



MINISTRY OF HEALTH

MALARIA COMMODITIES QUANTIFICATION AND SUPPLY PLANNING REVIEW FOR FY2013/14

Technical Report

September 2013

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MSH/Health Commodities and Services Management

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ACRONYMS

ACT	Artemesinin – Based combination therapy
AL	Artemether - Lumefantrine
AMFm	Affordable Medicines Facility - malaria
AMC	Average Monthly consumption
Amp	Ampoule
ANC	Antenatal Care
CHAI	Clinton Health Access Initiative
DHAP	Dihydroartemesinin - Piperaquine
DOMC	Division of Malaria control
DOP	Department of Pharmacy
CMTWG	Case Management Technical Working group
DSMSC	Drug Supply Management Sub Committee
F & Q	Forecasting and Quantification
GF	Global Fund
GFATM	Global fund to fight AIDS, Tuberculosis, and Malaria
HCSM	Health commodities and services Management (Program)
HIS	Health information system
IPTp	Intermittent preventive treatment in pregnancy
IM	Intramuscular
IRS	Indoor residual spraying
IV	Intravenous
KEMSA	Kenya Medical Supplies Agency
KNBS	Kenya National Bureau Of Statistics
LMIS	Logistics Management Information System
LMU	Logistics Management Unit
MEDS	Mission for Essential Drugs and Supplies
MOMS	Ministry of Medical Services
MOPHS	Ministry of Public Health & Sanitation
MOS	Months of stock
MSH	Management Sciences for Health
NMS	National Malaria strategy
OPD	Outpatient Department
PHFs	Peripheral Health Facilities
PMI	(USG) President’s Malaria Initiative
RDTs	Rapid Diagnostic Tests
SP	Sulphadoxine – Pyrimethamine
SOH	Stock on Hand
STGs	Standard treatment guidelines
USAID	United States Agency for International Development
WHO	World Health Organization

EXECUTIVE SUMMARY

Over the past few years, the Division of Malaria Control (DOMC) in collaboration with partners has been carrying out an annual forecasting & quantification exercise to establish the malaria commodities requirements for the country.

The quantification exercise is spearheaded by the Drug Supply Management Subcommittee (DSMSC) of the Case Management Technical Working group of the DOMC. This committee comprises the DOMC which is also the Chair, Management Sciences for Health (MSH) Health Commodities and Services Management (HCSM) program providing the secretariat, Kenya Medical Supplies Agency (KEMSA), the Department of Pharmacy, Department of primary Health Care Services and Clinton Health Access Initiative (CHAI). One of the key functions of the DSMSC is to advise the DOMC on commodity security and supply chain related issues for Malaria commodities.

The objectives of the exercise this year was to determine the national requirements for Malaria medicines and diagnostics (specifically Rapid Diagnostic Tests (RDTs)) for the financial year 2013-2014 and forecast the Malaria commodities requirements for 2013 – 2016.

In December 2012, the Division of Malaria control ran a countrywide initiative to have health facilities report their consumption of Malaria commodities via the Demographic and Health Information systems (DHIS). This saw the reporting rates of Malaria commodities rise from an average of approximately 40% achieved through the old LMIS system to approximately 70%. While the Malaria Program aims for even higher reporting rates in future, the DSCMC considers a reporting rate of 70% as sufficient to provide a viable country representative consumption data.

Since there was no recent consumption data for RDTs, the Malaria cases were extrapolated from the ACT consumption data and this used to formulate the RDT gap analysis.

While the DMSC had carried out a quantification exercise in June 2013, it was found necessary to carry out a second exercise in September 2013 which took into account the results of the quality of care survey and also took into account some revised assumptions namely the compliance to diagnostics and the revision of country targets for diagnostic coverage. Quantification is a dynamic exercise that should take advantage of the latest available data in making decisions and projections.

In conducting the forecast for ACTs and RDTs, the gap analysis template used during GF round 10 phase 2 application was used.

The Consumption-based method was applied in quantifying for quinine, while the morbidity-based method was applied for DihydroArtemisinin Piperazine (DHAP).

Key Results from 2013 - 2014 Quantification

Table 1: Summary of Malaria commodities requirements for FY 2013/2014

Gap Analysis of Antimalarial commodities FY 2013 - 2014										
Product	Unit	Net Requirement	AMC	Stock at KEMSA	MOS Kemsad	Available from PMI/USAI D	Available from GFATM	Available from GOK	Total in Pipeline	MOS Pipeline
		A	B	C	D	E	F	G	H	I
AL 6s	Pack of 6's	3,150,000	262,500	1,569,890	6	-	904,400	-	904,400	3
AL 12s	Pack of 12's	2,100,000	175,000	267,090	2	1,200,600	780,400	-	1,981,000	11
AL 18s	Pack of 18's	1,050,000	87,500	390	0	560,640	800,000	-	1,360,640	16
AL 24s	Pack of 24's	4,200,000	350,000	1,620,870	5	1,940,640	1,910,000	-	3,850,640	11
Quinine dihydrochloride inj	Amps	1,382,827	115,236	1,000	0			-	-	-
Quinine sulphate 200mg	Tab	3,719,805	309,984	1,989,000	6			-	-	-
Sulphadoxine / Pyrimethamine	Tin of 1000s	4,729,000	394,083	20,546,000	52	-	-	-	-	-
Dihydroartemisinin/Piperazine 160mg	Tab	577,500	48,125	-	-			-	-	-
Dihydroartemisinin/Piperazine 320mg	Tab	945,000	78,750	-	-			-	-	-
Artesunate rectal caps 50mg	caps	207,424	17,285	-	-			-	-	-
Artesunate rectal caps 200mg	caps	23,047	1,921	-	-			-	-	-
Artesunate injection	60mg vials	1,871,426	155,952	701,075	4			-	-	-
Rapid Diagnostic tests.	Tests	14,195,969	1,182,997	1,810,680	2	4,500,000	14,730,746	-	19,230,746	16

Key Conclusions/Recommendations

1. Timely procurement of malaria commodities and adherence to the recommended delivery schedules will ensure a full pipeline and prevent stock outs at central and facility level.
2. Currently ACTs and RDTs are below the recommended minimum stock level of six months, hence all scheduled deliveries should be fast tracked.
3. Procurement of Sulphadoxine/Pyrimethamine tablets should not be done during this financial year, and the excess stocks can be donated to reduce wastage due to expiries.

4. Regular monitoring of stock status is necessary so as to ensure that the pipeline is always on the recommended level.

BACKGROUND

Malaria remains one of the country's key public health concerns and is a leading cause of morbidity and mortality in Kenya. Clinically diagnosed malaria is responsible for 30 percent of outpatient consultations, 15 per cent of hospital admissions and 3-5 per cent of inpatient deaths. In 2007, there were 9.2 million cases of clinically diagnosed malaria reported across health facilities in the country¹.

In 2004, Kenya adopted the new ACT policy with Artemether/Lumefantrine (AL) for treatment of uncomplicated malaria. The first AL consignment was received in country in 2006. Since the adoption of the new treatment policy, the Drug Management subcommittee of the Case Management Technical Working Group of the DOMC has played a primary role in forecasting and quantification as well as monitoring of stock status of Malaria medicines recommended in the *National Guidelines for Diagnosis, Treatment and Prevention of Malaria for Health Workers in Kenya, 2008*. In 2010, these treatment guidelines were updated to include universal access to malaria diagnosis for all age groups and a second line treatment for uncomplicated malaria.

One of the key strategic interventions of the DOMC as outlined in the National Malaria Strategy (2009-2017) is to provide for prompt and effective treatment of malaria with 100 per cent of fever cases who present to health facilities receiving parasitological diagnosis before treatment by 2013². To improve rational use of malaria medicines, the DOMC adopted a universal diagnostic policy for all age groups. In order to improve diagnostic coverage, the DOMC conducted an accelerated roll out of malaria Rapid Diagnostic Kits in over 3000 health centers and dispensaries countrywide, coupled with strengthening quality assurance for microscopy.

An uninterrupted supply of diagnostics and Malaria medicines is crucial and beneficial to increasing access to treatment and providing quality care to malaria patients.

In an effort to assure continuous availability of malaria medicines the DOMC in collaboration with partners, have carried out seven annual Quantification and supply planning exercises since 2006 using different quantification approaches. In the initial years, morbidity-based estimates were used since there were challenges in obtaining the consumption data due to low health facility reporting rates, inaccurate and incomplete reports, a weak Logistics Management Information System (LMIS) for Malaria medicines and lack of inventory management tools at health facilities. However, from June 2009, the DOMC improved the LMIS system that has since provided consumption data for key Malaria medicines. This data was used to quantify for Malaria Commodities requirements in 2010, 2011 and 2012, with triangulation from morbidity estimates.

In December 2012, the DOMC recommended the use of the DHIS2 platform for reporting of Malaria commodities. This initiative saw the reporting rate rise from approximately 40% to approximately 70%. The DSCMC used this consumption data, adjusted for reporting rates for the 2013/2014 quantification and supply planning exercise.

¹ Ministry of Public Health and Sanitation, Kenya. National Malaria Policy, April 2010

² DOMC/MOPHS. 2009. *National Malaria Strategy 2009–2017*. Nairobi: DOMC/MOPHS.

On 20th and 21st June 2013, the DOMC in collaboration with partners from MSH/HCSM, KEMSA, Department of pharmacy (DOP), Department of primary health Care Services, and Clinton Health Access Initiative, carried out a national quantification exercise to determine the national Malaria medicines and RDT requirements for FY 13/14. This activity was supported by MSH/HCSM using funds from PMI/USAID. The quantification was further revised in September 2013 during the GFATM application based on the latest available information

INTRODUCTION

2.1 Scope

This F&Q targeted commodity requirements for the Kenyan public health sector and covered the period July 2013– June 2014. It also served to provide a forecast of Malaria commodities requirements for a three year period 2013 - 2016. The selected commodities were as recommended by the National *Guidelines for Diagnosis, Treatment and Prevention of Malaria in Kenya (2010)*.

The national guidelines recommend that all suspected malaria cases be tested for Malaria before treatment. Previously, the guidelines allowed for presumptive treatment of fever in children under the age of five years. In order to improve malaria diagnostics coverage in health facilities countrywide, the DOMC rolled out RDTs in the public sector. The roll out was carried out in October 2012 and a forecast of RDT requirements for the period June 2013 to June 2015 was established.

2.2 Malaria standard treatment guidelines

A total of 4 different conditions with specific recommendations for treatment were identified and used for the purposes of this quantification.

Table 2 below provides the breakdown for each specific condition along with the associated treatment regimens.

Table 2: Standard Treatment Guidelines for Malaria

Condition	Treatment	Dosage
1. Uncomplicated malaria (First-line treatment)	Artemether + Lumefantrine 20mg/120mg for patients of weight band 5-14kg (6 tabs)	Taken two times a day for three days at 0, 8, 24, 48, 60 and 72 hours
	Artemether + Lumefantrine 20mg/120mg for patients of weight band 15-24kg (12 tabs)	
	Artemether + Lumefantrine 20mg/120mg for patients of weight band 25-34kg (18 tabs)	
	Artemether + Lumefantrine 20mg/120mg for patients of weight band >35 kg (24 tabs)	
2. Treatment failure in uncomplicated malaria	Dihydroartemesinin piperakuine (DHAP) - available in adult and paediatric fixed dose combination tablets	4mg/kg/day Dihydroartemesinin and 18mg/kg/day piperakuine taken once a day for 3 days
3. Severe (Complicated) malaria	Artesunate (All age groups)	2.4 mg/kg to start then at 12 hours and then daily for 6 days

	Quinine Sulphate tabs (continuation phase)	10 mg/kg every 8 hrs (max 600mg) to complete a total (Parenteral + oral) 7 days of quinine therapy
	Quinine dihydrochloride injection	Loading dose of 20mg/kg (max 1200 mg) and then 10mg every 8 hours administered parenterally until the patient can take oral formulation
4. Intermittent preventive treatment	Sulphadoxine-Pyrimethamine	3 tablets administered 4 weeks apart for a total of three doses following quickening

OBJECTIVES

The main objectives of this quantification exercise were to :

- Determine AL and RDT needs for the financial year June 2013 - May 2014
- Forecast AL and RDT requirements for three years, 2013 -2016
- Carry out a gap analysis for Malaria commodities for the period 2013 – 2014
- Carry out a situational analysis for AL stock status to identify when the country may be stocked out of AL, for further action
- Develop a supply plan and delivery schedule for the expected procurements.

METHODOLOGY AND ASSUMPTIONS

Determining the method of quantification to use is an important part of the quantification process; medicine needs can be estimated using one or a combination of three standard methods: the consumption-based method, the morbidity-based method, and the adjusted consumption method (MSH & WHO, 1997). The method selected is based on data and information available, the number and types of patients receiving services, and the resources available for conducting the exercise.

Table 3 below provides an analysis of the different quantification methods by data and limitations, taking into consideration the Kenyan situation.

Table 3: Comparison of Quantification Methods

Method	Essential Data	Situation analysis for Kenya
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1. Consumption	<ul style="list-style-type: none"> • Reliable inventory records • Records of supplier lead time • Projected medicine costs 	<p>The DOMC, in January 2013 started using the DHIS platform for the reporting of Malaria commodities. This followed the numerous challenges encountered with the LMU based LMIS at KEMSA. Following this migration, which allowed collection of consumption data from January 2012, the reporting rates for malaria commodities, has risen to an average of over 70%, from the previous 40%.</p>
2. Morbidity	<ul style="list-style-type: none"> • Data on population and patient attendances • Actual or projected incidence of health problems • Standard treatments (ideal, actual) • Projected medicine costs 	<p>Morbidity data, comprising information on confirmed and clinical malaria cases, is collected by the Division of HIS, MoPHS.</p> <p>In the previous years, the main limitations of HIS data were: - low reporting rates, lack of adjustment for facility reporting rates and delayed compilation of data by the HIS. But this has improved lately with the introduction of the online platform DHIS 2, and we have witnessed reporting rates of 79%, of the patient morbidity data.</p> <p>Standard Treatment guidelines are available at most public health facilities but Quality of Care Survey results show poor but improving adherence to case management guidelines.</p>

Adapted from: Management Sciences for Health/World Health Organization. 1997. "Quantifying Drug Requirements" in Managing Drug Supply. 2nd ed. West Hartford, CT: Kumarian Press.

3.1 General assumptions

In quantifying the Malaria commodities requirements, the following general assumptions were applied:-

- The proportion of patients per weight band – based on actual patient numbers data obtained through the DHIS2 and monitored over a 18 month period is
 - 5-14kg = 30%
 - 15-25kg = 20%
 - 25-34kg = 10%
 - >35kg = 40%.

These above patient ratios have been used where applicable throughout this quantification exercise.

- The minimum recommended stock level at the central level is set at 6 months of stock (MOS)
- The maximum recommended stock level at the central level is set at 9 MOS.
- Physical count for end May 2013 was used while information on stocks pending with suppliers at the same time was obtained from KEMSA and the JSI-DELIVER website for PMI procured commodities, for Global fund commodities, the UNICEF delivery schedule was used.
- Quantification of ACTs requirements was based on actual consumption obtained from the DHIS2 from May 2012 – April 2013.

- Adjustment for reporting rate was done per county for the 47 counties; therefore epidemiological variations were taken into consideration.
- Prices were obtained from either KEMSA or the international price indicator guide.

Each commodity's quantification will be guided by both the general assumptions above as well as any specific ones applicable to the commodity under consideration.

4.0 ARTEMETHER-LUMEFANTRINE

4.1 Treatment regimen

The current recommended first line medicine for uncomplicated malaria is AL given as a 3 day dose depending on the weight of the patient upon diagnosis.

4.2 Methodology

4.2.1 DETERMINING CURRENT ANNUAL AL REQUIREMENTS:

In order to determine the country's current annual consumption of ACTs the Drug management subcommittee evaluated consumption data from the Demographic and Health Information System and adjusted the data for reporting rates by county.

4.2.1.1 Consumption data from the Demographic Health Information system (DHIS2):

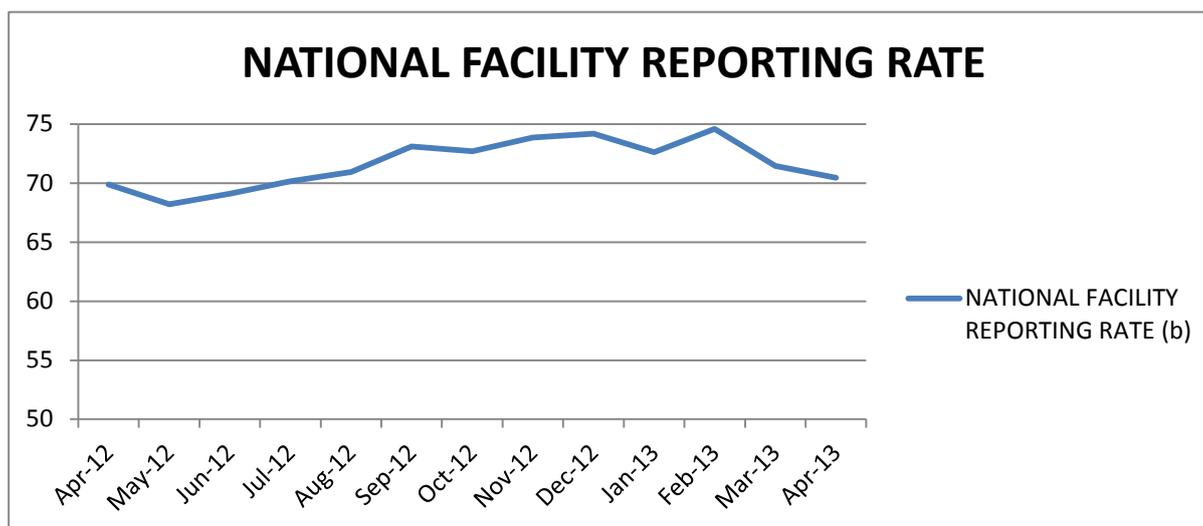
In December 2012, the DOMC decided to change the reporting system to DHIS. This saw the reporting rate increase from an average of 40% to approximately 70%.

The Key indicators tracked by the DHIS are:

<ul style="list-style-type: none"> National DHIS reporting rates 	<ul style="list-style-type: none"> Aggregated Losses
<ul style="list-style-type: none"> Aggregated adjusted consumption 	<ul style="list-style-type: none"> Aggregated expired stocks
<ul style="list-style-type: none"> Reporting rates by county 	<ul style="list-style-type: none"> Aggregated number of patients on AL.

Figure 1 below shows the trends in reporting rates over the review period.

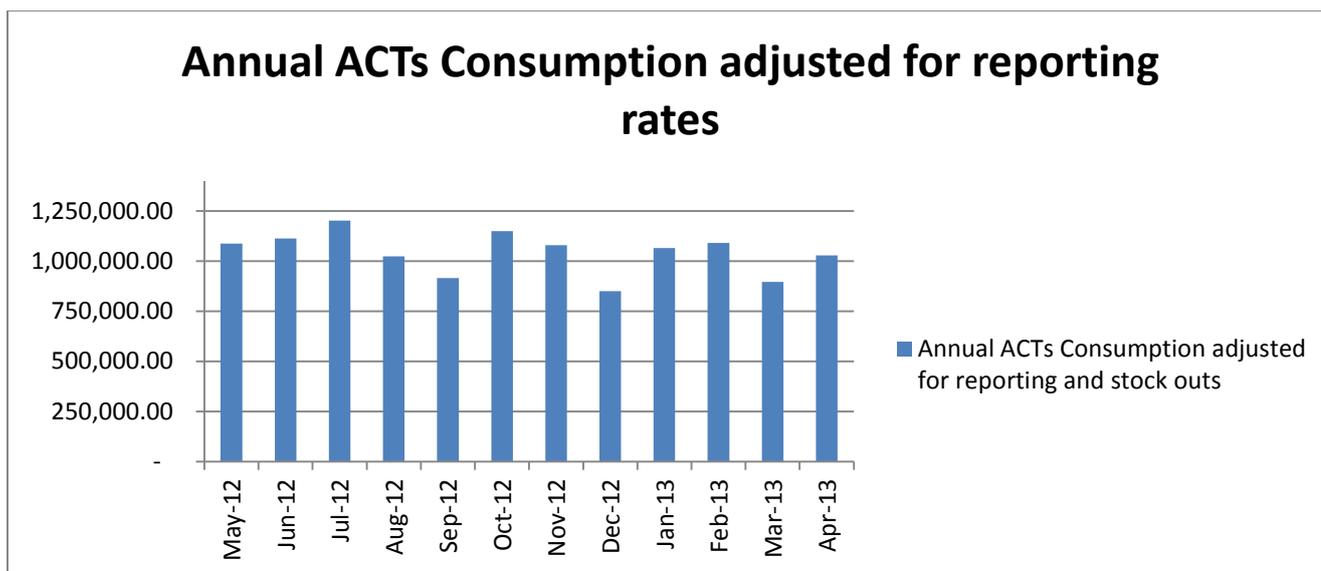
Figure 1: Facility reporting rates DHIS April 2012 – April 2013



We looked at the reported crude consumption data for the previous 13 months period (April 2012 – April 2013):

In adjusting for reporting rates, since different counties had different reporting rates, the DSCMC decided to adjust the consumption per county. This was done to ensure that regional differences in the reporting rates in the light of different malaria epidemiology across the country were taken into consideration.

Table 4: Estimated Annual consumption using DHIS consumption data (May 2012- April 2013)



a. Obtained from DHIS data over the period May 2012 – April 2013. This figure is adjusted for reporting rates and stock in each month over the period.

The data showed a total consumption, for the one year period (May 2012 to April 2013) of **11,618,000 doses**.

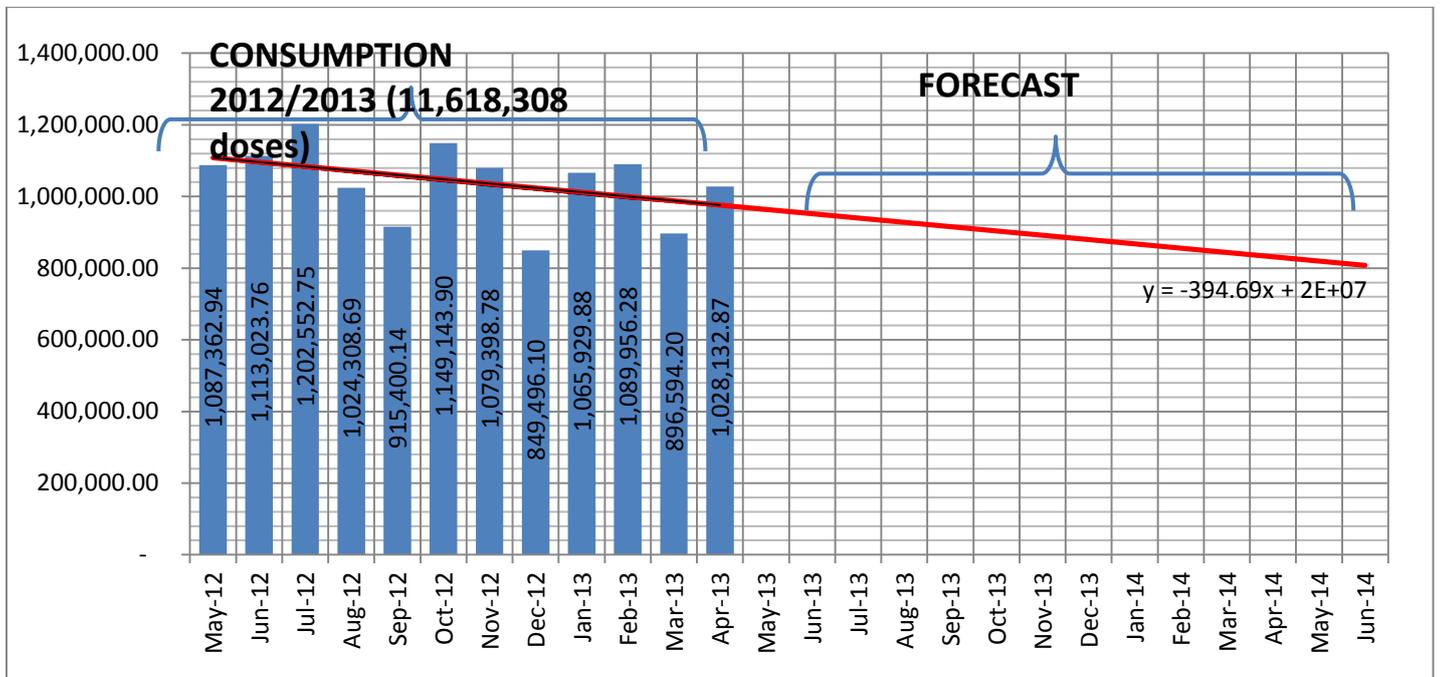
The data from the DHIS was plotted on a graph to show the trends and forecast the consumption for the year 2013/2014.

4.2.2 FORECASTING FOR THE YEAR 2013-2014

4.2.2.1 Assumptions

In order to forecast the annual consumption for the year 2013 to 2014, the committee plotted the monthly consumption and used the excel software to conduct a forecast for the next one year.

This forecast will take into consideration the fact that there is an ongoing roll out of RDTs in the country and the emerging trend of reduced ACTs consumption.



The computed estimated consumption for the year July 2013 to June 2012 is 10,104,130 doses of ACTs.

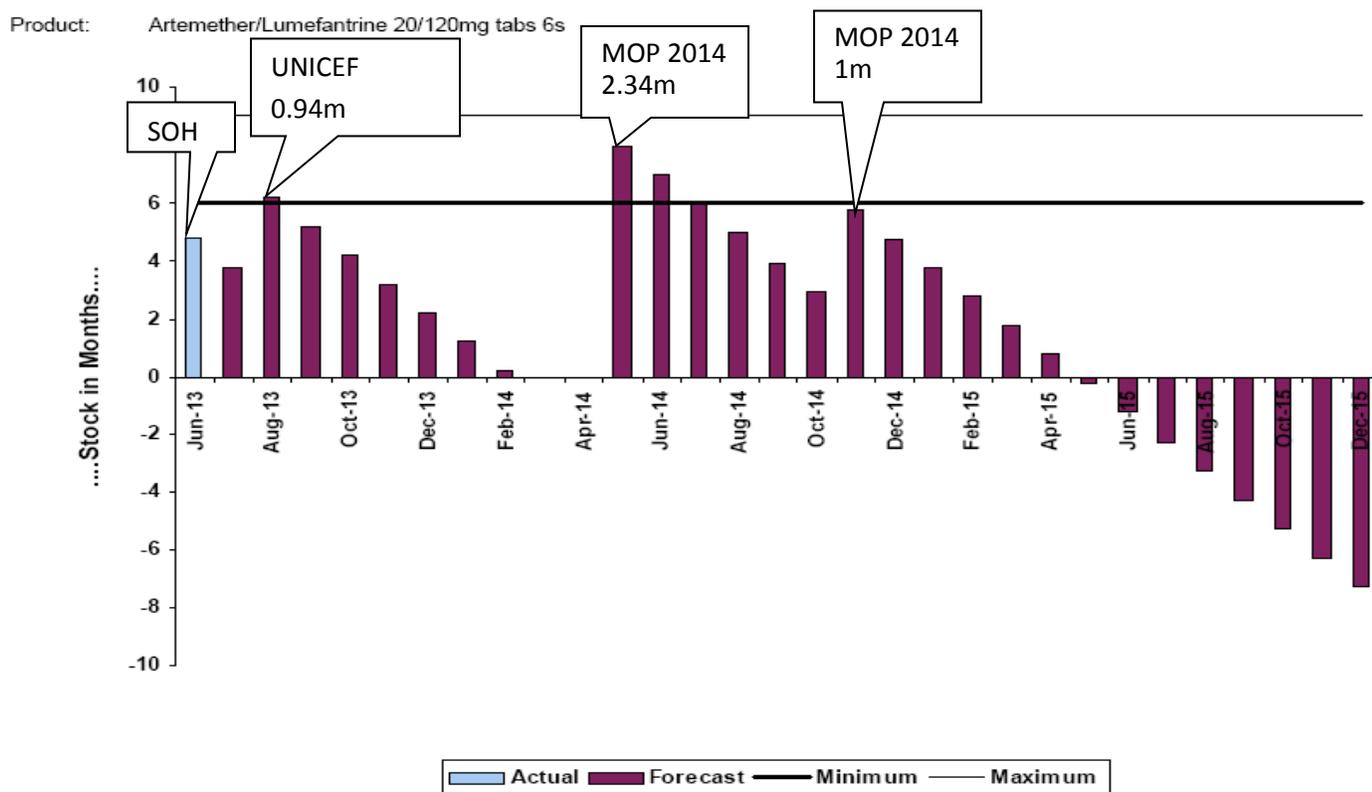
4.3: RESULTS:

Table 5: Projected Annual and monthly consumption for ACTs (July 2013 to June 2014)

	Ratios	Projected Annual Consumption	Projected Monthly Consumption
Artemether Lumefantrine 6s	30%	3,031,239	252,603
Artemether Lumefantrine 12s	20%	2,020,826	168,402
Artemether Lumefantrine 18s	10%	1,010,413	84,201
Artemether Lumefantrine 24s	40%	4,041,652	336,804
		10,104,130	842,011

4.4 Supply Planning for ACTs

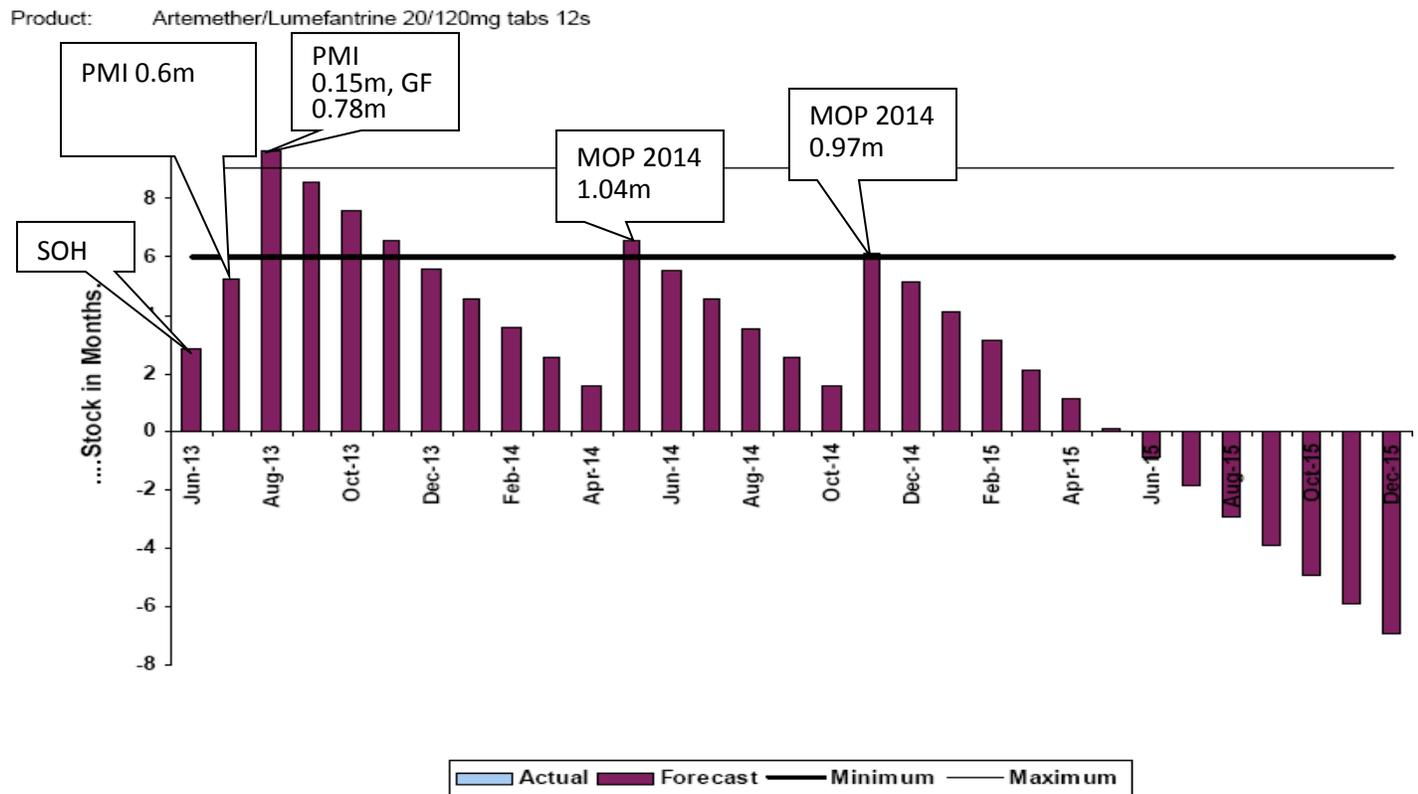
4.4.1: Artemether Lumefantrine 6 tablets per pack, Pediatric formulation:



The country currently has 5 months of stock on Hand. There are about 4 months of stock expected from the Global Fund in August 2013. The average monthly consumption of AL 6s has reduced from **292,239** to **252,603**, largely due to the scale up of RDTs and the increased compliance to the new diagnostics policy by health workers following country wide trainings. Indeed, results from the quality of care survey round 5 showed a consistent increase in the percentage of health workers who follow the malaria treatment guidelines when treating malaria suspected cases.

Based on the current consumption and expected shipments, and planned procurement under the PMI's Malaria Operational Plan 2014, a central level stock out is expected in March 2014 for a period of two months. A procurement of **1,575,000 doses** (Equivalent of 6 months of stock) to be delivered in country before February 2014, needs to be initiated immediately to avert this stock out.

4.4.2: Artemether Lumefantrine 12 tablets per pack, Pediatric formulation:

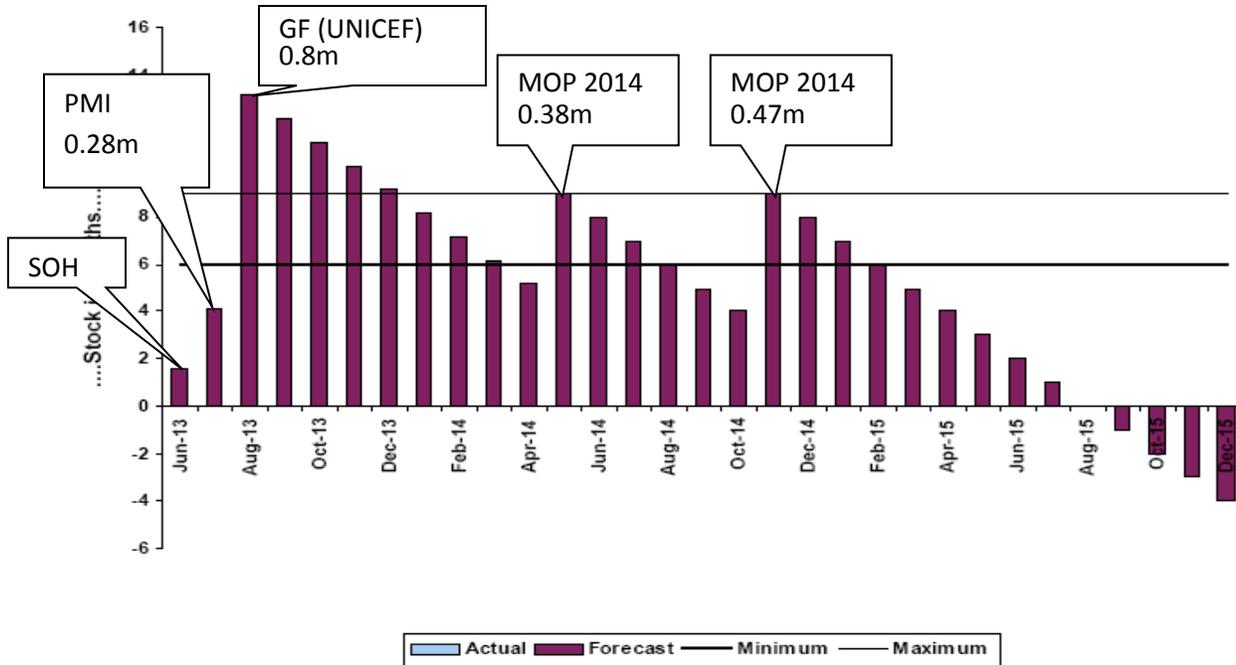


The country currently has 3 months of stock of AL 12s with about 8 months of stock expected from Global Fund and PMI in July and August 2013. The average monthly consumption of AL 12s has reduced from 193,638 to 168,402 largely due to the scale up of RDTs and the increased compliance to the new diagnosis policy by health workers following the countrywide trainings.

Based on the current consumption, expected shipments and planned procurements under PMI's Malaria Operational Plan, a procurement of **1,050,000 doses** (Equivalent to six months of stock) to be delivered before February 2014 to keep the central level of stock at optimal stock level.

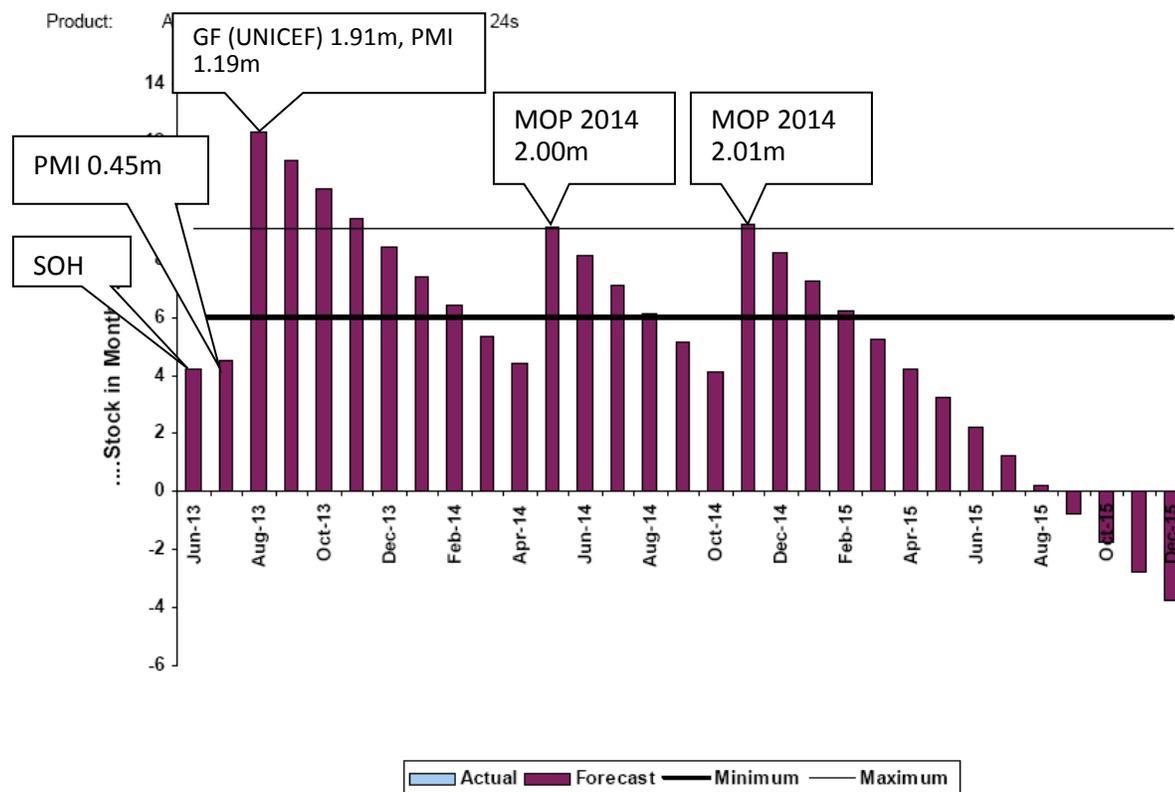
4.4.3: Artemether Lumefantrine 18 tablets per pack Adult formulation:

Product: Artemether/Lumefantrine 20/120mg tabs 18's



The central level stock and stock in pipeline for AL 18s is optimal and no procurements are required this year.

4.4.4: Artemether Lumefantrine 24 tablets per pack Adult formulation



AL 24s Notes

The central level stock and stock in pipeline for AL 24s is optimal and no procurements are required this year.

5.0 SULPHADOXINE – PYRIMETHAMINE

5.1 Treatment regimen

The current recommended medicine for IPTp is SP tablets (500mg Sulfadoxine + 25mg Pyrimethamine) given as a dose of three tablets upon presentation of the patient in an Antenatal care clinic. It is administered as three or four doses, each a month apart, after quickening to ensure protection against malaria.

The morbidity-based method combined with demographic estimates was used for quantification of SP for endemic regions of Nyanza and Western only, as these are the only areas that IPTp is currently being done in Kenya. .

5.2 Methodology

The analysis of SP consumption data from September 2009 – February 2011 found that there was no standard dosage form used to collect the consumption data as both tablets and tins of 1000s were being used. To correct this error in reporting, the DOMC revised the health facility monthly summary report to capture the number of women receiving IPTp so as to make a comparison between patients receiving IPTp and tablets consumed. Furthermore, SP is still used for treatment of uncomplicated malaria in some facilities making it difficult to establish the ‘real’ consumption.

Quantification of SP was therefore carried out using assumed Malaria In pregnancy cases based on a number of assumptions indicated below:

5.3 Specific assumptions

1. The expected number of pregnancies in the endemic areas of Nyanza and Western was expected to be 4% of the total population in the regions.
2. Number of pregnant women to receive IPTp was set to 80%, which was the national target in Malaria Strategic plan.
3. Each pregnant woman will receive a total of 4 doses, each 1 month apart after quickening (National Malaria STGs, 2010)
4. Kenya usually packs SP tablets in tin sizes of 1000 tablets, hence the final requirement of SP is based on the pack size of 1000 tabs per tin.

5.4 RESULTS

Table 6. Quantification of SP needs in the country

Sulphadoxine Pyrimethamine IPTp Requirements 2013 - 2016					
	2013	2014	2015	2016	Assumptions
Total population in endemic areas by year based on the NSP	12,313,981	12,674,215	13,045,400	13,427,853	expected percentage of pregnant = 4% of population living in areas of stable transmission
Expected number of pregnancies annually in targeted areas	492,559	506,969	521,816	537,114	4% of population
Number of pregnant women to be targeted annually = 80% of pregnant women	394,047	405,575	417,453	429,691	Multiply total number of pregnant women living in targeted areas by the targeted percentage coverage (80%)
Number of IPTp doses per woman (based on 4 ANC attendances)	4	4	4	4	National policy on 4 ANC scheduled visits and IPTp guidelines of IPTp dose every 4 weeks
Total number of IPTp doses	1,576,190	1,622,299	1,669,811	1,718,765	Multiply number of pregnant women in target area by number of doses
Total Number of SP tabs	4,728,569	4,866,898	5,009,434	5,156,296	3 Tabs per dose
Number of SP Tins Required	4,729	4,867	5,009	5,156	Total Tabs divide by 1000

Recommendation:

No procurement of SP is required in the current financial year. Close monitoring of movement of existing stocks at KEMSA is required to determine future procurements.

6.0 DIHYDROARTEMESININ PIPERAQUINE (DHAP)

6.1 Treatment Regimen

The recommended second line treatment for uncomplicated malaria in Kenya is Dihydroartemisinin-piperazine (DHAP). This is currently available as a fixed-dose combination with adult tablets containing 40 mg of dihydroartemisinin and 320 mg of piperazine, and paediatric tablets containing 20mg dihydroartemisinin and 160mg of piperazine. It is administered once daily for three days at a dose of 4 mg/kg/day dihydroartemisinin and 18 mg/kg/day for piperazine, with a therapeutic dose range between 2–10 mg/kg/day of dihydroartemisinin and 16–26 mg/kg/day of piperazine.

6.2 Methodology

In determining the quantity of DHAP required, it is assumed that the number of treatment failures will be 5% of uncomplicated cases given the 95% efficacy of AL. The number of tablets required per day was determined by computing the median patient weight (for each of the four weight bands) multiplied by the median dose of piperaquine required to achieve therapeutic efficacy (21 mg/kg/dose) and divided by the quantity of piperaquine per tablet (160 mg for the pediatric and 320 mg for the adult tablet). For each of the computed doses, the dosing for Dihydroartemisinin was checked to ensure that it is within the therapeutic dose range (2-10 mg/kg/dose).

6.3 Results

QUANTIFICATION OF DIHYDROARTEMESININ/ PIPERAQUINE											
Weight category	Median weight	Ratio of patients seen (%)	Number of doses of AL required	Patients expected to require 2nd line treatment	Number of DHAP tablets per dose	Number of tablets per dose rounded off to nearest tablet	Number of tablets per day	Number of tablets for whole 3 days course	To the nearest tablet	Total number of tablets required	Packs
160 mg Tablets											
5-14 kgs	10.00	30.00	3,150,000	157,500	1.31	1.50	1.50	4.50	5.00	787,500.00	262,500
15-25 Kgs	20.00	20.00	2,100,000	105,000	2.63	3.00	3.00	9.00	9.00	945,000.00	315,000
				262,500							577,500
320 mg Tablets											
25-34 Kgs	30.00	10.00	1,050,000	52,500	1.97	2.00	2.00	6.00	6.00	315,000.00	105,000
35+ Kgs	60.00	40.00	4,200,000	210,000	3.94	4.00	4.00	12.00	12.00	2,520,000.00	840,000
Total			10,500,000	262,500							945,000
Total Number of packs											1,522,500

7.0 Quantification for Severe Malaria

The DSMSC utilised Quinine injection consumption data collected from April 2012 to April 2013 as the basis for the consumption-based quantification of medicines for severe malaria because it was found to be fairly accurate. There are currently three options for the treatment of severe malaria: Quinine, Artesunate and

Artemether. New evidence suggests that Artesunate, when used to treat severe malaria, is more effective and leads to reduced mortality from malaria³.

In light of this evidence, the committee quantified for the country's needs for Quinine and Artesunate only for the treatment of the population with severe malaria.

Quinine is procured by KEMSA through government funding and is routinely distributed to all public health facilities.

Artesunate was normally procured through donor funding for epidemic response preparedness, but this will change during the FY 2013 – 2014, as the treatment protocol has changed from Quinine to Artesunate, but both products have been quantified for this financial year as quinine can still be used in the absence of Artesunate.

7.1 Assumptions

- The weight band ratios for uncomplicated malaria were assumed to also apply for severe malaria.
- Parenteral therapy is given for an average of 3 days
- The average continuation phase for all severe malaria cases is 4 days.
- Once an ampoule is opened, it will be discarded after the first dose is administered
- Quinine and Artesunate will be quantified exclusive of each other because Artesunate is expected to substitute Quinine under the new WHO recommendations. The F&Q team decided to determine what the country would require if either of the two were used for case management.
- Needles, syringes, gloves and other medical commodities required for parenteral administration of antimalarial injections are not included in this quantification. It is assumed that these will be quantified alongside other non pharmaceuticals.

7.2 Quinine Di-hydrochloride injection

7.2.1 Treatment regimen

Quinine dihydrochloride is indicated for the management of severe malaria and is administered parentally (IV/ IM). In both adults and children, a loading dose of 20 mg per kg is given followed by maintenance dose of 10mg/kg (max 600mg) every 8 hours, until the patient can take oral medication.

³ Dondorp AM, Fanello CI, Hendriksen IC, Gomes E, Seni A, et al, Artesunate versus quinine in the treatment of severe falciparum malaria in African children (AQUAMAT): an open-label, randomised trial. Lancet. 2010 Nov 13; 376(9753):1647-57. E pub 2010 Nov 7.

7.2.2 Methodology

To quantify the country's requirements of quinine injection, we used consumption data from the DHIS2. The consumption of quinine ampoules (300mg/ml, 2ml ampoules) reported from the DHIS was adjusted for both stock outs and the average reporting rates over the 13 months, and adjusted to 12 months to get an annual consumption figure.

7.2.3: Results

Table 7: Projected doses of Quinine injection ampoules

Total adjusted aggregated consumption of quinine ampoules (a)	Annual consumption (b)	Total Requirements (c)
1,498,063	1,382,827	1,382,827

Footnotes for Table 7:

- a) Total quantity of quinine injection consumed over 13 months period obtained from DHIS data and adjusted for stock-outs and reporting rates.
- b) Annual consumption computed as (a) / 13 x 12
- c) Total estimated country requirements: (c) = (b)

7.3 Quinine sulphate tablets

7.3.1 Treatment regimen

Quinine sulphate (available as 300mg tablets) is indicated for the continuation phase in the management of severe malaria. In both adults and children, quinine tablets are administered at a dose of 10 mg/kg every 8 hrs (up to a maximum of 600mg daily) to complete 7 days of quinine therapy.

7.3.2 Methodology for quinine sulphate tablets

The consumption data for quinine tablets from the DHIS was found to be unreliable due to use of varied units of issue for reporting (some facilities reported consumption in tins of 1000 tablets while others reported in unit tablets) resulting in inaccurate data.

Therefore, the Quinine Injection consumption was used to derive the expected number of severe malaria cases for the continuation phase – disaggregated by weight band using the ratios previously determined under section 3.1.

This was followed by a computation of the total number of quinine tablets required per weight band assuming a total of four days of oral therapy. The number of severe malaria patient cases estimated by this method was also used in the estimation of requirements for Artemether as well as Artesunate (IV and Rectal).

7.3.3 Results

Table 8: Projected quantities of Quinine Tablets

Weight band category	Ratio	Median weight	Total Estimated annual consumption (amps)	Number of cases	Tablets per dose	Total Number of tablets required per case	Quantity required of quinine tablets	Total quantity (including six months buffer stock)
(a)		(b)	(c)	(d)			(e)	(f)
5 - 15kgs	30.00%	10	414,848	69,141	0.5	6	414,848	622,272
15 - 25 kgs	20.00%	20	276,565	46,094	1	12	553,131	829,696
25 - 34 kgs	10.00%	30	138,283	15,365	1	12	184,377	276,565
Above 35 kgs	40.00%	60	553,131	55,313	2	24	1,327,514	1,991,271
Total	100.00%		1,382,827	185,913			2,479,870	3,719,805

Footnotes for Table 8:

- (a) Weight bands
- (b) Median weight for each weight band
- (c) The total estimated annual consumption of quinine injection based on the ratios per weight band and the respective expected number of ampoules per patient.
- (d) The total number of cases of severe malaria, computed from the average number of ampoules per patient as per recommended dosing schedule. It was assumed that each ampoule was used only once and discarded.
- (e) Total number of tablets required to treat patients as per recommended dosing schedule.
 - a. 5-15kg: were assumed to be taking half a tablet per dose
 - b. 15-25Kg and 25-35kg: were assumed to be taking one tablet per dose
 - c. ≥35kg: were assumed to be taking 2 tablets per dose
- (f) The number of tablets in (e) plus six months of buffer stock.

7.4 Artesunate injection

Artesunate can also be used for severe treatment of malaria since it is able to rapidly reduce the parasite load. The administration of Artesunate injection (IM and IV) is easier compared to quinine and therefore easier to use in health facilities without the capacity for IV treatment.

7.4.1 Treatment regimen

Artesunate is administered by the IM/IV route at 2.4 mg/kg to start, then 2.4 mg/ kg at 12 hours, 24 hours, and 48 hours. After that it is assumed all patients will be able to tolerate oral medicine.

7.4.2: Methodology

Refer to 7.3.2 above.

7.4.3 Results

Table 9: Requirements of Artesunate 60mg/amp injection ampoules

ARTESUNATE INJECTION FOR MALARIA CASE MANAGEMENT								
Artesunate 60mg injection								
Weight band (kg)	Median weight	Projected number of severe malaria cases	Amps per dose	Round off to nearest amps	Number of amps per patient	Total amps	6 Months Buffer stock	Total
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
4-14 kgs	10	69,141	0.4	1	4	276,565	138,283	414,848
15-25 kgs	20	46,094	0.8	1	4	184,377	92,188	276,565
25-35 kgs	30	15,365	1.2	2	8	122,918	61,459	184,377
Above 35 kg	60	55,313	2.4	3	12	663,757	331,878	995,635
		185,913				1,247,617	623,809	1,871,426

Footnotes for Table 9:

- (a) Patient category per weight band.
- (b) Median weight per weight category
- (c) Projected number of severe malaria cases computed from quinine injection consumption figures (Table 14, column d).
- (d) Number of ampoules per patient per dose computed as per the recommended dosing schedule.
- (e) Total number of ampoules required to treat a patient as per the recommended dosing schedule assuming that the patients are able to take oral medication after 48 hours.
- (g) (Cxf) giving the total number of ampoules required.
- (i) Total country requirement after adding six months of Buffer stock

7.5 Rectal Artesunate

In the absence of quinine injection, the guidelines also recommend that rectal Artesunate can be used to initiate treatment in cases of severe malaria.

7.5.1 Treatment regimen

It is administered at a dose of 10mg/kg. A second dose may be given after 24 hours if the patient is unable to access parenteral therapy.

7.5.2: Methodology

Refer to 7.3.2 above.

7.5.3 Specific Assumptions

- The number of patients requiring pre-referral treatment are estimated by the DOMC at 50% of all severe malaria cases
- Rectal Artesunate capsules will be used for pre referral treatment in children under 25 kgs.
- The 50mg capsule will be used for 5-15kg patients while the 200mg capsule will be used for 15-25 kg patients.
- Each child will receive two doses of the rectal Artesunate.

7.5.4 Results

Table 10: Requirements of rectal Artesunate for pre-referral care

Artesunate rectal capsules for pre-referral treatment

Weight band (kg)	Median weight	Projected number of severe malaria cases	patients requiring pre-referral treatment	Capsules per dose	Number of doses	Total per patient per patient	Total capsules required	6 months Buffer stock	Total
(a)	(b)	(d)		(e)	(f)	(g)	(h)	(i)	(j)
50mg/cap formulation									
4-14kg	10	69,141	34,571	2	2	4	138,283	69,141	207,424
200mg/cap formulation									
15-25kg	20	15,365	7,682	1	2	2	15,365	7,682	23,047

Footnotes for Table 10:

- (a) Refers to the various weight categories
- (b) Refers to the median weight for each weight category
- (c) Estimated number of severe malaria cases per weight category, computed from quinine injection consumption figures (Table 13, column d)
- (d) The number of patients requiring pre-referral treatment (estimated by the DOMC at 50% of all severe malaria cases).
- (e) Refers to the number of capsules required per dose for a patient within the weight category.
- (f) Refers to the total quantity of Artesunate capsules required per patient
- (g) The total country requirements per year.
- (h) The total country requirements after adding six months buffer stock.

8.0. RAPID DIAGNOSTIC TESTS (RDTs)

8.1 Methodology

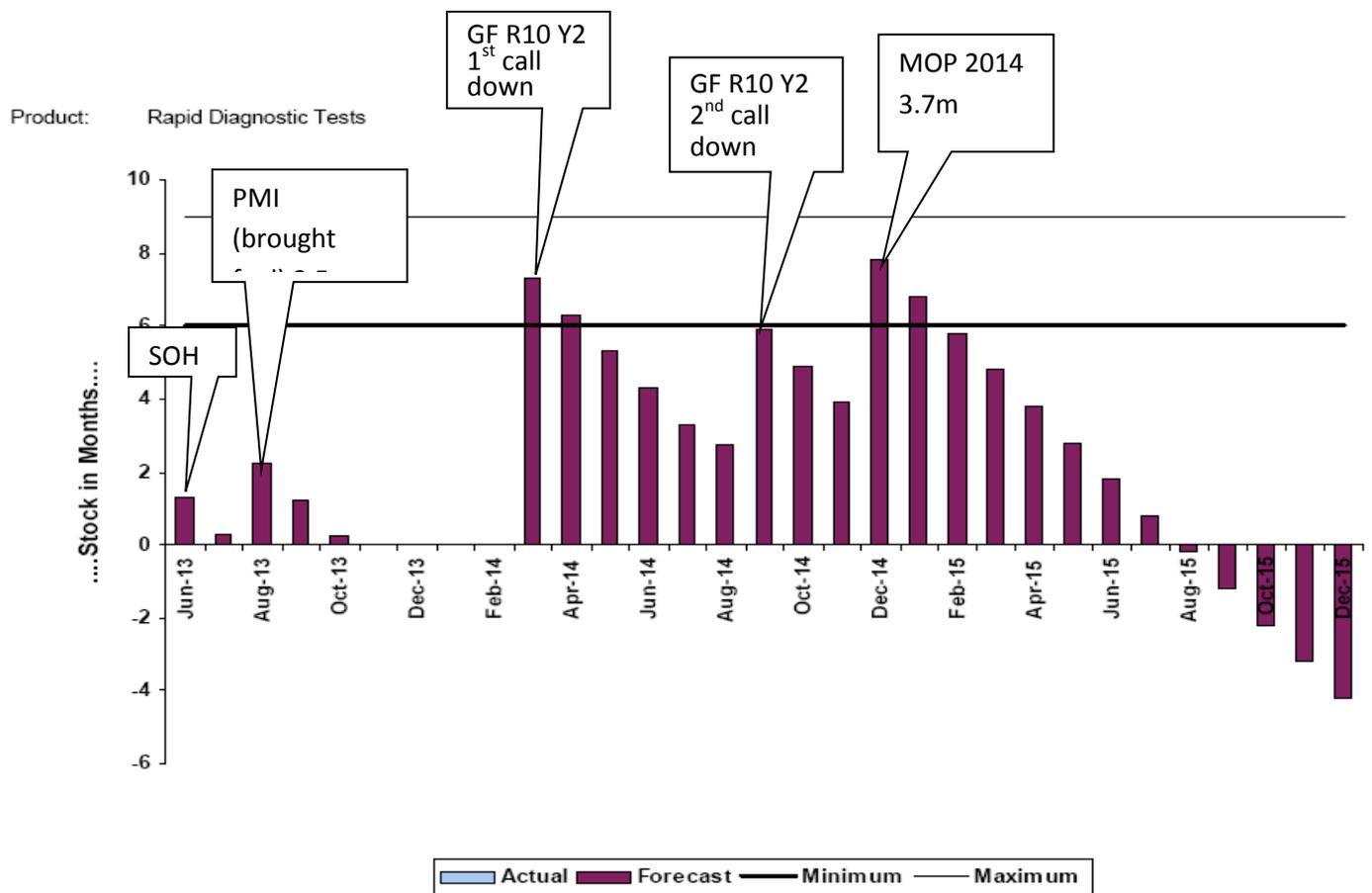
For the quantification for RDTs for FY 2013/ 2014, there being no accurate consumption data available from the DHIS2 or LMIS platform. DSCSM decided to use the gap analysis for RDTs used by the global fund.

Several assumptions are made in this analogy as indicated in the table low:

Table 11 Gap Analysis for RDTs

	2013	2014	2015
Malaria cases following reduction in vector control	16,161,364	17,625,532	19,151,743
Approximate number of fever cases requiring parasitologic diagnosis	32,322,729	35,251,064	38,303,485
Country target for diagnostic coverage Assumption B2	65%	68%	72%
% coverage of Public sector by RDTs	75%	75%	75%
% coverage of community by RDTs	4.6%	4.6%	4.6%
% coverage of private sector by RDTs	10%	10%	10%
Total RDT needed	12,139,118	13,938,465	15,905,569

RDT Supply Plan



RDT Notes

The country currently has less than two months of stock at Central level with three months of stock expected from PMI in June and August 2013.

The AMC of RDTs has increased from **852,784** to **1,011,593** following the launch of the RDTs and countrywide roll out in the end of 2012 and increased compliance by health workers to the current diagnostic policy following countrywide trainings.

Based on the current consumption, the country will experience a four month central level stock out in November 2013. This is attributed to the loss of 4.4 million tests (approx. 4 months of stock) in the KEMSA fire in January 2013 and an increase in the use of RDTs.

To avert this four month central level stock out, an urgent delivery needs to be done by October 2013 and the delivery of the first global fund consignment due in March 2014, needs to be done immediately to avert a facility level stock out.

9.0 FORECAST FOR ACTs AND RDTs

The DMSC carried out the forecast for ACTs and RDTs based on templates developed during the development of the GFATM round 10 proposal. These were later refined during the international RBM meeting carried out in Kenya and the subcommittee also further refined these based on the latest available data. For purposes of achieving a good forecast, the 2012 and 2013 were taken as baseline years in projecting targets for coverage. The starting point was the consumption data obtained from the quantification exercise. The total number of malaria cases was projected based on the consumption figures and this formed the basis for the next steps in determining the country requirements for ACTs and RDTs across the different sectors. The following key steps were taken in quantifying the commodities;

1. The vector control intervention was taken into account in reducing the number of malaria cases- this was based on the RBM guidelines for the proportion of cases that will reduce following the universal coverage with vector control interventions- the 2010 mass net distribution is the basis for the reduction in cases
2. The number of malaria cases was reduced further following diagnostic coverage.
3. The treatments financed through the GFATM 10 Phase 1 and PMI were taken into account.

9.1 GAP ANALYSIS AND FORECAST FOR ACTs

	2012	2013	2014	2015	2016	2017
Consumption data (Assumption A) extract from malaria quantification report 2013/2014	11,618,308	11,902,957	12,194,579	12,493,346	12,799,433	13,113,019
Total number of malaria cases extrapolated from consumption data (Assumption B)	29,078,119	29,790,533	30,520,401	31,268,151	32,034,221	32,819,059
Target coverage						
National target coverage of malaria cases % (Assumption C)	75.0%	77.5%	82.5%	87.5%	87.5%	87.5%
Total number of malaria cases targeted	21,808,590	23,087,663	25,179,331	27,359,632	28,029,943	28,716,677
Target coverage by sector (Assumption D-G)						
Health Facility	68.3%	68.3%	68.3%	68.3%	68.3%	68.3%
Community Case Management	2.1%	4.6%	4.6%	4.6%	4.6%	4.6%
Private Sector	29.6%	27%	27.1%	27.1%	27.1%	27.1%
Number of treatments required (Assumption H)						
Health Facility	14,895,267	15,768,874	17,197,483	18,686,629	19,144,451	19,613,490
Community Case Management	457,980	1,062,033	1,158,249	1,258,543	1,289,377	1,320,967
Private Sector	6,455,343	6,256,757	6,823,599	7,414,460	7,596,115	7,782,219
Total	21,808,590	23,087,663	25,179,331	27,359,632	28,029,943	28,716,677
Factor in decreasing consumption with vector control (Assumption I)						
No of malaria cases reduced with vector control	4,361,718	6,926,299	7,553,799	8,207,890	8,408,983	8,615,003
Total Number of treatment after subtracting number reduced vector control (2.4.4 - 2.5.1)	17,446,872	16,161,364	17,625,532	19,151,743	19,620,960	20,101,674
Factor in decreasing consumption with increasing diagnosis (Assumption J)						
Percentage diagnosis - Public Sector	47.9%	58%	65%	70%	75%	80%
Percentage diagnosis - Private Sector	10.0%	10%	15%	20%	20%	20%
Percentage negative tests	50%	50%	50%	50%	50%	50%
Correcting for compliance	57.8%	68.0%	75%	80%	90%	90%
No of malaria cases reduced with increasing diagnosis Health facility	1,650,190	2,176,735	2,934,321	3,662,579	4,522,877	4,942,600
No of malaria cases reduced with increasing diagnosis community						

	50,738	146,603	197,626	246,674	304,615	332,884
No of malaria cases reduced with increasing diagnosis private	149,303	148,911	268,679	415,210	478,555	490,280
Total Number of treatment after subtracting number reduced due to increasing diagnosis (2.5.2 - 2.6.4)	15,647,379	13,835,718	14,422,532	15,073,954	14,619,528	14,668,794
Proportion of malaria cases by sector (Assumption K)						
Health Facility	68.3%	68.3%	68.3%	68.3%	68.3%	68.3%
Community Case Management	2.1%	4.6%	4.6%	4.6%	4.6%	4.6%
Private Sector	29.6%	27%	27%	27%	27%	27%
Number of malaria cases by sector						
Health Facility	10,266,024	8,861,476	9,103,918	9,418,061	8,878,239	8,786,844
Community Case Management	315,646	596,820	613,148	634,306	597,949	591,793
Total need public sector	10,581,670	9,458,296	9,717,066	10,052,367	9,476,188	9,378,637
Total Private Sector	5,014,971	4,230,819	4,507,840	4,774,912	4,838,725	4,957,274
No. of treatments financed public sector (Assumption L)	4,185,000	8,317,194	4,000,000	4,000,000	4,000,000	4,000,000
No. of treatments financed private sector (Assumption L)	15,890,000	4,230,819	4,507,840	2,136,370		
Gap in ACTs needed public sector(2.7.7- 2.8.1)	6,396,670	1,141,102	5,717,066	6,052,367	5,476,188	5,378,637
Gap in ACTs needed private sector (2.7.8 - 2.8.2)	-	10,875,029	-	2,638,542	4,838,725	4,957,274

The quantification of ACTs took into account the following assumptions;

ASSUMPTIONS OF ACT GLOBAL FUND FORECASTING.

ASSUMPTION A: The projected requirement of ACTs by year. Consumption data is preferred where available, but if not available, other methods can be used to determine this forecast such as epidemiological projections.

ASSUMPTION B: Where data are from the HMIS or other surveys have been used for assumption A above, this should be corrected to reflect the entire population intended for coverage.

ASSUMPTION C: This is the proportion of malaria cases that are treated with ACTs as aligned with the targets in the National Malaria Strategy over the period of the gap analysis

Multiply the total number of malaria cases (2.2) by the target coverage (2.3.1.1)

ASSUMPTION D: This is the proportional contribution to access from each sector. This applies to public, community case management and private sector.

ASSUMPTION E: ACT deployment through Health facilities

%

ASSUMPTION F: ACT deployment through Community Case Management %

ASSUMPTION G: ACT deployment through the private sector %

ASSUMPTION H: Derive by multiplying the total number of malaria cases targeted by the % coverage expected for each sector. Apply this to the different sections below

ASSUMPTION I: Where local data on reducing cases with universal coverage for vector control is available, use this data. Where this data is not available, with Universal coverage to be attained assume a 10%, 20% and 30% reduction in malaria cases for the year following universal coverage.

ASSUMPTION J : Factor in decreasing consumption as a result of increased parasitological diagnosis taking into account slide positivity rates and parasitological diagnosis coverage

ASSUMPTION K: This is derived by determining the proportionate contribution of 2.4.1, 2.4.2 and 2.4.3. This is then used to allocate the total malaria cases (line 30) to the various sectors below.

ASSUMPTION L: This is the number of ACT already financed or available over the projected period.

9.2GAP ANALYSIS AND FORECAST FOR RDTs

The forecast for RDTs began with the number of malaria cases following vector control reduction factor. The following were taken into consideration in the forecast;

1. The fever cases is double the number of malaria cases
2. The diagnostic coverage for the country was taken into account
3. The share of diagnosis between RDT and microscopy was taken as 75%, 25% for RDT and microscopy respectively (based on the fact that there are approximately 3,000 level 2 and 3 facilities out of 4,000 facilities).

The figures in the table below were obtained.

9.2GAP ANALYSIS AND FORECAST FOR RDTs

GAP ANALYSIS FOR RDTs						
	2012	2013	2014	2015	2016	2017
Malaria cases following reduction in vector control	17,446,872	16,161,364	17,625,532	19,151,743	19,620,960	20,101,674
Approximate number of fever cases requiring parasitological diagnosis	34,893,743	32,322,729	35,251,064	38,303,485	39,241,921	40,203,348
Country target for diagnostic coverage Assumption B2	55%	65%	68%	72%	72%	72%
% coverage of Public sector by RDTs	75.0%	75%	75%	75%	75%	75%
% coverage of community by RDTs	2.1%	4.6%	4.6%	4.6%	4.6%	4.6%
% coverage of private sector by RDTs	10%	10%	10%	10%	10%	10%
Total RDT needed	10,416,871	12,139,118	13,938,465	15,905,569	16,295,256	16,694,490
Available RDTs (already financed from any source)	9,174,874	12,127,165	14,730,746	4,792,281		
Final Gap of RDTs needed	1,241,997	11,953	(792,281)	10,321,007	16,295,256	16,694,490

In arriving at the RDT requirements, the following were taken into consideration;

1. 60% of OPD attendance is due to fever causing infections including malaria
2. Half of these are due to malaria hence to determine the fever cases, the number of malaria cases after factoring in universal LLIN coverage are multiplied by two to determine the approximate number of fever cases
3. The diagnostic coverage is as the ACT projections
4. The RDT share is 75% based on the assumption that the level 2 and 3 facilities take up to 75% of the malaria burden(there are 3000 level 2 and 3 facilities out of approximately 4,000 facilities

10.0 RECOMMENDATIONS

Recommendations for the DOMC

Immediate

- Based on the proposed call down schedules, initiate the call-down of 100% of the PMI commodities to avert a stock out.
- Initiate the procurement of RDT from the Global Fund considering the lead time of one year from the previous procurement cycle, and ensure the delivery of the PMI RDTs to avert a stock.
- Based on the fact that KEMSA is overstocked with Sulphadoxine/Pyrimethamine (SP) tablets, the DOMC should communicate with KEMSA, via the Department of Pharmacy, to ensure that no further SP is procured for the public sector for the present financial year. A donation plan can also be implemented to reduce wastage due to expiries.
- The current quinine stock should be utilized and no more should be purchased this year due to the change in policy to Artesunate injection for the treatment of severe malaria.
- Continue to monitor the stock situation on a monthly basis to enable prompt response to emerging issues.

Medium term

- There should be a fallback plan to allow for direct procurement of antimalarials, when delays in the regular procurement process are eminent.
- The government of Kenya should increase funding for first line antimalarials
- There should be regular monitoring of the procurement process as well as management of the contracts.
- The Drug supply Management sub-committee should have a six month review of this quantification exercise due to changing trends.
- The Drug Supply Management Sub-Committee should continue to play their role in the facilitation of all urgent and system issues that are within their scope of responsibilities to improve management of malaria medicines.
- The supportive supervision role of health facilities by the County Health Management teams and Malaria focal persons should be strengthened to allow for improved inventory management and continuous flow of timely and accurate consumption data for decision making.
- The Logistics Management Information system for malaria medicines should be strengthened to ensure increased reporting rates as well as improved data quality.

- Findings from the Bi-annual Pharmaceutical Management of Malaria Medicines assessments/ Quality of care surveys that seek to establish the status of pharmaceutical indicators should be utilized to provide input into the annual quantification exercise.
- Continuous monitoring of the stock situation in the country is important to ensure timely identification of gaps in the supply chain leading to early solutions that will ensure improved access to Malaria commodities.

10.0 Limitations of the quantification process

- The DSMSC also acknowledge that the reporting rates from facilities need to increase in order that the quantification gives more precise reports. The committee is working with all the relevant stakeholders to ensure measures are put in place to realize improved data quality and reporting rates.

11.0 REFERENCES

- 1) Division of Malaria Control/Ministry of Public Health & Sanitation, Kenya. 2009. *National Malaria Strategy, 2010–2017*. Nairobi: DOMC/MOPHS, Kenya.
- 2) MOMS & MOPHS. 2010. *National Guidelines for Diagnosis, Treatment and Prevention of Malaria in Kenya*. Nairobi: DOMC/MOPHS, Kenya.
- 3) DOMC/MoPHS, KNBS & NCAPD. 2009. *2007 Kenya Malaria Indicator Survey*. Nairobi: DOMC/MOPHS, Kenya.
- 4) Central Bureau of Statistics (CBS) [Kenya], Ministry of Health (MOH) [Kenya], and ORC Macro. 2004. *Kenya Demographic and Health Survey 2003*. Calverton, Maryland: CBS, MOH, and ORC Macro.
- 5) Dondorp AM, Fanello CI, Hendriksen IC, Gomes E, Seni A, et al, Artesunate versus quinine in the treatment of severe falciparum malaria in African children (AQUAMAT): an open-label, randomised trial. *Lancet*. 2010 Nov 13; 376(9753):1647-57. E pub 2010 Nov 7.
- 6) Division of Malaria Control/Ministry of Public Health & Sanitation, Kenya. 2008. *A Modus Operandi for the Annual National Quantification of Antimalarial Medicines in Kenya*. Nairobi: Division of Malaria Control
- 7) Management Sciences for Health & the World Health Organization. 1997. "Quantifying Drug Requirements" in *Managing Drug Supply: The Selection, Procurement, Distribution and Use of Pharmaceuticals*. 2nd Edition, 1997. West Hartford, CT: Kumarian Press, Inc.
- 8) Management Sciences for Health & the World Health Organization. 2007. *International Drug Price Indicator Guide*. 2010 edition. Cambridge, MA: Management Sciences for Health.
- 9) Amin, A., Tetteh, G., et al. 2007. *Quantification of Artemether Lumefantrine and other antimalarial medicines for Year 2 of ACT Policy implementation in Kenya*. Submitted to the U.S. Agency for International Development by the Rational Pharmaceutical Management Plus Program. Arlington, VA: Management Sciences for Health
- 10) Division of Malaria Control/Ministry of Public Health & Sanitation, Kenya. 2008. *Antimalarial Medicine Requirements for July 2008- June 2009: Report of the Drug Supply Management Sub-committee*. Nairobi: DOMC/MOPHS, Kenya.
- 11) Division of Malaria Control/Ministry of Public Health & Sanitation, Kenya. 2009. *Antimalarial Medicine requirements for July 2009 - June 2010: Report of the Drug supply Management sub-committee*. Nairobi: DOMC/MOPHS, Kenya.

12) Division of Malaria Control/Ministry of Public Health & Sanitation, Kenya. 2010. *Antimalarial Medicine and diagnostics Requirements for July 2010 – June 2011: Report of the Drug Supply Management Sub-Committee*. Nairobi: Division of Malaria Control/MOPHS, Kenya.

APPENDIX

Appendix 1: Workshop Participants List

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