

**Strengthening Pharmaceutical Systems
Project in Ghana: An Activity Summary
February 2008 to September 2010**



Chinwe Owunna
Kwesi E. Eghan

October 2010



USAID
FROM THE AMERICAN PEOPLE



Strengthening
Pharmaceutical
Systems

Strengthening Pharmaceutical Systems Project in Ghana: An Activity Summary February 2008 to September 2010

Chinwe Owunna
Kwesi E. Eghan

October 2010



Strengthening Pharmaceutical Systems
Center for Pharmaceutical Management
Management Sciences for Health
4301 N. Fairfax Drive, Suite 400
Arlington, VA 22203 USA
Phone: 703.524.6575
Fax: 703.524.7898
E-mail: sps@msh.org

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 GHN-A-00-07-00002-00. 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 SPS

The Strengthening Pharmaceutical Systems (SPS) Program strives to build capacity within developing countries to effectively manage all aspects of pharmaceutical systems and services. SPS focuses on improving governance in the pharmaceutical sector, strengthening pharmaceutical management systems and financing mechanisms, containing antimicrobial resistance, and enhancing access to and appropriate use of medicines.

Recommended Citation

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

Owunna C. and Eghan K. E. October 2010. *Strengthening Pharmaceutical Systems Project in Ghana: An Activity, Summary February 2008 to September 2010*. Submitted to the US Agency for International Development by the Strengthening Pharmaceutical Systems (SPS) Program. Arlington, VA: Management Sciences for Health.

Strengthening Pharmaceutical Systems
Center for Pharmaceutical Management
Management Sciences for Health
4301 North Fairfax Drive, Suite 400
Arlington, VA 22203 USA
Telephone: 703.524.6575
Fax: 703.524.7898
E-mail: sps@msh.org
Web: www.msh.org/sps

CONTENTS

Contents	iii
Abbreviations and Acronyms	v
Country Context.....	1
Introduction to SPS Program Activities in Ghana	3
SPS Program Activities.....	5
Support the Finalization, Adoption, and Implementation of New Amendments in the Malaria Treatment Policy	5
Support the Rational Use of ACTs and Other Antimalarials as Part of Implementing the New Antimalarial Policy in the Public and Private Sector.....	6
Assessed the Capacity of Ghana’s RMSs to Warehouse and Store ACTs and Other Antimalarials.....	13
Map the Commodity Flow of ACTs in the Public, Mission (Private Not-For-Profit), and Private Sectors	15
Support the Design of the Distribution Model for ACTs in the Private Sector to Identify Private Providers to Increase the Uptake of ACTs	17
Assist in the Development of an M&E Framework for Private Sector ACT Distribution	18
Support Stakeholders to Assess the National Pharmacovigilance and Medication Safety System.....	19
Collaborators and Partners.....	23
Annex 1. M&E Framework for Distributing ACTs in the Private Sector	24

ABBREVIATIONS AND ACRONYMS

ACT	artemisinin-based combination therapy
ADR	adverse drug reaction
AL	artemether-lumefantrine
AMFm	Affordable Medicines Facility for Malaria
AS/AQ	artesunate-amodiaquine
CMS	Central Medical Stores
DHAP	dihydroartemisinin-piperaquine
DTC	Drugs and Therapeutics Committee
FDB	Food and Drugs Board
FY	fiscal year
GHS	Ghana Health Service
ITN	insecticide-treated nets
LCS	licensed chemical seller
M&E	monitoring and evaluation
MoH	Ministry of Health
MOP	Malaria Operational Plan
NMCP	National Malaria Control Program
PMI	President's Malaria Initiative
RMS	Regional Medical Store
SPS	Strengthening Pharmaceutical Systems [program]
SWAp	sector-wide approach
USAID	US Agency for International Development
WHO	World Health Organization

COUNTRY CONTEXT

Ghana is located in West Africa and has a population of about 24.3 million people. The country is divided administratively into 10 regions and 138 districts. Although malaria transmission occurs throughout the year, the northern part of the country experiences seasonal variations because of the prolonged dry season. In Ghana, 80–90 percent of malaria infections are due to *Plasmodium falciparum*. Ghana's Ministry of Health (MoH) estimates that malaria accounts for about 40 percent of all outpatient visits and 22 percent of deaths in children under five years. The under-five age group and pregnant women are most affected by malaria in Ghana. They constitute 20 percent and 4 percent of the general population, respectively¹.

The Ghana Health Service (GHS) under MoH is responsible for implementing health policies and programs and delivers services along with teaching hospitals and faith-based health organizations. One of the eight GHS divisions at the national level is the Public Health Division, which supervises the National Malaria Control Program (NMCP) and other disease-specified public health programs.

In 1996, Ghana started using a sector-wide approach (SWAp) to plan and manage health sector activities jointly with stakeholders through a common funding arrangement. About 80 percent of the health sector funding is provided by the Government of Ghana and development partners who contribute to the SWAp basket¹. A national health insurance scheme was instituted for basic health care service through mutual and private insurance schemes after the passage of the national health insurance law in 2003. Malaria treatment in Ghana is covered under the national health insurance scheme.

Since 1998, Ghana has been implementing the Roll Back Malaria Strategy. In 2008, a new *Malaria Strategic Plan (2008–2012)* was developed in Ghana to follow-up the previous *Malaria Strategic Plan (2001–2005)*, which created a framework for and a strategic direction to attaining the country's goal of reducing the malaria disease burden. The main goal in the current plan is to reduce the malaria disease burden by 75 percent by the year 2015, which aligns with the Millennium Development Goals. The strategic plan includes four main strategies: (1) improve malaria case management at all levels, (2) pursue multiple prevention strategies, (3) promote focused and evidence-based research, and (4) improve partnerships to reduce the current malaria disease burden by 75percent by the year 2015.

Malaria control in Ghana has always been based on partners working together toward a common plan—implementing evidence-based, results-focused interventions against malaria at the community level; providing high-level political backing leading to substantial increases in resources for health development; and making strategic investments in better tools. Therefore, one of the NMCP's key principles in controlling malaria is to increase collaboration by bringing together stakeholders based on their comparative strengths. These malaria control principles are in accordance with the objectives of MoH's Medium-Term Health Strategy to increase access, improve quality and efficiency in service delivery, and build partnerships in the context of overall sector-wide development.

¹ Ghana Health Service. *Strategic Plan for Malaria Control in Ghana 2008–2015*. Republic of Ghana.

INTRODUCTION TO SPS PROGRAM ACTIVITIES IN GHANA

Ghana was selected in the third round of beneficiary countries by the US government's President's Malaria Initiative (PMI), which seeks to "dramatically reduce malaria as a major killer of children in sub-Saharan Africa"². The five-year, 1.2 billion USD initiative targets 15 African countries for the rapid scale-up of malaria prevention and treatment interventions such as insecticide-treated nets (ITNs), indoor residual spraying, prompt and effective case management of malaria, and intermittent preventive treatment for pregnant women. The goal is to reduce malaria-related mortality by 75 percent after three years of program implementation in targeted countries.

In early 2007, a PMI team consisting of representatives from the US Agency for International Development (USAID), US Centers for Disease Control and Prevention, the World Health Organization (WHO), the Rational Pharmaceutical Management Plus Program,³ and the NMCP conducted a needs assessment to identify areas of PMI support within the context of Ghana's national malaria policy and a strategic plan that would complement Roll Back Malaria partner interventions. The assessment findings fed into the development of Ghana's 2008 PMI Malaria Operational Plan (MOP). The assessment identified a number of critical issues related to the management and use of antimalarials and ITNs that need to be addressed to reach national, donor, and international targets. These issues included medicine quantification and procurement planning, warehousing, training in pharmaceutical management at all levels of the distribution system, inventory control and information management, training in malaria case management (pre-service and in-service), artemisinin-based combination therapy (ACT) management and use in the private sector (chemical sellers, pharmacies and private clinics), and pharmaceutical quality assurance.

In January 2008, two PMI partners, USAID's Strengthening Pharmaceutical Systems (SPS) Program (the follow-on to the Rational Pharmaceutical Management Plus Program) and the USAID | DELIVER PROJECT jointly assessed pharmaceutical supply and logistics management systems in Ghana, including the appropriate use of malaria medicines. The team provided several recommendations and developed implementation plans to address identified needs through PMI support in addition to proposing follow-on activities, which if implemented by the Ghana MoH and its partners, would strengthen malaria medicine supply and logistics management. The team also agreed on how to coordinate technical assistance by delineating each project's roles and responsibilities based on project strengths and competence. In the Ghana MOP for 2008, USAID mandated that SPS help strengthen pharmaceutical management system capacity, including developing a comprehensive pharmaceutical management information system and providing supervision, forecasting, and warehousing support at regional and district levels. The fiscal year (FY) 2008 SPS PMI work plan for Ghana built upon work already accomplished by the Ghana MoH during FY07 and recommendations from the SPS and USAID | DELIVER assessment report within the mandate of the MOP.

² <http://www.whitehouse.gov/news/releases/2005/06/print/20050630-08.html>

³ Rational Pharmaceutical Management Plus Project of Management Sciences for Health

In FY09, the PMI MOP mandated that SPS build capacity in the public and private sectors to increase rational use of antimalarials. SPS's activities focused on supporting the implementation of the new malaria treatment policy for maximum public health impact.

The SPS Ghana project received 600,000 USD in Year 1 and 300,000 in Year 2 to implement PMI activities.

SPS PROGRAM ACTIVITIES

Support the Finalization, Adoption, and Implementation of New Amendments in the Malaria Treatment Policy

Ghana adopted a new first-line treatment regimen for malaria in 2004—an ACT, artesunate-amodiaquine (AS/AQ)—after verifying evidence of treatment failure for chloroquine, the previous first-line treatment. The regimen for AS/AQ is a three-day course of AQ at 10 mg/kg body weight + AS at 4 mg/kg body weight daily. Following the launch of the new ACT, local pharmaceutical companies began producing co-packaged AQ in 600 mg and AS in 150 mg tablets in an attempt to ensure private sector availability of the new first-line treatment. When patients took these high dosages of locally produced tablets, they experienced adverse effects, which resulted in negative publicity for the new ACT. MoH ordered the removal of these locally produced, triple-strength blisters from the market, but faced the difficult challenge of regaining public confidence in the new malaria treatment. In response to the challenge, Ghana amended the malaria treatment policy to include two alternate ACTs for use in first-line treatment of uncomplicated malaria. The two alternates, artemether-lumefantrine (AL) and dihydroartemisinin-piperaquine (DHAP), are primarily for patients who cannot tolerate the side effects of AQ. In addition, rectal AS suppositories have been introduced for pre-referral management of complicated malaria cases at health clinics and posts.

The SPS Program supported the finalization, adoption, and implementation of the new treatment guidelines through the following activities—

- Revised and updated the malaria treatment policy in collaboration with the MoH/NMCP to include new medicines and recommendations based on evidence of chloroquine resistance
- Supported the development and finalization of the malaria component of the standard treatment guidelines in collaboration with the Ghana National Drug Program; SPS also helped disseminate over 250 copies of the standard treatment guidelines to health facilities
- Collaborated with the Ghana Sustainable Change Project to review and update the licensed chemical seller (LCS) operations handbook
- Developed the *Malaria Case Management in Ghana: Training Manual for LCSs*; SPS supported the formatting and printing of 2000 copies of the training manual to distribute to LCSs; USAID also funded the Promoting Malaria Prevention and Treatment project and a local nongovernmental organization, Ghana Social Marketing Foundation, to conduct trainings at LCSs using this training manual in three regions (Northern, Upper East, and Western)
- Developed *Malaria Case Management in Ghana: Training Manual for Pharmacists* to educate pharmacists on the new malaria policy recommendations; SPS supported the

formatting and printing of 1000 copies of the handbook to distribute in the private and public sectors; the Pharmaceutical Society of Ghana used this manual when it rolled out its nationwide training program for pharmacists

- Supported the National Health Insurance Authority in its review and update of the national health insurance medicine list to reflect changes in the malaria policy

Support the Rational Use of ACTs and Other Antimalarials as Part of Implementing the New Antimalarial Policy in the Public and Private Sector

As mentioned, a PMI team assessed the medicine supply and logistics management systems in January 2008, which included the appropriate use of malaria medicines.⁴ The strengths and challenges highlighted in the assessment informed SPS activities and interventions for Years 1 and 2 in the area of rational antimalarial use. SPS implemented the activities that follow.

Conduct a Rapid Assessment of Antimalarial Prescribing and Dispensing Practices in the Private and Public Sectors

Based on the results of the PMI assessment in 2008, SPS conducted a rapid assessment at public health facilities, private pharmacies, and LCSs in 2009 to review prescribing and dispensing practices for antimalarials. First, SPS had simulated clients visit 43 retail outlets requesting advice as the caregiver of a four-year old girl who has fever on and off for a week. Half the simulators indicated that the sick child was able to take liquids and food and the other half said the child was unable to keep foods and liquids down because of vomiting. The two scenarios evaluated whether the dispenser would either appropriately recommend an ACT for simple malaria or provide an ACT suppository and then refer the child to a health facility for the more complicated case as recommended in the national malaria policy. Second, data collectors conducted interviews with customers exiting public health facilities (40), pharmacies (60), and LCSs (47) to assess the quality of prescribing and dispensing. Third, SPS conducted a retrospective prescribing and dispensing analysis with facility records from public (699), mission (496), and private (402) health clinics and hospitals.

Based on results from the simulated client scenarios, only about one-third of the dispensers in pharmacies and chemical shops asked about the child's symptoms. Less than half of dispensers in either location asked about the child's medication history before dispensing medications, although pharmacy dispensers asked more often. On a positive note, over 80 percent of dispensers in both types of outlets and in both scenarios provided information on how to take the medications recommended and sold; however, in over 80 percent of cases, the quality of the accompanying written information was poor. In addition, as table 1 illustrates, about two-thirds of clients exiting public health facilities had received ACTs, but ACT dispensing tapered off at

⁴Adegoke, Catherine, Egbert Bruce, Jaya Chimnani, Kwesi Eghan, Gladys Tetteh and Dragana Veskov. 2008. *GHANA: PMI Assessment of the Supply Chain and Pharmaceutical Care Management for Antimalarials and ITNs. Report of the Joint Assessment and Implementation Planning Visit by the USAID | DELIVER PROJECT, Task Order 3, and MSH/SPS Program.*

private pharmacies (43 percent) and chemical sellers' shops (21 percent), whose dispensers had not received education on the use of ACTs. In addition, 60 percent of the LCS clients received antimalarial monotherapies, which are not recommended.

Table 1. Results from Exit Interviews on Prescribed Therapy for Uncomplicated Malaria

Type of therapy prescribed	Health facility (N = 40)	Pharmacy (N = 60)	Chemical seller (N = 47)
Combination	65%	43%	21%
Monotherapy or inappropriate antimalarial	25%	48%	60%
Non-antimalarial medicine	10%	8%	19%

On the day SPS collected the data, nine Regional Medical Stores (RMSs) had the commonly used packages of AS/AQ available, but availability was lower in public and mission facilities and lowest in private health facilities (the assessment included nine of ten RMSs). Availability of AL 20/120, which is a second-line ACT, was also high at RMSs. Although the government had not yet procured AL, the regional stores had bought the stock through private suppliers. However, less than two-thirds of public clinics and hospitals and very few private facilities had it on hand (table 2).

Table 2. Percentage Availability of Acts in the Public and Private Sectors

Name and dose of medicine	Facility type			
	Public		Private	
	RMSs (%; N = 9)	Public clinic/ hospital (%; N = 24)	Mission clinic/hospital (%; N = 21)	Private clinic/hospital (%; N = 9)
AS/AQ 50 mg + 153 mg, 3×3	100	46	29	8
AS/AQ 50 mg + 153 mg, 6×6	100	21	14	0
AS/AQ 50 mg + 153 mg, 12×12	100	75	48	0
AL 20 mg/120 mg	78	58	10	8

In 156 exit interviews, most clients reported that they usually obtain their medicines at a retail pharmacy (45 percent) or a chemical sellers' shop (32 percent). Only 21 percent indicated that they get medicines at a health facility, although about half had a prescription from a health care provider. Over 60 percent reported walking 10 minutes or less to reach the facility, so proximity probably plays an important role in where people obtain their medications. As figure 1 below shows, over half of interviewees got their medication based on a prescription from a health facility or provider, whereas almost one-quarter relied on the medicine outlet dispenser for treatment advice.

SPS analyzed the prescribing records from about 1,900 malaria-certified cases (52 percent lab confirmed) from public, mission, and private hospitals and clinics. Results showed that 86

percent of malaria prescriptions in the public sector were for ACTs, whereas the proportions were lower in mission (67 percent) and private (66 percent) facilities, suggesting the need for improvement in the those sectors. Indeed, more than a quarter of prescriptions in the private sector involved monotherapies. In addition, 23 percent of antimalarial prescriptions from private facilities included chloroquine, quinine, or other combinations, such as sulfadoxine-pyrimethamine and chloroquine or sulfadoxine-pyrimethamine and artesunate.

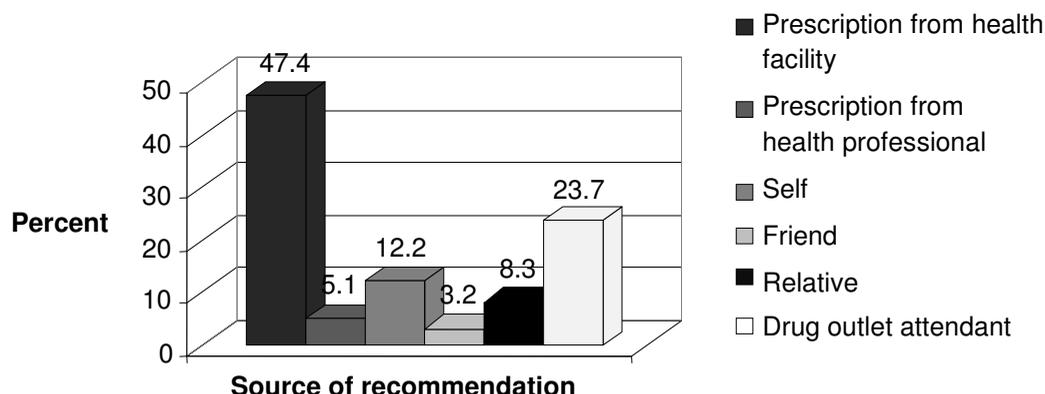


Figure 1. Source of malaria treatment recommendation based on exit interviews (N = 156)

Update Curriculum and Develop Continuing Education Training on Rational Prescribing and Dispensing of Antimalarials

The SPS Program provided technical support to the Pharmaceutical Society of Ghana and the Pharmacy Council to review, update, and incorporate the new malaria policy recommendations into the continuing education training program curriculum for pharmacists and LCSs in Ghana. Consequently, SPS conducted a training of trainers workshop in collaboration with NMCP, the Pharmaceutical Society of Ghana and the Pharmacy Council for pharmacists in the Southern and Northern Regions. Most of these trained pharmacists served as trainers for the PMI partner Promoting Malaria Prevention and Treatment and the local nongovernmental organization Ghana Social Marketing Foundation in the Northern Region. The Pharmaceutical Society of Ghana also used the trained pharmacists to implement its nationwide Malaria Continuous Education Program.

Provide Technical Support to Develop and Enforce Legal Requirements to Phase Out Antimalarial Monotherapies

The SPS Program provided technical support to the Ghana Food and Drugs Board (FDB) to develop strategies and procedures to phase out the distribution of antimalarial monotherapies in private and public sector facilities. The approaches established in collaboration with the NMCP involved a supply strategy and a demand strategy. In the supply strategy, the Minister of Health planned to issue a letter to all agencies, including FDB (letter already has been issued) and the Customs, Excise, and Preventive Service, instructing them to disallow permits for antimalarial monotherapies to come into the country. The demand strategy involved working with facility

Drug and Therapeutics Committees (DTCs) to remove antimalarial monotherapies from their formularies and procurement lists to increase the demand for ACTs.

Train DTC Members on Rational Medicine Use Concepts and Support DTCs to Strengthen the Implementation of New Antimalarial and Essential Medicines Policies

PMI funded SPS and the GHS Pharmacy Unit to conduct four regional training programs for DTCs comprised of medical superintendents, pharmacists, dispensers, and procurement officers from selected public and private sector facilities in the Central, Greater Accra, and Western Regions. The DTCs meet regularly to ensure that facilities adhere to formularies and the recommended prescribing, dispensing, and procurement policies. SPS support for this activity was in response to the need to strengthen existing DTCs and establish new DTCs at health facilities to ensure adherence to recommended treatment policies, good pharmacovigilance reporting, and reduction in resistance to antimicrobials highlighted in the GHS Pharmacy Unit’s *Improving Pharmaceutical Services in the Health Sector 2007–2011*.

SPS trained 155 DTC members from 48 public and private sector health facilities in the three regions. These trainings, conducted from December 2009 to October 2010, were done in collaboration with the Chief Pharmacist’s office of the GHS and the three Regional Directorates of Health Services. The purpose of the training was to support the MoH and the GHS to effectively implement the new antimalarial treatment policy in these regions. Table 3 displays a summary of the DTC trainings and supportive activities.

Table 3. DTC Training and Supportive Activity Summary for All Regions

	Greater Accra	Central	Western	Total
Number of trainings completed	1	1	2	4
Number of institutions trained	12	12	24	48
Number of staff trained by gender				
Male	18	17	47	82
Female	27	8	38	73
Number of staff trained by profession				
Medical doctors	6	6	12	24
Pharmacists	17	8	33	58
Nurses	16	4	17	37
Administrators	5	5	12	22
Medical assistants	0	1	7	8
Technical officers	1	0	3	4
Pharmacy assistants	0	1	1	2
Out of 48 DTCs total				
Number of functioning DTCs	11	4	9	24
Number of DTCs revived	0	6	8	14
Number of DTCs formed	1	1	3	5
Number of DTCs still not functional	0	1	4	5

Provide Supportive Supervision to Strengthen DTCs and Ensure the Rational Use of ACTs and Other Antimalarials

Following the training programs, a joint monitoring team made up of staff members from the Pharmacy Unit of the GHS, Regional Health Directorates for the Central, Greater Accra, and Western Regions, and the SPS Program conducted supportive supervision visits at 20 health facilities in these regions from May 2010 to September 2010. The mentoring team assessed—

- The level of implementation of DTCs after the trainings
- Rational medicine use practices
- Adherence to uncomplicated malaria treatment policy at the facilities’ outpatient departments

The DTCs at the health facilities visited were in various stages of implementing rational medicine use activities. Most DTCs had developed their formulary lists and revised their procurement lists in line with the current antimalaria policy.

Although baseline survey data showed that generic prescribing was as high as 90.3 percent in one facility in Greater Accra, all 20 facilities visited were below the regional target of 100 percent. Prescription of antibiotics in all but three of the 20 facilities was above the regional target of 30 percent. Additional prescribing indicators showed disparities between actual numbers and regional targets. Table 4 provides results from the prescribing indicators assessed in several facilities in the Greater Accra Region.

Table 4. Prescribing Indicator Results from Facilities in the Greater Accra Region

Facility^a	Average number of medicines prescribed per visit	Medicines prescribed by generic name (%)	Antibiotics prescribed (%)	Injections prescribed (%)	Medicines prescribed on the essential medicines list (%)	Medicines in stock (%)
PML ^b Children’s Hospital	3.6	63.0	26.0	3.0	74.0	68.8
La General	3.5	71.4	76.7	6.7	77.1	84.4
Ussher Polyclinic	3.4	90.3	43.3	10.0	92.2	92.2
Adabraka Polyclinic	3.3	59.6	46.7	13.3	85.4	79.7
Trust (quasi-public)	2.9	31.2	37.3	22	87.1	84.4
Regional target	3.0	100	30	20	100	95

^aAll facilities are public sector hospitals unless otherwise noted.

^bPrincess Marie Louise

SPS assessed malaria treatment indicators by reviewing approximately 30 patient records on file in each facility visited. The team observed encouraging results in one facility in the Greater Accra Region where 96 percent of malaria cases reviewed had been confirmed with microscopy or rapid diagnostic tests; however, these rates were low in other facilities in the region, ranging

from 0 to 16.7 percent. In the Central Region, half of the facilities surveyed showed that no malaria cases had been confirmed with microscopy or rapid diagnostic tests. This number varied from 0 to 40 percent for the Western Region facilities. Table 5 shows the results of malaria treatment indicators assessed in several facilities in the Western Region.

Table 5. Malaria Indicator Results from Facilities in the Western Region

Facility ^a	Conformed to antimalarial treatment policy ^b	Pre-scribed AS/AQ (%)	Pre-scribed AL (%)	Pre-scribed DHAP (%)	Prescribed nonrecommended antimalarial (%)	Cases confirmed by microscope or rapid diagnostic tests
Effia Nkwanta	76.7	5.73	73.3	23.3	3.0	33.3
Essikado Polyclinic	86.7	43.3	43.3	13.4	7.0	10.0
Takoradi	63.3	23.5	68.5	8.0	12.0	0.0
Ghana Ports and Harbors Clinic (quasi-public)	100.0	7.7	88.5	3.5	6.0	40.0

^aAll facilities are public sector hospitals unless otherwise noted.

^bConformed to antimalarial treatment policy means that an ACT was prescribed.

Conduct Baseline and Post-Intervention Supervisory Visits to Measure the Effectiveness of DTC Intervention Package in Two Facilities

In May 2010, SPS conducted a baseline survey for the Greater Accra region in eight health facilities. In September 2010, a post training survey was conducted in two health facilities in this region, Maamobi and Kaneshie polyclinics, using the same indicators.

Baseline survey findings at Maamobi polyclinic highlighted low levels of generic medicine prescribing (61 percent) when compared to the regional target (100 percent). Because the Ghana National Health Insurance Scheme vets prescription claims by generic medicine names, this facility can expect a high number of claims to be rejected. However, our survey findings after training and supervisory visits (post-intervention) showed an improvement for this indicator (81 percent). Further results from the baseline survey at Maamobi polyclinic indicated that approximately 70 percent of outpatient department cases seen daily were given an antibiotic to take home, which exceeds the regional target of 30 percent (Figure 2). In some cases, uncomplicated malaria patients were treated with both antimalarials and antibiotics. The post-intervention survey revealed that this number had decreased to 58 percent, closer to the regional target of 30 percent.

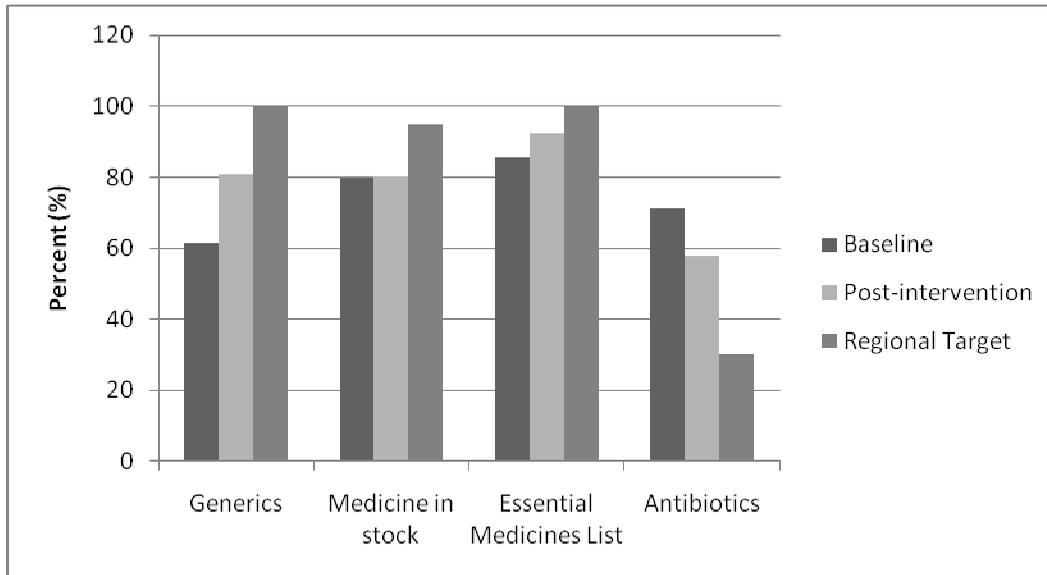


Figure 2. Prescribing indicator results from Maamobi Polyclinic

Although the initial percentage of generic prescribing at Kaneshie polyclinic was discouraging at 40 percent, post-intervention data revealed that the number had increased to 70 percent. Additional baseline data for prescribing indicators found that approximately 50 percent of the out-patient cases at Kaneshie were given an antibiotic. The post-intervention survey found a slight reduction for this indicator (42 percent), which is closer to the regional target of 30 percent (Figure 3).

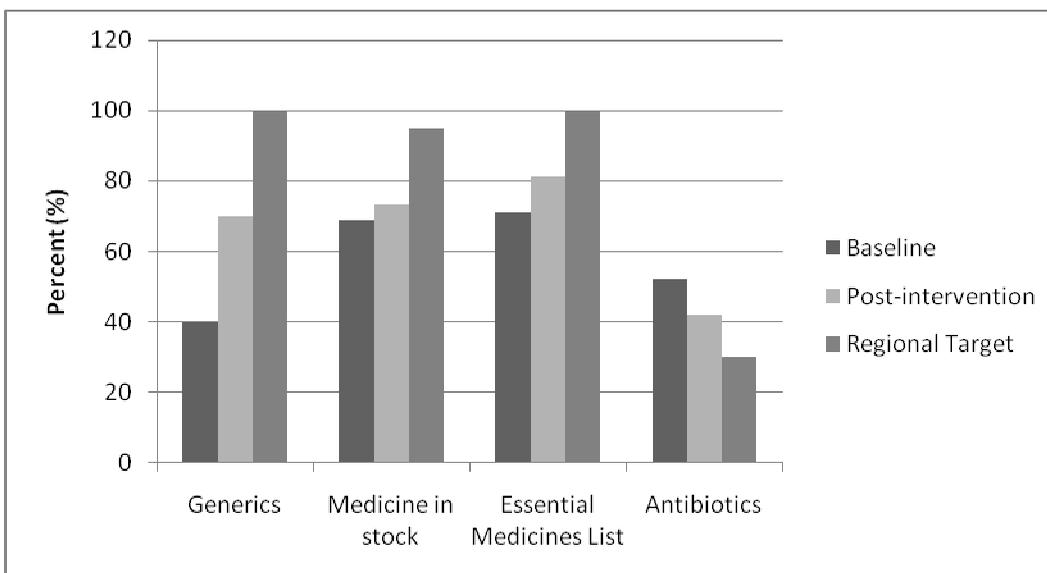


Figure 3. Prescribing indicator results from Kaneshie Polyclinic

Conformity to the policy for uncomplicated malaria treatment (ACT was prescribed) in Maamobi and Kaneshie polyclinics increased from 85 percent to 92 percent and 80 percent to 87 percent, respectively. Other malaria treatment indicators also increased, in some cases, significantly (Table 6).

Table 6. Adherence to Antimalaria Treatment Policy at Maamobi and Kaneshie Polyclinics

Indicator	Baseline (%)		Post-intervention (%)	
	Maamobi	Kaneshie	Maamobi	Kaneshie
Conformity to antimalaria treatment policy	85.0	80.0	92.0	87.0
Malaria treatment with appropriate dose frequency	35.0	50.0	55.0	62.0
Malaria treatment with appropriate dose for weight	60.0	43.3	70.0	58.3
Malaria treatment with appropriate duration of treatment	100.0	63.4	100.0	83.8
Malaria cases treated with AS/AQ	20.0	53.3	65.0	75.0
Malaria cases treated with AL	80.0	46.7	35.0	25.0
Malaria cases treated with DHAP	0	0	0	0
Malaria cases treated with other antimalarials	15.0	0	15.0	0

Although post-intervention data could not be collected for all 20 DTCs visited during the supportive supervisory visits, results from the post-intervention survey at Maamobi and Kaneshie Polyclinics in the Greater Accra Region demonstrated that training, monitoring, and mentoring interventions for DTCs constitute an effective approach toward improving rational medicine use in health facilities.

Although training, supervisory visits, and mentoring can be resource intensive, the survey findings show that these interventions constitute an effective approach that improves rational medicine use in health facilities. Furthermore, the impact of these interventions goes beyond the management of antimalarial medicines to support the overall strengthening of Ghana's health system.

Assessed the Capacity of Ghana's RMSs to Warehouse and Store ACTs and Other Antimalarials

SPS evaluated how well Ghana's 10 RMSs manage antimalarials, including ACTs. SPS collected data through interviews, observations, and reviews of existing records, registers, and reports. The study assessed inventory management and warehouse requirements, including the infrastructure improvements needed to strengthen availability and minimize stock-outs, wastage, and leakage.

Virtually all the RMSs have limited storage space because of increased demand for stock without complementary expansion of physical infrastructure. In addition, irregular maintenance has left many stores with leaking roofs, cracked walls, and poor ventilation. Most stores lack essential amenities such as air conditioning, ceiling fans, loading decks, and fire extinguishers. Eight medical stores reported losing power more than once a month, with four experiencing weekly

outages. Only one store has a generator that can power the cold chain freezer during an outage. Seven of the ten stores rated air conditioners and improving ventilation as their number one priority. The findings show an urgent need to address inadequate capacity and poor infrastructure to make the RMSs more efficient.

Despite limited storage space and challenging conditions, most stores follow some recommended storage and inventory control procedures. For example, all the stores separate cold chain products from other stock, although only four keep charts to monitor temperatures. Most stores have security measures in place, maintain proper ventilation and temperature control, and arrange antimalarials appropriately. All stores use stock management cards and distribute products closest to expiration first; however, three stores allowed product to expire in the previous year. In addition, about a third of the stores did not define minimum and maximum stock levels as part of the inventory control measures. Although all the stores had functional computers, only two had local area networks. The stores would need technology improvements to implement an effective electronic inventory monitoring and stock control system.

On the day SPS collected data on seven tracer antimalarials, most stores stocked the common pack sizes of the first-line treatment, AS/AQ, as well as sulfadoxine-pyrimethamine and AL, which is the second-line treatment. Two stores had AQ single formulation and one store had DHAP available (Table 7).

Table 7. Percentage of RMSs that had Common Antimalarials in Stock

Tracer products	Availability (% stores)
AL 20/120 mg	80
AQ	20
AS/AQ 50 mg+153 mg (12×12)	90
AS/AQ 50 mg+153 mg (3×3)	80
AS/AQ 50 mg+153 mg (6×6)	80
DHAP	10
Sulfadoxine-pyrimethamine	80

However, all seven antimalarials on the tracer list were stocked out at the regional stores at various times during 2008. The average number of stock-out days in RMSs for each of the three common brands of AS/AQ combinations ranged from 0 to as high as 198 days. The main reasons cited in interviews include supplier delivery delays, errors in forecasting how much would be needed, and delivery of quantities that did not match orders, which the RMS staff members identified as the most important problem. Staff from a few stores also mentioned transportation problems and lack of funds available to place orders.

The main pharmaceutical supplier to the RMSs is Ghana's Central Medical Stores (CMSs). The RMSs pick up orders from the CMSs; however, they are limited by both a shortage of vehicles and cash flow. All 10 regional stores, however, also order supplies from private sector wholesalers that deliver directly. Generally, all the stores used three main criteria to award

contracts to suppliers—product quality, product price, and suppliers’ past performance. In interviews with RMS staff, almost all expected CMSs to improve on product availability. Interestingly, none of the stores expected credit from either the CMS or private suppliers. Five of the stores deliver directly to their customer facilities, but none have any way to recoup the cost for transportation.

The private sector could provide useful lessons to the public sector in product distribution; collaborating with private companies may also be a way to improve regional pharmaceutical distribution.

USAID partners working in this area carried out follow-on activities in response to study findings.

Map the Commodity Flow of ACTs in the Public, Mission (Private Not-For-Profit), and Private Sectors

The SPS Program mapped the commodity flow of antimalarials and ACTs for 66 facilities in Ghana (38 percent were in the public sector, 35 percent were mission facilities, and 27 percent were private sector clinics or hospitals). The mapping covered key management issues such as pharmacy and dispensary unit staffing, product quantification, ordering, pricing, storage capacity, stock management, and pharmaceutical management information systems. The pricing information came from public and private clinics and hospitals in addition to retail pharmacies and LCS.

The cadres of staff included pharmacists, dispensing technicians, dispensing assistants, and health aides. Generally, public facilities had more skilled staff, such as pharmacists; for example, over 90 percent of public hospitals had at least one pharmacist compared to 48 percent of mission facilities and 22 percent of private facilities.

Storage conditions were generally satisfactory. Most had temperature control measures in place, adequate ventilation, protection from direct sunlight and moisture, and proper security measures. However, over half of public facilities and nearly 90 percent of private facilities stored some products directly on the floor; this was less of a problem in mission facilities (40 percent). Based on 12 indicators, public hospitals had the best storage practices in place, with an average of 77 percent, compared to 67 percent in mission facilities, and 53 percent in private facilities.

Facilities of all types relied on usage (consumption) data to quantify pharmaceutical needs (94 percent), as well as stock on hand (86 percent), and expiration dates of stock on hand (85 percent). Facilities relied least on standard treatment guidelines to quantify orders, especially in the private sector (39 percent).

When facilities choose a supplier, they most often look at the supplier’s product quality (79 percent), product price (77 percent), and supplier past performance (70 percent). Facilities pick up 92 percent of the orders that they place with the public sector (CMSs and RMSs); however, over half reported problems with lack of vehicles. In addition, 62 percent of facilities said the

public sector had poor product availability. Almost all facilities order supplies from private wholesalers or manufacturers, usually on a monthly or quarterly basis, and receive orders directly. Facilities reported fewer problems with private wholesalers and manufacturers; for example, only 23 percent cited low product availability. Complaints did include abrupt increases in prices without notice and suppliers' failure to deliver according to contract.

Using nine indicators, SPS assessed the pharmacies' stock management techniques, finding that most used first-expired-first-out (100 percent of public, 83 percent of mission, and 77 percent of private outlets) and stock cards (100 percent of public, 78 percent of mission, and 44 percent of private outlets) as their primary stock control measures. When all nine indicators, including defined minimum and maximum stock levels, renewing stock on scheduled dates, and using specific stock management tools are calculated, the private sector facilities' average was low—28 percent—compared with 40 percent in mission facilities and 51 percent in public hospitals. Only 10 of the pharmacies recorded the expiration of any antimalarial products in 2007 and 2008; five were mission facilities.

Facilities reported the dominant causes of stock out are delays in delivery of supplies and delivery of quantities that did not conform to what was ordered (both 61 percent). Table 8 shows the full list of reasons facilities cited for stock-outs.

Table 8. Percentage of Facilities Reporting Reasons for Medicine Stock-Outs

Reasons for stock-outs ^a	Facility type				Total % (n = 66)
	Public hospital % (n = 21)	Public clinic % (n = 4)	Mission clinic/hospital % (n = 23)	Private clinic/hospital % (n = 18)	
Delay in delivery	67	75	61	50	61
Quantities delivered not conforming with quantities ordered	81	100	65	22	61
Transportation not available	48	75	17	11	29
Funds not available for the order	33	0	44	22	32
Stock cards not up to date	14	25	13	22	18
Minimum/maximum stock levels not regularly updated	27	50	26	22	27
Error in forecasts	33	75	39	11	32
No stock control	5	50	17	17	15
Insufficient staff	43	25	22	17	27
Unqualified staff	19	0	17	22	18
Other	19	0	13	11	145

^aMultiple responses allowed

Almost three-quarters of facilities overall had a pharmaceutical management information system in place, but that included only 40 percent of private facilities. In addition, only 15 facilities had fully automated information systems—mainly public hospitals and mission facilities. Facilities regularly monitored quantities received (92 percent), stock on hand (92 percent), expiry dates (89

percent), and average monthly consumption (77 percent). Almost all facilities included patient dispensing information in their pharmaceutical management information system.

The prices of the standard treatments for malaria (AS/AQ for first line and AL for second line) ranged widely among public and private outlets. The lowest average prices were in the public and mission facilities, whereas private pharmacies charged the highest prices overall; however, the median prices for AL 20/120 mg formulation were virtually the same in all outlets, whereas the cost of the 3×3 pack of AS/AQ was six times cheaper in the chemical seller shops than in the private sector facilities (Table 9).

Table 9. Prices to Consumers by Facility Type (Median Retail Price per Pack in Ghanaian Cedis)

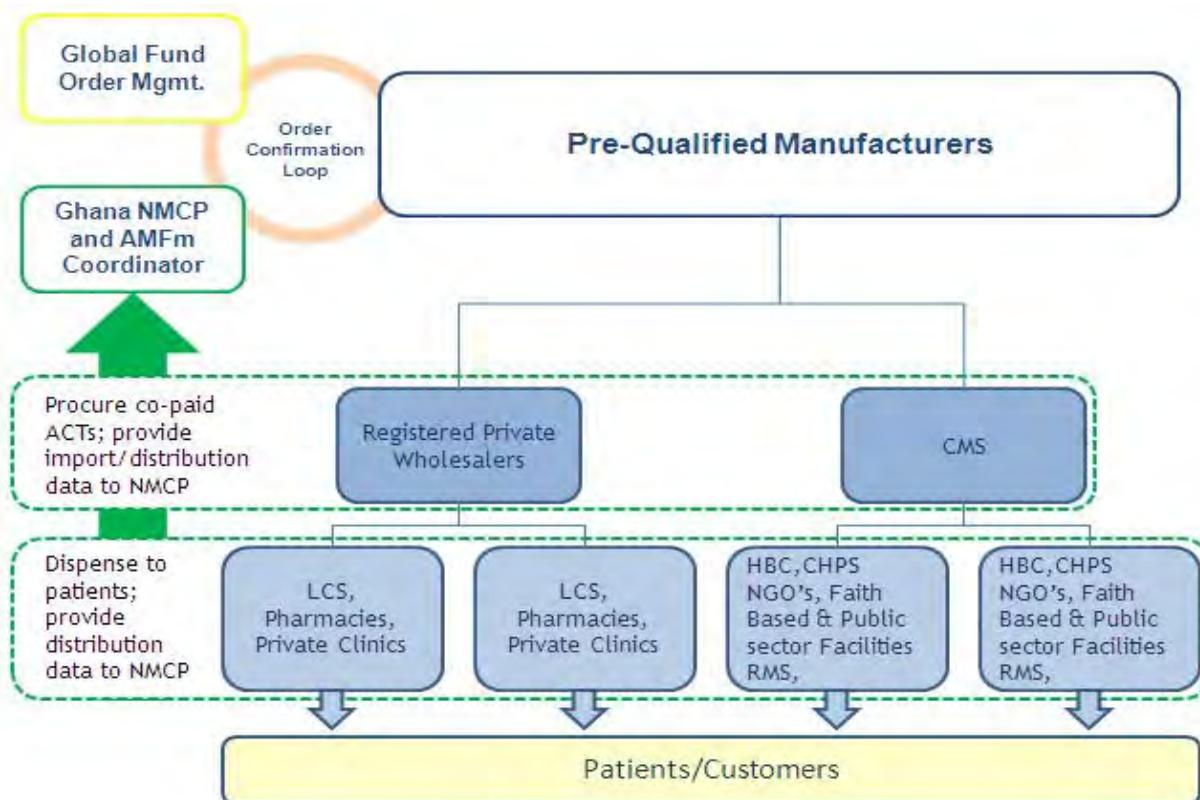
Name of medicine	Public clinic/hospital	Mission clinic/hospital	Private clinic/hospital	Private pharmacy	Chemical seller shop
AS/AQ (3×3)	0.78	1.56	3.60	3.42	0.60
AS/AQ (6×6)	1.20	1.08	2.00	3.00	3.50
AS/AQ (12×12)	3.00	3.40	3.50	3.60	3.00
AL 20/120 mg	4.50	4.50	4.53	4.50	4.50
AL 40/240 mg	4.50	4.50	4.50	4.80	4.00
AL 80/480 mg	4.50	4.50	4.50	5.00	5.00
Sulfadoxine/pyrimethamine 500/25mg	0.66	0.90	1.10	1.20	1.20
Average price (cedis)	2.73	2.92	3.39	3.65	3.11

The use of performance indicators for monitoring and evaluation (M&E) was very low in all types of outlets. The most commonly used M&E performance indicator was “number of stock-out days,” but even that was only cited by 57 percent of public hospitals, 48 percent of mission facilities, and 17 percent of private facilities. Findings based on six performance indicators suggested that less than half of facilities used them.

Other USAID partners are conducting follow-on activities as a result of this mapping.

Support the Design of the Distribution Model for ACTs in the Private Sector to Identify Private Providers to Increase the Uptake of ACTs

The SPS Program in collaboration with the NMCP, the Global Fund to Fight AIDS, Tuberculosis and Malaria Country Coordinating Mechanism, the MoH, and the Affordable Medicines Facility for Malaria (AMFm) initiative proposed distribution model for a private sector ACT delivery program for Ghana. To ensure efficient and cost-effective distribution of ACTs in the private sector, the group considered several distribution models, but dropped the initial idea of an accreditation model in favor of the open system illustrated in figure 4. Under this model, the selected private sector participants would be required to provide some case management data to support national malaria management and decision-making.



CHPS: Community-based health planning services
HBC: Home-based care

Figure 4. Ghana co-paid (subsidized) ACT delivery model for the private sector

Assist in the Development of an M&E Framework for Private Sector ACT Distribution

In response to a technical request, SPS developed an M&E framework to support the ACT distribution program in the private sector. Like most other countries opting for AMFm, Ghana had no mechanisms for monitoring the performance of the private sector players who are the first-line importers and distributors along the supply chain. M&E should be a key cornerstone of Ghana's plan to distribute subsidized ACTs through the private sector, and it would provide the information needed to make evidence-based decisions for the program to succeed.

SPS and NMCP in collaboration with the Global Fund's Country Coordinating Mechanism identified the following components to measure during the private sector ACT distribution program—

- Extent of national distribution coverage
- Product availability
- Price variations by region or district and by provider type

- Sales at the wholesale level—limiting the consumption data to this level assumes that the number of units sold is a measure of patient consumption⁵; a sales monitoring system will need to be developed for the health facility, LCS, and pharmacy levels
- Baseline data prior to AMFm roll out of to measure the size of the subsidized ACT market share compared to other antimalarials over time

All key stakeholders reviewed and agreed on the M&E framework in September 2010. The NMCP is exploring technical assistance resources to continue this activity. Details of the M&E framework can be found in Annex 1.

Support Stakeholders to Assess the National Pharmacovigilance and Medication Safety System

The SPS Program worked with the FDB, the NMCP, and other public health programs and stakeholders to assess Ghana’s pharmacovigilance system and used the results to develop recommendations for improving the safety of health products in Ghana.

The assessors used SPS’s recently developed Indicator-based Pharmaceutical Assessment Tool, which was adapted for the Ghanaian context based on feedback from stakeholders. Data collectors reviewed documents and interviewed key informants from MoH and other national-level organizations, public health programs, and health facilities, from clinics to tertiary care hospitals.

Policy, Law, and Regulation

Ghana’s National Drug Policy recognizes the need for pharmacovigilance and medicine information services and considers post-marketing surveillance an important aspect of Ghana’s pharmaceutical sector. However, the country lacks the legal provisions to enforce pharmacovigilance activities. Among its public health programs, the NMCP is the only one that clearly defines safety monitoring of antimalarials.

Systems, Structures, and Stakeholder Coordination

The FDB’s Safety Monitoring Unit is the national pharmacovigilance coordinating center. The assessment confirmed that the following are in place at the national level—

- National pharmacovigilance unit with mandate and structure
- Designated person(s) for pharmacovigilance
- Functional information and technology infrastructure
- Pre-service training on pharmacovigilance
- Collaboration with the WHO/Uppsala Monitoring Centre

⁵ Because only sales data on malaria products would be collected and no patient data would be collected, stakeholders agreed on the assumption that the number of sales for malaria treatment equals the number of malaria patients.

However, only 50 percent of assessment respondents said their health facilities had a pharmacovigilance mandate and structure; 46 percent confirmed that there is a staff person responsible for these activities; and 77 percent reported the availability of a functional information technology infrastructure to support pharmacovigilance activities. In addition, all levels (national, public health, facility) consistently reported poor results related to having a dedicated pharmacovigilance budget, a safety bulletin, training for healthcare workers, a mechanism to coordinate activities, or pharmacovigilance guidelines or standard operating procedures.

The current national guidelines for product safety monitoring target the industry and lack the critical components needed for a comprehensive guideline for health products safety surveillance. As a result, it has been challenging to map stakeholders' contributions or develop appropriate structures to implement pharmacovigilance activities.

Signal Generation and Data Management

Adverse event reporting and signal detection require a rigorous data management system. The assessment showed that adverse drug reaction (ADR) reporting forms are readily available in most levels of Ghana's health system. However, the scope of a pharmacovigilance system also covers therapeutic ineffectiveness, medication errors, and product quality, which can be collected using the existing ADR form, a separate form, or as a part of the patient case file. The assessment showed that these other events are rarely reported, and that respondents' knowledge or use of other reporting mechanisms is poor.

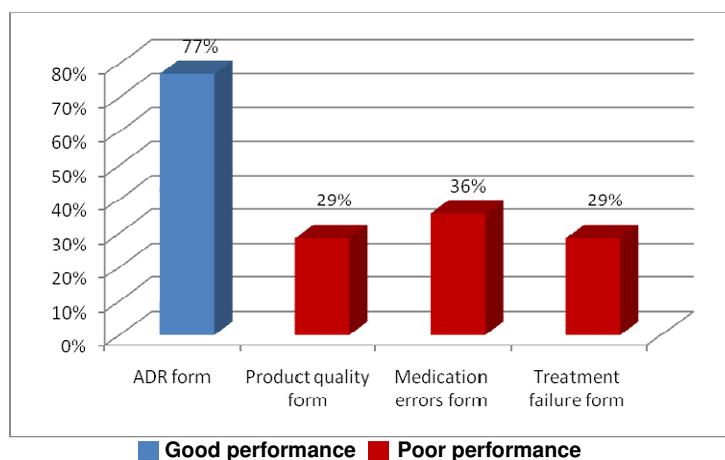


Figure 5. Percentage of health facilities with knowledge of reporting tools

Risk Assessment and Evaluation

Without collection, report, or analysis of adverse events data, signals of public health importance are missed and opportunities to learn about the safety and effectiveness of medicines during real-life use are lost. Table 10 shows that spontaneous reporting rates are not meeting expected rates.

Table 10. Safety Monitoring Unit's 2009 Pharmacovigilance Activities: Expected vs. Observed

	Observed	Expected ^a	Percent
Spontaneous reports received (×100)	1.6	23.0	7.0
Adverse events from immunization received	15.0	22.0	68.0
Product quality reports (×10)	0.2	14.8	1.0
International safety reports sent	13.0	38.0	34.0
Safety communications sent (Dear doctor/healthcare professional letters)	8.0	20.0	40.0

^aAssumptions based on internationally reported estimates

On the other hand, although general adverse event reporting has improved from 95 reports in 2005 to 171 reports in 2009, the total still fell short of the WHO recommended target of an average of 100 ADR reports per 1,000,000 people, which would be over 2400 based on Ghana's population.

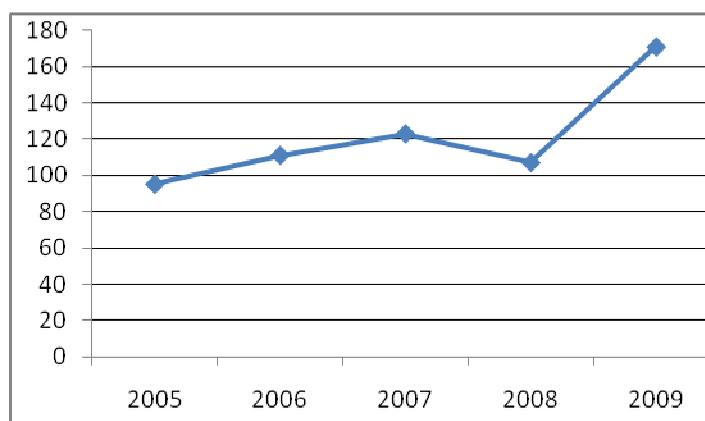


Figure 6. Number of adverse events reported to safety monitoring unit

In addition, the assessment identified 35 active surveillance studies and projects that are complete or ongoing in Ghana (some studies have multiple sites). The majority of the studies relate to the safety and effectiveness of antimalaria medicines, and 24 target antimalarial use in specific patient populations.

COLLABORATORS AND PARTNERS

- Expanded Program on Immunization
- Food and Drug Board
- Ghana Health Services
- Ghana Social Marketing Foundation
- Global Fund Country Coordinating Mechanism Ministry of Health
- National AIDS Control Program
- National Malaria Control Program
- National Tuberculosis Control Program
- Pharmacy Council
- Pharmaceutical Society of Ghana
- Promoting Malaria Prevention and Treatment project
- Regional Directorate of Health Services for Greater Accra, Western, and Central regions
- USAID | DELIVER
- World Health Organization

ANNEX 1. M&E FRAMEWORK FOR DISTRIBUTING ACTS IN THE PRIVATE SECTOR

Dimension	Variables	Indicators	Methodology ^a
Availability	Physical availability	<p>Proportion of public and private sector providers—</p> <ul style="list-style-type: none"> • That had the co-paid and other ACTs in stock at the time of the survey visit • That had antimalarials other than ACTs in stock at the time of the survey visit • Reporting no stock-out of co-paid and other ACTs at the time of the survey visit • With expired co-paid ACTs at the time of the survey visit 	Use sample size of 30 randomly selected public and private providers in each region
Affordability	Pricing	<ul style="list-style-type: none"> • Average median price of antimalarials for patients at different public or private sector providers (compare urban versus rural and/or selected different geographical locations) • Median cost of full course of treatment for uncomplicated malaria as recommended in the STG^b (adherence to STG and cost of full treatment) <p>NB: Assess whether payment is covered by NHIS^c or paid out-of-pocket</p>	Use sample size of 30 randomly selected public and private providers in each region
Accessibility	Wholesale supply channel	<ul style="list-style-type: none"> • Percentage of public and private sector providers within a two-hour's drive from first-line buyers • Percentage of public and private sector providers within a two-hour's drive from second-line buyers 	Measure indicators in all regions
	Monitoring suppliers' performance	<ul style="list-style-type: none"> • Number of registered public and private sector wholesalers selected as first- and second-line buyers • Quality of supplied products: number of batches that failed quality control test or number of deviations from agreed specifications per supplier or prequalified manufacturer for co-paid ACTs 	Use Pharmacy Council data on number of wholesalers; streamline with Global Fund baseline survey
	Supply chain coverage	<ul style="list-style-type: none"> • Number of licensed or registered public and private providers per region 	
Quality of services (restricted to sentinel surveillance proposed by NMCP)	Quality of pharmaceutical products	<ul style="list-style-type: none"> • Percentage of sampled antimalarials including co-paid ACTs registered with the Ghana Food and Drugs Board • Percentage of sampled antimalarials including co-paid ACTs that pass screening by thin-layer chromatography and mini lab methods 	Data collection from 30 randomly selected public and private sector providers in each region

Annex 1. M&E Framework for Distributing ACTs in the Private Sector

Quality of pharmaceutical services for uncomplicated malaria in children <5 years	<p>Percentage of encounters in which the—</p> <ul style="list-style-type: none"> • Appropriate first-line antimalarial medicine was sold for malaria treatment • Appropriate first-line antimalarial medicine was dispensed consistently in accordance with STGs • Attendant provided instructions on how to take the medication • Attendant asked about symptoms of the child • Attendant asked about any medication the child may have taken • Attendant asked about general danger signs in children under 5 years • Recommended first-line antimalarial was prescribed • Appropriate dose and frequency of administration for first-line ACT was prescribed 	Mystery shopper visits to selected private sector providers in each region to determine the quality of pharmaceutical services for malaria; use a sample size of 60 randomly selected private sector providers in each region
Consumer satisfaction	<p>Percentage of households—</p> <ul style="list-style-type: none"> • That obtain most of their medicines from private sector providers • Whose perception is that private sector provider’s attendants are knowledgeable about medicines • Whose perception is that antimalarials obtained from private sector providers are affordable • That choose a private sector provider as a first choice facility for advice • That have the money to buy the medicines they need • That report they can buy medicines on credit from the private sector provider 	Conduct limited household surveys based on adapted WHO ^d methodology to determine satisfaction indicators; select 30 randomly chosen private sector providers or shops; within this sample size, select 300 households in each region; ensure private providers or shops are stratified by density of geographical distribution in each region

^aData on the quality of pharmaceutical products and product affordability should be adapted and determined from the availability and price data collection tool based on Strategies for Enhancing Access to Medicines and Health Action International methodologies.

^bSTG, standard treatment guidelines

^cNHIS, National Health Insurance Scheme

