

An Assessment of Pharmaceutical Management of Malaria Medicines in Kenya

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Strengthening
Pharmaceutical
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ACRONYMS AND ABBREVIATIONS

ACT	artemisinin-based combination therapy
AL	artemether-lumefantrine
DHMT	District Health Management Team
DMoH	District Medical Officer for Health
DOMC	Division of Malaria Control
DPF	District Pharmaceutical Facilitator
DPTWG	Drug Policy Technical Working Group (DOMC)
FEFO	first expired, first out
FIFO	first in, first out
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GoK	Government of Kenya
IPTp	intermittent preventive treatment in pregnancy
KEMSA	Kenya Medical Supplies Agencies
LMIS	logistics management information system
M&E	monitoring and evaluation
MEDS	Mission for Essential Drugs and Supplies
MIP	malaria in pregnancy
MSH	Management Sciences for Health
OPD	Outpatient Department
PMI	President's Malaria Initiative
PMM	Pharmaceutical Management for Malaria
PSM	procurement and supply management
RDT	rapid diagnostic test
SOP	standard operating procedure
SP	sulfadoxine-pyrimethamine
SPS	Strengthening Pharmaceutical Systems (Program)
USAID	U.S. Agency for International Development
WHO	World Health Organization

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Special recognition goes to the District Medical Officers of Health (DMoHs), District Pharmaceutical Facilitators (DPFs), and District Health Management Teams (DHMTs) located within the 10 assessed districts (Kakamega, Kisii, Kitui, Kwale, Laikipia, Mombasa, Mwingi, Nakuru, Nyamira, and Vihiga) for supporting and cooperating with the field teams to make this activity successful; the team coordinators, along with the data collectors, data entry clerks, and data validators, are commended for smooth and dedicated field activity, as well as the delivery of high-quality data records and detailed team field reports.

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EXECUTIVE SUMMARY

In November 2008, using a locally adapted version of the PMI end-use tool, an initial feasibility study to collect data and assess the status of pharmaceutical management indicators for malaria medicines in Kenya was conducted in six districts in Kenya—Buret, Garissa, Kilifi, Nairobi, Suba, and Uasin Gishi—in 48 public and mission health facilities. One of the key recommendations of the dissemination workshop was that a larger and more representative assessment focusing only on procurement and supply management (PSM) indicators be carried out biannually.

The July 2009 PMM assessment is the first since the pilot study and its recommendations. The objectives were to sustain and advance the efforts and achievements of the November 2008 survey by extending the assessment to a larger and more representative number of facilities and districts, and using an assessment protocol that can be integrated with the DOMC's current monitoring and evaluation (M&E) supervisory component.

Ten districts were selected from the four malaria epidemiological zones of Kenya. They were Kwale/Mombasa and Kakamega/Vihiga (both endemic), Kisii /Nyamira (epidemic prone), Kitui/Mwingi (arid seasonal), and Laikipia/ Nakuru (low risk). A total of 100 public/mission facilities (10 facilities per district: seven dispensaries, two health centers, and one hospital) were assessed.

Three blocks of indicators (inventory management, systems strengthening, and facility) were assessed.

Generally a high level of availability of all artemether-lumefantrine (AL) was found on the day of the assessment (overall, by package sizes of AL: 6s, 87 percent; 12s, 83 percent; 18s, 77 percent; and 24s, 89 percent) in the facilities sampled. The availability of sulfadoxine-pyrimethamine (SP) was 94 percent overall, while both quinine tablets (300 mg) and injection recorded 86 percent availability. Most facilities had *at least one* of the AL weight bands (90 percent, 95 percent, and 94 percent in hospitals, health centers, and dispensaries, respectively) to treat uncomplicated malaria.

However, the history of stock-outs over the previous three months (April to June 2009) showed widespread interruptions had occurred in the availability of various antimalarial medicines in health facilities, with SP recording the least stock-outs. The levels of stock-outs (of more than seven continuous days) experienced throughout all the levels of care in the same period confirmed these were actual stock-outs and not temporary delays in resupply. Most facilities experiencing stock-outs reported at least two stock-outs of more than seven continuous days during the three-month period. The assessment indicated that the majority of facilities received fewer antimalarial medicines than they ordered; for ALs, less than 30 percent of facilities received what they ordered. These disparities can be explained by the capping of quantities of AL by the DOMC according to level of care and malaria zone classification. The average monthly consumption/adjusted monthly consumption figures obtained from the newly instituted logistics management information system (LMIS) will become a useful guide to procurement and distribution of the malaria medicines.

The assessment also revealed that all (100 percent) hospitals and health centers on pull¹ received malaria medicines within the stipulated two months and three months, respectively, from the Kenya Medical Supplies Agency (KEMSA). Of the push facilities² sampled (health centers and dispensaries), 80 percent received their malaria medicine supplies within the stipulated 12 weeks. The delay in pushing malaria medicines supplies, scheduled to commence in April 2009 for that quarter, resulted from the delay in the supply of health center and dispensary kits³ to KEMSA.

Inventory management tools had a high availability at all levels of care, except for Issue and Requisition Vouchers, which were available in only 35 percent of health centers and 25 percent of dispensaries. Most facilities had stock cards (actual or improvised) and had updated their records within the previous 30 days. Of the facilities sampled, 70 percent had experienced supervisory visits that checked on storage conditions and stock cards, giving most attention to the AL register. Although inventory management was generally supervised, a lot more attention was given to the stock cards (69 percent) than to the actual physical inventory (overall 39 percent). A review of stock card records compared to physical counts on the day of the assessment showed that less than 40 percent of the health facilities visited had stock card records that tallied with physical counts.

Up to 70 percent of health workers involved in stock management at different levels of care had been trained on stock management. Most (69 percent) received training through attending formal logistics training workshops.

Specific recommendations from this assessment include the following:

- Review the supply mechanism for malaria medicines:
 - Review capped quantities across all levels of care and by malaria zone.
 - Ensure a full pipeline (adequate supplies) across all levels of the supply chain.
 - Monitor procurement processes for timely and adequate supplies delivery.
- Develop modalities for targeted supplemental distribution of AL to endemic and epidemic-prone areas as a central strategy for limiting stock-outs.
- Perform monitoring and evaluation for inventory management of malaria medicines as well as supportive supervision to deal with the low percentage of facilities that have tallying records between bin card values and physical stock.
- Carry out periodic field assessments of the status of pharmaceutical management of malaria medicines and effectiveness of training activities on knowledge, attitudes, and practices.
- Make plans for sustained printing, supply, and distribution of malaria medicines consumption tracking tools by DOMC.

¹ Pull facilities order medicines periodically from KEMS/MEDS based on need.

² Push facilities receive a predetermined quantity of medicines based on facility type and level of care. These medicines are normally supplied as kits.

³ The health center and dispensary kits supplied by KEMSA consist of predetermined quantities of defined medicines and medical supplies that are prepackaged for distribution to facilities on a push system of supply.

- Set up a national and district database of health workers trained on malaria medicine management by cadre.
- Strengthen the link between the district pharmacist and the malaria focal person for inventory and information malaria medicines management.

The debriefing of the 10 DHMTs and the staff in facilities (those selected for the assessment and others within the district) by the DPFs remains a crucial next step to maximize the impact of the PMM assessments. Routine supervision for malaria medicine management within the DOMC's supervisory visits will be useful in assessing the dynamic status of PMM on various indicators.

In conclusion, the July 2009 assessment was focused, precise, and well managed. The indicators on inventory management and system strengthening offer a base for packaging of routine PMM supervision checks which, if entrenched in a pooled supervisory system, can make the scaling up of the PMM assessments effective and sustainable, with efficient management of resources. Other well-designed assessments, such as those on case management and drug use, will be complementary to these findings.

Scaling up to routine countrywide PMM medicine appraisal should be pursued to serve as a reliable basis for informing central level PSM decisions.

INTRODUCTION

Malaria is a major health problem in Kenya. It is reported to be the leading cause of death of children under five years of age and responsible for one of every four childhood deaths. Over the past few years, several funding streams have supported commodity procurement and management: these include the Government of Kenya (GoK) through the DOMC, the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), USAID, the World Health Organization (WHO), and the U.K. Department for International Development. In December 2006, Kenya was announced as a focus country for the PMI.⁴

The GoK and partners have invested heavily in the procurement of malaria medicines and commodities as well as in activities to strengthen the management of these commodities. In an effort to account for and optimize these investments, an initial feasibility study to assess the status of pharmaceutical management indicators for malaria medicines in Kenya was carried out in November 2008. This assessment was conducted in six districts—Bomet, Garissa, Kilifi, Nairobi, Suba, and Uasin Gishu—with a locally adapted version of the PMI end-use tool. The findings of this survey were disseminated to the DPTWG of the DOMC and other malaria stakeholders in March 2009.

One of the key recommendations of the dissemination workshop was that a larger and more representative assessment focusing only on PSM indicators be carried out biannually. The assessments would be used to inform the country and development partners on the status of pharmaceutical indicators for malaria and existing gaps in the PSM of malaria commodities.

The July 2009 assessment represents the earliest step in this direction of scaled-up and more institutionalized activity, using a localized version of the PMI end-use tool to monitor defined indicators on PMM medicines.

The July 2009 assessment had three objectives—

- To sustain efforts and achievements of the initial November 2008 survey
- To carry out a larger more representative assessment of the status of PMM indicators—in the country, with maximum management of resources, including time
- To use an assessment protocol that can be integrated within the present M&E supervisory component of the DOMC

This study is not statistically representative of the country, but it seeks to provide a snapshot of malaria medicine supply issues in selected districts and facilities, based on the selection criteria of malaria zones and levels of care. Furthermore, the main purpose of the study is not to compare statistics between these malaria regions; it seeks to involve a larger number of facilities, of various levels of care, focusing on pharmaceutical management indicators, with the aim of ultimately contributing to high impact of multiple intervention efforts in the management of malaria medicines in Kenya.

⁴ Other PMI countries are Angola, Benin, Ghana, Ethiopia, Liberia, Malawi, Mali, Madagascar, Mozambique, Rwanda, Senegal, Tanzania, Uganda, and Zambia.

BACKGROUND

The four malaria epidemiological zones in Kenya are (see map of Kenya)—

- Endemic, along the shores of Lake Victoria and the south coast with perennial malaria transmission
- Epidemic-prone highlands, which are highly populated, with seasonal transmission
- Arid and semiarid lowlands, which are sparsely populated
- Highlands around mountainous areas, with very low risk of transmission

Ten districts were selected⁵ from the four epidemiological zones in Kenya—

Endemic:	Mombasa/Kwale; Vihiga/Kakamega
Epidemic prone:	Nyamira/Kisii
Arid/seasonal:	Mwingi/Kitui
Low risk:	Laikipia/Nakuru

Three classifications of health care delivery levels were assessed in each of the 10 districts—hospital (one facility), health center (two facilities), and dispensary (seven facilities).

Levels of Care within the Public Health System

The National Health Sector Strategic Plan II (2005–10) contains the Kenya Essential Package for Health⁶ approach, which defines the six service delivery levels. The hospitals, health centers, and dispensaries fall into levels 4–6, 3, and 2, respectively.

Levels 2 and 3 primarily handle promotional and preventive care and some curative services. Levels 4–6 focus mainly on the curative and rehabilitative aspects of the service delivery package.

Existing Malaria Medicine Supply Mechanisms in Kenya

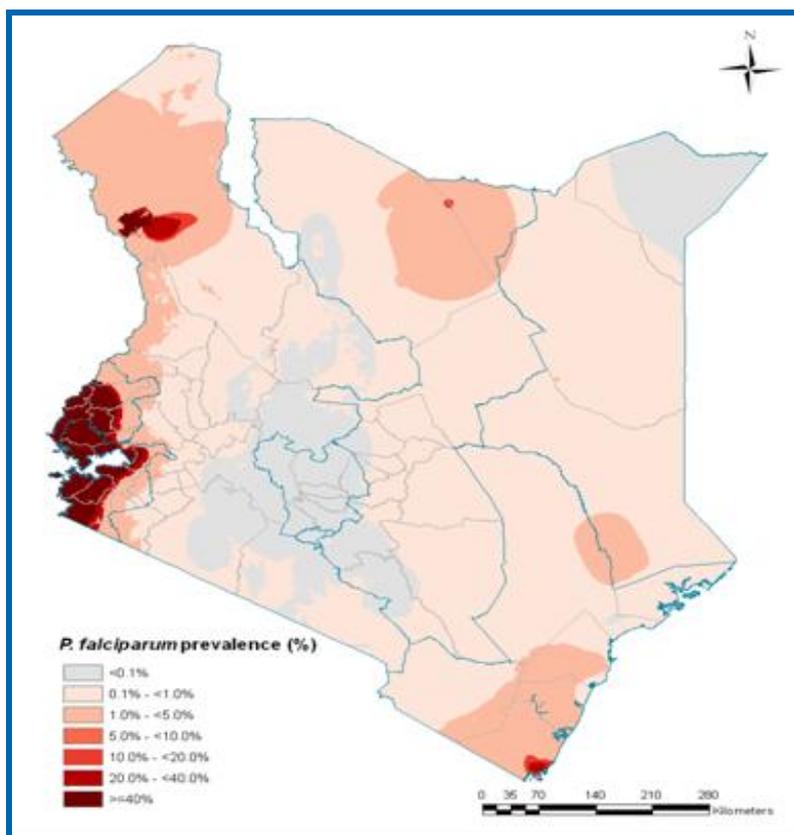
KEMSA is a government procurement agent mandated to procure, warehouse, and distribute medicines and medical supplies to public and selected mission health facilities in Kenya. All antimalarials once procured through various funding streams (GFATM for AL and KEMSA for SP and quinine) are received at KEMSA for storage and distribution. The DOMC provides a distribution list for distribution of AL to all public health facilities in the country. The distribution list provides the quantities of AL to be distributed to each facility type in the country based on the epidemiological zone in which the facility is located and the level of care. SP and quinine are distributed as part of a kit for push facilities and on demand for pull

⁵ The selection of districts was carried out by creating a sampling frame composed of pairs of contiguous districts (all districts within each malaria zone), pasting them randomly on a table, and then randomly choosing which pair of districts would be assessed by means of computer-generated figures.

⁶ The Kenya Essential Package for Health integrates all health programs into single package focused on improving health at different stages of the human life cycle.

facilities. The Mission for Essential Drugs and Supplies (MEDS Mission for Essential Drugs and Supplies) supplies medicines to mission health facilities in Kenya. MEDS receives its allocation of AL (as advised by the DOMC).

KEMSA distributes directly to all hospitals, public facilities, and selected mission health facilities. Facilities on a pull system place their orders according to the distribution schedule drawn up by KEMSA, while those on a push system receive supplies on a fixed schedule. KEMSA uses an outsourced transport system to deliver medicines to all public health and designated mission facilities. Distribution from MEDS is also two-level, directly from central warehouse to the mission facilities. Mission facilities served by MEDS are on a demand-driven (pull) system.



Noor A.M., P.W. Gething, V.A. Alegana, A.P. Patil, S.I. Hay, E. Muchiri, E. Juma, and R.W. Snow. 2009. The risks of malaria infection in Kenya in 2009. *BMC Infectious Diseases* 9:180.

Map of Kenya Showing Malaria Zones and Selected Districts

METHODOLOGY

This assessment was cross-sectional and descriptive. It used a multistage, stratified random sampling procedure, with programmatic adjustments.⁷

The sampling frame constituted the 72 “old” districts⁸ within the country as classified by the DOMC, with two main considerations: the endemicity of the district (for malaria) and the level of care of the health facilities. The stages in stratification were to (a) divide the districts by epidemiological zone, (b) select malaria districts (paired by contiguous location) to be visited in each of the four malaria zones (10 districts in all), and (c) select the facilities in each of the sampled districts. A total of 100 health facilities were assessed; by level, 10 hospitals, 20 health centers, and 70 dispensaries.⁹

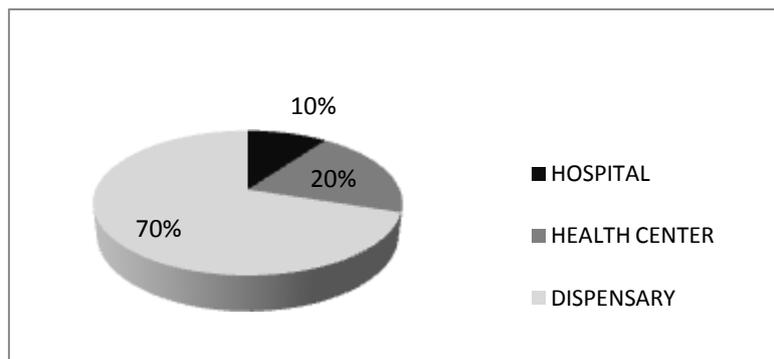


Figure 1. Percentage of total sample

The forms for collecting data comprised three blocks of indicators (in order of the questionnaire: facility indicators, system-strengthening indicators, and inventory management indicators).¹⁰

The main groups of personnel involved in the fieldwork were core supervisors (comprising staff and consultants from MSH/SPS); field personnel (five team coordinators, 15 data collectors—3 in each team); and six data entry clerks. The database developer/analyst with two data validators coordinated the data quality and validation from the central level (in the Nairobi MSH office) with two support staff members for logistics and administration.

All field staff received an intensive three-day training course at central level, incorporating a pilot test (and feedback) on the tools as well as hands-on data entry of test data. The data-processing staff received more intensive training on data entry. The PMM survey training manual was used as a supplement and reference material in addition to the training presentations and dummy exercises.

⁷ Annex 2 details the criteria and processes for sampling.

⁸ DOMC recommendation.

⁹ Please refer to Annex 3b for the complete list of facilities sampled per district.

¹⁰ See Annex 1: List of Indicators.

Logistical planning to ensure smooth implementation of the fieldwork entailed sending out sensitization letters for the impending activity and letters of introduction of field personnel, preparing for transport, and making accommodation and other administrative and financial arrangements.

Primary data were obtained by direct recording of data onto the data collection tools provided, with validation of entries by the data collectors and team coordinator before they left the facility. The data were then immediately entered into a data screen template and transmitted daily to Nairobi (central) by e-mail for initial validation by the data validators. On completion of the exercise, each team presented the final database entries and the hard copies of the questionnaires. A second level of data validation was carried out by the data entry clerks (and team coordinators where necessary) to confirm the accuracy and completeness of all data that had been previously entered and validated.

Data analysis was conducted in accordance with indicator–data source linked guidelines. This assessment used an Access database, which is more appropriate for larger samples and has the added advantage of more robust query than the MS Excel Worksheet used in the November 2007 survey. Quantitative and qualitative analyses were undertaken for global (complete list of facilities irrespective of level of care) and stratified (by levels of care) data.

Appropriate tables or graphs were generated for all the indicators and are presented and discussed the Findings section of this report.

FINDINGS

The July 2009 PMM assessment was conducted between July 13 and 23, 2009, in 100 facilities, at three levels of care: hospital, health center, and dispensary.

The findings from the analyses of data collected in the assessment are presented in three blocks of indicators¹¹—

1. Inventory management indicators, comprising four groups of indicators: stock status (availability, stock-out, expiry), stock management, store management, ordering/receiving
2. System-strengthening indicators, comprising four groups of indicators: supervision, availability of reference materials, availability of inventory management materials, reporting to higher levels
3. Facility indicators, comprising two groups of indicators: service delivery points, personnel training assessment

Inventory Management Indicators

1. Stock Status (Availability)

Indicator 1a: Percentage of facilities with unexpired malaria medicines on day of the supervisory visit (all medicines, including AL)

Rationale: To measure the availability of quality malaria medicines in the health facilities visited

Table 1. Percentage of Facilities with Unexpired Malaria Medicines on the Day of the Supervisory Visit, by Level

Product	Percentage of Hospitals n = 10	Percentage of Health Centers n = 20	Percentage of Dispensaries n = 70	Percentage Overall N = 100
AL 6s	80	75	91	87
AL 12s	90	75	84	83
AL 18s	70	75	79	77
AL 24s	90	90	89	89
SP	100	95	93	94
Quinine tablets (300 mg)	100	90	83	86
Quinine tablets (200 mg)	30	20	17	19
Quinine injection	100	90	83	86

The results show a generally high level of availability of all the ALs in the facilities sampled. AL 18s recorded the lowest availability (global and stratified) of all the ALs. The availability

¹¹ See Annex 1: List of Indicators.

of SP was 94 percent overall, while both quinine tablets (300 mg) and injection recorded 86 percent overall.

There seems to be no remarkable differences in the availability of the antimalarial medicines when analysis is stratified by level of health care delivery; however, hospitals generally recorded highest values, with the exception of AL 6s and AL 18s. Only quinine 200 mg recorded generally low figures, with an overall percentage availability of 19 percent,¹² because quinine 200 mg is no longer procured through KEMSA for supply to public health facilities. Stocks found in the field are part of old supplies or those procured through cost-sharing money.

The level of availability, when stratified by malaria zone (see table 2) follows the same pattern of generally high availability of all the antimalarial medicines assessed. However, the availability of antimalarial medicines recorded in facilities in the endemic malaria zone is noticeably lower for most antimalarial medicines.

Table 2. Percentage of Facilities with Unexpired Malaria Medicines on the Day of the Supervisory Visit, by Malaria Zone

Product	Percentage of Arid/Seasonal n = 20	Percentage of Endemic n = 40	Percentage of Epidemic n = 20	Percentage of Low Risk n = 20	Percentage Overall N = 100
AL 6s	95	78	95	90	87
AL 12s	75	78	100	85	83
AL 18s	75	68	95	80	77
AL 24s	85	85	100	90	89
SP	100	85	100	100	94
Quinine tablets (300 mg)	90	73	100	95	86
Quinine tablets (200 mg)	20	13	20	30	19
Quinine injection	100	65	100	100	86

Indicator 1b. Percentage of facilities with unexpired AL (at least one) of the four weight bands on the day of the supervisory visit

Rationale: To measure the ability of facilities to treat uncomplicated malaria cases with artemisinin-based combination therapy (ACT), using any of the four AL weight bands

¹²The findings on the availability of quinine tablets 200 mg are not discussed in detail throughout the report because it has been superseded by quinine 300 mg in supply mechanisms and is no longer procured or distributed. However, it represents old (but usable stock) when available.

Table 3. Percentage of Facilities with Unexpired AL (at Least One) of the Four Weight Bands on the Day of the Assessment, by Level

Facility	Number of Facilities	Total Number of Facilities	Percentage of Facilities
Hospital	9	10	90
Health center	19	20	95
Dispensary	66	70	94
Overall	94	100	94

The analyses of health facilities with at least one unexpired AL highlight the facility’s ability to treat for uncomplicated malaria (with any of the AL weight bands), as demonstrated by the overall figure of 94 percent, as well as by the stratified analysis, which presents figures of 90 percent, 95 percent, and 94 percent for hospitals, health centers, and dispensaries, respectively.

Table 4. Percentage of Facilities with Unexpired AL (at Least One) of the Four Weight Bands on the Day of the Assessment, by Malaria Zone

Malaria Zone	Number of Facilities	Total Number of Facilities	Percentage of Facilities
Arid/seasonal region	19	20	95
Endemic region	36	40	90
Epidemic region	20	20	100
Low-risk region	19	20	95
Overall	94	100	94

Review (by malaria zone) of the percentage of facilities with at least one unexpired AL on the day of the assessment shows that only 90 percent (36) of facilities visited in the endemic regions were able to treat for uncomplicated malaria. Facilities from endemic regions may be more likely to run out of certain AL weight bands unless stock supplied is commensurate with high use. Plausible explanations may be found in the level of usage, along with the supply quantities and resupply times. However, larger samples of facilities and a detailed history of supply will be needed to reach rational and satisfactory conclusions.

Indicator 1c: Percentage of facilities with unexpired AL (which ones) of the four weight bands on the day of the supervisory visit

Rationale: To measure which AL weight bands are available in health facilities on the day of the assessment

Table 5. Number/Percentage of Facilities with Unexpired AL of the Four Weight Bands on the Day of the Assessment

Type of AL	Hospital n = 10		Health Center n = 20		Dispensary n = 70		Total N = 100	
	No.	%	No.	%	No.	%	No.	%
AL 6s (only)	0	0	0	0	3	4	3	3
AL 24s (only)	0	0	1	5	0	0	1	1
AL 6s, AL 12s, AL 18s, AL 24s (all four weight bands)	6	60	11	55	53	76	70	70
Other combinations	3	30	7	35	10	14	20	20

Most (70 percent) of the facilities sampled at the different levels of care had all four AL weight bands (AL 6s, AL 12s, AL 18s, AL 24s) in stock on the day of the assessment. Facilities with three AL weight bands (AL 12s, 18s, and 24s) as well two AL weight bands (AL 6s and 12s) had the next overall percentages of 6 percent each, while the others were, in descending order, AL 6s, 12s, and 24s (5 percent); AL 6s only (3 percent); AL 6s and 12s (2 percent); AL 24s only (1 percent); and AL 6s, 12s, and 24s (1 percent).

The analysis shows that three facilities (dispensaries) had only one AL in stock (AL 6s) of the four weight bands, while one facility (health center) had only al 24s in stock on the day of the assessment. When stratified, results from the four malaria zones sampled show that 90 percent of facilities from epidemic zones, 80 percent from low risk, 75 percent from arid seasonal and 53 percent from endemic region had all four weight bands in stock on the day of the assessment.

2. Stock Status (Stock-Out)

Indicator 2a: Percentage of facilities with complete stock-out on the day of the assessment

Rationale: To measure the inability of facilities to treat uncomplicated malaria cases with ACTs

Table 6. Facilities with Complete Stock-Out of All AL Weight Bands

Type of Facility	Number of Facilities with Complete Stock-Out	Denominator (Total Number of Facilities Visited)	Percentage of Facilities
Hospital	1	10	10
Health center	1	20	5
Dispensary	4	70	6
Overall	6	100	6

An appraisal of the percentage of facilities without any AL on the day of the supervisory visit shows that 6 of 100 facilities sampled (6 percent) did not have at least one of the four weight bands of AL in stock. Four of the 6 facilities that had a complete stock-out of all four weight bands of AL were dispensaries. One hospital and one health center fell into this category.

These figures represent a small number of facilities and do not indicate any significant pattern.

Table 7. Percentage of Facilities with Malaria Medicine Stock-Outs on the Day of the Assessment

Product	Percentage of Hospitals n = 10	Percentage of Health Centers n = 20	Percentage of Dispensaries n = 70	Percentage Overall N = 100
AL 6s	20	25	9	13
AL 12s	10	25	16	17
AL 18s	30	25	21	23
AL 24s	10	10	11	11
SP	0	5	7	6
Quinine tablets (300 mg)	0	10	17	14
Quinine tablets (200 mg)	70	80	83	81
Quinine injection	0	10	17	14

The values obtained for facilities with stock-out of the various malaria medicines on the day of the assessment are (expectedly) low, as shown by the high values of availability of malaria medicines recorded in previous tables. Table 7 reveals that the product with least stock-outs was SP with overall value of 6 percent. At the hospitals, no stock-out was recorded for products such as SP, quinine tablets (300 mg), and quinine injection. As expected, quinine tablets (200 mg) have most stock-outs at all levels of care.

Indicator 2b: Percentage of facilities where a stock-out occurred April–June 2009¹³

Indicator 2c: Percentage of facilities that experienced stock-outs where the stock-out lasted seven days or more (April–June 2009)

Rationale: To measure the incidence of stock-outs of malaria medicines in the health facilities visited

Figure 2 compares the number of facilities that experienced any stock-out over the three-month period with those that experienced a stock-out of more than seven days.

¹³ Stock-outs occurring in the last three months are indicated only for facilities that kept records.

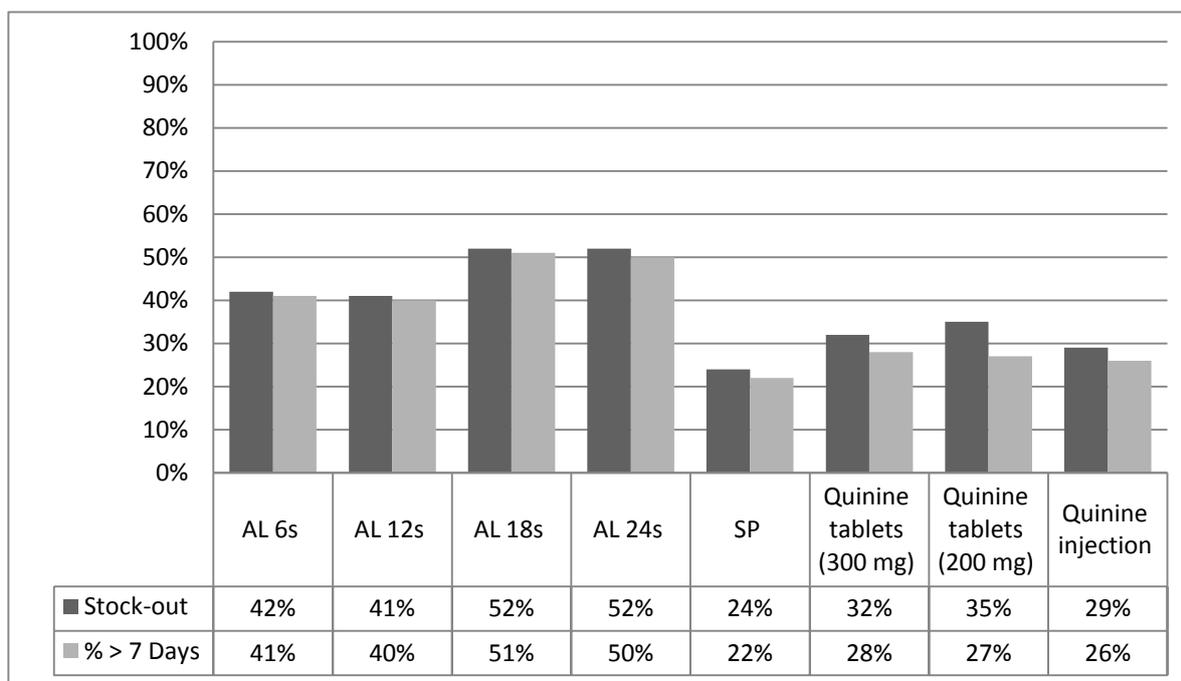


Figure 2. Comparison between facilities that had experienced a stock-out and those that experienced a stock-out lasting seven days or more (April–June 2009)

A comparison of the facilities that experienced stock-outs with those where the stock-out extended for at least seven days shows very similar figures. This suggests that the widespread stock-outs were not caused by infrequent or incidental delays in arrival of stock at the facility but caused by more fundamental issues with availability of adequate supply.

The history of stock-outs of seven days or more experienced over the three months prior to the assessment (April–June 2009) shows that up to 51 percent of facilities experienced stock-out of AL 18s and 24s, while 41 percent and 40 percent had stock-outs of AL 6s and AL 12s, respectively. The stock-out of SP was the lowest (aggregate value of 22 percent), while 28 percent and 26 percent had run out of quinine tablets 300 mg and quinine injection, respectively. These figures depict a history of interrupted availability of antimalarial medicines in health facilities over the April–June 2009 period. This situation may be partly explained by the supply of inadequate capped quantities of AL to all malaria zones and levels of care and the low reporting rates on consumption of AL. For facilities that are on the push system, the stock-outs of other malaria medicines may be explained by the kit system where quantities packed are inadequate. Health centers in all instances (except for quinine tablets 300 mg) accounted for the greatest levels of percentage stock-outs.¹⁴ Products with stock-outs of more than seven days ranged from SP (22 percent), quinine tablets 300 mg (28 percent), AL 12s (40 percent), AL 6s (41 percent), AL 24s (50 percent), to AL 18s (51 percent).

¹⁴ See Figure 2. Quinine tablets 200 mg had the greatest stock-outs in dispensaries, but this finding is not a discussion highlight.

Indicator 2d: Average number of stock-outs (times) for facilities that experienced stock-out of seven days or more (April–June 2009)

Rationale: To measure the occurrences of malaria medicine stock-outs in the health facilities visited

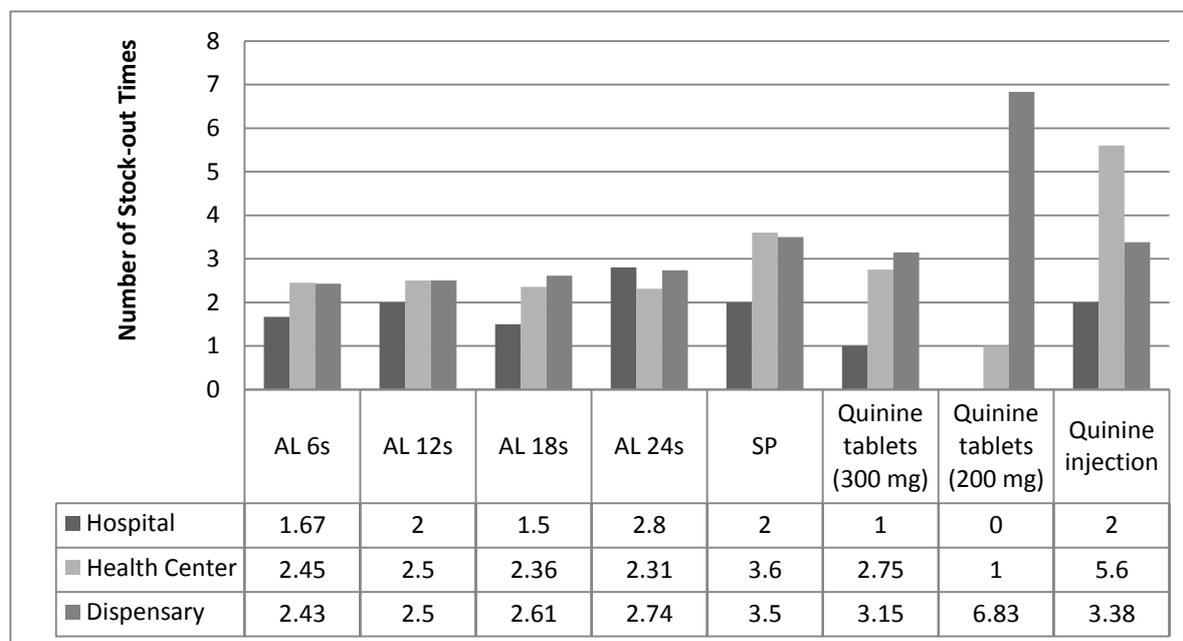


Figure 3. Number of stock-outs over the three-month period in facilities that experienced stock-outs

Figure 3 depicts the average frequencies of the number of stock-outs of the facilities that experienced stock-outs of seven days or more in the three months before the assessment. A cursory look at the trend shows a range of between two and three times for all malaria medicines. The highest number of stock-outs was 5.6 times for quinine injection at the health centers.¹⁵ The stock-out times mostly occur before the arrival of the order for the quarter and at the end of the quarter before the next supplies arrive. The higher stock-out times for quinine may be explained by periodic “borrowing” from nearby facilities when stock runs out.

3. Stock Status (Expiry)

Indicator 3a: Percentage of facilities with products expiring in the next three months

Rationale: To measure the quality of inventory management of malaria medicines and commodities in health facilities (stores and dispensaries)

¹⁵ Findings on quinine tablets (200 mg) are not included in this discussion for reasons explained.

Table 8. Percentage of Facilities with Malaria Medicines Expiring in the Next Three Months from the Day of Assessment

Product	Number (%) of Hospitals n = 10	Number (%) of Health Centers n = 20	Number (%) of Dispensaries n = 70
AL 6s	0%	0%	2 (3%)
AL 12s	1 (10%)	0%	3 (4%)
AL 18s	1 (10%)	0%	2 (3%)
SP	1 (10%)	0%	1 (1%)

The overall percentage of facilities with malaria medicines expiring in the next three months (that is, between July and October) was remarkably low and in actual terms represents very few facilities: one facility at the hospital level and up to 3 dispensaries (of 70 sampled) had medicines about to expire. The medicines concerned were AL 6s and 18s (two facilities), AL 12s (three facilities), and SP (one facility). No health center had any antimalarial medicines expiring within three months of the assessment.

Indicator 3b: Percentage of facilities with products already expired

Rationale: To measure the quality of inventory management of malaria medicines and commodities in health facilities (stores and dispensaries)

Table 9. Percentage of Facilities with Expired Malaria Medicines on Day of Assessment

Product	Percentage of Hospitals n = 10	Percentage of Health Centers n = 20	Percentage of Dispensaries n = 70	Percentage Overall N = 100
AL 12s	0	5	0	1
AL 18s	0	5	0	1
SP	0	5	0	1
Quinine tablets (200 mg)	30	40	3	13
Quinine injection	10	30	3	9

Of health centers, 30 percent (six facilities), and one hospital had expired quinine injection in inventory. When correlated with the fact that stock-oust of quinine injection had been experienced in the last three months (25 percent in health centers), the issue of proper inventory management and redistribution of stock becomes crucial.

4. Stock Management

Indicator 4a: Percentage of facilities with stock cards, by level

Indicator 4b: Proportion of facilities with updated stock cards (in last 30 days) by level

Rationale: To measure the availability of stock cards (for inventory management) at health facilities

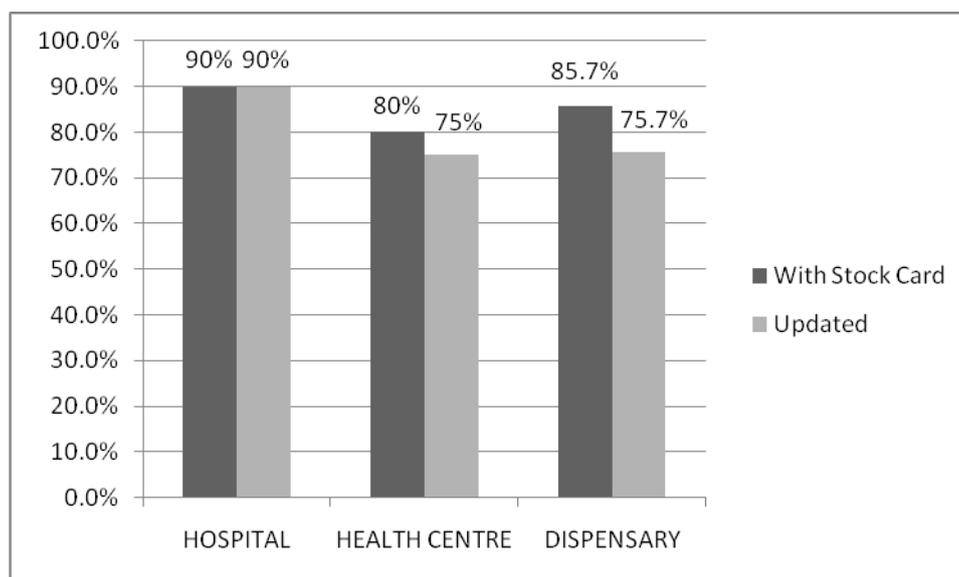


Figure 4. Comparison between percentage of facilities with stock cards and the proportion of those updated

The findings from the facilities assessed shows most (90 percent) hospitals having stock cards (90 percent), while dispensaries and health centers recorded 85.7 percent and 80 percent, respectively. Of the 100 facilities selected for this assessment, 93.2 percent of pull facilities had stock cards, compared to 78.6 percent of push facilities.

Indicator 4c: Percentage of facilities with differences between stock balance and physical inventory on day of assessment, by level

Rationale: To measure the degree to which stock record system reflects the real status of physical stock

Table 10. Percentage of Facilities with No Difference¹⁶ between Stock Card Balance and Physical Inventory on Day of Assessment (for Facilities with Stock Cards)

Product	Percentage of Hospitals n = 10	Percentage of Health Centers n = 20	Percentage of Dispensaries n = 70
AL 6s	0	38	11
AL 12s	11	23	9
AL 18s	22	31	13
AL 24s	11	15	8
SP	0	6	5
Quinine tablets (300 mg)	0	6	4
Quinine tablets (200 mg)	100	50	53
Quinine injection	0	0	12

¹⁶ No difference means those in which the stock card tallied exactly with the physical inventory on the day of the assessment.

The percentages for no difference (an index of proper, accurate, and updated record keeping) range between 0 percent for some medicines (AL 6s, SP, quinine tablets 300 mg, and quinine injection in the hospitals) to figures such as 30 percent for AL 18s in hospital and health center levels. These findings show that the extent to which accurate physical stock quantities of malaria medicines are reflected on stock cards is very low across all levels of care.

Indicator 4d: Percentage of facilities with difference in quantity of medicines issued from central stores and quantity received in the most recent three months, by level

Rationale: To monitor the distribution system and identify problems such as theft, spoilage during delivery, compliance with delivery standard operating procedures (SOPs), and record keeping

Table 11. Percentage of Facilities with No Difference¹⁷ between Quantity of Malaria Medicines Issued from Central Medical Stores and Quantity Received in the Last Three Months

Product	Percentage of Hospitals			Percentage of Health Centers				Percentage of Dispensaries				
	n	No Diff.	+ Diff.	- Diff.	n	No Diff.	+ Diff.	- Diff.	n	No Diff.	+ Diff.	- Diff.
AL 6s	7	100	0	0	7	71.4	0	28.6	19	100	0	0
AL 12s	5	100	0	0	7	100	0	0	20	95	0	5
AL 18s	8	100	0	0	9	100	0	0	26	84.6	0	15.4
AL 24s	9	100	0	0	9	100	0	0	25	92	4	4
SP	5	80	0	20	8	100	0	0	8	87.5	0	0
Quinine tablets (300 mg)	5	60	0	40	3	66.7	0	33.3	2	50	0	50
Quinine tablets (200 mg)												
Quinine injection	9	66.7	0	33.3	5	100	0	0	13	100	0	0

The percentage of facilities with no difference between quantity of malaria medicines issued from central medical stores and quantity received is generally high for AL. To a large extent, most facilities received the quantities of medicines dispatched from KEMSA.

¹⁷ *No difference* means the quantity issued tallied exactly with the quantity received, from delivery notes and tally cards.

5. Store Management

Indicator 5: Proportion of facilities that adequately meet storage standards

Rationale: To assess the health facilities in terms of storage of malaria (and other) medicines

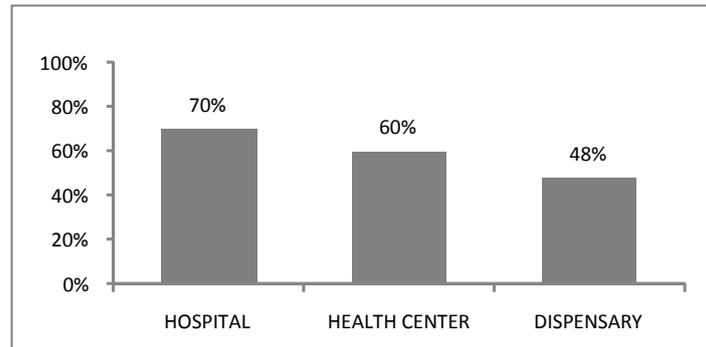


Figure 5. Percentage of facilities that adequately meet storage standards

The assessment of storage facilities for medicines was done using two levels of questionnaires—one for hospitals and health centers, and the other for dispensaries. Percentages of facilities meeting storage standards in both groups are 70 percent of hospitals and 60 percent of health centers (30 facilities) and 48 percent for dispensaries (70 facilities).

6. Ordering/Receiving

Indicator 6a: Timeliness of placing order for malaria medicines by facility, by level

Rationale: To measure the timeliness of facilities to order for malaria medicines

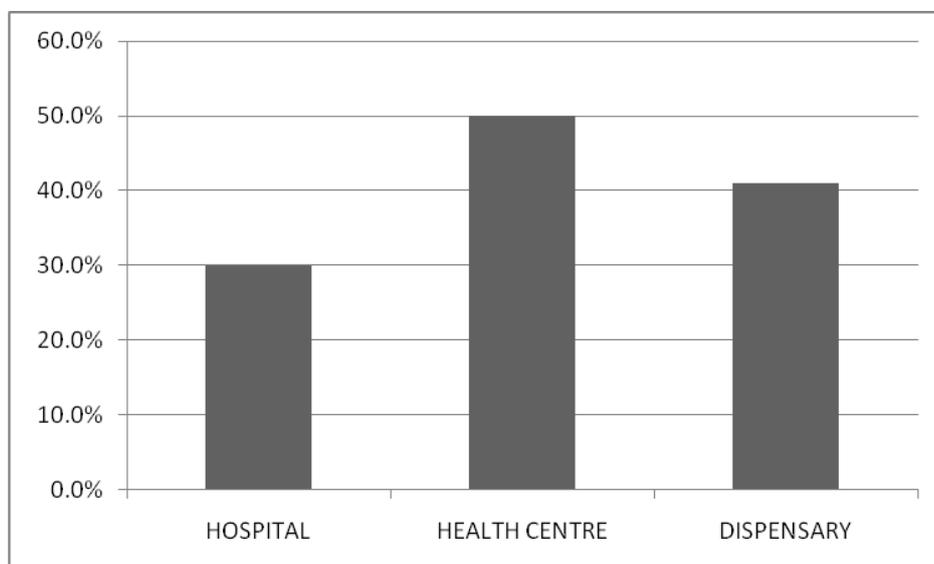
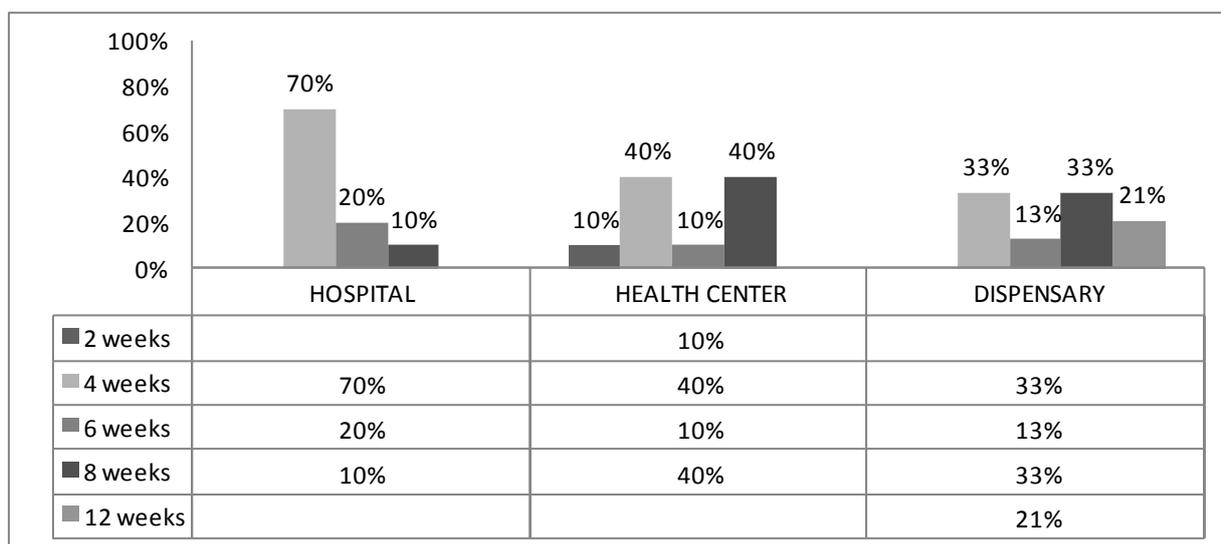


Figure 6. Timeliness of placing order for malaria medicines

Placement of orders for malaria medicines by pull facilities shows that 30 percent of hospitals, 50 percent of health centers, and 41 percent of dispensaries were timely with their orders.¹⁸ A qualitative appraisal of the results revealed that some facilities claim not to know the KEMSA delivery date/schedule. KEMSA needs to institute notification mechanisms for delivery schedules to all public health facilities they serve.

Indicator 6b: Time (in weeks) between ordering and receiving malaria medicines at facilities, by level (pull facilities)

Rationale: To measure the lead time in supply of malaria medicines after order is submitted



n = Hospitals-10, Health Centers-10, Dispensaries-24.

Figure 7. Time between ordering and receiving malaria medicines (pull facilities)

All (100 percent) pull facilities received medicines within the KEMSA-prescribed schedules.¹⁹ The majority (90 percent) of hospitals received malaria medicines within six weeks. All health centers received supplies within eight weeks.

Indicator 6c: Time between receiving shipments of malaria products at facilities, by level (push facilities)

Rationale: To measure the frequency of supply of malaria medicines to push facilities

¹⁸ Timeliness for placing orders is defined as the facility placing orders a minimum of 17 days before the KEMSA notified day of delivery.

¹⁹ Frequency of supplies of medicines from KEMSA: bimonthly for hospitals and quarterly for regional health facilities served by them.

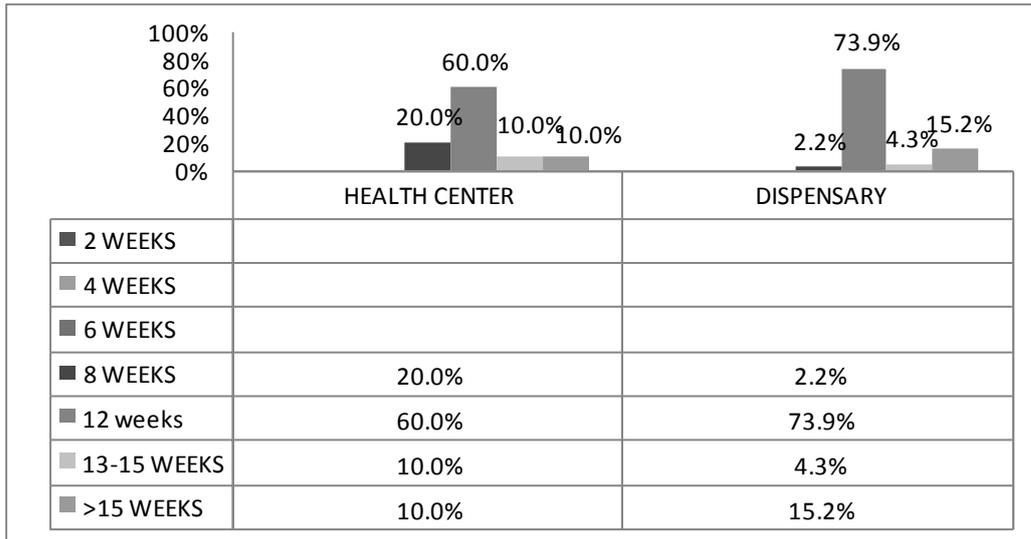


Figure 8. Time between ordering and receiving malaria medicines (push facilities)

Eighty percent of health centers²⁰ and 76 percent of dispensaries on the push system received malaria medicines within the stipulated time intervals. Only 20 percent of health centers and about 20 percent of dispensaries received malaria medicines after more than 12 weeks. This figure may be explained by the delay in delivery of dispensary and health center kits to KEMSA by suppliers, which meant that AL could not be distributed either.²¹

Indicator 6d: Distribution mechanism for malaria products to the facility, by level

Rationale: To investigate the distribution mechanism for supply of malaria medicines to facilities

Of the facilities, 100 percent, 95 percent, and 97 percent (hospital, health center, and dispensary, respectively) responded that KEMSA is the distribution mechanism through which malaria medicines are supplied, whereas 5 percent of health centers and 1.4 percent of dispensaries sampled are supplied by MEDS. Only one facility (a dispensary) recorded that it collects malaria medicines from the district—this lone answer is an outlier, representing an isolated instance, and not a method for distribution from KEMSA.

Indicator 6e: Modes of transport most frequently used to transport malaria products to facility, by level

Rationale: To investigate the modes of transport of malaria medicines to facilities

Delivery by truck is undoubtedly the method of choice (100 percent for hospitals, 95 percent for health centers, and 97.1 percent for dispensaries). Public transport was recorded in 5 percent of health centers and 1.4 percent of dispensaries. Only one dispensary of the 70 assessed (1.4 percent) recorded ever using a private vehicle.

²⁰ All hospitals are pull facilities, so they are not included in this assessment for push facilities.

²¹ KEMSA has an integrated mode of distribution such that AL is supplied to health facilities with other medicines.

Indicator 6f: Percentage difference between quantity of order placed and quantity of order received in the last order period, by level

Rationale: To determine the magnitude of discrepancy between quantity ordered and quantity received to assess ordering adequacy

Table 12. Percentage of Facilities with a Difference²² between Quantity of Order Placed and Quantity of Order Received in the Last Three Months

Product	Percentage of Hospitals n = 10			Percentage of Health Centers n = 10			Percentage of Dispensaries n = 24		
	No Diff.	+ Diff.	- Diff.	No Diff.	+ Diff.	- Diff.	No Diff.	+ Diff.	- Diff.
AL 6s	1	4	5	1	3	5	2	11	11
AL 12s	3	2	5	1	2	6	4		20
AL 18s	1	2	7		2	7	1	3	20
AL 24s		2	8		3	6	3	4	17
SP	7		3	8		1	22	2	1
Quinine tablets (300 mg)	7		3	6		3	18		3
Quinine tablets (200 mg)	1						1	2	
Quinine injection	7		3	9			20	11	

Most facilities did not receive the quantity of malaria medicines ordered. This may be because of the capping of quantities as determined by the DOMC for level of care and malaria zone.

For an in-depth appraisal and a bottom-to-top approach to problem identification, a series of qualitative questions were included in the assessment for pharmaceutical management. The responses were unprompted to obtain a greater spectrum of answers than could have been assembled by the tool design. The approach for the analysis of this largely qualitative indicator was serial: (a) list all problems encountered, (b) code them into a list of options, and (c) analyze the frequency.

The goal of maximum listing of issues was largely achieved. Even though the next step (to rate the responses given by frequency) was to give an indication of the occurrence of that issue, personal limitations in interviewing, time management, and articulateness of respondents can affect the types, clarity, and number of responses given by an interviewee. Therefore, only the most obvious and consistent issue ratings are discussed.

²² No difference means the Quantity Received tallied exactly with the Quantity Ordered, from Order Notes and tally cards; a positive difference represents those in which the Quantity Received was greater than the Quantity Ordered; and a negative difference represents those in which the Quantity Received was less than the Quantity Ordered.

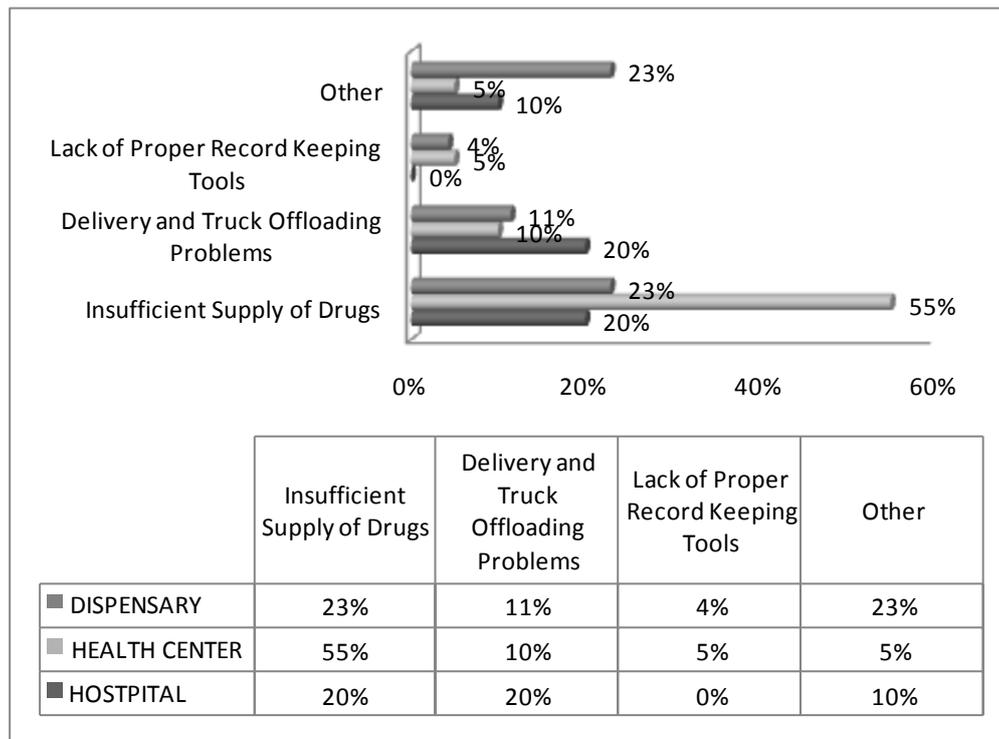


Figure 9. Problems encountered in ordering and receiving malaria products, by level

The two major problems identified (by all levels of care) are (a) insufficient supply of drugs at health centers (55 percent), dispensaries (23 percent), and hospitals (20 percent) and (b) delivery and truck offloading problems:²³ hospitals (20 percent), dispensaries (11 percent), health centers (10 percent).²⁴

Indicator 6g: Specific recommendations for improving the availability of malaria products at facilities

Main recommendations for improving availability of malaria medicines proffered by interviewees (across levels) include supplying malaria medicines in quantities that meet demand, timely delivery of medicines, and more training for health workers on pharmaceutical management.

²³ These problems include late supply of medicines outside working hours, no notification of anticipated arrival of supplies, and delivery note quantities not tallying with actual stock delivered.

²⁴ Issues classified as “other” include short drug expiry dates (10 percent of hospitals); drug branding inconsistencies (10 percent of hospitals); oversupply of drugs (7 percent of dispensaries); and differences in delivered drugs and delivery note (7 percent of dispensaries).

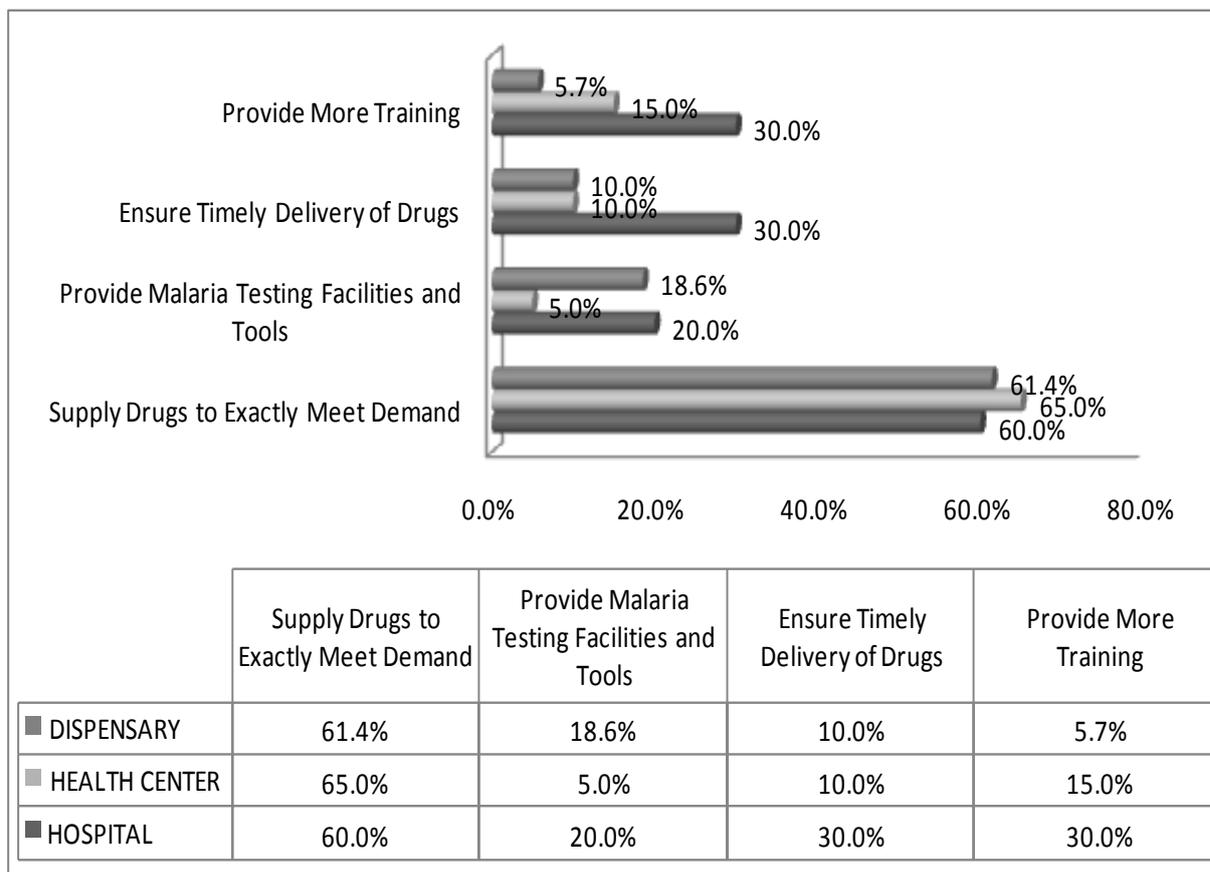


Figure 10. Recommendations for improving availability of malaria products at facilities, by level

System-Strengthening Indicators

7. Supervision

Indicator 7a: Proportion of facilities that have received supportive supervision on management of medicines in the last six months, by level

Rationale: To measure system-strengthening efforts for improved management of medicines

A remarkable record of supervision activities across all facilities is evidenced by the high percentages recorded. All hospitals and health centers had received supervision; only three dispensaries indicated that no supervision had been received within the last six months. However, the assessment did not verify the level of supportive supervision on these visits.

Indicator 7b: Proportion of facilities that received supervision on order form, stock cards, storage conditions, physical inventory, and AL register, by level

Rationale: To measure specific system strengthening efforts for improved inventory management

Table 13. Supervision of Pharmaceutical Management

Product	Percentage of Hospitals	Percentage of Health Centers	Percentage of Dispensaries	Percentage Overall
AL register	80.0	50.0	54.3	56.0
Order form	40.0	50.0	33.3	39.0
Physical inventory	70.0	40.0	31.4	37.0
Stock card	90.0	60.0	68.6	69.0
Storage conditions	90.0	60.0	70.0	70.0

Specific investigations were made to establish the extent to which supervision applied directly to pharmaceutical management. The findings in table 13 show that 70 percent of the visits had focused on storage conditions (hospitals 90.0 percent; dispensaries 70.0 percent; health centers 60.0 percent) and stock cards (69 percent with similar values across the levels of care). Some (56 percent) attention had been placed on supervision for the AL register. Low (39 percent) attention had been placed on the order forms.

Indicator 7c: Proportion of facilities that have supervision reports, by level

Rationale: To measure the extent to which reports are written following supervision visits

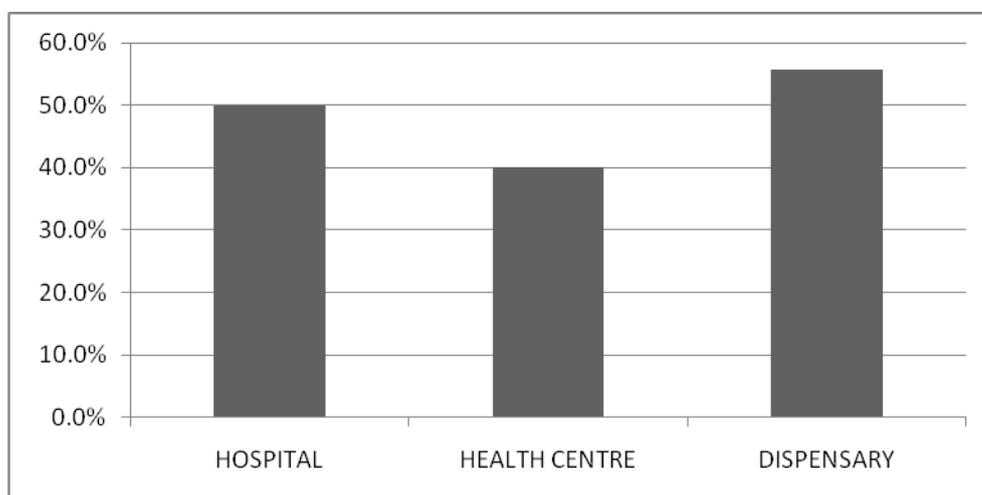


Figure 11. Proportion of facilities that have supervision reports

The documentation providing evidence for a supervision report was any kind of write-up on the supervisory visit; 50 percent of hospitals (of 100 percent visited), 40 percent of health centers (of 100 percent visited), and 55.7 percent of dispensaries (of 95.7 percent visited) had supervision reports.

Indicator 7d: Proportion of supervision reports where checklists were used for supervision, by level

Rationale: To measure the extent to which checklists are used to guide supervision visits

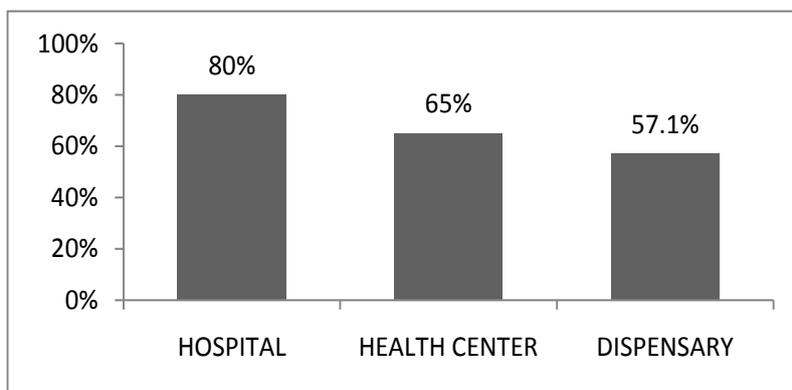


Figure 12. Proportion of supervision reports where checklists were used

Health facilities that reported checklists being used for supervision were hospitals (80 percent), health centers (65 percent), and dispensaries (57.1 percent). However, these checklists were not standardized. The checklists in use need to be assessed, updated, and made available in adequate quantities.

8. Availability of Reference Materials

Indicator 8a: Proportion of facilities with a manual for management of pharmaceutical products (SOPs)

Rationale: To measure the availability of standard operating procedures

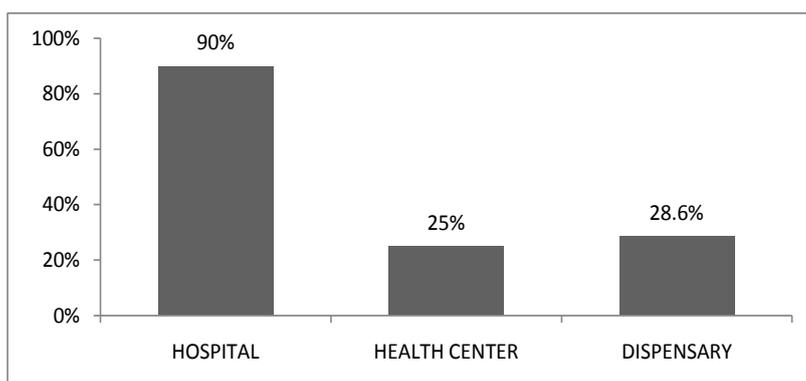


Figure 13. Proportion of facilities with SOPs

Although the majority of hospitals (90 percent) sampled had a manual for managing pharmaceutical products, approximately 70 percent of dispensaries and health centers lacked manuals. SOPs are important in improving inventory management of malaria medicines and overall pharmaceutical management procedures.

Indicator 8b: Proportion of facilities with a copy of the treatment guidelines for malaria case management

Rationale: To measure the availability of standard treatment guidelines in facilities as a component of rational use of malaria medicines

All hospitals and health centers sampled have the latest (2008) malaria standard treatment guidelines; 7 percent of dispensaries (10 facilities) did not have the 2008 malaria standard treatment guidelines, while all (100 percent) had the 2006 edition.

9. Availability of Inventory Management Materials

Indicator 9a: Proportion of districts with district monthly summary tool available

Rationale: To measure the availability of inventory management tools at district level

All districts selected for the July 2009 assessment (whether pull or push) had the district monthly summary tools in both manual and electronic copies. Revised inventory management tools have recently been distributed (June 2009) to all health facilities countrywide, as evidenced in the findings.

Indicator 9b: Proportion of facilities with inventory management documents and registers (bin cards, issue/requisition vouchers, AL register, health facility monthly summary, standard order form) available

Rationale: To measure the availability of inventory management materials at facility level

Table 14. Availability of Inventory Management Materials

Inventory Management Material	Percentage of Hospitals	Percentage of Health Centers	Percentage of Dispensaries	Percentage Overall	% Pull	% Push
AL register	100.0	100.0	94.3	96	95.5	96.4
Bin cards	90.0	80.0	71.4	75	90.9	62.5
Health facility monthly summary	100.0	95.0	88.6	91	93.2	89.3
Issue/requisition voucher	90.0	35.0	20.0	30	45.5	17.9
Standard order form (pull only)	100.0	90.0	95.8	95.5	95.5	0

The availability of AL registers and health facility monthly summary forms was highest (96 percent and 91 percent, respectively) for all levels of care. Bin cards were available in only 75 percent of facilities overall, with more pull facilities (90.9 percent) having bin cards than push facilities (62.5 percent). Issue/requisition vouchers recorded a very low overall availability of 30 percent, with only 35 percent of health centers and 20 percent dispensaries having the vouchers. Standard order forms were available in 95.5 percent of facilities on a pull system.

10. Reporting to Higher Levels

Indicator 10a: Percentage of facilities submitting regular reports on malaria medicines to higher level (reporting rates) during the April–June 2009 quarter (districts and facilities, by different levels)

Rationale: To determine whether information on medicine use is passed on to the higher levels in a regular manner for monitoring and planning purposes

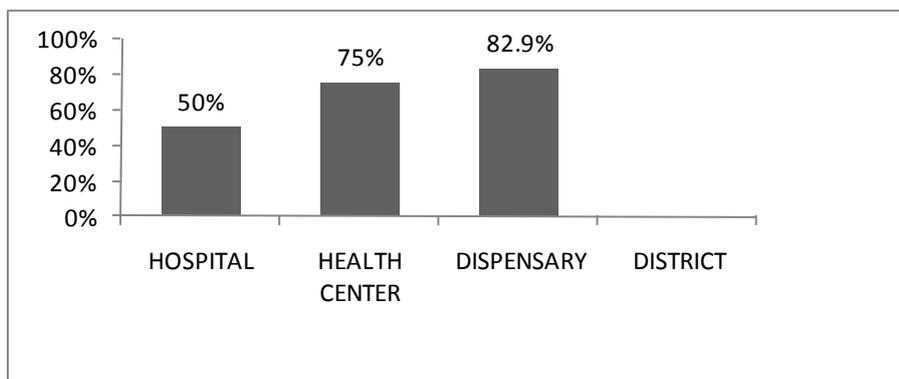


Figure 14. Percentage of facilities submitting regular reports on malaria medicines to higher level

Regular reporting²⁵ to higher levels was greater for rural health facilities (82.9 percent for dispensaries and 75 percent for health centers) than hospitals (50 percent).

Indicator 10b: Timeliness of dispatch of reports from health facilities to district level (by 5th of following month); from district level to National Logistics Management Unit (by 20th of following month)

Rationale: To determine the timeliness of information on disease trends and medicine use passed on to the higher level for monitoring and planning purposes

²⁵ All public health facilities receiving malaria medicines are required to provide monthly reports to higher levels.

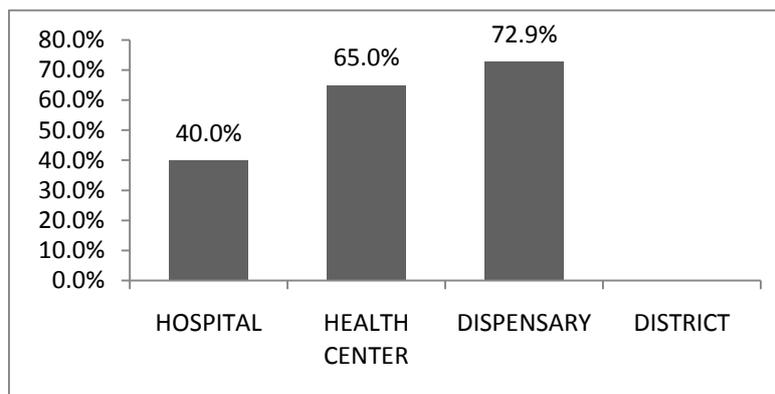


Figure 15. Timeliness of facilities in submitting reports on malaria medicines to higher level

The dispatch of these reports according to the criteria established (above) from the findings shows the timeliness recorded as follows: dispensaries (72.9 percent), health centers (65.0 percent), and hospitals (40.0 percent).

Facility Indicators

11. Service Delivery/Service Delivery Points

Indicator 11a: Services for malarial control offered by facilities, by level

Rationale: To establish the services offered for malaria control in different facilities

Table 15. Type of Malaria Control Services Offered, by Level of Care

Services	Percentage of Hospitals n = 10	Percentage of Health Centers n = 20	Percentage of Dispensaries n = 70
Uncomplicated malaria treatment	100.0	100.0	100.0
Severe malaria treatment	100.0	55.0	31.4
Severe malaria referral	50.0	95.0	91.4
Microscopy	100.0	80.0	32.9
Malaria RDTs	40.0	5.0	0.0
IPTp	100.0	100.0	97.1
Bednet vouchers	80.0	80.0	74.3

All selected levels of care (expectedly) offer services for uncomplicated malaria treatment. Severe malaria referral is offered by 91.4 percent of dispensaries and 95 percent of health centers.

Expectedly, no dispensary had rapid diagnostic tests (RDTs), but the assessment revealed that 32.9 percent of dispensaries offered microscopy (laboratory services) even though by

classification of level they should not. Further qualitative probes showed that these laboratories were largely community efforts.

Indicator 11b: Principal person managing stocks of antimalarial medicines at facilities, by level

Rationale: To map the principal person managing stock of malaria medicines in different facilities

Table 16. Principal Person Managing Malaria Medicines, by Level of Care

Persons (in Block Categories)	Percentage of Hospitals n = 10	Percentage of Health Centers n = 20	Percentage of Dispensaries n = 70
Medical Officer/Assistant Medical Officer/Clinical Officer	0.0	30.0	5.7
Pharmacist/Pharmacy Technician	100.0	15.0	4.3
Nurse	0.0	70.0	94.3
Medical attendant			
Other			

Antimalarial medicine stock management is totally by pharmacists in all hospitals (100 percent); in dispensaries (94.3 percent) and in health centers (70 percent), the principal person is mostly a nurse.

Indicators 11c and 11d: Principal persons prescribing/dispensing ACTs at facilities, by level

Rationale: To establish the principal persons prescribing/dispensing ACTs in different facilities

Table 17. Persons Prescribing/Dispensing ACTs, by Level of Care

Persons (in Block Categories)	Prescribing ACTs			Dispensing ACTs		
	Percentage of Hospitals n = 10	Percentage of Health Centers n = 20	Percentage of Dispensaries n = 70	Percentage of Hospitals n = 10	Percentage of Health Centers n = 20	Percentage of Dispensaries n = 70
Medical Officer/Assistant Medical Officer/Clinical Officer	100.0	80.0	15.7		15.0	1.4
Pharmacist/Pharmacy Technician				100.0	20.0	5.7
Nurse		20.0	84.3		60.0	78.6
Medical attendant						4.3
Other (support staff, nurse's aid, community health worker, casual)					5.0	10.0

Prescription of ACTs is carried out solely by medical officers in hospitals (100 percent), mainly by clinical officers (80 percent) in health centers, and by nurses (84.3 percent) in dispensaries. Dispensing of ACTs is carried out solely by pharmacists/pharmacy technicians (100 percent) in hospitals and mainly by nurses in health centers (60 percent) and dispensaries (78.6 percent). Support staff are involved in dispensing ACTs in some dispensaries (10 percent) and health centers (5 percent).

Indicators 11e and 11f: Principal persons prescribing/dispensing SP for IPTp at facilities, by level

Rationale: To establish the principal person prescribing/dispensing SP for intermittent preventive treatment in pregnancy (IPTp) in different facilities

Table 18. Persons Prescribing/Dispensing SP for IPTp, by Level of Care

Persons (in Block Categories)	Prescribing SP for IPTp			Dispensing SP for IPTp		
	Percentage of Hospitals n = 10	Percentage of Health Centers n = 20	Percentage of Dispensaries n = 70	Percentage of Hospitals n = 10	Percentage of Health Centers n = 20	Percentage of Dispensaries n = 70
Medical Officer/Assistant Medical Officer/Clinical Officer	10.0	5.0	2.9	0.0	0.0	1.4
Pharmacist/Pharmacy Technician				20.0	0.0	0.0
Nurse	90.0	100.0	98.6	80.0	100.0	92.9
Medical attendant				0.0	0.0	4.3
Other (support staff, nurse's aid, community health worker, casual)						

Prescription of SP (for IPTp) is usually carried out by nurses (100 percent in health centers, 98.6 percent in dispensaries, and 90 percent in hospitals). Dispensing is also carried out mostly by the nurses (100 percent in health centers, 92.9 percent in dispensaries, and 80 percent in hospitals). No support staff was recorded to be involved in the prescription or dispensing of SP for IPTp in any of the 100 facilities assessed.

Indicator 11g: Location where SP for IPTp is dispensed at facilities, by level

Rationale: To establish the location where SP for IPTp is dispensed

SP for IPTp is mostly dispensed at the prenatal clinic at all levels of care. However, 28.6 percent of dispensaries disclosed that SP is dispensed in the pharmacy. When this is compared with the earlier finding where 92.9 percent of dispensing is carried out by the nurses, this suggests a relocation of the same person (the nurse) between the prenatal clinic and the place where medicines are ordinarily dispensed (pharmacy), rather than a shift of persons between prescribing and dispensing.

12. Assessment of Personnel Training

Indicator 12a: Proportion of staff trained in stock management to total number working in stock management at facilities, by level

Rationale: To determine availability of human resources trained in managing supply chain issues, at each level of the health system

Table 19. Proportion of Staff Trained in Stock Management, by Level of Care

Facility	Percentage of Staff Trained/Working in Stock Management
Hospital	75
Health Center	74
Dispensary	70

On average, 73 percent of the staff working in stock management among the sampled facilities had received training on stock management.

Indicator 12b: Proportion of staff trained in stock management by how training was received, by level

Rationale: To determine how health workers trained in stock management were trained

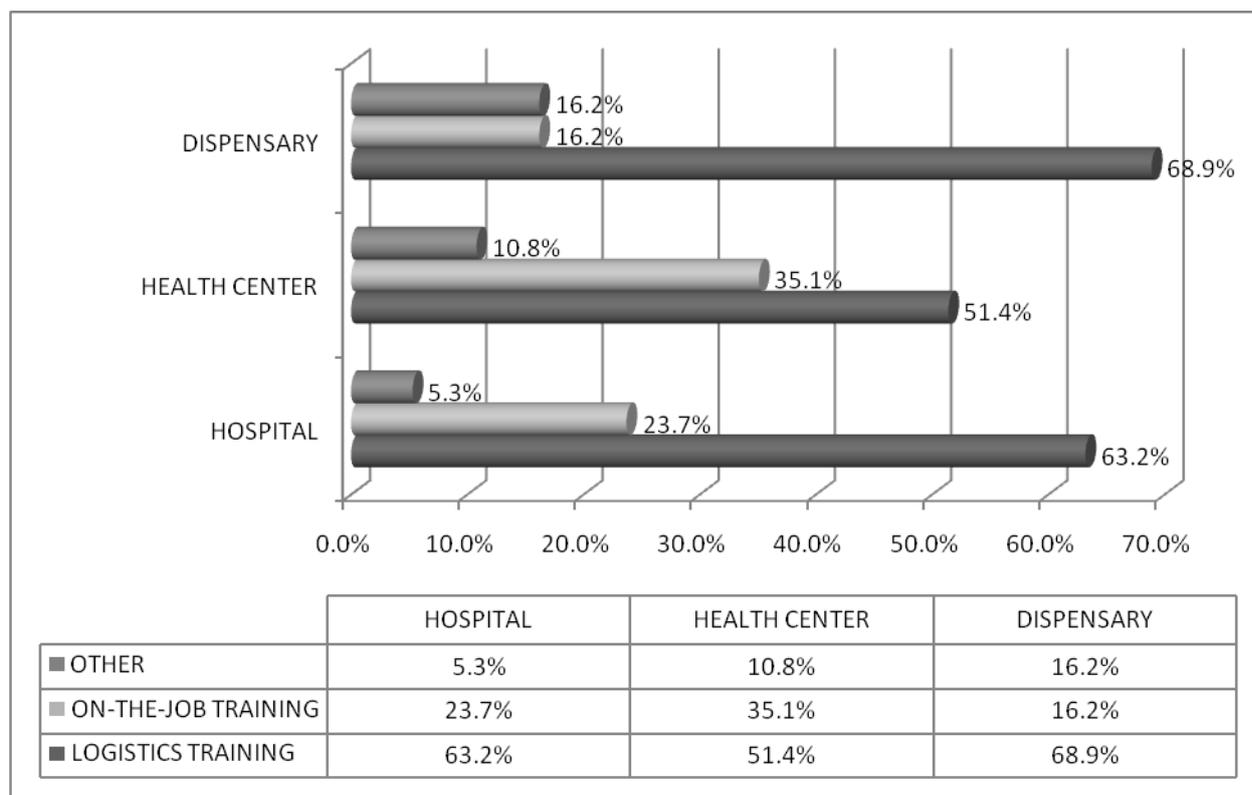


Figure 16. Health worker training in stock management

Findings show that the majority (61 percent) of the staff trained in stock management had attended a workshop in logistics training.

DISCUSSION

Three blocks of indicators were assessed—inventory management, system-strengthening, and facility indicators. The findings are summarized and discussed below.

Inventory Management Indicators

Inventory management indicators involve measuring whether facilities have adequate stock of antimalarial medicines, including buffer stock, with optimum shelf life to prevent expiries. Opportunity costs associated with poor inventory management include missed treatments (in case of stock-out) and expiry, returns, and irrational use (in cases of overstock or wrong stock lists). The group of inventory management indicators in this report includes stock availability, stock-outs, expiry, stock management, store management, and ordering/receiving procedures.

The assessment showed a generally high level of availability of all the ALs on the day of the assessment (overall, AL 6s: 87 percent, 12s: 83 percent, 18s: 77 percent, and 24s: 89 percent) in the facilities sampled. The availability of SP was 94 percent overall, while both quinine tablets (300 mg) and injection recorded 86 percent. Most facilities had at least one of the AL weight bands (90 percent, 95 percent, and 94 percent in hospitals, health centers, and dispensaries, respectively). However, 6 facilities—one hospital, one health center, and four dispensaries (of 100 facilities selected)—had no stock of any AL on the day of the assessment.

Stock-outs of malaria medicines on the day of the assessment were very low. However, the history of stock-outs as traced over the previous three months (April to June 2009) showed widespread interruptions had occurred in the availability of various antimalarial medicines in health facilities: 47 percent of facilities had experienced stock-outs of AL 18s and 24s, while 38 percent and 37 percent had stock-outs of AL 6s and AL 12s, respectively. The stock-out of SP was the lowest (aggregate value of 19 percent), while 24 percent and 22 percent had run out of quinine tablets 300 mg and quinine injection, respectively.

A comparison of the percentage of facilities that experienced any stock-out to those that experienced a stock-out of more than seven continuous days in the three-month period from April to June 2009 was similar for all the levels of care. This finding confirmed that these stock-outs did not result from temporary delays in resupply but were actual stock-outs. This finding represents a significant absence of malaria treatment (and prevention) opportunities by weight band. Over the 92-day period (April–June 2009), most facilities experienced two or three stock-outs of malaria medicines. A plausible explanation for this finding is an insufficient supply of AL to health facilities according to requirements, resulting in stock-outs being experienced at the beginning and at the end of a distribution period. Quinine injection stock-out times recorded high stock-out times of up to 5.6 in health centers and 2 in hospitals. This finding may be explained by underestimation of needs by hospitals on a pull system coupled with intermittent borrowing from neighboring facilities for treatment of severe malaria.

Very few facilities (one hospital and three dispensaries) were reported as having any malaria medicine expiring within the three months following the assessment (i.e., between July and October 2009). Six health centers (30 percent) had expired quinine injection in inventory.

When correlated with the fact that stock-outs of quinine injection had been experienced in the last three months (25 percent in health centers), the issue of proper inventory management and redistribution within provinces requires urgent intervention. However, because expired medicines are not removed from the stores immediately, there is need to ascertain (at the next assessment) exactly when the products expired by including the expiry date and batch number in the data collection tool. This useful filter for this indicator will help trace improvements in inventory management resulting from training, supervision, and system-strengthening efforts.

Stock cards are imperative for proper and complete management of medicines. Hospitals recorded the highest availability of stock cards (90.0 percent), while dispensaries and health centers recorded 85.7 percent and 80.0 percent, respectively. Of pull facilities, 93.2 percent had stock cards, compared to 78.6 percent of push facilities. Of these, all hospitals and most health centers (94 percent) and dispensaries (88 percent) had updated their records within the previous 30 days. However, consistent discrepancies existed (across all levels of care and malaria medicine type) between recorded bin card and physical stock counts. Generally, less than 40 percent of the health facilities visited had stock card records that tallied with physical counts. The consequence of these disparities on inventory management is of immense proportions, which reveals that better practices need to be developed for inventory management of malaria medicines. This indicator will measure the results of recent trainings in inventory management.

The analyses of the assessment show that a majority of the facilities received less than they ordered. Generally, depending on AL pack size, 0–30 percent of facilities received what they ordered. These disparities could be explained by the capping of quantities by the DOMC based on level of care and malaria zone classification. For SP and quinine, a majority of the facilities (60–92 percent) received what they ordered. It may be necessary to reassess the capped quantities of AL to ensure an uninterrupted supply of malaria medicines. The average monthly consumption and adjusted monthly consumption figures obtained from the newly instituted LMIS will become a useful guide for procurement and distribution of the medicines. The assessment confirmed that KEMSA is the main mechanism through which malaria medicine supplies are distributed for most public health facilities; deliveries are usually made by trucks. Mission hospitals are supplied by MEDS. Furthermore, analyses of qualitative reports indicate the need to rationalize the supply distribution mechanism to stop double supply of some mission facilities by both KEMSA and MEDS.

The need to place rational orders in a timely manner is an integral part of the pull system of supply. An appraisal of the assessment of this indicator shows that a relatively low percentage of pull facilities (30 percent of hospitals, 50 percent of health centers, and 41 percent of dispensaries) recorded timely ordering of medicines. However, the need to institute notification procedures for delivery was a major issue in this regard.

A consistent finding was that all hospitals and health centers on the pull system received malaria medicines within the stipulated two and three months, respectively, from KEMSA. About 20 percent of the push health facilities (health centers and dispensaries) did not receive their malaria medicine supplies within the stipulated 12 weeks. However, the delay in receiving malaria medicines at this time in particular resulted from the lack of kits at KEMSA in April 2009. Given that dispensaries represent the first call for treatment of malaria, stock-outs between these periods are inevitable unless supplies are based on realistic consumption and buffer stocks.

Percentages of facilities meeting storage standards by level of care were 70 percent of hospitals, 60 percent of health centers (30 facilities), and 48 percent for dispensaries (70 facilities). The lack of adequate storage space has compelled peripheral health facilities to use the dispensing area for storage of medicines. The effects of substandard storage facilities as addressed in the questionnaires (including cleanliness, arrangement, adequate space for organization according to FEFO and FIFO; separation of damaged and expired products; protection from direct sunlight, water, and humidity; security and safety of the storage area) can be severe. ACTs, in particular, are very sensitive to storage conditions—light, temperature, and humidity—and their short shelf life (compared to other antimalarial medicines) makes storage according to FEFO even more important. The persistent problem of storage conditions for medicines, especially at the lower facility levels, needs to be explored holistically by all pharmaceutical and malaria stakeholders.

In conclusion to this block on inventory management, two major problems identified in the ordering and receipt of malaria medicines (by all levels of care) are (a) insufficient supply of medicines and (b) delivery and truck offloading problems. Specific recommendations made by the health workers interviewed about improving the availability of malaria products at facilities include adequate supply of medicines to meet demand, timely delivery of medicines, training on pharmaceutical management, and provision of the delivery schedules for malaria medicines and commodities by KEMSA.

System-Strengthening Indicators

Health system strengthening means improving critical components of health systems to effectively improve health outcomes. Failing or inadequate health systems are one of the main obstacles to scaling up effective strategies. System-strengthening indicators measure the commitment of resources to the health system and the immediate outcomes of such interventions.

A remarkable report of supervision activities across all facilities in the last six months is evidenced by the high percentages recorded (all hospitals and health centers) and 67 dispensaries. However, there was no measure of how supportive these supervisions were in terms of adding value to knowledge and practices and the opportunities for on-the-job training. The importance of writing supervision reports needs to be emphasized; it would be valuable to provide reporting templates for complete and uniform reporting of visits. Of the facilities recording supervisory visits, the greatest proportion with supervision reports were dispensaries (95.7 percent), and health centers were the least. The institutionalization and support of the practice of supervision reports is a necessary bridge to enable ongoing issues to be brought to the fore in a timely and acceptable way, thus actualizing the main objectives of supervision—system support and strengthening.

In this assessment, facilities that reported using checklists were hospitals with the highest percentage at 80 percent; health centers recorded 65 percent and dispensaries, 57 percent. Checklists ensure that the objectives of the supervision visits are clear and complete. The risks of incomplete assessment or diversion to inconsequential issues on supervision visits are enormous; therefore, the current checklists should be reassessed, updated, printed, and distributed for routine and sustainable use.

Further probing about whether this supervision applied directly to pharmaceutical management shows that 70 percent of the facilities visited had focused on storage conditions and stock cards (69 percent, with similar values across the levels of care). More attention had been placed on the AL register (56.0 percent overall, but a high value of 80.0 percent in hospitals) than order form and physical inventory (39 percent and 37 percent, respectively). Hospitals recorded more supervision on physical inventory (70 percent) than the other levels (health centers 40.0 percent and dispensaries 31.4 percent). The most glaring disconnect is between the high percentages of supervision on stock cards (69 percent) compared with supervision on physical inventory (overall 39 percent). Supervision on stock cards should go hand in hand with physical inventory as a true confirmation of accurate and up-to-date stock entry. This is apparently not the case; the effect of this omission is shown in the high disparity between the actual physical and stock card counts.

Most hospitals (90 percent) have an SOP for managing pharmaceutical products, compared to dispensaries (28.6 percent) and health centers (25 percent). All hospitals and health centers have the latest (2008) malaria treatment guidelines; only 10 dispensaries did not have the 2008 treatment guidelines. Inventory management tools were available at all levels of care, except for issue and requisition vouchers, which were available in only 35 percent of health centers and 25 percent of dispensaries. All districts selected for the July 2009 assessment (whether pull or push) had the district aggregation and summary tools in both manual and electronic copies. The main recommendation in this regard is to sustain the availability of malaria medicine consumption tracking tools.

Regular reporting to higher levels was greatest at the dispensary level (82.9 percent), followed by health centers (75 percent) and hospitals (50 percent). Pull facilities recorded marginally higher regularity of reporting (86.4 percent) than push facilities (71.4 percent). The dispatch of these reports according to the criteria established in the assessment shows timeliness as follows: dispensaries (72.9 percent), health centers (65.0 percent), and hospitals (40.0 percent).

Facility Indicators

Facility indicators relate mainly to the technical and administrative operations and processes within that particular facility—in terms of conformity (or deviations) to the standards prescribed for those levels of care, as well as the characteristics of the personnel that manage these facilities.

The findings from the assessment show that all facilities in all levels of care (expectedly) offer services for uncomplicated malaria treatment. Severe malaria referral is offered by 91.4 percent of dispensaries and 95 percent of health centers. No dispensary had RDTs, but the assessment discovered as many as 32.9 percent of dispensaries offering microscopy (laboratory services) even though by classification of level of care they are not supposed to provide microscopy services. A need exists to inspect, regularize, and strengthen the laboratories being run in dispensaries.

In hospitals, management of antimalarial medicines is wholly (100 percent) by pharmacists, while the nurses principally manage stock in dispensaries (94.3 percent) and health centers (70 percent). Prescription of ACTs is carried out solely by medical officers in all hospitals (100 percent), whereas it is mainly carried out by clinical officers (80 percent) in the health

centers and by nurses in dispensaries (84.3 percent). Dispensing of ACTs is carried out solely by pharmacists and pharmacy technicians in hospitals (100 percent) and mainly by nurses in health centers and dispensaries. Support staff are involved in dispensing ACTs (10 percent in dispensaries and 5 percent in health centers). Prescription and dispensing of SP (for IPTp) is carried out principally by nurses at almost all levels of care. SP for IPTp is mostly dispensed at prenatal clinics (in hospitals, health centers, and dispensaries), with a few dispensaries recording the pharmacy area because of relocation of the same nurse within different areas of the facility.

Overall, 73 percent of staff managing stocks in health facilities sampled at all levels of care has been trained in stock management; the majority received their training through formal logistics training workshops. In the period April–June 2008, the DOMC with technical and logistical support from MSH/SPS trained 3,500 health workers (including nurses, pharmacy technicians, and pharmacists) countrywide on effective management of malaria medicines. This training focused on inventory and information management of malaria medicines. In addition, various partners have carried out integrated case management trainings using standardized curricula. These partners included MSH/SPS (training of 1,163 health workers in Coast Province for lab technicians, clinical officers, nurses, pharmacists, pharmacy technicians, and medical officers); Population Services International (about 1,004 health workers); and the WHO (training using outsourced trainers, targeting at least 4,000 health workers in the rest of the country, with aim of nationwide coverage). The next step will be to assess the effect of training on improving malaria medicines management as well as adherence to standard treatment guidelines by health workers.

It is envisaged that a close appraisal of these findings will help hone targeted interventions to rapidly advance the strengthening of pharmaceutical management for malaria in Kenya.

CONCLUSIONS AND RECOMMENDATIONS

The July 2009 assessment advanced the efforts of the November 2008 pilot study. It was larger and more representative (10 districts were assessed compared with 6 in the pilot study). The range of indicators chosen—inventory management, system-strengthening, and facility indicators—was sufficiently broad and inclusive to afford a pragmatic overview of PMM practices, yet focused enough to allow effective data management and valuable information capture. Data entry into a newly designed Access database was initiated at the field level by the data entry clerks, with impressive outcomes.

The involvement of the relevant DPFs from training through fieldwork solidified ownership of the assessment and has been recommended for future assessments. The protocol thus has the potential of strengthening institutionalized data collection on specific logistics management indicators by DHMTs.

Recently (between April and June 2009), training has been carried out across the country on pharmaceutical management with emphasis on inventory and information management. An evaluation of the effects of the training on malaria medicine management is necessary in the near future. The July assessment may have been too early to gauge these system-strengthening efforts. Follow-up checks may need to be instituted that would ensure an enabling environment to practice and entrench the improved knowledge, attitudes, and practices in a sustainable way, and a snowball effect to draw in those who were not directly trained.

Uninterrupted availability of malaria medicines along the entire supply chain is key to improving access to treatment for all patients. Periodic stock-outs in this assessment point to the need for strengthening the LMIS for malaria medicines to provide timely and accurate reports for informed decision making and a review of the capped quantities of AL by facility type and malaria zone to ensure a high facility order fill rate.

Specific recommendations from this assessment include the following:

- The Drug Management Sub-committee should urgently review the malaria medicine supply mechanism to address the following:
 - Review/revise capped quantities of AL across all levels of care and by malaria zone
 - Ensure a full pipeline exists (adequate supplies) across all levels of the supply chain
 - Monitor procurement processes for timely and adequate supplies
- Develop modalities for targeted supplemental distribution of AL to endemic and epidemic-prone areas as a central-level strategy for limiting stock-outs.
- Institute M&E for inventory management of malaria medicines and supportive supervision by the DHMT and Provincial Health Management Team to deal with the low percentage of facilities where records between bin card values and physical stock tally.

- The DOMC should perform periodic field assessments of the status of pharmaceutical management of malaria medicines and effectiveness of training activities on knowledge, attitudes, and practices.
- The DOMC should make plans for sustained printing, supply, and distribution of tracking tools for malaria medicines consumption.
- Set up a national and district database of health workers trained on malaria medicine management by cadre.
- Strengthen the links between the DPF and the malaria focal person for malaria medicines management.
- The DPFs should debrief the 10 DHMTs and the staff in health facilities (those selected for the assessment and others within the district) to maximize the effect of the PMM assessments. Routine supervision for malaria medicine management should assume its full potential in assessing the dynamic status of PMM on various indicators.

In conclusion, by all standards, the July 2009 assessment was focused, precise, and well managed. The indicators on system strengthening and inventory management offer a base for the packaging of routine PMM supervision checks, the collation of which, if entrenched into a pooled supervisory system, can make the scaling up of the PMM assessments effective and sustainable, with efficient management of resources. Other well-designed assessments, such as on case management and malaria medicine use, will complement these findings.

The scale-up to routine, countrywide appraisal of pharmaceutical management of medicines should be pursued to serve as a basis for informing central-level PSM decisions.

ANNEX 1: LIST OF INDICATORS

Inventory Management Indicators

1. Stock Status (Availability)

- a. Percentage of facilities with unexpired malaria medicines on day of the supervisory visit (all medicines, including AL)
- b. Percentage of facilities with unexpired AL (at least one) of the four weight bands on the day of the supervisory visit
- c. Percentage of facilities with unexpired AL (which ones) of the four weight bands on the day of the supervisory visit

2. Stock Status (Stock-Out)

- a. Percentage of facilities with complete stock-out on the day of supervisory visits
- b. Percentage of facilities where a stock-out occurred in the most recent three months
- c. Percentage of facilities that experienced stock-outs where the stock-out lasted seven days or more (in the most recent three months)
- d. Average number of stock-outs (times) for facilities that experienced stock-outs of seven days or more (in the most recent three months)

3. Stock Status (Expiry)

- a. Percentage of facilities with products expiring in the next three months
- b. Percentage of facilities with products already expired

4. Stock Management

- a. Percentage of facilities with stock cards, by level
- b. Proportion of facilities with updated stock cards (in last 30 days), by level
- c. Percentage of facilities with differences between stock balance and physical inventory on day of assessment, by level
- d. Percentage of facilities with difference between quantity of medicines issued from central store and quantity received (in the most recent three months), by level, by type

5. Store Management

- a. Proportion of facilities that adequately meet storage standards

6. Ordering/Receiving

- a. Timeliness of placing order for malaria medicines by facility, by level
- b. Time between ordering and receiving malaria medicines at facilities, by level (pull facilities)
- c. Time between receiving shipments of malaria products at facilities, by level (push facilities)
- d. Distribution mechanism for malaria products to the facility, by level
- e. Modes of transport most frequently used to transport malaria products to facility, by level
- f. Percentage difference between quantity of order placed and quantity of order received in the last order period, by level
- g. Specific recommendations for improving the availability of malaria products at facilities

System-Strengthening Indicators

7. Supervision

- a. Proportion of facilities that have received supportive supervision on management of medicines in the last six months, by level
- b. Proportion of facilities that have received supervision on order form, stock cards, storage conditions, physical inventory, and AL register, by level
- c. Proportion of facilities that have supervision reports, by level
- d. Proportion of supervision reports where checklists were used for supervision, by level

8. Availability of Reference Materials

- a. Proportion of facilities with a manual for management of pharmaceutical products (SOPs)
- b. Proportion of facilities with a copy of the treatment guidelines for malaria case management

9. Availability of Inventory Management Materials

- a. Proportion of districts with district monthly summary tools available (manual and electronic)

- b. Proportion of facilities with inventory management documents and registers (bin cards, issue/requisition vouchers, AL register, health facility monthly summary, standard order form) available

10. Reporting to Higher Levels

- a. Percentage of facilities submitting regular reports on malaria medicines to higher level (reporting rates) during the April–June 2009 quarter (districts and facilities, by different levels)
- b. Timeliness of dispatch of reports from health facilities to district level (by 5th of following month); from district level to National Logistics Management Unit (by 20th of following month)

Facility Indicators

11. Service Delivery/Service Delivery Points

- a. Services for malarial control offered by facilities, by level
- b. Principal person managing stocks of antimalarial medicines at facilities, by level
- c. Principal person prescribing ACTs at facilities, by level
- d. Principal person dispensing ACTs at facilities, by level
- e. Principal person prescribing SP for IPTp at facilities, by level
- f. Principal person dispensing SP for IPTp at facilities, by level
- g. Location where SP for IPTp is dispensed at facilities, by level

12. Personnel Training Assessment

- a. Proportion of staff trained in stock management to total number working in stock management at facilities, by level
- b. Proportion of staff trained in stock management by how training was provided, by level

ANNEX 2: CRITERIA FOR SELECTION OF DISTRICTS AND FACILITIES

Guiding Principles and Rationale

A sample is said to be representative when—

1. Every person (or unit) in the population from which the sample is drawn has some chance of being included in it (bias is eliminated), and
2. Every nonoverlapping subgroup (stratum) has representation in the final selection.

Statistically, the larger the representative sample size, the more significant the findings. However, that only holds *if* (and only if), the preceding two conditions hold for the proposed assessment. One common limitation exists to large sample size—budget! “Large” and “representative” must be clearly defined. Sample size can be large and not representative and vice versa.

Emphasis on representativeness should be on the stratification based on the existing four malaria zones and also on the type of facility rather than population of the districts or province or any administrative division.

Therefore, a multistage sampling procedure²⁶ will be adopted in sample selection—

- All four malaria zones will be included in the assessment.
- Ten districts will be sampled within the four malaria zones (four districts including two pairs of two contiguous districts in the endemic zone, and two districts including one pair of contiguous districts per malaria zone in the other three zones: arid/seasonal, endemic, and low-risk zones).
- Sample facilities will be based on level of care (district hospital, health centers, and dispensaries) in the districts chosen.

²⁶ Stratified random sampling technique will be used.

When a population is sampled with several strata, one generally requires that the proportion of each stratum in the sample is the same as the proportion in the general population. The issue of representativeness is addressed if the preceding condition is met.

One must proceed with caution when applying statistical methods because the representativeness of samples and the validity of results must first be evaluated. Statistically, a 25 percent sampling of any population (if well selected) is representative enough, but limitations of budget are important. However, the aim of this assessment is not to describe well-defined data but to identify issues (and later, trends) in the management of directed malaria medicines at all levels of care in the country, for better interventions and their monitoring.

Outline of Sampling Protocol

The sampling procedure is a multistage, stratified random sampling, with programmatic adjustments.

1st stage: All four malaria zones are included in the assessment (100 percent of malaria zones)

- Arid/seasonal regions (zone 1)
- Endemic region (coastal and lake) (zone 2)
- Epidemic/highland regions (zone 3)
- Low-risk regions (zone 4)

2nd stage: District selection

All districts in each zone are divided into pairs of contiguous districts (with malaria zone color-coded list of districts in Kenya). In each of the four malaria zones, one pair of districts is randomly selected, thus selecting two districts per chosen province, except for the endemic region, where two pairs of districts were chosen randomly, making a total of four districts in that zone. Thus, 10 districts in total were selected.

3rd stage: Facility selection

The aim of the last stage is to select 100 facilities (10 each from each of the 10 districts, totaling 10 facilities per province) from the different levels of health care delivery.

Sampling Frame for Each District

The sampling frame for each district, from which 10 facilities will be selected, should include the following as minimum requirements, in addition to the outputs of the previous stages of sampling—

- Facilities included in the sampling frame should have outpatient departments (OPDs) that attend to children under five and offer antenatal services for pregnant women *at least four days a week*.
- A minimum average number of three children with fever and three pregnant women should be seen daily in the OPD and antenatal clinic for the facility to be included in the sampling frame.
- In situations where government-sanctioned guidelines, methods, and tools exist for selecting health facilities and doing supervision, they should be followed.

Quota for Selecting Facilities

In each of the 10 districts, randomly select a facility (from the sampling frame described above, and classified as follows—

1. District hospital—1 (*Must be a public hospital—the district hospital*).
2. Health centers—2 (1 urban and 1 rural, if applicable). *At least one of the health centers must be a public health facility.* (If applicable, a mission health facility can be included.)
3. Dispensary—7 (3 urban and 4 rural). *At least 5 of the 7 dispensaries must be publicly owned health facilities.* (If applicable, a maximum of two mission dispensaries can be included in the sample.)

Note: Even though classification into *urban/rural* facilities is desired, the situations on the ground at different districts differ, and the classifications are not strict.

Therefore, teams should note that adequate discussions at district level should guide the final decisions of facilities on how to classify the facilities according to urban/rural divides. Note, however, that this classification is not a stratification point. The main stratifications for data analysis are (a) the epidemiology of the zone for malaria, and (b) the level of care: hospitals, health centers, and dispensaries, as already outlined.

Process Outline: Selection of Facilities (Health Centers and Dispensaries)

1. Write out the names of the facilities that have met the requirements within each sampling frame—per level.
2. To choose the facilities within the quota allotted, using ballots—
 - Drop all the lists of names of the facilities, written on paper and folded, into a box or hat.
 - Have one person pick the first one ballot.
 - To select subsequent facilities, repeat until the allocated number of facilities are picked.

Purposeful Adjustment

The urban facilities chosen at all levels should not be too far from each other. Start from the district hospital and vote to choose so that the distances of the urban health center and dispensaries are not more than an hour drive away from the central facility (starting point).

The rural facilities should (preferably) be at a different subdistrict location. Start with the health center as the hub, and make sure that the rural dispensaries are not more than one hour's drive from the central starting point.

ANNEX 3A: LIST OF SELECTED DISTRICTS

S/N	District Type	S/N	Name of District Selected
A	Endemic malaria	1	Kwale
		2	Mombasa
		3	Kakamega
		4	Vihiga
B	Highland epidemic prone	1	Kisii
		2	Nyamira
C	Arid epidemic prone	1	Kitui
		2	Mwingi
D	Low risk	1	Laikipia
		2	Nakuru
Total Number			10 Districts

ANNEX 3B: LIST OF ASSESSED FACILITIES, BY LEVEL, PER DISTRICT

No.	Zone	Hospitals	Health Centers	Dispensaries	Districts
1.	Endemic	Kakamega District 1) Malava District Hospital Vihiga District 1) Vihiga District Hospital	1) Bukura Health Center 2) Musoli Health Center 1) Vihiga Health Center 2) Tigo Health Center	1) Approved Dispensary 2) Emusanda Dispensary 3) Nabongo Dispensary 4) Elwesero Dispensary 5) Matioli Dispensary 6) Elukhambi Dispensary 7) Ingotse Dispensary 1) Idukhu Dispensary 2) Nadanya Dispensary 3) Mulele Dispensary 4) Musitinyi Dispensary 5) Boyani ADC 6) Likindu Dispensary 7) Kapchemwani Dispensary	Kakamega/ Vihiga
2.	Endemic	Mombasa/ Kwale Districts 1) Msambweni District hospital 2) Port Reitz district hospital	1) Shimba Hills Health center 2) Samburu Health center 3) Shimo La Tewa Health center 4) Likoni Health center	1) Mkongani Dispensary 2) Muhaka Dispensary 3) Diani dispensary 4) Magodzoni dispensary 5) Waa dispensary 6) Mazeras dispensary 7) Majoreni dispensary 8) Shimo La Tewa dispensary 9) State house dispensary 10) Railways dispensary 11) NYS Mtongwe Dispensary 12) Stella Maris dispensary 13) Bokole CDF dispensary 14) Miritini dispensary	Mombasa/ Kwale

No.	Zone	Hospitals	Health Centers	Dispensaries	Districts
3.	Arid seasonal	<p>Kitui District</p> <p>1) Kitui District Hospital</p> <p>Mwingi District</p> <p>1) Mwingi District Hospital</p>	<p>1) Mbitini Health Center</p> <p>2) Yatta Health Center</p> <p>1) Nuu Health Center</p> <p>2) Thitani Health Center</p>	<p>1) Matinyani Dispensary</p> <p>2) Tulia Dispensary</p> <p>3) Mulango Dispensary</p> <p>4) Chuluni Dispensary</p> <p>5) Kisasi Dispensary</p> <p>6) Kwa – Vonza Dispensary</p> <p>7) Tiva Dispensary</p> <p>1) Kalisasi Dispensary</p> <p>2) Katalwa Dispensary</p> <p>3) Mumbuni Dispensary</p> <p>4) Nzatani Dispensary</p> <p>5) Kanyunga Dispensary</p> <p>6) Thitha Dispensary</p> <p>7) Kamuongo Dispensary</p>	Kitui/ Mwingi
4.	Low risk	<p>Laikipia District</p> <p>1) Nanyuki District Hospital</p> <p>Nakuru</p> <p>1) Naivasha District Hospital</p>	<p>1) Ol Jabet Health Center</p> <p>2) Doldol Health Center</p> <p>1) Subukia Health Center</p> <p>2) St. Anthony's Health Center</p> <p>3) Njoro Health Center</p>	<p>1) Kalalu Dispensary</p> <p>2) Muramati Dispensary</p> <p>3) Sweet Waters Dispensary</p> <p>4) Mutara Dispensary</p> <p>5) Pesi Dispensary</p> <p>6) Il Polei Dispensary</p> <p>7) Matanya Dispensary</p> <p>1) Kabazi Dispensary</p> <p>2) Kapkures Dispensary</p> <p>3) Lanet Dispensary</p> <p>4) Maji Tamu Dispensary</p> <p>5) Nys College Dispensary</p> <p>6) Karunga Dispensary</p>	Laikipia/ Nakuru

Annex 3B: List of Assessed Facilities

No.	Zone	Hospitals	Health Centers	Dispensaries	Districts
5.	Epidemic	<p>Nyamira District</p> <p>1) Nyamira District Hospital</p> <p>Kisii District</p> <p>1) Kisii District Hospital</p>	<p>1) Ogongo Health Center</p> <p>2) Tombe Health Center</p> <p>1) Iranda Health Center</p> <p>2) Kiogora Health Center</p>	<p>1) Tindereti Dispensary</p> <p>2) Riakwaro Dispensary</p> <p>3) Kenyerere Dispensary</p> <p>4) Amaterio Dispensary</p> <p>5) Getare Dispensary</p> <p>6) Miriri Dispensary</p> <p>1) Nyasancha Dispensary</p> <p>2) Nyaguta Dispensary</p> <p>3) Isecha Dispensary</p> <p>4) Entanda Dispensary</p> <p>5) Nyagoto Dispensary Matongo Dispensary</p> <p>6) Nyakwana Dispensary</p>	Nyamira/ Kisii

Day Two: July 9, 2009		
TIME	ACTIVITY	
8.00–8.30 am	Teams: (all team members except Data Clerks) Set off for Pilot testing (in real-life teams)	Data Entry Clerks stay behind for Intensive Training on— 1. Manual data cross-checking 2. Data entry 3. Data validation 4. Data filing/ Presentation <i>Andrew Mwaura/Catherine Adegoke</i>
9.00 am–1.30 pm	Data Collection: Health Facility	
1.30–2.00 pm	Return to Base (Training Venue)	
2.00–2.30 pm	Lunch	
2.30–3.30 pm	Cross-Checking of Filled Data Forms // Adjustments to Data Collection Forms across teams <i>Charles/Andrew Mwaura/Catherine Adegoke</i>	
3.30–4.30 pm	Group presentations—Challenges and Recommendations <i>Mildred Shieshia</i>	
4.30–5.30 pm	Presentation: Reporting Formats for Assessment—Daily and End of Exercise <i>Catherine Adegoke</i>	
5.30 pm	Tea Break / Closing	

Day Three: July 10, 2009		
TIME	ACTIVITY	
8.30–9.00 am	Registration	
9.00–10.30 am	Recap of Days 1 and 2—Clarifications (on ALL sessions) <i>Mildred Shieshia</i>	
10.30–11.00 am	Tea Break	
11.00 am–2.00 pm	Presentation: <ul style="list-style-type: none"> • Data Cross-Checking, Entry, and Validation <ul style="list-style-type: none"> ○ Ground Rules for Data Entry <i>Andrew Mwaura</i>	
2.00–2.45 pm	Lunch	
2.45–5.00 pm	<ul style="list-style-type: none"> • Plenary Discussions: Review of Documents and Activities for PMM Assessment <i>(Questions and Answers, Clarifications)</i>—ALL • Logistics--Taking Off for Fieldwork—With Checklists <i>Mildred Shieshia</i>	
5.30 pm	Closing / Tea Break	

Activity: TAKING OFF FOR FIELDWORK, July 11, 2009

Getting Set for Fieldwork:

1. Logistics: Transport, Accommodation, Cards, etc.
2. Letters of Introduction to Districts
3. Communications/Reporting Systems
4. Administrative Issues: Reporting, Administrative Support, Funds
5. Collect List of Facilities/District
6. Collect All Field Supplies: Questionnaires, Calculators, etc.
7. Data Handling Issues/Timelines: E-mail and other arrangements
8. Verification of Field Readiness: Individual Team Coordinators
9. Any Other Business

ANNEX 5: LIST OF PERSONS WHO PARTICIPATED IN PMM ASSESSMENT, JULY 2009

MSH/SPS—Process Facilitators

Dr. Mildred Shieshia	MSH/SPS
Dr. Kate Adegoke	MSH/SPS Consultant
Andrew Mwaura	MSH/SPS Consultant

Drug Supply Management Sub-Committee Members

Dr. Dorothy Memusi	DOMC
Dr. George Muthuri	PPB
Dr. Mildred Shieshia	MSH/SPS
Dr. Joan Wakori	KEMSA
Dr. James Mwenda	MEDS
Dr. Charles K. Mburu	JSI/GFPSCMC
Dr. Andrew Nyandigisi	DOMC

DHMT Members

Helen Kanyugo	Bahati DH
Mwanasha Ahmed Athman	MOH Kilindini
Kimutai Cheruiyot	Kisii DH
David Njenga Ngugi	Kitui DH
Benedict Kilonzo Munyaka	Mwingi DH
Dr. Hadley Sultani	Kakamega PGH
David M. Kinyanjui	Vihiga DH
Valentine Ngeleso	Nanyuki DH

Data Collection Team

Team Coordinators

George Walukana	KEMSA
Geoffrey A. Mwagwi	KEMSA
Kenneth K. Bukachi	KEMSA
Jackson G. Mwangi	KEMSA
Linda Tindi	KEMSA

Data Collectors

Gladys M. Kioko	Dorothy Kelai Shoma
Eliud Keoro	Roselyne Thuo
Cyrus Maoga	Florence K. Kirimi
Valerie Obare	Sarah W. Mwangi

Norah K. Maore
Calvin Lwaka
Allan Chelogoi
Danstone Ogeno

Dagane Takhal Dabar
Nancy Mola
Reuben Kiptui

Data Entry Clerks/Validators

Natasha Murgor
Richard Miano
Jemimah Anzabwa Omeno
Elizabeth Nyokabi

Hillary Mulialia
Emily Yeko
Dorcas Naneu
Caroline Kinuthia

Rapporteur/Administrative Support

Irene Muchoki
Agnes Mukiri

MOH
MSH/SPS

ANNEX 6: COMMENTS ON FIELD WORK, REPORTS FROM TEAMS

Fieldwork commenced with the departure of the teams to the first district chosen as the base (or starting point) on July 12, 2009, and concluded with the return to Nairobi on July 22, 2009.

A debriefing session to present the field processes and reports firsthand was held in Nairobi on July 24, 2009. The Team Coordinators made presentations and submitted detailed reports on the data collection exercise (*each team having responsibility for two districts*).

The summary of field challenges and immediate solutions to these on the field, as well as lessons learned on the conduct of assessments on pharmaceutical management of malaria are presented in the following table.

Summary of Challenges/Immediate Solutions/Lessons Learned

Issue	Fieldwork Challenges	Immediate Solutions to Challenge	Lessons Learned/ Recommendations
Terrain	Rough and muddy roads caused poor accessibility. Vehicles had low ground clearance.	For sections of the roads that were impassable, teams asked for alternative routes because nothing could be done about the state of the roads. The teams made a habit of clarifying directions at every intersection.	Four-wheel-drive vehicles are recommended for the assessment exercise because of rough terrain.
Administrative division, districts	Sampling of the larger districts posed challenges to visiting all the DMOHs. Resampling of facilities was time consuming when appropriate data on districts were scarce. Information on the demography and maps of larger districts were not easily accessible. The DPFs (chosen from the smaller districts) were not conversant with the routes and terrain of the original larger districts; teams got lost on occasion.	Adequate time for visits to the DMOHs was factored into the assessment plans. The teams sought the services of accompanying persons from the districts to direct the teams.	The DPF should be an integral part of the DHMT so that commodity management aspects are routinely assessed. Strengthen DPF office to facilitate supervision.
Accompanying person(s) from district offices	Accompanying person sometimes interfered with interview (prompting) and also delayed the team when they conducted their other duties at the facility.	The team coordinator was mandated by the teams to brief the accompanying persons on the purpose, methodologies, and timelines for facility visits so that focus and time management were effected.	Accompanying persons were brought into the full picture of the assessment—objectives and time limitations.
Non availability of principal staff	Sometimes, the principal in-charges, such as the Med-Sup and the DMOH, were not available.	Some other staff, such as the Deputy DPHN or the Nursing Officer in Charge, had to be substituted.	Prior communication and confirmation of the interviewees should be done in advance. A contingency plan is needed in case the principal interviewees are not in on the day of the visit.

Annex 6: Comments on Fieldwork

Issue	Fieldwork Challenges	Immediate Solutions to Challenge	Lessons Learned/ Recommendations
Infrastructure of facilities	Service areas in some facilities were too small to accommodate data collectors. In some facilities, lack of shelves made it hard to determine if they were practicing proper stock management, for example, storage of medicines, using the FEFO method.	Where feasible, advice and practical demonstrations on better arrangements of the stores were done.	Advised the in-charge to improve store infrastructure, for example, putting in shelves and pallets. Advised staff to improvise fire extinguisher, for example, sand in a bucket.
Facility/staffing Issues	Many facilities, especially dispensaries, are run by a single staff person, so the assessment appreciably interrupted the flow of work. Conversely, delay in starting the assessment as well as frequent interruptions experienced in low-staffed facilities meant that sometimes the assessment ran past closing time. The sampled districts had competing activities, such as distribution of food (Kwa-Vonza dispensary) and malaria case management trainings (Mombasa). Staff reported late on duty, or the storekeeper was absent and had not left keys of medicine cabinet with another staff member. New staff could not answer questions on past or present practices or records.	The team arrived early, fielded the necessary questions to the staff, asked for the relevant records, and allowed/asked the staff to attend to the patients. Patients at most facilities tended to arrive late. Resampling was done at facilities where the in-charge or a health staff might be available. Exercise was carried out over the weekend. An update on IPT and inventory management was done to enable staff to understand what was expected of them.	For facilities with only one health worker, it was important that the team be accompanied by a health worker from the DPHN office who could attend to patients in case only one staff member was on duty. Develop a tool for facility supervision.

Issue	Fieldwork Challenges	Immediate Solutions to Challenge	Lessons Learned/ Recommendations
Inventory/data management issues	<p>In many hospitals, data had to be sourced across various units/departments.</p> <p>Some facilities lacked stock control cards for AL. Some were using the AL register, thus making stock-out dates/cycles and expiries difficult to obtain.</p> <p>Improvised bin cards such as hardcover books were not used effectively in some facilities.</p> <p>Poor inventory management, specifically in updating and ensuring accuracy in record keeping—incorrect entries, late entries, issues and receipts in same column—led to lack of correlation of physical stock with stock control cards.</p> <p>Facility copies of the Standard Order Forms were not found in some facilities making it difficult to obtain order quantities and dates.</p>	<p>Issued AL register and health facility monthly summary tools.</p> <p>Provision of current malaria treatment guidelines (2008), AL dispenser's book, and health facility monthly summary to those facilities that did not have them.</p> <p>Where the bin cards were not updated, the AL register, delivery notes, and physical counts were used to obtain the data.</p> <p>Cross-checking of the submitted AL summary report with data from the AL register was done to ensure the correct data were collected.</p> <p>Current treatment guidelines (2008) were provided.</p>	<p>Stock management tools and training of the health workers on the same need to be provided.</p> <p>Regular monitoring and resupply of AL registers are necessary where they are filled up.</p> <p>Timely entries into bin cards are necessary.</p> <p>Availability of good and updated records increases the efficiency of data collection.</p>
Training on inventory/data management tools	<p>In a few facilities, none of the health workers had been trained on inventory/data management.</p> <p>Many facilities are still using untrained support staff to dispense and manage stock of medicines.</p> <p>Some staff that attended the training did not give feedback; some kept the tools, and some have not started using them for inventory management.</p>	<p>Immediate on-the-job training of health facility staff by the DPF on inventory management was done.</p>	<p>Training personnel in good inventory management should be emphasized.</p> <p>Regular supportive supervision on stock management needs to be carried out in the facilities.</p> <p>On-the-job training can be used successfully in training other health workers on stock management, thus assisting the nurse on the same.</p>
Information capture	<p>Information given at the district headquarters was not consistent, especially on the issues of trained staff.</p> <p>Historical records were not available in some facilities.</p> <p>At times, an unwillingness to give information existed.</p>	<p>Comparisons were made to ensure internal consistency—clarifications of questions and repetition of assessment objectives.</p>	<p>A district database for staff trained by type of training and cadre should be developed.</p>

Future PMM Assessments—Opportunities, Threats, Recommendations

Opportunities

- The exercise motivated facilities to maintain good inventory records: with adequate harnessing, this will snowball to other facilities in the district.
- On-the-job training and updates, as well as supportive supervision on commodity management, can influence staff to develop positive attitudes and jumpstart good record-keeping practices.
- The DPF's support supervision on commodity management needs to be strengthened and redistributed by exposure to field visits and practical supportive supervision.
- The data collection exercises can be used to improve pharmaceutical management practices for all medicines, not only antimalarials.
- The district stakeholders consultative meeting on presentation of assessment findings provides an opportunity to synchronize malaria activities with other district activities.

Challenges

- Continuous supply of malaria medicine tracking tools and issue and requisition vouchers needs to be ensured.
- In some facilities, AL registers serve as substitutes for bin cards, which should not be the case, because issue and adjustment data are easily obtainable from bin cards and not from AL registers.
- High workload coupled with numerous vertical inventory management tools makes filling of tools tedious for most of the health workers. Many facilities have one in-charge who is overwhelmed. The long stock-out periods for the first-line medicines in some facilities may demoralize staff and lead not only to the neglect of record keeping but also to use of nonrecommended therapies, as noted in some facilities.
- Gaps still remain in the training of health workers countrywide on effective management of malaria medicines in various facilities. Also, some of the trained staff still do not implement better management practices.
- Staff turnover is high, leaving gaps in medicine and commodity management.
- Mapping of facilities within the new districts needs to be completed by a health management information system to ease logistical and protocol challenges that take a lot of time away from fieldwork.
- Malaria activities sometimes run parallel to other health activities within the district, thus health staff may not be available in some facilities during assessment periods.
- Logistics challenges such as the poor road network and fuel unavailability exist in some distant places.

- Low network coverage in most places causes delay in sending data for data validation.

General Recommendations for Future PMM Assessments

- When designing future assessments, designers need to familiarize themselves with the new administrative boundaries (of old and new districts).
- Using the same data collectors/field staff for the assessments improved the outputs and quality of fieldwork. Therefore, as much as is possible, the team members should be maintained for future assessments.
- The introductory letter should get to the district headquarters well in advance, followed by confirmation of receipt of the letter. Also, early communication should take place to district focal persons in advance of upcoming PMM assessments.
- Involvement of the district focal persons (DPF and DPHN) in the assessments is important for building rapport, facilitation, and provision of feedback to the DHMT and the facilities where the assessment is conducted.
- Facilities need to keep a filed copy of the Standard Order Form and Delivery notes for review by any officer carrying out supervision or an assessment.
- The time frame should allow for a maximum of two facility visits a day, and adequate time for writing reports, to minimize stress and rushing.
- Proper feedback through the DPF (i.e. use of a written report) to sampled facilities in the assessment should be mandatory and done in good time, thus helping facilities improve management.
- A need exists to establish how many faith-based dispensaries are getting double allocation of AL, that is, receiving supplies from both KEMSA and MEDS.

ANNEX 7: DATA COLLECTION TOOLS

PMM End-Use Verification Tool

For each form provided, include an entry for every question. If the question does not apply, please write NA. For most questions, a space is provided for comments.

Form 1: Facility Identification Form

This form should be completed by the surveyor for all facilities selected in each quarter.

1. Facility Code [__/_/_/_/_/_/_]		1b. Pull <input type="checkbox"/> Push <input type="checkbox"/>	1c. Rural <input type="checkbox"/> Urban <input type="checkbox"/>
<i>Check where applicable</i>			
2. Today's date (dd-mm-yyyy) [__][__]-[__][__]-[__][__][__][__]			
3. Interviewer's name(s) [_____]			
4. Malaria Zone [_____]	5. Malaria Zone Code [__][__][__]	Province Name [_____]	5. Province Code [__][__][__]
6. District [_____]			7. District Code [__][__][__]
8. Facility Name (if no name, record "no name") [_____]			
9. Operating Authority (1 = MOH; 2 = NGO; 3 = Mission; 4 = Private) [____]			
10. Facility Type (1 = Warehouse; 2 = SDP) [____]	11. If warehouse, mark level (1= Central, 2 = Zonal, 3 = District 9 = NA) [____]	12. If SDP, mark Level of Facility (1 = District hospital; 2 = Health center; 3 = Dispensary) [____]	

13. Title and Name of the In-charge [_____]	14. Title and Name of Principal Person Being Interviewed [_____] Signature _____
15. Telephone number (mobile) of the In-charge [_____]	16. Telephone number of the Person being Interviewed [_____]
17. Title and Name of any district person accompanying the team [_____] Signature _____	Names and Signatures of Team Members 1. Team Coordinator..... 2. DPF..... 3. Data Collector..... 4. Data Collector..... 5. Data Collector..... 6. Data Entry Clerk.....
18. Telephone number (mobile of district person accompanying) [_____]	

Facility Code [_/_/_/_/_/_/_/_]

Form 2: Facility Questionnaire*It is preferable to conduct this interview in the language in which the respondent is most comfortable.*

No	Question	Code Classification
1	Which services do you offer for malaria control at this facility? (Read all options and circle the numbers that apply)	Uncomplicated Malaria treatment... 1 Severe Malaria Referral 2 Severe Malaria Treatment 3 Microscopy 4 Malaria RDTs 5 IPTp 6 Bed-net Vouchers 7 Other (specify) 9
	Comments:	
2	Who is the principal person managing stocks of antimalarial medicines at this facility? (Read all options and circle the numbers that apply)	Medical Officer/Assistant Medical Officer/Clinical Officer 1 Pharmacist/Pharm. Tech 2 Nurse 3 Medical Attendant 4 Other (specify) _____ 9
	Comments:	
3	Who is the principal person prescribing ACTs at this facility? (Circle only one number)	Medical Officer/Assistant Medical Officer/Clinical Officer 1 Pharmacist/Pharm. Tech 2 Nurse 3 Medical Attendant 4 Other (specify) _____ 9
	Comments:	
4	Who is the principal person dispensing ACTs at this facility? (Circle only one number)	Medical Officer/Assistant Medical Officer/Clinical Officer 1 Pharmacist/Pharm. Tech 2 Nurse 3 Medical Attendant 4 Other (specify) _____ 9
	Comments:	
5	Who are the principal people prescribing SP for IPTp at this facility? (Circle all that apply)	Medical Officer/Assistant Medical Officer/Clinical Officer 1 Pharmacist/Pharm. Tech 2 Nurse 3 Medical Attendant 4 Other (specify) _____ 9
	Comments:	
6	Who are the principal people dispensing SP for IPTp at this facility? (Circle all that apply)	Medical Officer/Assistant Medical Officer/Clinical Officer 1 Pharmacist/Pharm. Tech 2 Nurse 3 Medical Attendant 4 Other (specify) _____ 9
	Comments:	

No	Question	Code Classification
7	Where is SP for IPTp dispensed? (Circle all that apply)	Antenatal clinic 1 OPD 2 Pharmacy 3
	Comments:	Does not apply 4 Other (specify) _____ 9
8	How many health workers are at this facility?	Enter a number for employer: GOK: _____ NGO/Development Partners: _____ Other (hospital, internships, community, volunteers etc): _____
	Comments:	
9	Of those health workers, how many have been trained in the malaria treatment guidelines?	Enter a number: _____
	Comments:	
10	How many health workers at this facility dispense IPTp?	Enter a number: _____
	Comments:	
11	How many health workers dispensing IPTp have been trained in MIP?	Enter a number: _____
	Comments:	
12	(For Health Centers and Hospitals only) How many health workers working at this facility perform malaria microscopy?	Enter a number: _____
	Comments:	
13	(For Health Centers and Hospitals only) How many of the health workers performing microscopy have been trained in malaria microscopy?	Enter a number: _____
	Comments:	

Annex 7: Data Collection Tools

Facility Code [_/ _/ _/ _/ _/ _]

No	Question	Code Classification
14	How many health workers at this facility work in stock management? (record keeping, ordering, receiving, FEFO etc.) Give the number of support staff separately	Enter a number excluding support staff: _____ Enter a number or support staff: _____
	Comments:	
15	a. How many of the health workers involved in stock management have been trained in stock management? b. Of those trained in stock management, how did they receive their training? (Write a number next to each method of training).	15 a. Enter a number: _____ 15 b. During logistics training _____ On-the-job training _____ Other (specify) _____ N/A _____
16	Has the facility received any supervisory visit in the last six months?	Yes 1 No 0
17	Has any supervision that occurred in the last six months included the following: (Circle all the letters that apply, and sum the total number of entries. If the total is 50% or greater, answer yes.)	Reviewed order form (Pull Facilities).. A Examined stock cards B Reviewed storage condition C Conducted physical inventory D Reviewed dispensing register E
	Comments	Yes 1 No 0
18	What was the title of the person who performed the supervision in question 16?	Title: _____
	Comments	
19	Is there any report of the supportive supervision (conducted in the last six months)?	Yes 1 No 0
20	Was any checklist used to conduct the supportive supervision (conducted in the last six months)?	Yes 1 No 0
21	Is there a copy of a manual for management of pharmaceutical products? (ask to be shown the manual; only mark “yes” if you see the manual)	Yes 1 No 0
	Comments	

Annex 7: Data Collection Tools

Facility Code [_ / _ / _ / _ / _ / _]

No	Question	Code Classification
31	What mode of transport is most frequently used to transport malaria products to your facility?	Truck 1 District Vehicle 2 Facility vehicle 3 Public transportation 4 Private vehicle 5 Boat 6 Motorcycle 7 Bicycle 8 Other (specify) _____ 9
32	What are the most common problems that you have experienced in ordering and/or receiving malaria products? Do not read the list of options to the respondent. Circle all that apply, and write in comments and details. Comments	None 0 Ordering cycle 1 Completing forms 2 Long lead times 3 Low order fill rate 4 Rainy season 5 District doesn't have transportation 6 Facility doesn't have transportation 7 Receiving products with a short shelf life 8 No per diem available 10 Other 9 Please specify in detail:
33	Do you have any specific recommendations for improving the availability of malaria products at this facility? Comments	Please specify in detail:

PMM End-Use Verification Tool

Form 4: Stock Status Collection Form Instructions

Column:

1. Name of all products that will be counted.
2. Unit of count for the product.

Note: Columns 1 and 2 are already filled out.

3. Whether or not the product is managed at this facility, answer 1 for Yes or 0 for No. Note that for some products, at certain levels all facilities should manage the product. In such cases, this column should be marked 1. **(If No, draw a line through the row and skip to next commodity.)**
4. Check if the stock card is available; answer 1 for Yes or 0 for No. **If the answer is No, fill the columns with dashes through column 13.** Continue to conduct physical inventory and enter your responses for Column 14–17. **If another type of record is used (e.g., stores ledger), please note in Column 4, and continue to gather consumption information using another type of record.**
5. Check if the stock card has been updated within the last week. Answer 1 for Yes or 0 for No. Note: If the stock card was last updated with the balance of 0 and the facility has not received any resupply, consider the stock card up to date.
6. Record the most recent balance on the stock card.
7. Record the stock on hand as of three months ago, as per stock card.
8. Record if the facility has had any stock-outs of the product from April to June 2009; answer 1 for Yes or 0 for No, according to stock card or ledger books. **If the answer is No, then enter 0 in columns 9 and 10.**
9. Look through the stock card for any stock-outs lasting longer than seven days. Record the total number of stock-outs, not days.
10. Record the total number of days the product was stocked from April to June 2009, based on the number of days that pass between when a balance of 0 is recorded on the stock card, to when a receipt of product is recorded on the stock card. A product may stock-out more than once from April to June 2009, and the total sum of days without product should be calculated.
11. Record the quantity of product received from April to June 2009.
12. Record the quantity of product issued from April to June 2009.
13. Record the total number of months the data represent (may be less than 3). This is calculated by including the months for which there is any valid data recorded, including months where there were stock-outs (a zero in the stock card) and no product was received.
14. Conduct a physical inventory for each of the products (only in the storeroom). If there is no stock available in the storeroom, count the product in the dispensing area. If there is no product in the dispensing area, record a 0.
15. Record if the facility is experiencing a stock-out of the product on the day of the visit, **according to the physical inventory**, answer 1 for Yes or 0 for No.
16. Record the quantity of product in inventory that will be expiring in the next three months.
17. Record the quantity of expired products. Count all expired products on the day of the visit.

PMM End-Use Verification Tool

Form 4: Stock Status Data Collection Form

Malaria Commodities (For last three months to today's date)																	
Product	Units of count	Managed at this facility? Y = 1 N = 0	Stock card available? Y = 1 N = 0	Stock card updated? Y = 1 N = 0	Balance on stock card	Stock on hand 3 months ago (per stock card) A	Stock-out (from April to June 2009) Y = 1 N = 0	Total # of stock-outs lasting longer than 7 days	Total # of days stocked out	Total received (from April to June 2009) B	Total issued (from April to June 2009) C	Number of months of data available	Physical inventory		Stock-out today? Y = 1 N = 0	Quantity of product expiring in the next 3 months	Quantity of expired product
													Store Room	Dispensing area			
1	2	3	4	5	6	7	8	9	10	11	12	13	14		15	16	17
Artemether Lumefantrine 1x6	Strip of 6																
Artemether Lumefantrine 2x6	Strip of 12																
Artemether Lumefantrine 3x6	Strip of 18																
Artemether Lumefantrine 4x6	Strip of 24																
SP	tab																
Quinine tablets	Tab (300 mg)																
Quinine tablets	Tab (200 mg)																
Quinine injection	amp																
Comments (including redistribution counts):																	

PMM End-Use Verification Tool

Form 5: Percent Difference between Quantity Ordered and Quantity Received (for Pull)

Column:

1. List the same products as in Form 4, or choose a subset of products you are interested in. (Note: Do this before finalizing the questionnaire and making photocopies.)
2. Enter the quantity ordered for the last order period for which products should have been ordered (do not include open orders whose expected receipt date has not arrived).
3. Enter the date the order was placed.
4. Enter the quantity received based on the order referred to in column 2.
5. Enter the date the order was received.

Product Name	Quantity Ordered (Last Order Period)	Date Order Placed	Quantity Received (Last Order Period)	Date Order Received
1	2	3	4	5
Artemether Lumefantrine 1x6				
Artemether Lumefantrine 2x6				
Artemether Lumefantrine 3x6				
Artemether Lumefantrine 4x6				
Sulfadoxine/Primethamine (SP)				
Quinine tablets (300 mg)				
Quinine injection				

PMM End-Use Verification Tool**Form 6: Malaria Products Storage Conditions Form**

No.	Description	Yes...1 No...0
1	Malaria medicines and supplies that are ready for distribution are arranged so that identification labels and expiry dates and/or manufacturing dates are visible.	
	Comments	
2	Malaria medicines and supplies are stored and organized according to first-expired, first-out (FEFO) counting and general management.	
	Comments	
3	Cartons and boxes are in good condition, not crushed due to mishandling.	
	Comments	
4	The facility makes it a practice to separate damaged and/or expired malaria medicines and supplies from usable malaria medicines and supplies and removes them from inventory.	
	Comments	
5	Malaria medicines and supplies are protected from direct sunlight on the day of the visit.	
	Comments	
6	Cartons and boxes are protected from water and humidity on the day of the visit.	
	Comments	
7	Storage area is visually free from harmful insects and rodents. (Check the storage area for traces of rodents [droppings] or insects.)	
	Comments	
8	Storage area is secured with a lock and key, but is accessible during normal working hours. Access is limited to authorized personnel.	
	Comments	

No.	Description	Yes...1 No...0
9	Storeroom is maintained in good condition (clean, all trash removed, sturdy shelves, organized boxes.)	
	Comments	
10	Fire safety equipment is available and accessible (any item identified as being used to promote fire safety should be considered.)	
	Comments	
11	Malaria medicines and supplies are stored at the appropriate temperature on the day of the visit, according to product temperature specifications.	
	Comments	
12	Roof is maintained in good condition to avoid sunlight and water penetration.	
	Comments	
13	The current space and organization is sufficient for existing malaria medicines and supplies, including room for reasonable expansion in the event of receipt of expected product deliveries.	
	Comments	

A	<p>For dispensaries add the total number of Ys for rows 1 through 13 = _____</p>	<p>If 11 or higher (does meet appropriate storage conditions).....1</p> <p>If 10 or lower (does not meet appropriate storage conditions).....0</p>
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Annex 7: Data Collection Tools

Facility Code [_/_/_/_/_/_/_/_]

The additional standards below should be applied to any storeroom large enough to require stacking of multiple boxes. (Hospitals and Health Centers Only?)

No.	Description	Yes...1 No...0
14	Malaria medicines and supplies are stacked at least 10 cm off the floor.	
	Comments	
15	Malaria medicines and supplies are stacked at least 30 cm away from the walls and other stacks.	
	Comments	
16	Malaria medicines and supplies are stacked no more than 2.5 meters high.	
	Comments	
17	Malaria medicines and supplies are stored separately from insecticides and chemicals.	
	Comments	

B	For hospitals and health centers, the total number of Ys for rows 1 through 17 = _____	If 14 or higher (does meet appropriate storage conditions).....1 If 13 or lower (does not meet appropriate storage conditions).....0
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C	Does this facility adequately meet storage standards? _____ Clarify your answer: _____
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Denominators

Hospitals	10	Pull	44	Pull Hospitals	10	Push Hospitals	0
Health Centers	20	Push	56	Pull Health Centers	10	Push Health Centers	10
Dispensaries	70			Pull Dispensaries	24	Push Dispensaries	46
Total	100			Total	44	Total	56

Arid/Seasonal Region	20
Endemic Region	40
Epidemic Region	20
Low Risk Region	20
Total	100