths
- Protecting Communities from Infectious Diseases

SIAPS has received funding from the US President's Malaria Initiative (PMI) to work in eight countries—Angola, Burundi, Democratic Republic of the Congo (DRC), Ethiopia, Kenya*, Guinea, Mali, and South Sudan—to strengthen pharmaceutical systems for improved malaria control.



* SIAPS provided support to activities in Kenya through the Health Commodities and Services Management Program.

ABOUT THIS REPORT

This report synthesizes the pharmaceutical systems strengthening efforts of SIAPS and documents how the approach was used to support efforts to control malaria. To that end, a retrospective review was conducted to document systems strengthening interventions that support improved prevention and treatment of malaria.

SIAPS conducted a desk review of activities and results across the eight countries for which the program received funding from PMI, and interviewed key project staff, government stakeholders, implementation partners, and beneficiaries. A total of 73 interviews were conducted, including 33 with SIAPS staff, 25 with government officials, 8 with partners, 4 with health care providers, and 3 with training institution staff.

This report is not intended to serve as an evaluation or study to assess the direct impact on health outcomes. Rather, it aims to mine program data, results, and lessons learned across the duration of SIAPS to document how the

SIAPS health systems strengthening approach supported PMI in improving malaria commodity availability and use.

This report is organized to highlight the systems-strengthening approach used by SIAPS. Each section features program results across five health system components highlighted in the SIAPS Framework (figure 1).

Like the challenges they seek to address, systems strengthening solutions in the pharmaceutical sector are frequently interrelated and interconnected across multiple health system components. Efforts to strengthen governance of pharmaceuticals, for example, would likely influence most or all other parts of the pharmaceutical system, including financing, human resources, and service delivery. The activities documented in this report may be presented under one health system component even though nearly all of our activities touch upon multiple components simultaneously.

A SYSTEM STRENGTHENING APPROACH

Between 2000 and 2015, major efforts to scale up and expand proven malaria interventions have cut the global malaria mortality rate by 60%. The incidence rate of new cases globally has also fallen by 37%.⁴ However, the disease is still endemic in many regions, especially sub-Saharan Africa, where it is the leading cause of death in countries such as Nigeria and DRC, which alone account for 40% of global cases.⁵ In many health facilities across DRC, malaria accounts for more than 80% of patient visits to health centers.⁶ Reliable access to safe, effective, and high-quality medicines and diagnostics remains out of reach for many, as do the services that support effective delivery of prevention, diagnosis, and treatment services.

The progress against malaria to date has shown that elimination is possible. However, as the

world's population grows, more people will live in areas where becoming infected with malaria is a persistent threat, which will place additional strain on health systems. Furthermore, major obstacles—civil unrest, climate change, drug resistance, and other disease outbreaks like Ebola—represent barriers to achieving long-term, sustained malaria control and elimination.

Accelerating progress and scale up of proven malaria interventions requires addressing challenges within health systems that contribute to uneven availability of antimalarial medicines. Supporting systems that allow for a robust regulatory process, efficient medicine registration, and effective monitoring of medicine safety are critical to maintaining uninterrupted availability of quality-assured antimalarials.

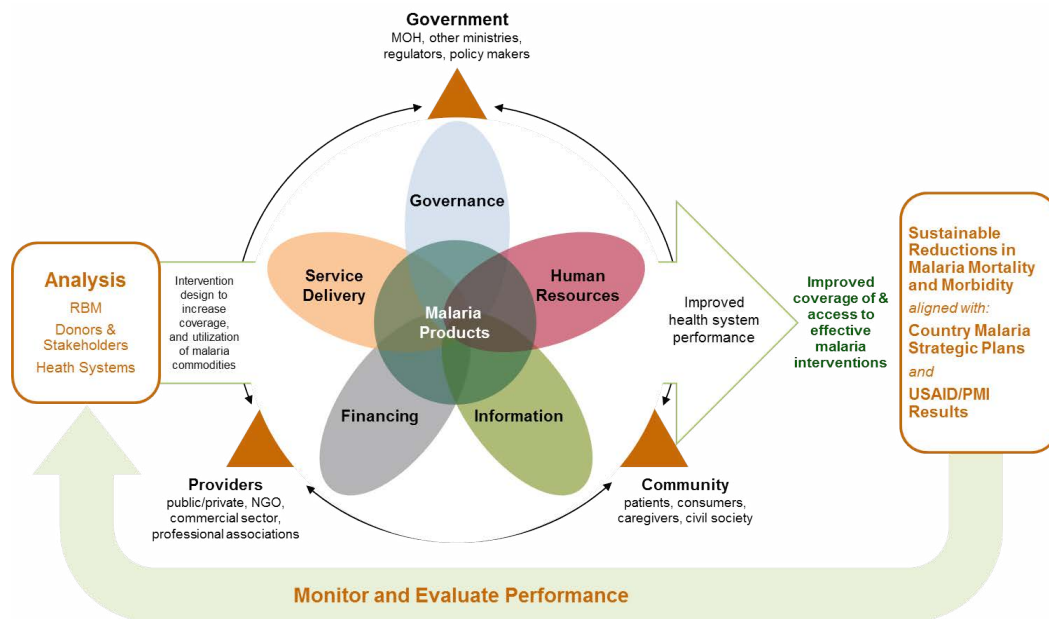


Figure 1. SIAPS malaria framework

SIAPS works to:

- Strengthen pharmaceutical-sector **governance** to foster accountable and transparent organizations and management
- Build **human resources and institutional capacity** for more effective and sustainable organizations
- Address **information** needs, including product and patient data to support evidence-based decision making
- Strengthen **financing** strategies and mechanisms to ensure adequate funding and efficient use of resources
- Increase access to effective **pharmaceutical products and services** that meet a patient's needs and help to improve health outcomes

While SIAPS works across multiple disease priorities, including tuberculosis, maternal and child health, and HIV/AIDS, this report focuses specifically on SIAPS' malaria-related activities.

With approximately USD 43 million in PMI funding over six years, SIAPS collaborated with in-country partners and stakeholders to develop and implement activities aimed at strengthening the pharmaceutical management of antimalarial products to ensure uninterrupted availability of malaria commodities and minimize product stock-outs and expiries.

To achieve this, SIAPS supports national ministries of health and malaria control programs (NMCPs), regulatory authorities, central medical stores, program managers, district-level staff, and health care providers in supply planning; quantification; logistics and information management; distribution; diagnostics; case management; and promotion of appropriate prescribing and medicine use, including medicine safety.

GOVERNANCE

Good pharmaceutical governance helps shield programs from corruption and mismanagement, which can diminish access to antimalarials and lead to the distribution and use of unsafe, ineffective, or poor-quality products that may harm patients. These problems can also lead to wastage and misuse of scarce resources as well as inflated prices for medicines, which can be costly for governments, institutions, and individuals.

“SIAPS doesn’t come in as leaders; rather they help us to lead instead.”

—Dr. Moussa Konaté, Director General, Pharmacie Central de Guinée

AREAS OF IMPACT

Strengthening governance and improving the adoption of and adherence to good governance principles, such as transparency, accountability, stakeholder participation, and responsiveness, can be supported by working with ministries of health and NMCPs to:

- Establish and implement policies and legislation supported by the rule of law
- Strengthen organizational structures that are able to exercise appropriate decision making, authority, and oversight
- Improve transparency and accountability in systems and processes in accordance with best practice norms and guidelines
- Enhance human resource management to promote effective performance and ethical practices

Approaches that facilitate skills transfer, build capacity for leadership and good governance, and engage a range of stakeholders help to foster country ownership. While this approach takes time, it ultimately enables interventions to be better integrated into country systems and helps to promote sustainable results.

Governance: Why It Matters for Malaria

Examples in this chapter describe how SIAPS' governance-related activities contribute to:

- Increasing synergy among implementing partners
- Avoiding duplication of efforts
- Integrating management of antimalarials with other public health programs to achieve efficiencies of scale and support integrated service delivery
- Increasing accountability and transparency to support appropriate decision making and oversight
- Procuring commodities in correct quantities
- Reducing requisition time for commodities
- Improving availability of malaria commodities
- Avoiding wastage and expiries
- Increasing access to malaria treatment for vulnerable populations, including children



Antimalarial medicines are tracked and stored at a central storage facility in Juba, South Sudan.

DEVELOPING EFFECTIVE PHARMACEUTICAL LAWS AND POLICIES

Policies and legislation provide the framework for the national regulation of pharmaceuticals, including antimalarial commodities, and must be supported by guidelines, standard operating procedures, effective contractual agreements, and monitoring and tracking systems. Effective malaria control relies on having effective, relevant, and updated laws and policies in place to safeguard the antimalarial supply chain from fraud, theft, losses, and the entry of substandard or falsified products. These laws also support national regulatory authorities in developing more rigorous and sound medicine registration processes and pave the way for more effective procurement and distribution processes, which in turn directly influence the availability and accessibility of antimalarial medicines and diagnostics.

Through PMI support in Guinea, SIAPS worked with the national medicines regulatory authority (Direction Nationale de la Pharmacie et des Laboratoires (DNPL)), the World Health Organization (WHO), and other partners to develop the 2014 National Pharmaceutical Policy and a five-year implementation plan. SIAPS is currently supporting government partners to revise the country's pharmaceutical law, which is more than 20 years old. The revised national policy and planned legislation will help to improve the regulation of manufacturing, procurement, export, prescription, and distribution of antimalarials and all other medicines in the country.



Antimalarial medicines stocked in a central storage facility in Juba, South Sudan.

REGULATORY SYSTEMS STRENGTHENING

National regulatory authorities help to govern the safety, efficacy, and quality of pharmaceutical products and related services through product registration, licensing of establishments and personnel, inspection, control of pharmaceutical marketing processes, quality testing, and safety monitoring. However, in many countries, the regulatory authority lacks the capacity to carry out these functions effectively, leading to a proliferation of substandard or falsified medicines entering the market, which can directly and negatively impact the health outcomes of patients. Patients suffering from malaria may receive antimalarials that are fake, adulterated, or of poor quality that may do little to improve the patient's condition and even exacerbate the severity of their illness, cause harm, and contribute to the emergence of drug resistance.

In DRC, SIAPS' efforts to strengthen the medicine registration process through the establishment and continued support of a national registration committee have resulted in an increase in the number of registered medicines from 200 in 2010 to 3,934 in 2016. Seventy-two percent of the medicines on DRC's essential medicines list (EML) have at least one product registered, up from 44% in 2011. In addition, the list of registered medicines is now publicly available, regularly disseminated throughout the health system, and used by government inspectors to control medicines at ports of entry.

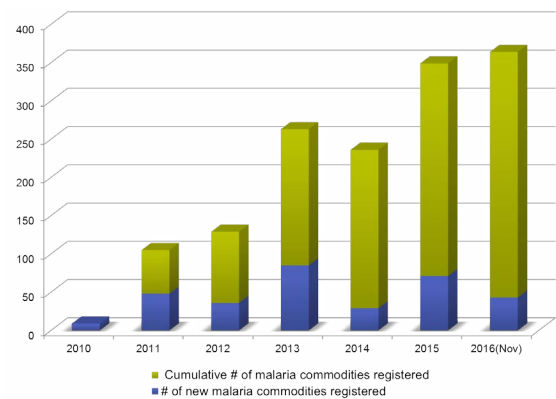


Figure 2. Newly registered and total number of registered malaria commodities in DRC, 2010–2016

When SIAPS began, only nine malaria commodities had been registered in DRC. Building on the work of the Strengthening Pharmaceutical Systems (SPS) project, a predecessor to SIAPS, SIAPS supported the Department of Pharmacies, Medicines, and Traditional Medicine in registering more than 300 antimalarial commodities as of November 2016. Registering these commodities enables them to be procured, distributed, and prescribed throughout the country in accordance with the EML and standard treatment guidelines (STGs) and saves time during the procurement process by eliminating the need for a product waiver.

COORDINATION ACROSS THE PHARMACEUTICAL SYSTEM

SIAPS has helped to establish or strengthen national or regional coordination committees in the eight PMI-supported countries in which it works. These coordination committees, which range from national-level quantification committees and pharmaceutical technical working groups to provincial- and district-level medicines committees, coordinate the procurement and distribution of antimalarial commodities.

In DRC, these types of committees exist at both the national and provincial levels. SIAPS supported the national medicines coordinating committee in conducting a partner mapping exercise that helped clarify roles and eliminate duplication of effort in some provinces.

At the provincial level, where accessing quality data on consumption was a persistent challenge, these committees began regularly requesting and collecting data on medicine consumption, which has enabled a transition to a more accurate partial pull system of distribution in some health zones. In addition, these committees helped centralize and integrate storage of commodities from different donors and programs to improve efficiency and optimize distribution of products. For example, redistribution schemes were developed to allow the exchange of commodities among health zones and facilities to reduce stock-outs and expiries.



A pharmacy inspector and customs officer in DRC review the new Registered Medicines Directory.

Photo credit: Helena Walkowiak

Creating an Enabling Environment for Decentralization

Many countries are working toward more decentralized models of pharmaceutical management. SIAPS is supporting improved decentralized malaria control by fostering effective coordination, supervision, and capacity building at the local and county levels.

In South Sudan, numerous development agencies and partners are working to strengthen the health system and provide health services; however, each partner comes with a different mandate and geographical reach. To better coordinate pharmaceutical management among partners and across provinces, SIAPS helped establish the Pharmaceutical Technical Working Group. This group brings together implementing partners to discuss pharmaceutical management issues, share information and best practices, and minimize duplication of effort and medicines waste.

Country Highlights

Angola

National-level committees for quantification of commodities and partner coordination established

Burundi

Intermittent preventive treatment in pregnancy (IPTp) policy adopted

DRC

More than 3,900 medicines (321 malaria commodities) registered through improved registration processes

Ethiopia

National Standard Malaria Diagnosis and Treatment guidelines updated

Guinea

National Pharmaceutical Policy and Implementation Plan finalized

Mali

National Medicines Committee established

South Sudan

National Malaria Strategic Plan 2014/15–2020/21 developed

CAPACITY BUILDING

Developing stronger pharmaceutical systems that allow for greater and more equitable access to health commodities, including antimalarials and rapid diagnostic tests (RDTs), hinges on the availability of skilled health care workers, program managers, and leaders with the appropriate knowledge, skills, and training to effectively implement pharmaceutical management activities. It also requires organizations and institutions that have sufficient capacity to lead, manage, and effect positive change within the pharmaceutical sector.

“We start with what is feasible and build bit by bit... build consensus, build capacity, and ultimately build systems.”

—Serigne Diagne, Senior Technical Advisor, SIAPS Guinea

AREAS OF IMPACT

SIAPS engages with a broad range of stakeholders—from country governments and universities to health facilities and health care workers—to:

- Address pressing human resource capacity challenges, such as health care worker shortages, resource constraints, and policy-level issues
- Identify areas and opportunities for capacity improvement and develop strategies to strengthen the system in the long term
- Leverage training opportunities to establish mechanisms for continuous process improvement

Our approach to capacity building goes far beyond conducting trainings or workshops. It focuses on implementing capacity-building interventions that are supported and reinforced through country-led review, supervision, and feedback mechanisms. Activities related to capacity building are prominent in all eight PMI-supported countries in this report and span all health system components.



The Central Equatoria State warehouse manager stocking shelves at a storage facility in Juba, South Sudan.

Capacity Building: Why It Matters for Malaria Control

Examples in this chapter describe how SIAPS' capacity-building activities contribute to:

- Procuring the correct quantities of commodities
- Reducing the requisition time for malaria commodities to mitigate stock-outs
- Improving diagnosis and rational use of antimalarials
- Increasing efficiency so that more resources and funding are available for malaria programs
- Improving the quality of services and access to malaria treatment

“The national malaria program was one of those programs which, though it was there, it was not a very strong program, but today, regionally and globally, we are being recognized for the strength of our program in South Sudan.”

—Harriet Pasquale, NMCP Program Manager, South Sudan

SUPPORTING EFFECTIVE LEADERSHIP

Strengthening National Malaria Control Programs

At the country level, SIAPS works to strengthen NMCPs to improve and streamline the management of malaria commodities, including artemisinin-based combination therapy (ACT) and RDTs, and support malaria prevention, diagnosis, and case management efforts. Our systems strengthening approach helps position NMCP staff as leaders and supports them in implementing locally relevant, feasible, and responsive solutions.

Our support to NMCPs is tailored to each country's context and distinct set of challenges and includes optimizing organizational structure, developing guidelines and standards, fostering professional development and leadership opportunities, reinforcing ownership, and strengthening and expanding core functions and processes.

In South Sudan, SIAPS support to the NMCP began in 2011, which was a time of intense conflict, economic turmoil, and major governmental change. SIAPS worked in partnership with the NMCP to strengthen its key functions, revise the national malaria strategic plan, develop and distribute key malaria guidelines (e.g., for the distribution of long-lasting insecticide-treated nets), and conduct the national malaria indicator survey. The NMCP has developed rapidly and has received recognition from groups such as the African Leaders Malaria Alliance, which acknowledged the NMCP with an award of excellence for Most Improved in Malaria Control in 2015.



Pharmacists at a community pharmacy in Guinea.

“SIAPS doesn’t come in and do it in place of the government or instead of the government. They are different; they come in and say ‘Let’s do this together’”

—Dr. Moussa Konaté, Director General, PCG, Guinea

Revitalizing Central Medical Stores

In Guinea, SIAPS has been working closely with the central medical store (Pharmacie Central de Guinée, PCG) to strengthen pharmaceutical management of all essential medicines, including antimalarials. The PCG had not been implementing good storage or distribution practices and struggled to achieve many of its key mandates, which led some partners and stakeholders to create parallel and duplicative processes for the procurement, storage, and distribution of health commodities.

Consistent with its systems strengthening approach, SIAPS conducted an options analysis to understand the issues and then identified potential solutions to strengthen the PCG.

SIAPS supported the PCG to build its institutional capacity in a number of ways, including self-assessment and performance reviews,

development of a strategic plan, implementation of good storage and management practices, and establishment of coordination mechanisms both internally and with external partners.

As a result, the PCG was able to conduct the first successful international tender for commodities in 2014, coordinate an emergency distribution of ACTs that ended a prolonged national stock-out, and revive coordination between the PCG, other government entities, and implementing partners. Noting the improvements at the PCG, other government and implementing partners have once again started using the central store, which has eliminated many of the parallel structures that previously existed.

A MULTIFACETED APPROACH TO STRENGTHENING HUMAN RESOURCES FOR MALARIA CONTROL

SIAPS has worked to build individual and institutional capacity through effective trainings complemented by a range of reinforcing mechanisms, including supportive supervision, professional development and continuing education, peer-to-peer mentoring, and the development and use of guiding documents (e.g., standard operating procedures, job descriptions, organograms, checklists, job aids).

In DRC, SIAPS was asked to provide malaria case management support to 44 health zones that were not receiving support from other partners.

SIAPS worked with the NMCP to revise case management guidelines and training materials. Together with the NMCP, SIAPS conducted cascade trainings in all 44 health zones that were complemented by targeted supervision and mentoring of trainers to promote consistency and quality in training. In all, 965 health workers were trained on the updated guidelines for case management, prophylaxis for pregnant women, and management of antimalarial commodities.



Learning about malaria prevention and treatment on World Malaria Day in South Sudan.

Photo credit: Margaret Lejukole

Country Highlights

Angola

62 senior-year pharmacy students were trained on pharmaceutical management

Burundi

12 provinces rolled out new policy for IPTp through targeted trainings at the national, district, and community levels (5,474 people were trained on pharmaceutical management)

DRC

965 health workers were trained on management of antimalarial commodities and malaria case management

Ethiopia

5,601 health professionals were trained on pharmaceutical management

Guinea

6 pharmacists from regional depots were trained in the decentralization of stock and the distribution of antimalarial medicines

Mali

1,650 health workers were trained on pharmaceutical management

South Sudan

1,019 health workers were trained on pharmaceutical management, 107 were trained on the new malaria treatment guidelines, and 171 were trained to monitor therapeutic efficacy of antimalarial medicines at sentinel sites

INFORMATION FOR DECISION MAKING

The collection, analysis, and use of patient and logistics data drive better decision making at all levels of a health system. In the pharmaceutical sector, accurate and timely information is used to help pharmacy managers ensure a steady supply of medicines; provide insights into the factors that enable patients to adhere to treatment regimens; guide the development and revision of national treatment protocols; and facilitate more accurate quantification, procurement, and costing for medicines and other health supplies at the national level.

“To control malaria you need data and that data must be handled properly and with care ... so it can be used to plan the way forward.”

—Ismail Maybumaya, NMCP Coordinator, Western Equatoria State, South Sudan

AREAS OF IMPACT

SIAPS works to improve the availability and use of pharmaceutical data through:

- Revision and roll out of appropriate data collection tools (paper-based and electronic)
- Development of more efficient systems for collecting, collating, and analyzing data
- Creation of user-friendly, electronic early warning systems and other tools to facilitate the use of data for effective decision making

Accurate data that are managed with effective systems enable evidence-based decision making that, in addition to improving medicine availability, contributes to better patient care, stronger health systems, and better health outcomes.

Information for Decision Making: Why It Matters for Malaria Control

Examples in this chapter describe how SIAPS' work on information systems contributes to:

- Improving the accuracy of forecasting and supply planning of health commodities
- Implementing data-driven decision making to improve the availability of antimalarial commodities
- Improving planning for commodities distribution and early warning of potential shortages and stock-outs
- Increasing transparency in the management of antimalarial products and related finances to strengthen tracking, oversight, and accountability



A child gets tested for malaria on World Malaria Day in South Sudan.

Photo credit: Margaret Lejukole

STRATEGIC INFORMATION HELPS DRIVE BETTER DECISIONS AND AVERT RISKS

In partnership with PMI and other partners, including the USAID-funded DELIVER project, and building on the achievements of SPS, SIAPS helps to implement the End Use Verification (EUV) tool to help assess malaria commodity stock status and malaria case management practices. SIAPS also continues to assist countries in preparing PMI-required quarterly procurement planning and monitoring reports (PPMRm). Data collected by these tools have helped to monitor and pre-empt stock-outs; avert potential expiries; and disseminate relevant, up-to-date information that directly supports stronger supply chains and greater availability of medicines.

EUV surveys allow in-country malaria programs to view a snapshot of the malaria supply chain status, including current availability of commodities, and make data-driven decisions. For example, in Mali, even though ACTs were free for children and pregnant women, payment was still required for the RDT to confirm the diagnosis before a patient was able to receive ACTs. The EUV survey noted under consumption of RDTs and over consumption of a key antimalarial, artemether-lumefantrine, indicating that the medicine was still being prescribed based on symptoms such as fever rather than on a positive RDT. Based on this finding and in a move to reduce barriers to obtaining accurate malaria diagnoses, the Ministry of Health decided to make RDTs available to the entire population

free of charge. This change is expected to increase rapid diagnostic testing for malaria in patients presenting with fever, which will enable prescribers to better comply with the recommendations of the new treatment policy.

The EUV survey has demonstrated such value to malaria programs that it is now being adopted by other health programs in Angola, DRC, and Mali to monitor the availability of HIV/AIDS, maternal and child health, and other essential medicines. In DRC and Guinea, the Global Fund to Fight AIDS, TB, and Malaria (GFATM) has also begun implementing EUV surveys in the provinces in which they support malaria activities.



Facility-level malaria register, NMCP Guinea.

CONTINUOUS RESULTS MONITORING SYSTEM

In Ethiopia, the Continuous Results Monitoring System (CRMS) helps to track trends over time in the management of antimalarial commodities and the pharmaceutical services through which they are provided. Data are collected monthly and discussed at monthly review meetings.

When SIAPS began, data from CRMS helped to identify a widespread practice of providing treatment for malaria based solely on the presence of key symptoms rather than seeking a laboratory confirmation of the diagnosis. Many patients were therefore receiving unnecessary medicines, which resulted in widespread stock-outs. CRMS showed a discrepancy between the number of laboratory-confirmed cases and the number of patients receiving malaria treatment prompted stakeholders to take action to remedy this practice through pharmacist trainings, supportive supervision, and mentoring.

Data now show that the percentage of cases being treated without laboratory confirmation has been cut nearly in half at facilities implementing CRMS. In addition, because laboratory testing also tells physicians and pharmacists which type of malaria a patient has (e.g., *P. vivax* or

P. falciparum), the health care team can ensure that each patient receives the medicines that are most appropriate for the type of malaria diagnosed, which helps patients recover more quickly and avoids the development of drug resistance to antimalarial medicines.

With better prescribing and dispensing practices brought about by CRMS, along with other major interventions in malaria control, the number of patients treated annually for malaria dropped from a high of more than 50,000 in 2011 to just over 15,000 in 2014.

“We used to give antimalarial medicines to patients if they had the symptoms, but we would always run out and would have to turn away patients. Now, we only dispense antimalarial medicines when the laboratory confirms the diagnosis, and as a result we’ve had fewer stock-outs and avoid giving patients medicines they don’t need.”

—Pharmacist, Facility, Ethiopia

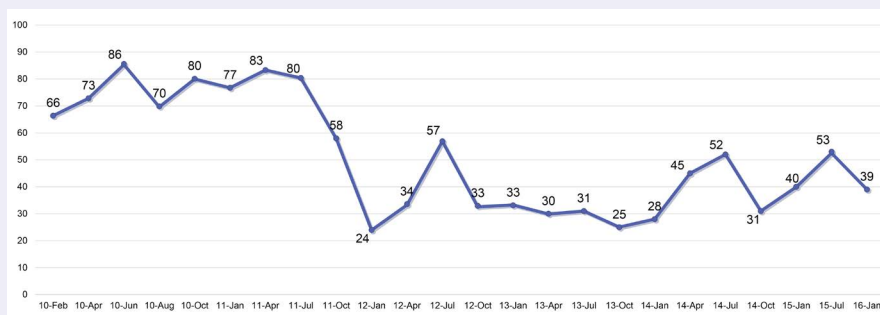


Figure 3. Percentage of cases treated without laboratory confirmation, February 2010 to October 2014

USING DASHBOARDS TO FACILITATE USE OF DATA IN DECISION MAKING

Simply collecting and reporting data on the management of commodities does not necessarily mean that the data will be used effectively to inform decision making. Our approach recognizes that timely, high-quality, and complete data must be complemented by efforts to ensure accessibility, understandability, and usability of the data. Dashboards are often used as visual representations of the data or to provide indicators, signals, or alerts of potential issues.

In Mali, a lack of regular and reliable pharmaceutical management data for decision making and an inadequate and fragmented logistics system that failed to take into account community-level data contributed to frequent stock-outs of antimalarial commodities at service delivery points.

SIAPS supported the Ministry of Health in Mali in designing and rolling out a web-based dashboard that provides an early warning system for key public health priority programs, including malaria; maternal, newborn, and child health (MNCH); and

family planning. The dashboard, called Outil de Suivi des Produits de la Santé (OSPSANTE), is the first tool for managing malaria, family planning, and maternal and child health commodities that combines logistics and patient information in the same platform. The purpose of this dashboard is to capture, track, aggregate, and make available malaria, MNCH, and family planning commodities data and patient information in real time.

SIAPS supported the Ministry of Health in training warehouse managers from national, regional, and hospital facilities and continues to train and mentor managers at the district level on OSPSANTE data entry. The dashboard is being populated with data collected nationwide and it already captures data from 50 districts in 1,186 health facilities in Mali. The reporting rate—the number of health facilities completing and submitting a logistics management information system (LMIS) report—increased from 67% in 2014 to 87% at the end of 2015.



Screenshots from SIAPS' OSPSANTE, Mali tool.
Credit: MSH/SIAPS

Country Highlights

Angola

672 of 778 health facilities are using appropriate tools for malaria logistics data

Burundi

EUV findings helped to streamline processes and reduced requisition time for malaria commodities from 2 weeks to 2 days.

DRC

EUV was adopted by the NMCP as one of its monitoring and evaluation mechanisms

Ethiopia

25 of 44 facilities are managing CRMS and antimalarial medicine management activities without SIAPS support

Mali

More than 1,100 facilities are feeding data into OSPSANTE

Guinea

A 90% reporting rate was achieved in 2015 with new LMIS tools, up from 30% in 2012

South Sudan

391 facilities in 2 states are using approved tools and reporting monthly stock status of essential medicines (including antimalarials) to the logistics management unit (LMU)



Waiting in line for testing and treatment on World Malaria Day in South Sudan.

Photo credit: Margaret Lejukole

FINANCING

In many low- and middle-income countries, insufficient financial resources limit the availability and accessibility of antimalarial medicines and diagnostics. Even when adequate funding is available, the in-country capacity to manage funds efficiently or plan for future funding may be insufficient or absent.

“Because of this kind of support provided by SIAPS, we were able to obtain a Global Fund grant of \$74 million.”

—Harriet Pasquale, NMCP Program Manager, South Sudan

AREAS OF IMPACT

SIAPS works with ministries of health and NMCPs to conduct analyses to improve cost containment, efficiency, and resource mobilization for malaria commodities through:

- Assessment of cost drivers to enable better financial planning and identify opportunities for improving efficiency
- Evaluations and options analyses for cost containment and recovery mechanisms
- Development of systems to improve transparency, accountability, and control of pharmaceutical spending and transactions



A sign displays fees for services at a community health center in Conakry, Guinea.

Financing: Why It Matters for Malaria

Examples in this chapter describe how SIAPS' finance-related activities contribute to:

- Improving cost estimates for procurement planning and distribution of malaria commodities
- Increasing local capacity to pursue international funding resources (e.g., GFATM)
- Improving the transparency and accountability of financial transactions
- Increasing cost savings by reducing product losses, expiries, and inappropriate prescribing

UNDERSTANDING COST DRIVERS

SIAPS has provided technical support to assist countries in conducting costing exercises to better understand and identify cost drivers in the provision of antimalarial commodities.

For example, in 2014, SIAPS conducted a study to estimate the cost of distributing ACTs and RDTs from central medical stores to the health facility level. In Kenya, the study showed that in some cases, the total supply chain costs accounted for more than 30% of the initial acquisition cost

of the products, a figure that depends heavily on the volume of product being distributed. The biggest cost drivers (labor, transport, and utilities) were predominately borne by the health facilities themselves.⁷ Accurate cost estimates are critical to ensuring that adequate resources are available for the malaria supply chain, and these types of assessments help to better understand the true cost of ensuring continuous availability of antimalarial products.

RESOURCE MOBILIZATION

SIAPS has supported countries' submission of successful GFATM applications. Since 2012, SIAPS has supported six countries, including Burundi, Guinea, and South Sudan, to successfully apply for an estimated USD 401 million by assisting in the generation of quantification and forecasting data for GFATM applications. For these six countries, every USD 1 invested by USAID raised approximately USD 55 in GFATM grants.⁸

In Angola, Burundi, Guinea, and South Sudan, SIAPS collaborated with NMCPs and other implementing partners to develop each country's concept note in line with the new GFATM funding model. As a result of this support, the GFATM approved Burundi's concept note in the amount of USD 24,921,561 to support NMCP malaria activities for three years.

A SYSTEM FOR MORE ACCOUNTABLE AND TRANSPARENT PHARMACEUTICAL TRANSACTIONS IN ETHIOPIA

The limited availability of essential medicines, unnecessary product waste due to expiry and loss, and the poor quality of pharmaceutical services in Ethiopia's health care system persist as major barriers to reducing the burden of malaria.

Many of these issues stem in part from the absence of proper standards and guidelines, inadequate record keeping and documentation, and insufficient oversight in common pharmaceutical transactions and services. These deficiencies in governance can diminish staff accountability, inflate pharmaceutical costs, exacerbate existing problems in stock management, impede evidence-based decision making, and negatively impact the quality of services and patient satisfaction.

In response, the Government of Ethiopia decided to implement a national hospital reform program guided by the Ethiopian Hospital Reform Implementation Guidelines. In recognition that these problems stem in large part from a lack of transparency and accountability in the management of pharmaceuticals, including transactions and services, SIAPS worked with the Ministry of Health to design the Auditable Pharmacy Transactions and Services (APTS), a package of interventions that addresses accountability and transparency, access to information for decision making, efficient use of medicines budgets and human resources, and quality of pharmacy services.

Key Results

- A total of 75 health facilities have customized and implemented APTS tools
- There has been a 23% increase in revenue from medicine sales at APTS sites

- Routinely collected data from eight hospitals currently implementing APTS shows that regular stock status analysis has improved efficiency and saved more than 400 types of medicines from expiry at a cost savings of USD 173,232
- The availability of medicines for the top 10 diseases in APTS-implementing hospitals increased from the national average of 65% to 95%

The implementation of APTS at select facilities in Ethiopia means that all essential commodities, including antimalarial medicines, are now being tracked, managed, and dispensed through more accountable and transparent pharmaceutical transactions that help to preserve existing financial resources; avert stock-outs and waste; and improve access to effective malaria prevention, diagnostic, and treatment services.

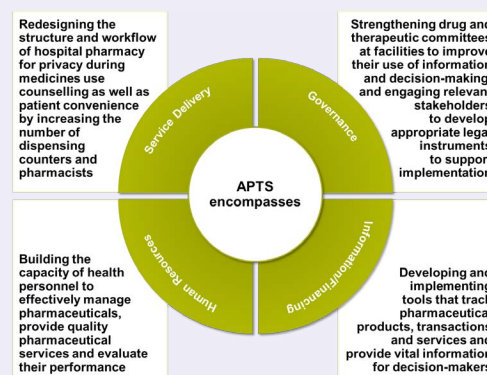


Figure 4. Auditable Pharmacy Transactions and Services

Country Highlights

Burundi

The GFATM awarded USD 24,921,561 following SIAPS support for the grant process

Ethiopia

541 pharmacy accountants and cashiers were trained on APTS tools and procedures for more transparent and accountable transactions

South Sudan

The GFATM awarded USD 97.6 million following SIAPS support for the grant process



A woman pays for her prescription in Juba, South Sudan.

AVAILABILITY OF PHARMACEUTICAL PRODUCTS AND SERVICES

Protecting communities from infectious diseases like malaria relies on effective supply chains for antimalarial medicines, RDTs, and other health technologies. However, in countries most affected by malaria, these supply chains are constrained by weak human resource capacity and high turnover, inadequate leadership, poorly defined supply chain operating procedures, inadequate infrastructure, insufficient funding, a lack of reliable supply chain data, and poor medicine storage conditions and practices.

Providing antimalarials does not necessarily translate to reductions in malaria morbidity and mortality. Antimalarial medicines must also be provided through systems and services that ensure that the medicines themselves are safe, effective, and of good quality; appropriate to a patient's clinical needs; provided with accurate medicine information; and aligned with current treatment guidelines and protocols.

“When we think of systems strengthening, we don’t just look at whether products, like bed nets or antimalarials, are available. It’s before the product even arrives that the hard work is done—preparing sound procurement and distribution plans, identifying the need, and developing the guidelines. That’s where we find that the system has been strengthened.”

—Dr. Kalume Tutu, National Director, Directorate of Families and Specific Groups, DRC Ministry of Health

AREAS OF IMPACT

Our approach, which aims to improve the availability of safe and effective antimalarial products of assured quality and the services through which they are provided, leverages our efforts across the other health system components to address the systemic issues that cause and perpetuate stock-outs and inappropriate medicine use.

Specifically, we work to:

- Conduct supply chain assessments, options analyses, and other evaluations to gauge supply chain capacity across the pharmaceutical system
- Develop and implement interventions aimed at strengthening the system in the long term based on assessments and through stakeholder engagement and consensus building
- Promote the rational prescribing, dispensing, and use of medicines to support the achievement of health outcomes and mitigate the development of antimicrobial resistance
- Improve the quality of services through which medicines are provided through effective case management and drug and therapeutics committees (DTCs)

Availability of Pharmaceutical Products and Services: Why It Matters for Malaria Control

Examples in this chapter describe how SIAPS' work in the areas of supply chains and pharmaceutical services contributes to:

- Reducing stock-outs and expiries through more accurate quantification and cost effective procurement and supply planning for antimalarials, including seasonal variations
- Improving procurement coordination and strategic planning to use resources more efficiently
- Improving warehousing and distribution practices to minimize product losses and ensure malaria commodities are made available where and when they are needed most
- Increasing the number of patients under the age of five who are diagnosed and treated through improved case management
- Increasing the availability of malaria products



A pharmacist in Waliso, Ethiopia, prepares to fill a patient's prescription.

QUANTIFYING MALARIA COMMODITIES

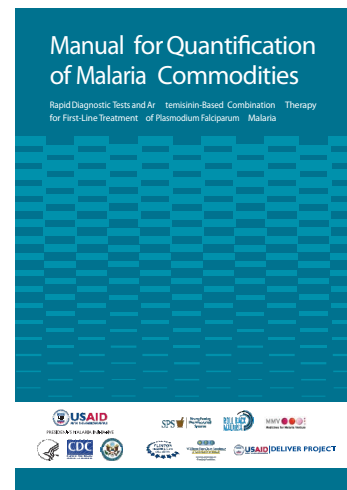
Determining accurate estimates for the quantity of antimalarial commodities to be procured, a process known as quantification, requires close collaboration with partners, relevant and accurate data, and sufficient capacity at the central and peripheral levels.

Recognizing the gap in capacity in many countries for accurate quantification, SIAPS worked with USAID/PMI, the Centers for Disease Control and Prevention, DELIVER, Roll Back Malaria, the William Davidson Institute, and other partners to develop the Manual for Quantification of Malaria Commodities, which provides step-by-step guidance for carrying out a national-level quantification of ACTs and RDTs.

This manual has been used across all SIAPS countries that receive PMI support and has been adopted by Roll Back Malaria as its official quantification manual.

SIAPS has also improved quantification processes in Angola, South Sudan, Burundi, Guinea, Mali, and Ethiopia by revitalizing national quantification

committees and helping local leaders conduct quantifications of antimalarials and RDTs. These committees work with not only NMCPs but also health programs for tuberculosis, HIV/AIDS, and family planning to create more streamlined, horizontal, and reliable quantification systems.



Manual for Quantification of Malaria Commodities

LOGISTICS MANAGEMENT UNITS

LMUs help to systematize information flow, strengthen data-driven decision making, and increase coordination and strategic planning for procurement. By integrating supply services through LMUs in countries such as Ethiopia and South Sudan, SIAPS helps to leverage resources across programs and partners, maximize financial resources for health commodities, and minimize expiries and waste.

Currently, 391 health facilities in South Sudan provide monthly stock status reports to the

LMU for analysis and reporting. The results are then reviewed and used by the Pharmaceutical Technical Working Group to adjust supply planning, procurement, and distribution plans. Because of improvements in the collection and analysis of supply chain data, the LMU in South Sudan has helped enable some counties to shift to a partial pull system where commodities are procured and distributed based on actual consumption rather than on less accurate estimates.

WAREHOUSING AND DISTRIBUTION

Ensuring that the quality of antimalarial medicines and health commodities is maintained throughout the supply chain—from the central medical store to the patient—is critical. SIAPS works at all levels of the health system to ensure that these medicines are stored properly to maintain product quality and are distributed through processes informed by data. Our work to develop and regularly update distribution and supply plans across all PMI-supported SIAPS countries includes coordination bodies that can help quickly respond to distribution issues and develop standard operating procedures to ensure that lifesaving antimalarials are available when and where they are needed.

In Angola, SIAPS helped the national central medical store (CECOMA) design tools and process-improvement approaches and to adopt key performance indicators for its warehousing, inventory management, and distribution systems. SIAPS conducted trainings on good warehousing practices, process improvements, and system monitoring to help bolster staff capacity and performance. Staffing at the central medical store was reorganized to align with key warehouse functions rather than health conditions. This

reorganization has helped harmonize, integrate, and improve supply systems for all essential commodities, including antimalarials; streamlined operations; and made warehousing processes more effective and efficient.



Medicines are delivered to a central warehouse in Juba, South Sudan.

FLEXIBLE REDISTRIBUTION STRATEGIES

Even when medicines are procured optimally using consumption and other relevant data, medicines stores, regional depots, and facilities may still encounter overstock or understock situations that require immediate attention to ensure an uninterrupted supply of antimalarials and RDTs. SIAPS has worked in Angola, Ethiopia, and DRC to develop guidelines and procedures

for redistribution of commodities at the local level to respond to realities on the ground.

In DRC, the provincial-level coordination committees, which meet regularly to review the stock status of antimalarials across all partners in the province, have developed a mechanism to mitigate potential stock-outs in one facility by redistributing identified overstock from other facilities.

STANDARD TREATMENT GUIDELINES

STGs outline appropriate recommendations for providers to prevent, diagnose, and treat uncomplicated as well as severe malaria. Encouraging provider adherence to STGs is critical in ensuring that patients receive the most effective treatment possible and attain the best possible health outcomes. STGs, when used to develop EMLs, also help to encourage rational medicine use by influencing which medicines will be procured and distributed throughout a country. Adherence to STGs by health providers also reduces inappropriate prescribing practices that can contribute to the spread of drug-resistant strains of malaria.

In Guinea, the Ebola epidemic that engulfed West Africa in 2014 necessitated adjustments to standard treatment protocols to allow health care workers to effectively treat patients for malaria while minimizing their potential exposure to the Ebola virus.

In 2015, recognizing the urgent need for revised guidelines to be developed and disseminated, the DNPL requested support from SIAPS in developing a process for revision that emphasized stakeholder engagement, consensus building, ownership, and integration. The DNPL seized the opportunity to update not only the treatment guidelines for malaria but also all other relevant disease conditions.

Supporting DNPL as the leader of the process, SIAPS reviewed current treatment standards, assessed recently published STGs from nearby countries, and ensured that proposed revisions aligned with international guidelines. After an extensive review process that incorporated feedback from a wide range of both internal and external collaborators and stakeholders, the STGs were approved in 2015. The new STGs will also enable and form the basis for planned updates to the EML, which will also be revised by the NMCP.

“If you think about trying to increase health worker capacity, we can add new practitioners, but then they get on the job, the treatment guidelines are either nonexistent or out of date. If we can have one document with all the treatment protocols in one place, it will be an important step forward.”

—Dr. Maria Walusimbi, Consultant, SIAPS Guinea

COMMUNITY CASE MANAGEMENT

SIAPS also supports effective case management strategies for common diseases to ensure effective treatment and medication safety, promote high-quality care and cost-effective outcomes, and help contain drug resistance. Working with the Ministry of Health in Burundi, SIAPS helped develop malaria protocols and job aids and train more than 500 community health workers in two districts. Results from a post-implementation evaluation showed that nearly all symptomatic children (97%) seen by community health workers were given an RDT, and more than half were diagnosed with malaria. Nearly all those diagnosed (92%) were given the correct dose of artesunate-amodiaquine within 24 hours.

Similarly, in DRC, SIAPS has worked in 44 PMI-supported zones to support the NMCP in developing new malaria case management guidelines. SIAPS also helped disseminate the guidelines through a series of cascading trainings that generated a pool of trainers at the province level who then were able to train more than 750 health providers in effective malaria case management. The new guidelines also emphasize prevention and counseling aspects for malaria, particularly for pregnant women, which has resulted in a significant increase in prenatal visits in many provinces. SIAPS supported the development of similar guidelines in South Sudan, which are being disseminated through trainings in Central and Western Equatoria.



A technician tests a child for malaria at a health center in Kinshasa, DRC.

DRUG AND THERAPEUTICS COMMITTEES

DTCs, which comprise physicians, pharmacists, and other health professionals, are used to manage the selection of medicines and to evaluate and improve medicine use at health facilities and hospitals.

In DRC, a study conducted by SIAPS demonstrated that DTCs can help improve

the management of malaria medicines in decentralized settings. The study, which compared facilities with and without DTCs, showed how DTCs can result in differences in prescriber behavior and malaria case management. Selected results are presented in table 1.⁹

Table 1. Selected Result Indicators Comparing Hospitals in DRC With and Without DTCs

Indicator	Average in hospitals with DTCs	Average in hospitals without DTCs
Average number of medicines prescribed per outpatient department encounter	2.47	4.01
Percentage of medicines prescribed by generic name	70.48	58.69
Percentage of medicines prescribed from EML	85.24	69.29
Percentage of malaria cases treated according to malaria guidelines	60.11	44.50

“DTCs have been a major win for DRC, they’ve given us an opportunity to see what is possible for the rest of the country”

—Prof. Tona Lutete, Professor, University of Kinshasa, DRC, Faculty of Pharmaceutical Sciences

Country Highlights

Angola

2 forecasts and a quarterly supply plan review for malaria commodities were performed

Burundi

99% (n=788) of children under the age of five who were diagnosed with malaria were treated with appropriate ACTs within 24 hours of the onset of fever

DRC

777 health facilities have at least one provider trained on malaria case management

Ethiopia

21 of 28 DTCs documented improvements in medicine use, including malaria medicines

Guinea

Malaria case management guidelines adapted to reduce the risk of Ebola transmission

Mali

97% of health facilities use consumption data to inform ordering

South Sudan

750,000 long-lasting insecticide-treated nets; 635,650 doses of ACTs; 250,000 doses of sulfadoxine-pyrimethamine; and 1 million RDT kits were distributed

LESSONS LEARNED

Coordination at all levels is a necessary but often overlooked part of developing stronger pharmaceutical systems. In every country where SIAPS is supporting PMI's efforts to control malaria, platforms that enable better coordination of the activities of donors, implementing partners, government agencies, and disciplines have provided the foundation for more effective, and streamlined activities, processes, and systems. Coordination is not only relevant at the central level, but at all levels of the pharmaceutical system.

SIAPS has seen the benefits of pharmaceutical technical working groups and quantification committees at the national level in optimizing procurements of antimalarials and ensuring a continuous supply of medicines. Coordination at the depot or hospital level has also shown tremendous value in helping to maintain standards and processes down to the last mile of distribution, including prescribing, dispensing, and use.

Effective partnerships pave the way for scale up of best practices. While working to bolster coordination under the leadership of local counterparts, SIAPS has also worked to leverage collaborations with other implementing partners to roll out best practices and scale up effective interventions. In South Sudan, after a successful pilot project to clear out expired medicines, unused supplies, and defunct equipment in several storage facilities in one province, SIAPS developed guidelines and provided assistance that enabled the process to be replicated in other provinces by other implementing partners. This process, known locally as dejunking, helped ensure that newly procured products could be stored properly.

Similarly, in DRC and Guinea, after several successful rounds of EUV surveys, the GFATM decided to introduce the survey in GFATM-supported provinces and zones and asked SIAPS to support this expansion. In DRC, where malaria remains one of the top causes of death, this partnership enables EUV surveys to generate increasingly accurate snapshots of the supply chain and availability of malaria commodities. In Angola, the EUV survey methodology has been adopted by other programs and donors to monitor the availability of HIV/AIDS, maternal and child health, and other essential medicines.

Visualization of data spurs its use and drives effective decision making. While efforts to increase data availability and quality are vital and ongoing in all PMI-funded SIAPS countries, Mali is going one step further and learning that when data are available, there are ways to ensure that the data are centralized, synthesized, and presented in ways that enable and promote more effective decisions and actions.

Through the PMI-supported OPSANTE dashboard, SIAPS has helped make supply chain data available to all relevant stakeholders—from the national level down to the province and facility levels. OPSANTE's interactive design and highly customizable reports allow users to quickly access the information they need and flag potential issues before they arise. The ability to use data in this way has catalyzed accountability and the demand for more data, and the introduction of OPSANTE has helped to spur increases in reporting rates and the number of facilities contributing data.

In Guinea, where SIAPS helped to overhaul the LMIS system for malaria commodities, reporting rates remained high even as the country struggled to manage the Ebola outbreak. Regular reporting continued largely because the LMIS was rooted in mechanisms that promoted accountability, feedback, and ownership. These factors, combined with leadership from the NMCP, ensured that the LMIS continued to function, even in a time when the larger pharmaceutical system was in crises.

Even small and incremental steps toward stronger systems can help build resiliency. Strengthening pharmaceutical systems is a collaborative, stakeholder-driven, and incremental process that is sustained by fostering country ownership and engagement. Although strengthening systems takes time, several PMI-supported SIAPS countries have seen how even small changes that fortify processes, policies, and local capacity have resulted in demonstrably stronger systems.

NEXT GENERATION SYSTEMS STRENGTHENING FOR IMPROVED MALARIA CONTROL

Strengthening systems that promote uninterrupted and equitable access to antimalarial medicines and diagnostic tests requires incremental and contextually relevant approaches because countries face different constraints and priorities depending on whether they are building upon existing systems or starting anew. This wide spectrum of support requires technical assistance that can respond to immediate needs while maintaining a focus on building and sustaining systems for the long term.

As the contexts and systems in which we operate evolve, so should our efforts to defeat malaria. Through SIAPS, we have seen the power of harnessing data for effective decision making, and the investment case is clear for **expanding and strengthening information systems that improve data collection, quality, analysis, and use**. Dashboards and other user-friendly data visualization platforms offer a unique opportunity to significantly increase the availability and use of data and introduce new safeguards and early warning systems to prevent stock-outs of malaria commodities.

While malaria is still the leading cause of mortality in some countries, others are facing shifting epidemiological patterns that will necessitate an increased focus on interventions to help **reduce the risk of malaria for key populations**. Efforts to expand community case management and IPTp have been successful in reaching at-risk and remote populations and will likely need to be scaled up as incidence rates decrease. Other interventions, such as seasonal malaria chemoprophylaxis, are also showing promise in reaching large numbers of people during seasons with high rates of transmission. Pharmaceutical systems and processes will need to be realigned to support these new priorities and interventions.

With ever-increasing access to antimalarial medicines, efforts are also needed to ensure that these medicines are used rationally by both patients and providers. **Interventions that monitor and promote proper medicine use** are critical to safeguarding the quality of medicines and the services through which they are provided, ensuring continued efficacy, and protecting patients from harm. Such efforts are increasingly important in the struggle to curb the emergence and spread of resistance to ACTs.



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