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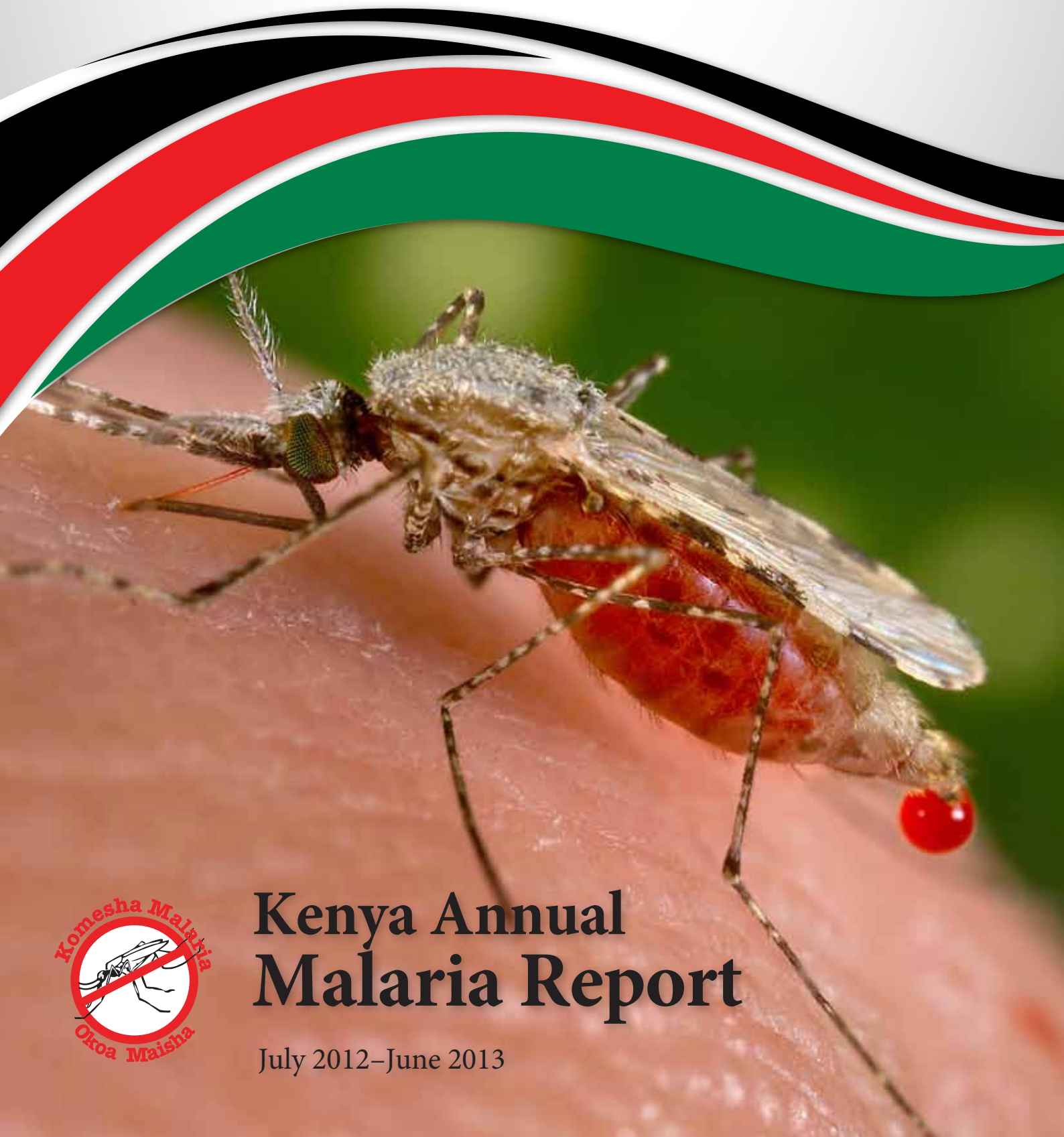
Kenya Annual
Malaria Report

July 2012–June 2013

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Division of Malaria Control

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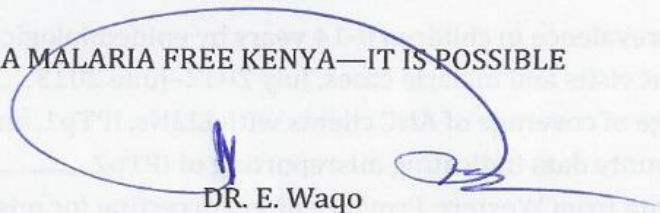   Email: head.domc@domckenya.or.ke

FOREWORD

Malaria remains one of the most commonly diagnosed ailments in out-patient departments of Kenya's health facilities. This was recognized in the formulation of the National Malaria Strategy (NMS 2009–2017), which has a goal to reduce morbidity and mortality caused by malaria in the various epidemiological zones by two-thirds of the 2007–2008 level by 2017. Achievement of this ambitious goal is pegged to implementation of the objectives, strategies, and activities that are detailed in the NMS strategy. The purpose of the annual malaria report is to monitor and report on the performance and progress achieved in each fiscal year during implementation of the NMS activities.

In view of the devolution of public services, which began during the 2012–2013 reporting period under the new Constitution of Kenya 2010, the national malaria program needed to review its business model and reprogram some of its activities to take into account the increased county responsibilities. Even so, Kenya accomplished significant achievements in malaria control during this period. One primary achievement was a reduction in the proportion of cases diagnosed as malaria out of the total outpatient cases recorded at health facilities country wide, an indicator which was reported at 21%, compared with 31% reported in fiscal year 2011–2012. Also during this reporting period, 3 million long lasting insecticidal nets (LLIN) were distributed through the mass net distribution channel, which was the last batch of 10.6 million nets secured with funding in 2010. This distribution contributed to progress toward achievement of the stated target for universal coverage with at least one LLIN for every two people. The malaria control program also rolled out rapid diagnostic tests (RDTs) throughout the country to strengthen diagnosis and manage malaria in the context of the T3 policy—testing, treating and tracking—all malaria cases. Results from the fifth quality-of-care survey showed evidence of positive progress in the quality of services provided at public health facilities in the management of malaria cases.

Despite the significant progress achieved during the current and previous fiscal years, analysis of the financial situation indicates that implementation of some of the NMS activities may not be achieved, primarily because of the continued lack of resources, delays in disbursement of committed resources, and delayed deliveries of malaria commodities. Even where activities have been implemented, the targeted outcomes have not been achieved because of factors such as reluctance to change behavior among recipients of certain interventions, such as the use of LLINs, indicating a need for increased advocacy and behavior change communication. The need to strengthen reporting and monitoring of malaria outcome and impact indicators also remains.

Finally, I would like to extend our gratitude and appreciation to all our partners who have supported implementation of NMS activities and programme management by providing funding, technical assistance, research, training, and other support. Let us continue to work together to achieve further progress and impact on malaria control in Kenya.

A MALARIA FREE KENYA—IT IS POSSIBLE

DR. E. Waqo

Programme Manager

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ABBREVIATIONS

ACSM	Advocacy communication and social mobilization
ACT	Artemisinin-based combination treatment
AL	Artemether-lumefantrine
AMFm	Affordable Medicines Facility for Malaria
AMREF	African Medical and Research Foundation
ASAL	Arid and Semi-Arid lands
BCC	Behavior change communication
CHEW	Community Health Extension Worker
CHW	Community Health Worker
cMIP	Community MIP
DDSR	Division of Disease Surveillance and Response
DFID	Department for International Development
DHIS	District Health Information Software
DHIS-2	District Health Information Software 2
DHIRO	District Health Records Information Officer
DOMC	Division of Malaria Control
DRH	Division of Reproductive Health
EMA	Essential Malaria Actions Guide
EPR	Epidemic Preparedness and Response
FY	Fiscal Year
Global Fund	The Global Fund to fight AIDS, Tuberculosis, and Malaria
HMIS	Health Management information System
ICD-10	International Classification of Diseases-10
IDSR	Integrated Disease Surveillance and Response
IEC	Information, Education, and Communication
IPTp	Intermittent Preventive Treatment in Pregnancy
IRS	Indoor Residual Spraying
KEMRI	Kenya Medical Research Institute
KEMSA	Kenya Medical Supplies Agency
LLIN	long-lasting insecticide-treated net
LMIS	Logistic Information Management System
M&E	monitoring and evaluation
MCHIP	Maternal and Child Health Integrated Program
MIAS	Malaria Information Acquisition System
MICC	Malaria Interagency Coordinating Committee
MIP	malaria in pregnancy
MIS	Malaria Indicator Survey
NMS	National Malaria Strategy
PMI	United States President's Malaria Initiative
PSI	Population Services International
QA	Quality Assurance
QC	Quality Control
QoC	Quality of Care Survey
RDT	Rapid Diagnostic Test

SBM-R	Standards-Based Management and Recognition
SM&E	Surveillance, Monitoring and Evaluation
SMEOR	Surveillance, Monitoring and Evaluation, and Operations Research
SP	Sulfadoxine-Pyrimethamine
TPR	Test Positivity Rate
TWG	Technical Working Group
UK-AID	United Kingdom aid
UNHCR	United Nations High Commission for Refugees
UNICEF	United Nations Children's Fund
US$	United States Dollar
USAID	United States Agency for International Development
WHO	World Health Organization
WMD	World Malaria Day

EXECUTIVE SUMMARY

An in-depth review of Kenya's National Malaria Program conducted in 2009 concluded that malaria elimination is possible given current technologies and adequate funding, plus strategic investments aimed in the medium-term at expanding malaria-free areas. It was against this backdrop that the National Malaria Strategy (NMS) 2009–2017 vision of a malaria-free Kenya was developed. Kenya uses a combination of globally recommended malaria interventions for malaria control: (a) vector control using integrated vector management, including long-lasting insecticide-treated nets (LLINs), indoor residual spraying (IRS), larval control and environmental management; (b) prompt diagnosis and treatment with effective medicines at all levels of the health system; (c) prevention and treatment of malaria in pregnancy; and (d) public health education aimed at enhancing uptake and appropriate use of interventions. This report summarizes achievements in malaria control from July 2012–June 2013.

Progress in achievement of the NMS 2009–2017 goal is measured primarily through the use of routine malaria mortality and morbidity surveillance data obtained from the Division of Health Management and Information Systems. Based on this data, malaria remains one of the most commonly diagnosed ailments in out-patient departments in Kenya. Out of the 41.8 million out-patient visits form July 2012–June 2013, 8.82 million cases (21%) of suspected malaria were reported. This was a major decrease compared with the 12 million cases (31%) diagnosed from July 2011–June 2012. On average, 735,364 malaria cases were reported each month, of which a monthly average of about 254,294 cases (34.6%) were reported as confirmed through testing by rapid diagnostic testing (RDT) or microscopy.

Over the last 3 years a total of more than 20 million nets have been distributed in malaria-prone areas through free routine net distribution at antenatal care (ANC) and Child Wellness Clinics, the mass net distribution channel, and social marketing. During the 2012–2013 reporting period, 3 million nets were distributed through the mass net distribution channel, which was the last batch of 10.6 million nets secured with 2010 funding commitments. Overall, these net distributions have contributed significantly toward achievement of the stated target for universal coverage of at least one LLIN for every two people. Despite the high net coverage rates, evaluation studies show that net use is still low at 32% in the general population, which indicates a need for continuous advocacy and community mobilization to bridge the gap between ownership and usage.

Another malaria prevention strategy in use since 2000 is IRS. Initially IRS was done only in epidemic prone areas for prevention of epidemics, but subsequently it was introduced in areas of high transmission to reduce disease. During the 2012–2013 reporting period, the finding that the impact of IRS is now threatened by the emergence and spread of insecticide resistance to pyrethriods has necessitated a policy change on the recommended insecticide. The Department of Malaria Control (DOMC) developed a draft Insecticide Resistance Management Strategic Plan to guide implementers on possible ways to prolong the usefulness of the available insecticides for public health in Kenya.

The prevention of malaria in pregnancy continued through implementation of a comprehensive ANC package, which comprises administering at least two doses of intermittent preventive treatment of malaria in pregnancy (IPTp), distributing LLINs, and providing prompt diagnosis and treatment of suspected malaria cases. The percentage of ANC mothers in the endemic regions who received IPTp1 ranged between approximately 70–90%, while coverage with LLINs for ANC mothers remained at 90% and above over the last half of the reporting period. The implementation of this intervention is limited to high endemic areas of the country, in the counties in Western, Nyanza, and Coastal regions.

Approximately 15.7 million treatments of artemether-lumefantrine (AL) were procured and distributed to public and private not-for-profit health facilities in 2012–2013 with funding from the Global Fund Round 10 grant and the U.S. President's Malaria Initiative (PMI). The national RDT launch was in October 2012, and subsequently DOMC embarked on rolling out RDTs in the country to strengthen diagnosis and management of malaria in the context of implementing the World Health Organization's testing, treating, and tracking (3T) policy. Currently, RDTs are supplied to all health facilities, with the main target being the community level and facilities at levels 2 and 3, where microscopes and trained laboratory personnel are in short supply. Unfortunately, during the year DOMC lost 4.3 million RDTs, an equivalent of 4 months of stock in a Kenya Medical Supply Agency (KEMSA) fire in January 2013. This loss resulted in an acute stockout of RDTs and significantly affected the coverage of diagnostics in the public sector, particularly in tiers 1, 2, and 3. The value of the RDTs was estimated at Kshs 180,489,120. At the same time, 130,590 doses of AL 12, valued at Kshs 11,192,829, also were destroyed in the fire.

Although Kenya had adopted the 3T strategy, up to five-fold use of artemisinin-based combination treatment (ACT) was recorded in the 2012–2013 reporting period over the expected target, which was gauged on the number of malaria cases with confirmed laboratory diagnosis. This result indicates that a high percentage of suspected malaria cases are receiving antimalarial treatment with AL without a test for parasites through microscopy or RDTs, which is called for in the national guidelines. This indicates a need to consistently sensitize health workers on the treatment guidelines. The last quarter in the reporting period, however, showed a promising decrease in over-treatment from 400% in April 2013 to 200% in June 2013. The positive trend could be attributed, in part, to an increase in testing capacity of health facilities because of increased availability of RDT kits in the country. With continued expansion of RDT uptake at all health facilities and continued RDT training, it is expected that this discrepancy in the number of AL dispensed and the number of confirmed malaria cases will continue to decrease.

As the Affordable Medicines Facility for Malaria (AMFm) pilot drew to an end, stakeholders in Kenya held a series of meetings to look at post-AMFm pilot scenarios. The stakeholders acknowledged that AMFm generally had increased affordability and access to effective ACTs and eased pressure on the public health system, and therefore, strongly recommended its continuation and expansion. The agreed upon way forward for the program is now to sustain the gains achieved in market share and compliance through similar supporting interventions, such as inspection visits, training private sector health workers, and advocacy. The introduction of community case management in 12 high malaria burden districts in western Kenya planned for implementation in 2012–2013 was not implemented because of the delayed disbursement of resources needed to train at least 2,000 community health workers (CHWs).

A rapid assessment was conducted in epidemic-prone districts to identify the needs and plan the way forward in epidemic preparedness and response in these areas. Malaria surveillance activities in the epidemic prone districts, monitored by malaria case thresholds, insecticide-resistance monitoring, and entomological surveillance in all IRS districts, continued. Weekly malaria surveillance continued through monitoring of malaria case thresholds. All epidemic-prone districts in the western highlands conducted mapping of the epidemic prone areas in their regions.

In the second week of July 2012, a malaria outbreak was detected in Pokot North, when all five sentinel surveillance facilities in the district reported malaria cases above the malaria-action thresholds. The test positivity rates from weekly surveillance data showed an increase from 33% to 59% during outbreak weeks. The occurrence of the outbreak in Pokot County, particularly in Pokot North sub-county, was exacerbated by the long heavy rains that started in April 2012. Long distances to health facilities limited access of health services; hence, many people were not treated in time. An outbreak team responded with medical supplies, strengthening of health care services, and creation of public awareness, all of which contributed to the containment of the outbreak.

The malaria program continued to use the passive data collection model for essential malaria surveillance data. Malaria data for surveillance indicators is obtained from existing routine data reporting systems that include DHIS-2, Logistics Management Information System, and Division of Disease Surveillance and Response (DDSR). Based on this data, the program produced quarterly surveillance bulletins that are used as a scorecard of progress toward achieving the set targets in the National Malaria Control Strategy. The bulletins are used to report on key malaria indicators that are necessary to boost the program's ability to predict, respond to, and monitor malaria situations in the country. Data on these indicators is presented using the essential surveillance graphs, as recommended by the World Health Organization (WHO) and adopted by the DOMC. In addition, the bulletin is also provides counties with an opportunity to showcase their performance in malaria control.

The M&E Technical Working Group developed a malaria surveillance curriculum package that was reviewed internally and externally. The final curriculum package has now been approved by the Ministry of Health for rollout to train health care workers. The curriculum is expected to strengthen malaria surveillance and malaria monitoring and evaluation systems in all four malaria epidemiological zones and seasonal transmission areas by equipping health care workers with the knowledge and skills to carry out surveillance activities. Three data quality audits were completed in the Nyanza region in Busia and Bungoma counties during the 2012–2013 reporting period to improve on data quality of selected malaria indicators.

MCU continued to conduct malaria medicines post-market surveillance and quality assessment, drug efficacy monitoring, entomological surveys, and insecticide resistance monitoring, and the results are being used to inform action by the malaria program. The Fifth Quality of Care Survey (QoC) was completed and the findings disseminated at the national and sub-national levels. The QoC surveys are based on random, nationally representative samples of all public health facilities. Findings revealed that by June 2013, nearly all key indicators on malaria test and treat policy have shown significant improvement since initiation of the QoC surveys in January 2010. The composite performance, defined as "febrile patient tested and treated in accordance with national guidelines," improved from 16% to 50% at all study facilities and from 28% to 55% at facilities with diagnostics and AL in stock. Significant improvements also were observed in parasitological capacity of health facilities with the availability of at least one malaria diagnostic service increasing from 55% to 90%, mainly because of increases in RDT availability following the national rollout.

The main activity undertaken under this strategy was the commemoration of World Malaria Day on April 25, 2013. The national event was held at Moi Girls Kipsitet High School grounds in Kericho County. Development partners and UN agencies, as well as implementing partners and other malaria stakeholders, were represented at the function. "***Invest in the future: defeat malaria"*** is the common theme that partners chose for the Sixth World Malaria Day and the next 3 years to call attention to the big push needed to reach the 2015 Millennium Development Goals and defeat malaria in the future. The Kenyan customized slogan, ***"Pamoja tuendelee kuangamiza malaria,"*** which is in line with the Roll Back Malaria (RBM) theme, emphasizes the importance of strengthening partnerships and inter-sectorial, national, and global commitment in the fight against the deadly disease.

The program collaborated with partners, such as Population Services International, RTI International, and African Medical and Research Foundation (AMREF), mainly in development of suitable advocacy communication and social mobilization (ACSM) messages for dissemination. Community education training also was undertaken in Nyanza, Western, and Coast regions using the newly published community education and training manual and Essential Malaria Actions Guide (EMAs). Some of the other planned activities, such as provision of support for holding quarterly meetings by malaria ACSM groups at all levels, could not be undertaken because of a lack of funding.

The malaria control program continued to benefit from strong, committed partnerships with donors, implementation agencies, and other stakeholders; however integration of malaria control into the health sector planning process needs to be strengthened through inclusion of malaria activities in the medium term expenditure framework (MTEF) at national and county levels. With the implementation of a devolved system of government, the need has now shifted to focus on capacity building of county malaria personnel for malaria control and program management.

A lack of adequate funding prevented the program from providing office equipment and operational support at the regional levels as planned in the NMS; however, the program continued undertaking regular performance reviews that are shared with the partnership through the Malaria Interagency Coordinating Committee (MICC) and biannual review meetings. During the biannual review meeting held in the year, the program's financial performance could not be assessed for all funding sources, and MICC identified a need to discuss funding with partners and define an appropriate mechanism to document financial investments in malaria control in Kenya. MICC also noted that the review information shared and discussed did not always incorporate an assessment of the performance against set periodic targets, as envisaged in the NMS.

Strengthening of the resource mobilization capacity to improve malaria control financing was hindered by delayed recruitment of a planning officer because of delayed funding. The mid-term review of the malaria program was planned during the reporting period, and subsequently was undertaken in July 2013. This exercise is scheduled for completion in fiscal year 2013–2014.

INTRODUCTION

BACKGROUND

The government of Kenya recognizes malaria as a health and socioeconomic burden, and malaria control is a priority investment necessary for realization of Kenya Vision 2030. Malaria is a debilitating disease and a key driver of poverty for the majority of Kenya's population that lives in malaria-prone areas. In the past, the disease also has been consistently responsible for up to 30% of all outpatient consultations in the country's health facilities. The Kenya National Malaria Strategy (NMS) 2009–2017 was developed with the goal of sustaining and enhancing gains achieved during implementation of the previous strategy by scaling-up interventions to universal coverage for all people at risk. The strategy emphasizes prevention and treatment as key strategies for achieving the overall strategic goal of reduction of malaria morbidity and mortality by at least two-thirds of the 2008 levels by 2017.

The NMS 2009–2017 includes an elaborate implementation plan with clear activities, implementation timelines, and budgets. During the 2012–2013 reporting period, the country initiated the devolution of health services to the 47 new counties created according to the new Constitution of Kenya 2010. In view of this devolved system of government, Kenya needed the malaria control program to review its business model and reprogram activities to take into account increased county responsibilities. This annual report summarizes the situation of malaria in Kenya as of June 2013 and provides an insight into malaria control efforts made July 2012–June 2013 by all partners, in line with the NMS implementation plan. The information in the report was obtained through review of relevant reports and other documents, highlighted in Annex A.

EPIDEMIOLOGY OF MALARIA IN KENYA

The epidemiology of malaria in Kenya has been changing over the years. A comparison of previous malaria maps and recently updated malaria prevalence maps shows shrinking malaria-endemic areas and expansion of low-transmission zones. Currently, between 60% and 70% of the country, where 78% of the population lives, has a parasite prevalence of less than 5%. A steady decline in transmission in endemic areas has been characterized by an increase in the prevalent age group, with the highest prevalence among children younger than 5 years to those between ages 5 and 10 years.[1] Nevertheless, according to routine data from public health facilities, malaria accounts for more than 20% percent of outpatient attendance and is a leading cause of death in children under age 5 years.

Kenya has four malaria epidemiological zones, with diversity in malaria risk determined largely by altitude, rainfall patterns, and temperature. Figure 1 shows malaria prevalence by zone. Here is a summary of malaria conditions in Kenya:

- *Endemic zones* are areas of stable malaria transmission around Lake Victoria in western Kenya and along the coast. Transmission is intense throughout the year, with annual percentages of entomological inoculation rates ranging from <10% to >100%. The parasite prevalence rate is estimated at 4.8% P_fPR and 38% P_fPR for the Coastal and Lake endemic regions, respectively.
- *Seasonal malaria zones* include semi-arid areas in northern, eastern, and southeastern parts of the country that experience short periods of intense malaria transmission during

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[1]Division of Malaria Control, Kenya National Bureau of Statistics and ICF Macro. (2011). *2010 Kenya Malaria Indicator Survey.* Nairobi, Kenya DOMC, Kenya National Bureau of Statistics, and ICF Macro.

the rainfall seasons, which may result in epidemics. The parasite prevalence rate is normally less than 1% P_fPR in this zone.

- *Highland epidemic zones* are areas of seasonal malaria transmission in the western highlands of the Rift Valley. Malaria epidemics, which occur when climatic conditions favor vector breeding, were common during the early years of the malaria control program in Kenya. The normal parasite prevalence rate now, however, is less than 1% P_fPR.

- *Low-risk zones* cover the central highlands of Kenya, which includes Nairobi where traditionally low seasonal temperatures inhibit sporogony; however, the increasing temperatures and changes in the hydrological cycle associated with climate change are likely to increase the areas suitable for malaria vector breeding, with the introduction of malaria transmission in areas where it had not existed before. Again, the prevalence rate in this zone is generally less than 1% P_fPR.

Figure 1: Malaria prevalence in children 0-14 years by epidemiologic zone in 2010
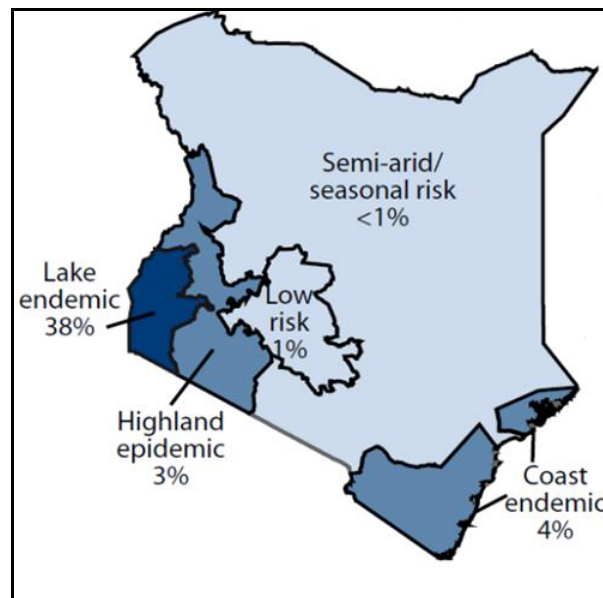
Source: Malaria Indicator Survey 2010

All four species of human *Plasmodium: P. falciparum, P. malariae, P. ovale,* and *P. vivax* occur in Kenya. *P. falciparum,* which causes the severest form of the disease, accounts for 98% of all malaria infections. The major malaria vectors in Kenya are members of *An. gambiae* complex and *An. funestus*.

In line with the devolution process, the Department of Malaria Control (DOMC) has developed malaria county profiles, which are now at the approval stage. The profiles are expected to support the new county governance structures in understanding their malaria disease burden status and facilitate targeted interventions and priority investments in malaria.

GOAL AND OBJECTIVES OF MALARIA CONTROL

The NMS 2009–2017 envisions a malaria-free Kenya. Kenya uses a combination of globally recommended malaria interventions for malaria control: (a) vector control using integrated vector management, including long-lasting insecticide-treated nets (LLINs), indoor residual spraying (IRS), larval control, and environmental management; (b) prompt diagnosis and treatment with effective medicines at all levels of the health system; (c) prevention and treatment

of malaria in pregnancy; and (d) public health education aimed at enhancing uptake and appropriate use of interventions.

The NMS 2009–2017 comprises six specific objectives, each with key strategies that outline how these objectives will be achieved during the strategic plan period. Following is a summary of these objectives:

1. *Objective 1:* By 2013, to have at least 80% of people living in malaria risk areas using appropriate malaria prevention interventions.
2. *Objective 2:* To have 80% of all self-managed fever cases receive prompt and effective treatment and 100% of all fever cases that present to health workers receive parasitological diagnosis and effective treatment by 2013.
3. *Objective 3:* To ensure that all malaria epidemic-prone districts have the capacity to detect malaria epidemics and the preparedness to respond to them annually.
4. *Objective 4:* To strengthen surveillance, monitoring, and evaluation systems so that key malaria indicators are monitored routinely and evaluated in a timely manner in all malaria-prone districts by 2011.
5. *Objective 5:* To strengthen advocacy, communication, and social mobilization capacities for malaria control to ensure that at least 80% of the people in malaria-prone areas have knowledge of the prevention and treatment of malaria by 2014.
6. *Objective 6:* By 2013, to strengthen capacity in program management to achieve malaria programmatic objectives at all levels of the health care system.

IMPLEMENTATION STATUS OF MALARIA INTERVENTIONS

Each of the six specific objectives contained in the NMS 2009–2017 has a detailed planning and implementation matrix that shows the different strategies and associated activities and timelines, as well as a monitoring and evaluation (M&E) framework with clear targets, indicators, and responsibility. This section reports on the performance of the malaria control program for impact, outcome, and selected output indicators for July 2012–June 2013.

Progress in achievement of the NMS 2009–2017 goal is measured mostly through the use of routine malaria mortality and morbidity surveillance data obtained from the division of Health Management and Information Systems (HMIS). Other indicators are the slide rapid diagnostic test (RDT) test positivity rate (TPR) at a health facility that routinely reports its data monthly and the malaria parasitaemia (*pf*) prevalence rate, which is obtained during the Malaria Indicator Survey (MIS) conducted once every 3 years. Following are some reports on these indicators.

PART A: IMPACT—REDUCE MORBIDITY AND MORTALITY DUE TO MALARIA

Morbidity and mortality data are collected monthly in the District Health Information Software 2 (DHIS-2) managed by the division of HMIS. The data are reported by all health facilities nationwide and updated either directly in the DHIS-2 at the larger health facilities or sent to the District Health Records Information Officers for entry into the system. Malaria inpatient and mortality data, which are reported in DHIS-2, still are not accurate or reliable because of inaccurate coding of data right from the source. All facility inpatient and mortality data need to be recoded to ensure conformity with the International Classification of Diseases-10 (ICD 10) codes.

Outpatient Malaria Cases

Malaria is still one of the most commonly diagnosed ailments in out-patient departments in Kenya. About 8.82 million cases (21.1%) of malaria were reported out of 41.8 million out-patient visits from July 2012–June 2013. This result is a major decrease compared with the 12 million cases (31%) diagnosed from July 2011–June 2012. The proportion of malaria cases out of all outpatients varied widely over the months, ranging from 13.4% in December 2012 to 24.6% in April 2013. On average, 735, 364 malaria cases were reported each month, with about 254, 294 (34.6%) reported as confirmed cases (see Figure 2). It is worth noting that the diagnostic capability of health facilities in Kenya was still very low considering the number of facilities that could perform microscopy. With the increasing rollout of RDTs, it is expected that confirmed malaria cases will be more accurate.

Figure 2: Outpatient visits and malaria cases, July 2012–June 2013
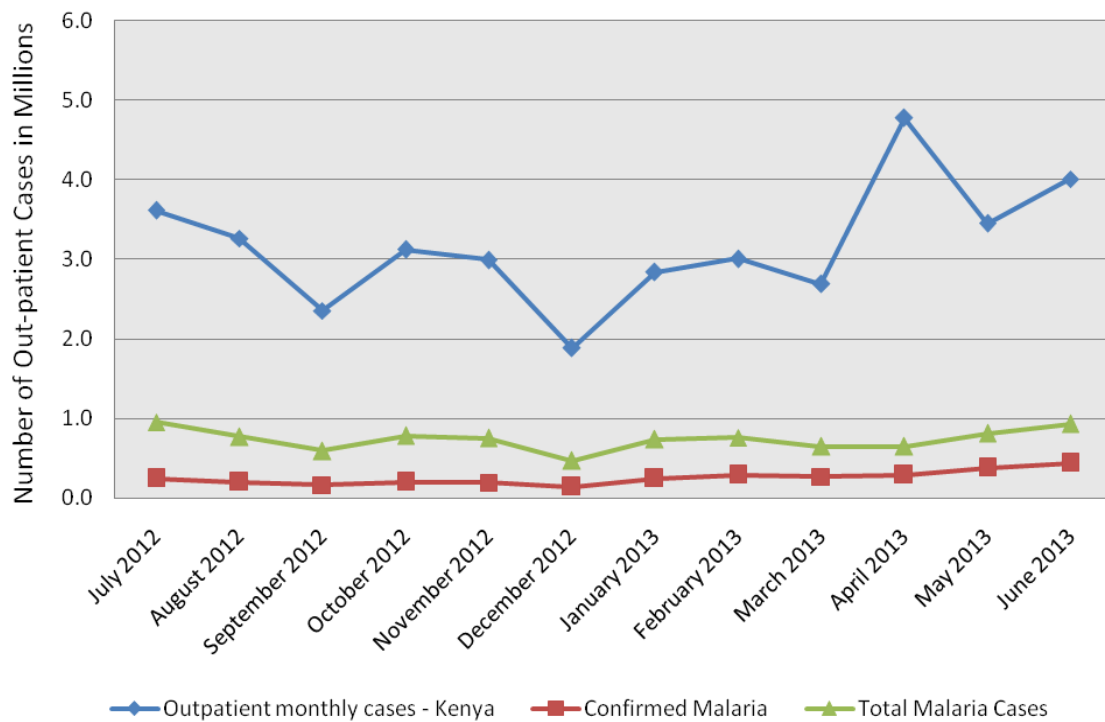
Source: HMIS data

In-patient Malaria Cases and Malaria Mortality

The malaria inpatient and mortality data available in the DHIS-2 system still is not accurate or reliable because of disease coding challenges in an effort to conform to the WHO ICD-10 system.

PART B: PERFORMANCE BY OBJECTIVE—MALARIA PREVENTION

Objective: By 2013, to have at least 80% of the people living in malaria risk areas use appropriate malaria preventive interventions.

Strategies:

- Pursue universal distribution of LLINs through appropriate channels (one LLIN for two people).
- Conduct IRS in the targeted areas.
- Support the malaria-free schools initiative.
- Provide intermittent preventive treatment in pregnancy (IPTp) at ANC clinics and community levels.

Planned Activities: To achieve universal coverage of LLINs, the key activities planned for 2012–2013 were mass and routine distribution of LLINs, plus social marketing of LLINs in designated rural locations. Planned activities under the IRS strategy included implementation of IRS in epidemic-prone and fringe-endemic districts, capacity building for IRS, and procurement and distribution of IRS commodities and equipment. Activities also were planned to support the malaria-free schools initiative through implementation of IRS in targeted schools and mainstream malaria control in the school curriculum. The latter activities were not implemented because of a lack of funding. Finally, under the IPTp strategy, planned activities included supportive supervision of malaria in pregnancy (MIP) activities, procurement and distribution of effective medicines for IPTp, training of service providers in IPTp, mobilization and advocacy, and

technical working group (TWG) meetings. Table 1 outlines performance against indicators and targets for malaria prevention through vector control.

Table 1: Targets and indicators for vector control

Objective	Indicator	Target	Achievement*
Achieve universal coverage with LLINs in malaria endemic zones	At least one LLIN for every two people in a household	100% of targeted households own at least two or more LLINs	63.8% [Based on post mass net distribution evaluation in lake endemic region]
Cover all household dwelling structures in five endemic districts with IRS	Proportion of households in targeted areas sprayed in last 12 months	100% of targeted structures sprayed	0% [Suitable alternative to pyrethroids not yet identified]
Achieve consistent use of LLINs by household members	Proportion of population in targeted areas of people who slept under an LLIN on night before a survey	80% of targeted population	32% (DOMC, 2012)
Achieve malaria-free status for schools in targeted areas	Proportion of targeted schools sprayed annually	100% of targeted schools sprayed	0%

ACHIEVE AND MAINTAIN UNIVERSAL COVERAGE WITH LLINS

Mass distribution of 10.6 million LLINs, made possible by funding commitments secured by the program in 2010, was completed during the 2012–2013 reporting period. Various partner contributions are listed in Table 2. All nets were distributed in 2011, except for the 2.3 million World Bank and 720,000 Global Fund (GF) Round IV-supported nets, which were distributed from July–October 2012 in the coast region, Bomet County, and parts of Kericho and Nandi counties, excluding Nandi North sub-county, which had received the U.S. President's Malaria Initiative (PMI)-supported nets.

Table 2: Partners' contributions of LLINS for mass distribution

Partner	Number of LLIN contributed (millions)
GF Round IV Phase II	5.2
USAID-PMI	2.7
World Bank	2.3
World Vision	0.3
Total	**10.5**

Evaluation results of the post-mass net distribution (phases 1 and 2) showed that 83.4% of the households in the lake endemic region owned at least one LLIN, while 63.8% had more than one LLIN. On average, households in this region owned 2.24 nets. Despite high insecticide-treated nets (ITN) possession in the population following the mass distribution campaign, evaluation studies showed that net use was still low at 32% (DOMC, 2012). Intensive continuous advocacy and community mobilization should be conducted using all appropriate channels to bridge the gap between ownership and usage. The next mass net distribution is planned for 2014.

CONDUCT INDOOR RESIDUAL SPRAYING IN TARGETED ENDEMIC DISTRICTS

IRS was introduced in 2000 to prevent and control regularly occurring malaria epidemics in the highlands west of the Rift Valley. IRS has since been introduced in areas of high transmission for disease burden reduction. A policy change during the reporting period required the use of carbamates rather than pyrethroids after recent studies on insecticide resistance showed high-level resistance to pyrethroid-based insecticides in the western part of the country compared

with organophosphate and carbamate-based insecticides. This decision was also in keeping with the WHO recommendation that pyrethroids should be preserved for LLINs and another class of insecticides should be used for IRS. As a result, no household spraying was conducted during the period because a suitable alternative to pyrethroids had not been identified. The Ministry of Health has since recommended the use of carbamates during the 2013–2014 spraying cycle for IRS in areas with perennial malaria transmission.

SUPPORT MALARIA-FREE SCHOOL INITIATIVE

The plan for the 2012–2013 period of the malaria control program was to undertake implementation of IRS in schools in targeted areas and mainstream malaria control in the school curriculum. These activities did not receive funding, and hence, they could not be implemented.

PROVIDE IPTP AT ANTENATAL CLINICS AND COMMUNITY LEVELS

The prevention of malaria in pregnancy uses a combination of interventions that together are aimed at reducing maternal and perinatal morbidity and mortality caused by malaria. A comprehensive ANC package comprises at least two doses of IPTp, provision of LLINs, and prompt diagnosis and treatment of suspected malaria cases.

As illustrated in Figure 3, in 2012–2013 the percentage of ANC mothers in the endemic regions who received IPTp1 ranged between approximately 70–90%, with a drop in this figure being experienced over the period from November 2012–January 2013 as a result of a nurses' strike. Coverage with LLINs for ANC mothers remained at 90% and higher over the last half of the reporting period. A stockout of LLINs occurred in late 2012, and mothers who missed the nets were asked to pick them up later, which explains the 140% net coverage in December 2012. All MIP activities continued being supported by PMI through Jhpiego's Access Uzima Programme up to March 2012, and then transitioned to the Maternal and Child Health Integrated Program (MCHIP), implemented jointly by the Division of Reproductive Health (DRH) and DOMC. The program held two MIP TWG meetings out of the four planned for FY 2012–2013.

Figure 3: Percentage of coverage of ANC clients with LLINs, IPTp1, and IPTp2

Legend:
- % of ANC Clients receiving IPT2 (New ANC visit)
- % of ANC Clients receiving IPT1 (New ANC visit)
- % of ANC patients reciving LLINs
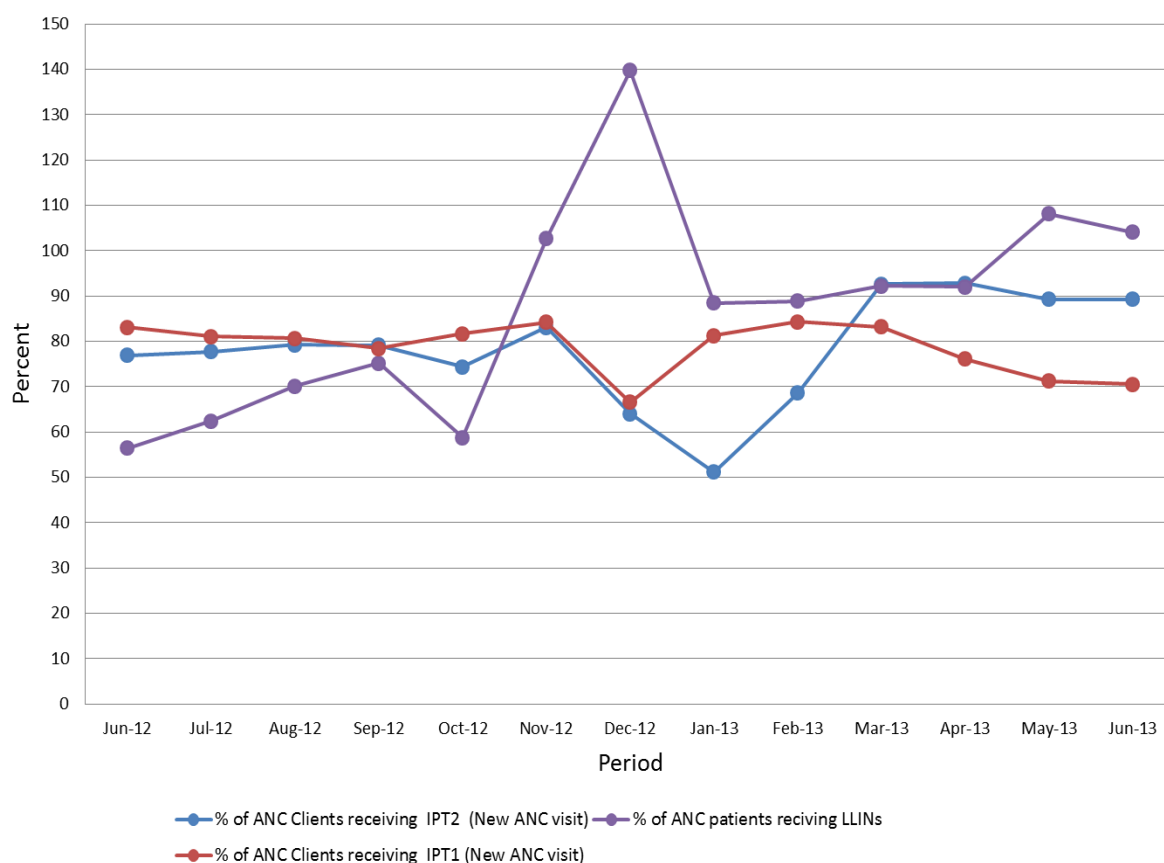
Source: DDSR, HMIS

The performance against indicators and targets for MIP activities is shown in Table 3.

Table 3: Malaria in pregnancy indicators and targets

Indicator	Target	Achievement N (%)	Comments
Proportion of health care workers trained in IPTp	Orientation of 6,000 health workers on simplified IPTp guidelines Training of 1,120 community health workers (CHWs) in 28 counties	4,079 (68%) private-sector health workers trained 1,116 (99.6%) CHWs trained on case management	These trainings were carried out during the case management trainings
Proportion of pregnant women who had at least one ANC visit	540,000 (100%)	446,120 (82%)	Target calculated as 4% of projected population in target districts
Proportion of pregnant women who received IPTp 2	100%	unknown	A challenge arose in reporting on this indicator, with facilities summarizing all IPTp2+ doses and reporting them as IPTp2
Proportion of facilities with no reported stockout of IPT drugs lasting more than 7 days in last 3 months	100%	100%	Stockouts of the commodity did not occur during the period

REVIEW AND ANALYZE MIP DATA

Joint supportive supervision of MIP activities by the DOMC, DRH, and Provincial Health Management Teams and District Health Management Teamss is considered a crucial activity and was planned for implementation in each year of the NMS 2009–2017; however, the program subsequently adopted integrated supportive supervision for all malaria control activities under the common M&E framework. The program undertook a review of MIP data and analysis for all counties in malaria endemic regions. DHIS-2 ANC data for 2012–2013 was downloaded and analyzed for all counties targeted for implementation of IPTp activities. Subsequently, the program held meetings with district focal personnel and in-charges of mother and child health services in all districts implementing IPTp in Western, Nyanza, and Coast provinces to discuss the analyzed data. These district representatives brought along ANC registers from facilities under their jurisdiction so that data entry in the registers could be checked and feedback given.

Following is a list of some of the primary issues discussed at the meetings:

- Challenges on uptake of IPTp and how these could be addressed.
- How to mitigate the factors that contribute to poor quality MIP data and, in particular, the situation where facilities were summarizing all IPTp2+ doses and reporting them as IPTp2, which led to the erroneous outcome when uptake of IPTp2 was reported to be higher than that of IPTp1, shown on the surveillance graph in Figure 4.
- District teams were encouraged to analyze their data regularly and use them for decision making.
- Linkages were built with service delivery partners (e.g., APHIAplus) and arrangements were made to disseminate MIP messages during their meetings with service providers.

Examples of the data discussed are shown in Figure 4 for Migori County and overall for Western Province. Figure 4 shows the analyzed ANC data for Migori, which indicated higher coverage of IPTp2 compared to IPTp1. This resulted from reporting of IPTp2+ doses as IPTp2 doses in DHIS-2. This error was corrected during the meetings with the district focal personnel, which resulted in the more correct data illustrated in Figure 5.

Figure 4: Migori County data indicating misreporting of IPTp2
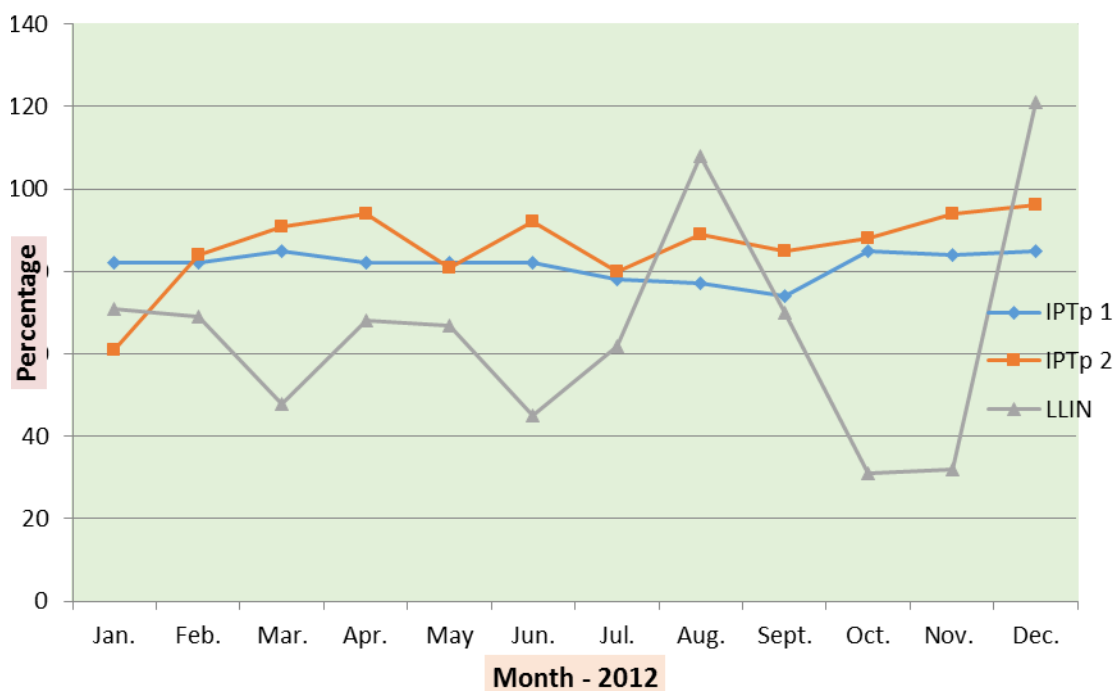
Figure 5: Overall data from Western Province after correcting for misreporting of IPTp2
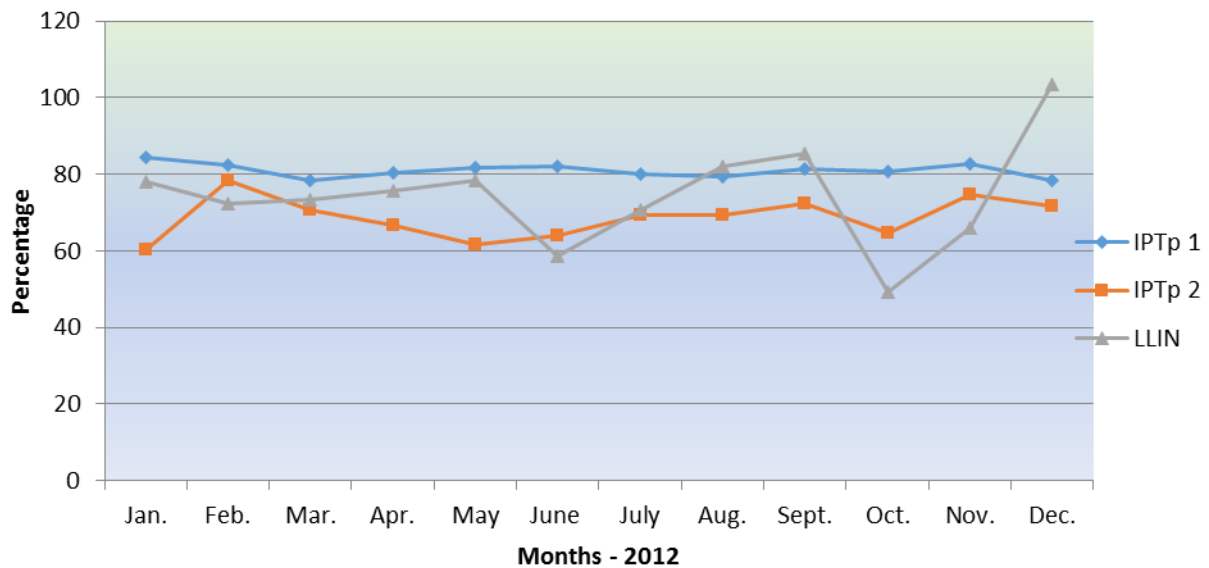
PROCURE AND DISTRIBUTE EFFECTIVE MEDICINE FOR IPTP

During the 2012–2013 period, the sulfadoxine-pyrimethamine (SP) for IPTp was procured and distributed to health facilities through the Kenya Medical Supply Agency (KEMSA). This ensured that pregnant women who sought ANC services in the targeted areas received IPTp as required, and stockouts of the commodity did not occur.

PROVIDE TRAINING SERVICE PROVIDERS IN IPTP

Training service providers on MIP uses an integrated curriculum with malaria case management. In 2012–2013, 4,079 private-sector health workers were trained on integrated case management of malaria, including MIP and IPTp.

To improve the MIP service provision quality, MIP TWG proposed development of a tool to assess MIP services at health facilities. The MIP Standards-based Management and Recognition (SBM-R) tool subsequently was developed and its approval for use in targeted provinces was obtained from the MIP TWG meeting held in January 2013. Dissemination of the tool in Nyanza and Western provinces took place during the 2012–2013 period, and the tool is expected to enhance adherence to MIP guidelines. The health workers targeted in the dissemination of the tool were District Malaria Control Coordinators, DRH coordinators, District Health Records Information Officers, and in-charges of peripheral health facilities and in-charges of mother and child health services in hospitals. During the reporting period, the MIP SBM-R tool was disseminated to 1,231 health workers and 100 supervisors in Nyanza and Western provinces.

PROVIDE MOBILIZATION AND ADVOCACY FOR MIP

DOMC and DRH, with support from USAID and MCHIP, continued rolling out community MIP (cMIP) activities in Bungoma, Siaya, and Homa Bay counties. The activity involved training of community health extension workers (CHEWs) and CHWs on cMIP, after which the CHWs would register all pregnant women in their community units and conduct monthly follow-up to ensure that they seek services that are due at ANC clinics. During implementation of this activity, 27 trainers of trainers and 304 CHEWs were trained on cMIP. The CHEWs, in turn, trained 1,476 CHWs to enable them to disseminate MIP messages, register pregnant women, follow them monthly, and refer ANC and IPTp defaulters to health facilities. A total of 3,212 pregnant women were identified and a major outcome from implementation of this activity was that 47% of

registered pregnant women were referred to health facilities by CHWs for ANC services because they were either late in starting ANC or were defaulters to scheduled ANC visits.

Provide Prompt Diagnosis and Treatment of Malaria

Objective: By 2013, to have 80% of all self-managed fever cases receive prompt and effective treatment and 100% of all fever cases that present to health workers receive parasitological diagnosis and effective treatment.

Strategies:

- Build capacity for malaria diagnosis and treatment at health facilities.
- Provide access to affordable malaria medicines through the private sector.
- Strengthen HMM through community health workers using the community strategy.

Planned Activities: The activities planned for 2012–2013 in support of capacity building for malaria diagnosis and treatment at health facilities strategy were to (1) conduct case management supportive supervision in health facilities, (2) procure and distribute RDTs and laboratory supplies for malaria diagnostics, (3) establish and maintain a central malaria reference laboratory, (4) establish and review a sustainable maintenance plan for microscopes and other equipment, and (5) conduct ACSM in support of prompt and effective treatment. Under the AMFm strategy, the planned activities for the year were to participate with the private sector in AMFm to ensure access to affordable ACTs in the private sector; undertake quarterly planning and coordinate meetings with the private sector; and provide technical support for private sector activities. Planned activities to strengthen HMM for the reporting period were to supply kits for CHWs and CHEWs and supervise CHWs and CHEWs.

Table 4 lists 2012–2013 case management and HMM indicators and their targets.

Table 4: Case management and HMM indicators and targets, 2012–2013

Indicator	Target	Achievement*	Comment
Proportion of targeted health workers trained on malaria diagnosis and treatment	12,880 (100%)	11,335 (88%)	88% of the 12,880 targeted health workers were trained between 2010 and 2013 (see draft MTR report)
Proportion of health facilities having no stockout of ACTs for 7 consecutive days in past 3 months*	100%	93%	Stockout defined as simultaneous absence of all four AL packs
Proportion of patients with fever presenting to health facility who are tested for malaria with RDT or microscopy*	100%	47%	Low achievement, mainly due to delayed funding for RDT procurement from the GFATM
Proportion of patients with fever presenting to health facility who are managed in accordance with national malaria guidelines*	100%	50%	Overall, better performance because of wider availability of RDTs
Proportion of patients with confirmed diagnosis of malaria who are prescribed ACT*	100%	90%	This applies only to facilities with diagnostics and AL in stock
Proportion of districts implementing community strategy that includes HMM	100%	29%	See draft MTR report
Proportion of patients with fever who tested positive by a CHW and who were treated with ACT	80%	0%	Although they received training, most CHWs were not issued with treatment kits

*Data from the fifth Quality of Care survey.

**Includes confirmatory testing, treatment of test positive with AL, and test negative not treated for malaria.

BUILD CAPACITY FOR MALARIA DIAGNOSIS AND TREATMENT AT HEALTH FACILITIES

Approximately 15.7 million treatments of AL were procured and distributed to public and private not-for-profit health facilities in 2012–2013. Funding for the procurement of these commodities was from the Global Fund Round 4 grant and PMI. The Government of Kenya procured 17 million

quinine tablets and 300,000 ampoules of quinine injection, all of which were distributed to public health facilities.

Despite Kenya adopting the T3 strategy, the reporting period recorded up to fivefold use of ACTs over the expected target (number of malaria cases with confirmed laboratory diagnosis). This indicates a very high percentage of suspected malaria cases received antimalarial treatment with AL without proper diagnosis by microscopy or RDTs, according to the national guidelines. This clearly indicates a continuing need to consistently sensitize health workers on updated treatment guidelines. The last quarter in the reporting period, however, showed a promising decrease in the number of treatments from 400% in April to 200% in June 2013. This positive trend could be, in part, attributed to an increase in testing capacity of health facilities because of increased availability of RDT kits. With continued expansion of RDT uptake at all health facilities and continued RDT trainings, it is expected that this discrepancy in the number of treatments with AL and the number of confirmed malaria cases will continue to be minimized. Figure 6 shows the percentage of outpatient cases treated with AL compared with the treatment target.

Figure 6: Percentage of outpatient cases treated with AL compared with treatment target
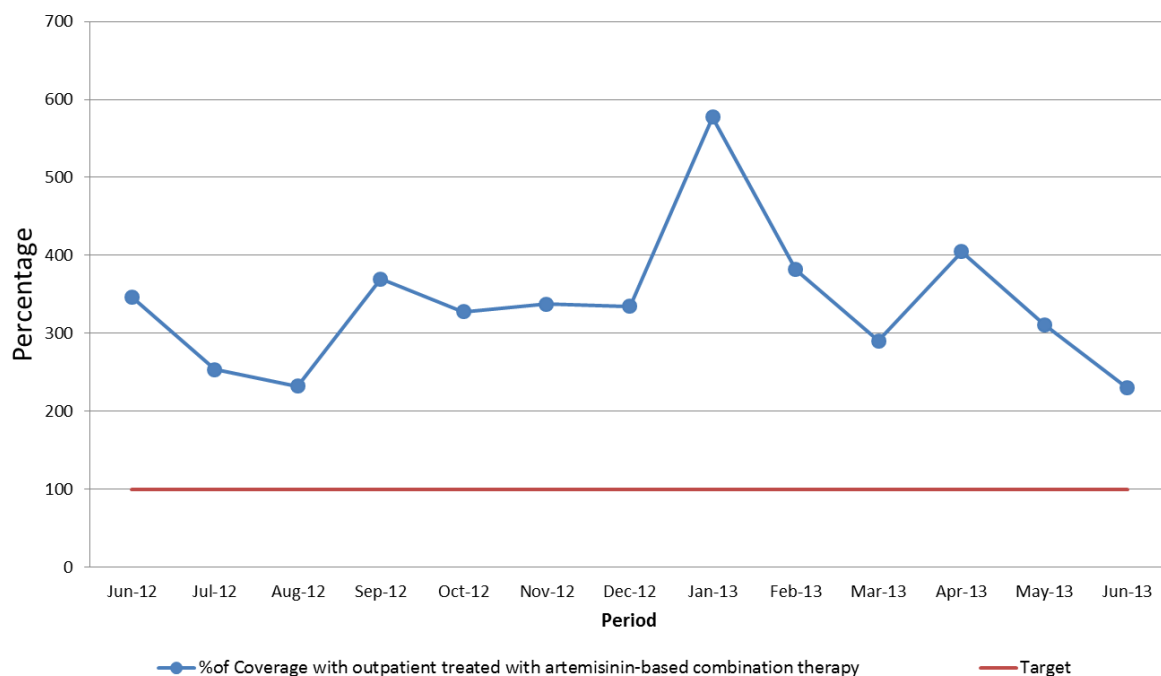
Source: HMIS

PROVIDE CASE MANAGEMENT SUPPORTIVE SUPERVISION IN HEALTH FACILITIES

Supportive supervision for case management activities was done only once in the 2012–2013 reporting period. Supervision was planned for June 2013, but changes in how national programs engage with counties under the new constitution caused disbursement challenges. Supervision is integrated with M & E activities, and one comprehensive malaria supervision manual is used.

PROCURE AND DISTRIBUTE RDTS AND ESSENTIAL LABORATORY SUPPLIES

The RDT activity was launched in October 2012, and subsequently the DOMC embarked on rolling out RDT kits throughout the country to strengthen diagnosis and management of malaria. The rollout was conducted in the context of the T3 policy—testing, treating, and tracking—for all suspected malaria cases. Since the launch, nearly 3,000 public health care workers have received a 1-day RDT sensitization training, and 500 community health workers have been trained on community case management of malaria using RDTs. RDTs are now supplied to all public health

facilities through KEMSA. The target facilities are levels 1, 2, and 3, where microscopes and trained laboratory personnel are in short supply.

GF funds were used to obtain 7.2 million RDTs, and of those, 2.9 million were distributed to public and private not-for-profit health facilities during the 2012–2013 reporting period. Unfortunately during the year, DOMC lost 4.3 million RDTs, the equivalent of 4 months of stock, in a KEMSA fire in January 2013. This resulted in an acute stockout of RDTs and significantly affected the coverage of diagnostics in the public sector, particularly in tiers 1, 2, and 3. The effects of the fire are yet to be fully mitigated in the supply chain. The value of the RDTs was estimated at Kshs 180,489,120. Also destroyed were 130,590 doses of AL 12s, valued at Kshs 11,192,829.

STRENGTHEN CAPACITY FOR MALARIA DIAGNOSIS AND TEST POSITIVITY RATES

The diagnostic capability of health facilities in the country is illustrated in Figure 7. Data were obtained by comparing the number of outpatients with suspected malaria cases and the number of outpatients that underwent a laboratory diagnosis. The results demonstrate that the diagnostic capabilities of health facilities in Kenya have improved steadily with the supply of RDTs. The testing rate increased from about 60% in July 2012 to slightly above 100% by the end of the reporting period. The observed increase in the testing rate could be attributed to an increased use of RDT kits after the rollout in October 2012; however, it is possible that some of the DDSR data were inaccurate because some tests may have been double counted through the use of microscopy and RDTs.

Figure 7: Percentage of suspected malaria cases tested with RDTs and microscopy
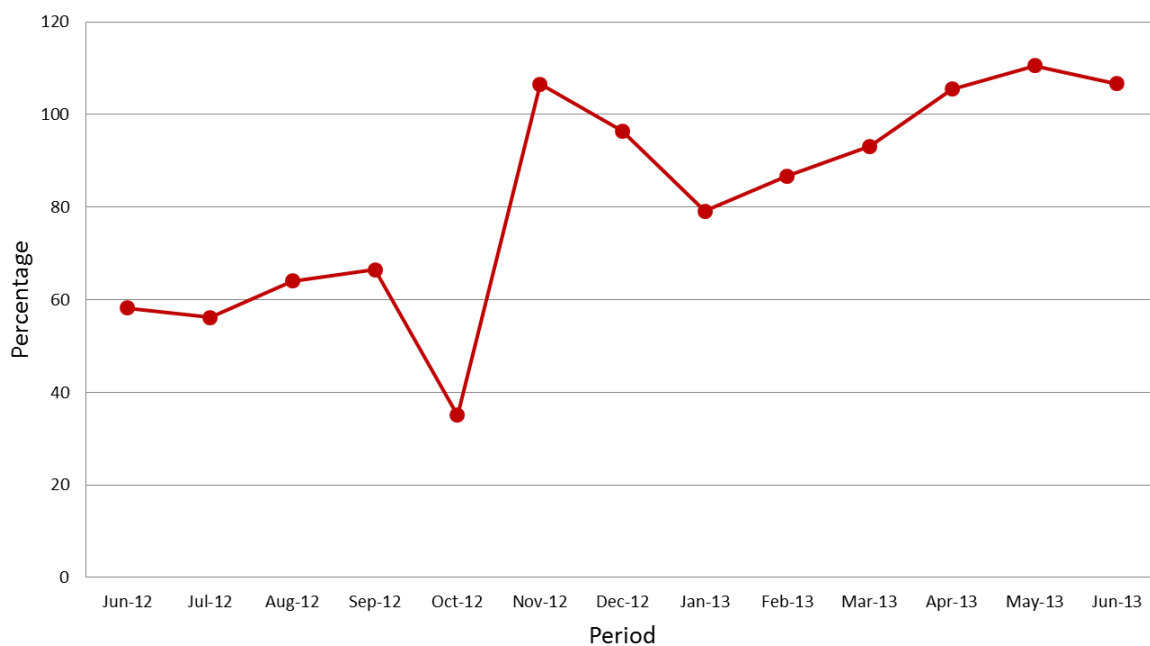
Source: Weekly IDSR reports

An overall gradual increase in the outpatient TPR for children under age 5 years and all ages was observed during the reporting period. On average, TPR for all ages increased from about 25% to 35% during the period. Figure 8 compares the outpatient TPR for children under age 5 years and all ages in Kenya.

Figure 8: Outpatient TPR for < 5 years and all ages
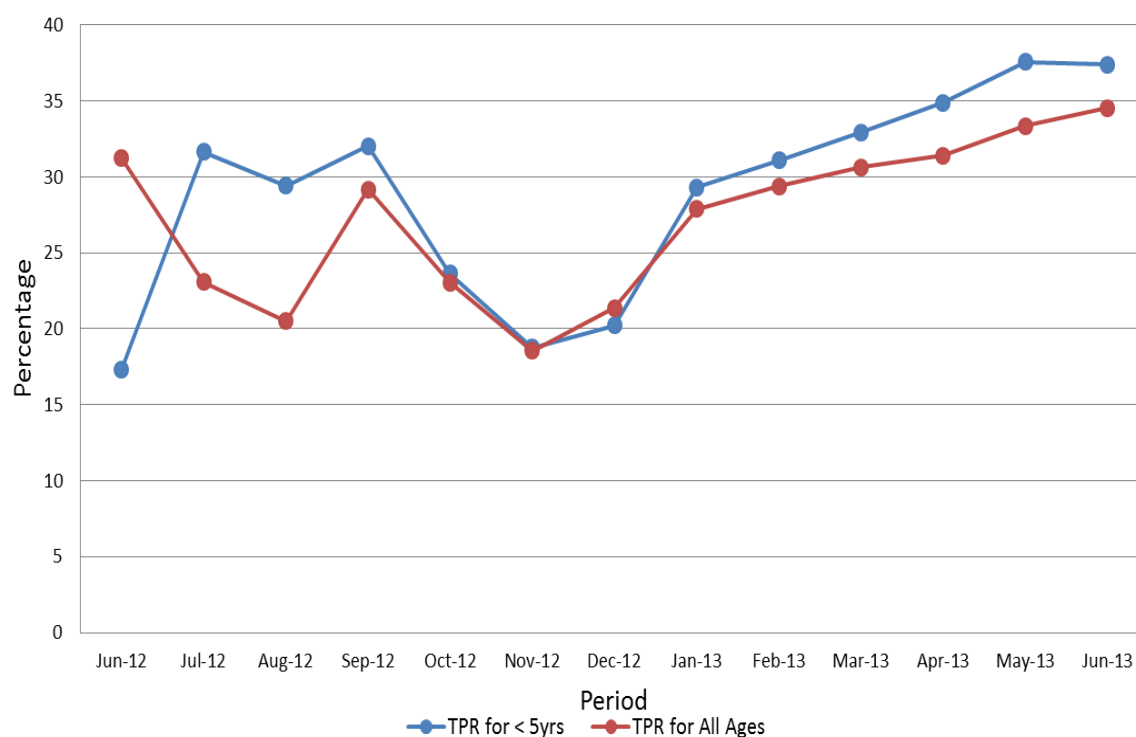
Source: DDSR

ESTABLISH AND MAINTAIN CENTRAL MALARIA REFERENCE LABORATORY

The central malaria reference laboratory became operational during the 2012–2013 reporting period. Although it is only partially equipped, staffing is complete and the work of receiving specimens from the counties for processing has been initiated. More plans are in place to make it operate effectively, including the addition of equipment.

The planned activity to establish and review a sustainable maintenance plan for microscopes and other equipment was not done as planned during the period. The activity is now planned for implementation in FY2013–2014.

PROVIDE ACSM IN SUPPORT OF PROMPT AND EFFECTIVE TREATMENT

The ACSM unit of the malaria control program initiated the process of procuring services from consultants who will develop messages on diagnosis and treatment, MIP, and LLINs. This activity progressed with support from AMFm and GF R10.

PROVIDE ACCESS TO AFFORDABLE MALARIA MEDICINES THROUGH THE PRIVATE SECTOR

Kenya is one of eight countries included in the pilot phase of the AMFm, a public-private financing mechanism hosted by the Global Fund that subsidizes the cost of quality-assured ACTs for both public and private sector buyers in endemic countries. The objective of the AMFm subsidy is to (1) increase ACT affordability, (2) increase ACT availability, (3) increase ACT use, including among vulnerable groups, and (4) reduce the sale and use of ineffective and artemisinin monotherapies by gaining market share for quality-assured ACTs. Poor access to effective treatment negatively affects the program objective to reduce the morbidity and mortality of malaria through prompt and effective treatment.

IMPLEMENT AMFM SUPPORTING INTERVENTIONS

As phase 1 of AMFm implementation in Kenya drew to a close by July 2013, evaluation of this program's indicators provided evidence that the program's objective to increase access, affordability, and market share of ACTs in the private sector was met successfully. The challenge now is to ensure that this status is sustained with a component of improved quality of care by promoting diagnosis in the private sector before treatment, in line with the current treatment policy.

The supporting interventions supported under AMFm during the reporting period included the following activities:

- Provide training for private sector HWs
- Provide training for CHWs
- Conduct drug inspection visits
- Carry out post-market surveillance
- Develop advocacy campaigns (radio messages, road shows, and community meetings)
- Hold private-sector stakeholder meetings

The way forward for AMFm is now to sustain the gains achieved in market share and compliance through similar supporting interventions, such as making inspection visits, training private-sector HWs, and developing advocacy campaigns, especially on the new recommended price. The new recommended price has been adjusted from shs 40 to shs 85. Other measures include seeking funding from other donors, such as Department for International Development (DFID) and subsequent grants from the GF. The DFID funding support has since been approved.

HOLD QUARTERLY PLANNING AND COORDINATION MEETINGS WITH THE PRIVATE SECTOR

An essential component of the success of the AMFm program in Kenya was effective planning and coordination of activities between the program and the private sector was, which was undertaken consistently from the beginning of the AMFm planning activities in 2010, with CHAI supporting many of the planning meetings. Progress reports on these meeting were further discussed at the Case Management TWG meetings, which DOMC organized quarterly. The Pharmaceutical Society of Kenya and first-line buyers of malaria medicines were major contributors to the meeting deliberations.

PROVIDE TECHNICAL SUPPORT FOR PRIVATE SECTOR ACTIVITIES

During the 2012–2013 reporting period, the malaria program provided guidance, participated in planning and meeting coordination, and provided timelines for activities to be done in the private sector. Officers from DOMC participated in implementation of the following activities:

- Procuring ALs for private and public sectors
- Training of health workers
- Training of CHWs, mainly in the Nyanza and Western regions
- Providing advocacy and social mobilization
- Conducting drug availability studies in private-sector pharmacies
- Making drug inspection visits by DOMC and the Pharmacy and Poisons Board to target private-sector outlets

STRENGTHEN HMM THROUGH CHWS USING THE COMMUNITY STRATEGY

HMM can be strengthened only when the CHWs are empowered through training and provision of adequate kits to enable them to undertake HMM. In November 2012, the Pharmacy and Poisons Board gave permission to dispense AL in areas of high endemicity, according to the treatment guidelines. This was a big step that contributed positively to HMM. Subsequently, a regular monitoring and supervision of this activity was needed to ensure it is performed adequately for

the benefit of the targeted communities; however the supervision activity was not done during the reporting period as planned because of delayed disbursement of funding for the activity. The activity was rescheduled to FY2013–2014.

TRAIN COMMUNITY HEALTH WORKERS ON HMM

The introduction of community case management in 12 high malaria burden districts in western Kenya that had been planned for implementation in 2012–2013 was not implemented because of the delayed disbursement of resources needed to train at least 2,000 CHWs. With available funding, only 500 CHWs were trained in FY2011. The remaining CHWs were targeted for training during the current reporting period, but it did not happen.

SUPPLY KITS FOR CHWS AND CHEWS

Despite planning in the NMS, CHWs were not supplied with kits because RDTs were not available. The T3 policy already was adopted, but the CHWs were not provided with ACTs without the RDTs. RDTs have since been supplied, and CHWs are now being provided with the kits.

REVIEW COMMUNITY CASE MANAGEMENT TOOLS

In line with community case management strategy, DOMC, in collaboration with community health units and neonatal, child, and adolescent health units, plus other stakeholders, reviewed the Community Health Information Services tools to address community case management. A community case management register was developed to collect data on malaria case management at the community level plus data on other interventions. The tools are being piloted.

Epidemic Preparedness and Response

Objective: By 2010, to ensure that all malaria epidemic-prone districts have the capacity to detect malaria and the preparedness to respond to epidemics annually.

Strategies:

- Build capacity for epidemic preparedness and response
- Strengthen disease surveillance capacity

Planned Activities: Epidemic preparedness and response (EPR) activities traditionally have focused in highland epidemic-prone districts where epidemics are predictable; however, the NMS 2009–2017 recognized the need to include arid and semi-arid land (ASAL) districts that tend to experience unpredictable outbreaks during periods of excessive rainfall, exacerbated by floods often preceded by prolonged droughts. About 17 million Kenyans (40% of 2011 population estimates) lived in areas of seasonal malaria transmission; half of those people lived in the western highland epidemic-prone districts, and the other half lived in the expansive ASAL of northern and eastern Kenya. In the 2012–2013 reporting period, EPR activities focused on 45 highland epidemic-prone districts and 75 ASAL districts.

Three key activities were planned for implementation during the reporting period to build capacity for epidemic preparedness and response. These activities were to (1) conduct risk mapping of epidemic prone areas, (2) review EPR plans for district teams, and (3) build capacity for district and health facility teams in malaria surveillance for epidemics. Activities planned to strengthen the disease surveillance capacity included to (1) train disease surveillance officers on active surveillance of malaria, (2) procure supplies to screen members of households of index cases of confirmed malaria, (3) procure AL to treat the confirmed cases, (4) revise malaria epidemic thresholds for health facilities, (5) hold surveillance meetings at district and lower levels, (6) conduct post epidemic audits, and (7) maintain malaria epidemic kits for malaria epidemic management. Table 5 lists the indicators, targets, and performance achieved in implementing these EPR activities.

During the reporting period, a rapid assessment was conducted in epidemic-prone districts to identify the gaps in planning and activity implementation and plan the way forward in EPR in these areas. Malaria surveillance activities in the epidemic-prone districts (monitored by malaria case thresholds) continued.

Table 5: Epidemic preparedness and response indicators and targets

Indicator	Target	Achieved N (%)	Comment
Proportion of target districts with functional sentinel facilities for epidemic detection and response	45 highland epidemic-prone districts 75 ASAL districts	40 (33%)	The same level of achievement was maintained from the 2011/2012 reporting period. it was low because the ASAL districts had not been trained on sentinel surveillance
Proportion of districts with at five least-sentinel facilities reporting updated surveillance graphs (alert thresholds) for detecting epidemics	45 highland epidemic-prone districts 75 ASAL districts	30 (25%)	Malaria surveillance data consistently reported weekly in at least five facilities
Proportion of target districts with an EPR plan	45 highland epidemic-prone districts 75 ASAL districts	45 (37.5%)	Target achieved only in highland epidemic-prone districts
Proportion of malaria epidemics detected within 2 weeks of onset	100%	100%	Only one outbreak occurred during the period
Proportion of target districts with updated EPR guidelines	45 highland epidemic-prone districts 75 ASAL districts	45 (37.5)%	Target achieved only in highland epidemic-prone districts

BUILD CAPACITY FOR EPIDEMIC PREPAREDNESS AND RESPONSE

EPR activities were targeted for implementation in 45 highland epidemic-prone districts and 75 ASAL districts. During the 2012–2013 reporting period, a rapid assessment was conducted in epidemic-prone districts to identify the needs and plan the way forward in EPR in these areas. Weekly malaria surveillance continued in the epidemic-prone districts through monitoring of malaria case thresholds. All epidemic-prone districts in the western highlands conducted mapping of the epidemic prone areas in their region. EPR review and planning meetings were conducted for all sub-counties and national staff, and all sub-counties presented their updated EPR plans as an outcome of that meeting. Achievement of the EPR targets remained at the same level as they had been in FY2011, primarily because the proposed capacity building for the seasonal transmission areas to enable EPR activities was not conducted. The ASAL areas had not received training on EPR, but this is planned in FY2013–2014.

The surveillance weeks run by calendar year from January to December, and the data are included as part of the integrated disease surveillance reports from the districts. As illustrated in Figures 9–13, surveillance graphs from five sentinel facilities in the seasonal transmission area of North Pokot district were used to inform the malaria control program of an outbreak in the area. The cases were above the alert threshold from week 25, and outbreaks occurred in weeks 26–28. The response activities described in section 3.2.1 were put in place, and cases decreased, as shown in the graphs.

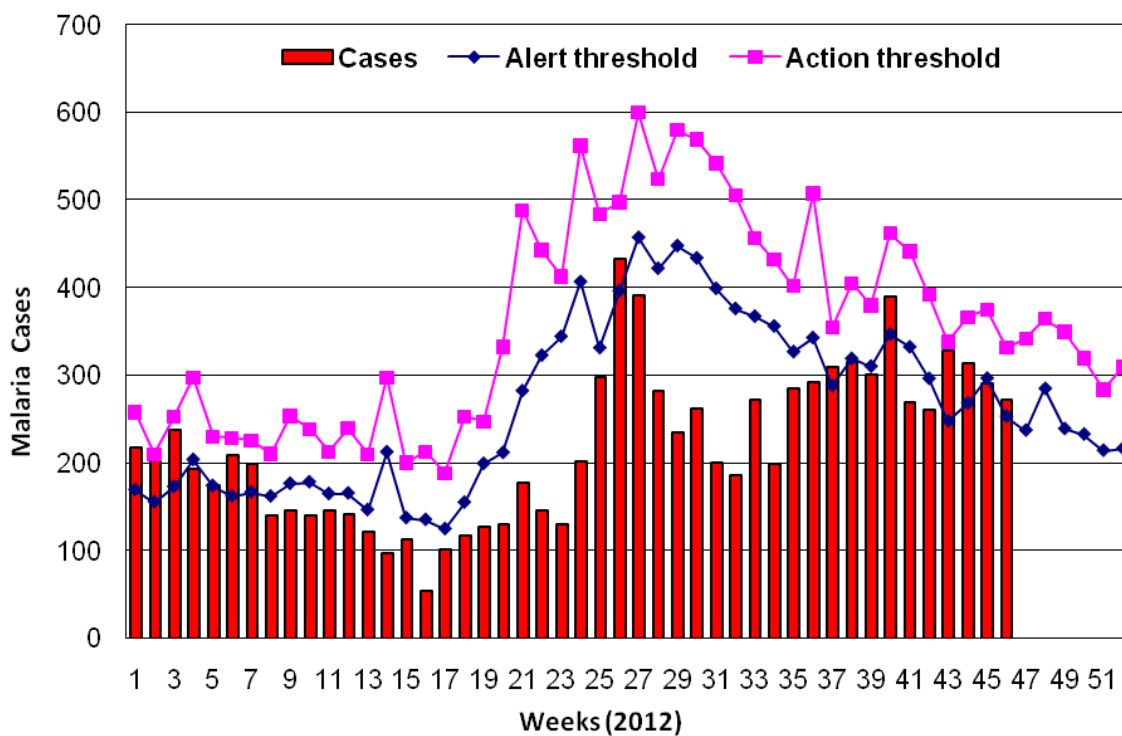**Figure 9: Kacheliba Hospital, North Pokot district, 2012 malaria surveillance**

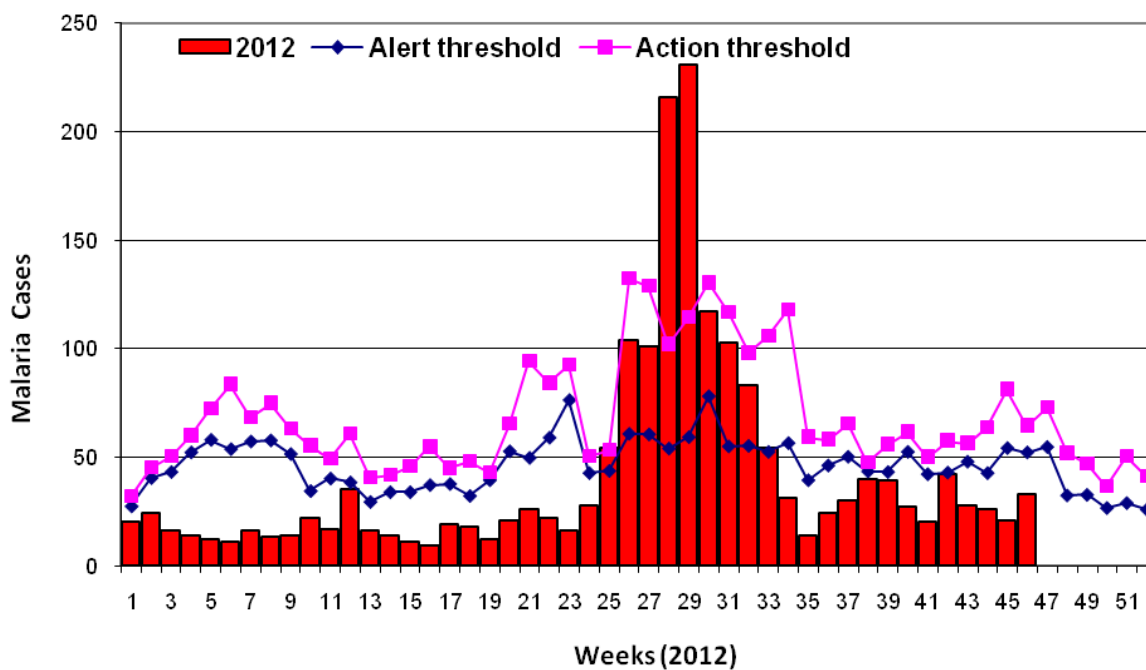**Figure 10: Alale AIC Health Centre, North Pokot district, 2012 malaria surveillance**

Figure 11: Kasei Dispensary, North Pokot district, 2012 malaria surveillance
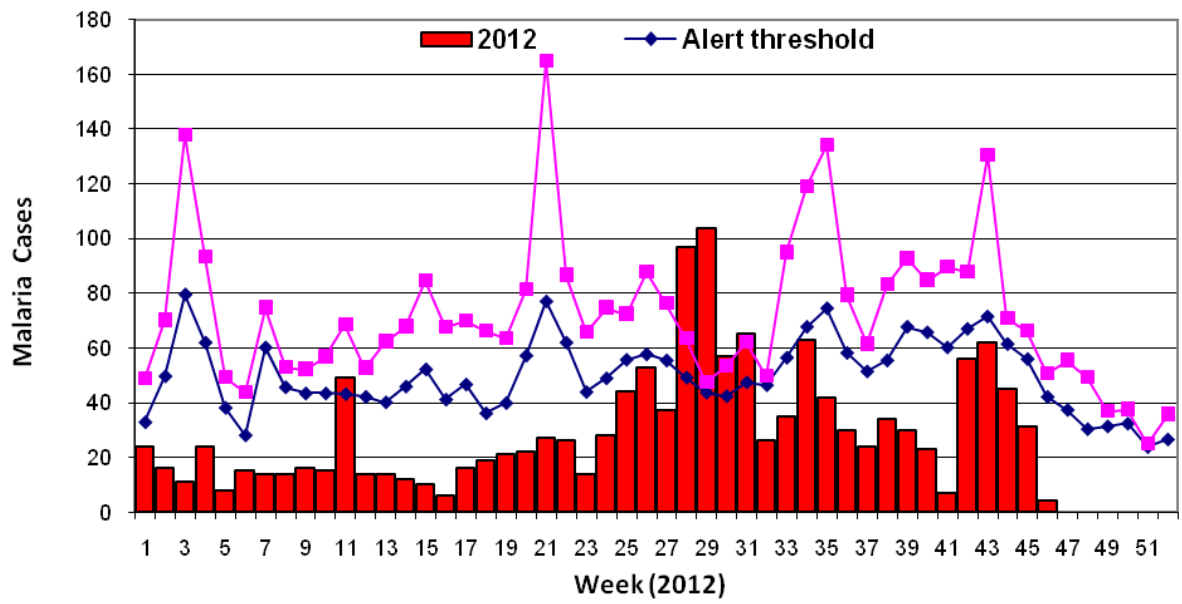

Figure 12: Konyao Health Centre, North Pokot district, 2012 malaria surveillance
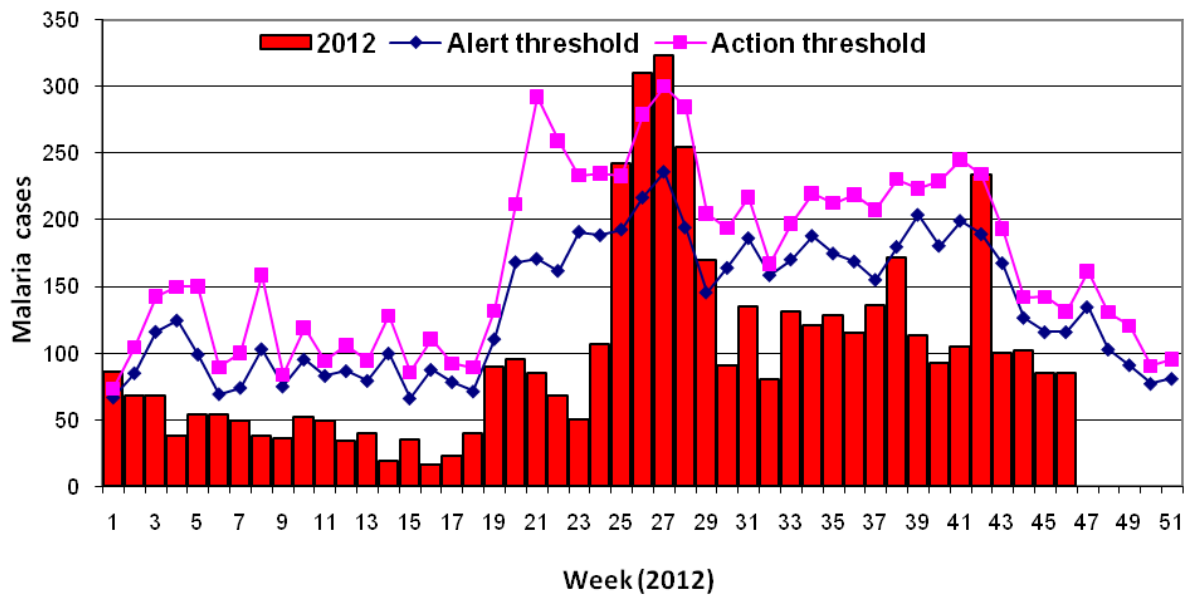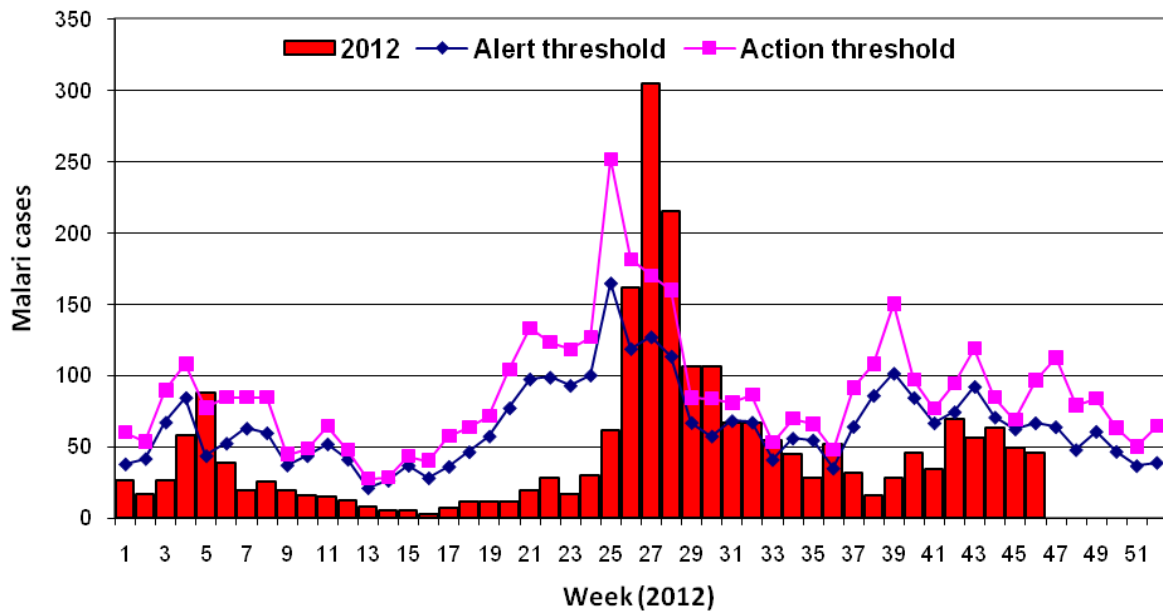
Figure 13: Kodich Dispensary, North Pokot district, 2012 malaria surveillance

STRENGTHEN DISEASE SURVEILLANCE CAPACITY

The planned activity to train disease surveillance officers on active surveillance of malaria was not supported during the 2012–2013 reporting period. Instead, it was rescheduled to be conducted in 2013–2014. Funding was not provided for procurement of supplies to screen members of households for index cases of confirmed malaria. Procurement of AL to treat the confirmed cases in these districts was done as part of the overall quantification and procurement process for the entire program needs, based on past commodity consumption data. DDSR carried out the planned deployment of a disease surveillance team for household visits. Communication support for disease surveillance in epidemic-prone and low-transmission area also was not done, due to inadequate funds. Health facilities in these areas continued to revise their thresholds based on their analysis of weekly surveillance data. Malaria epidemic kits for malaria epidemic management were maintained in all epidemic-prone districts.

During the long rains from March to August, the districts in the western highlands of Kenya usually experience increased transmission of malaria, which in some years may rise to epidemic proportions. In week 27 during July 2012, DOMC received reports from the DDSR that indicated a malaria outbreak in Pokot North district. As illustrated in the graphs earlier, all five sentinel facilities in the district were reporting malaria cases above the malaria action thresholds. The TPRs from weekly surveillance data showed an increase from 33% to 59% during week 23. The hardest hit area was Alale, as reported in the AIC Alale Health Centre.

A multidisciplinary outbreak investigation team comprising members from the DOMC, DDSR, Field Epidemiology and Laboratory Training Program, and the Rift Valley province Provincial Health Management Team was constituted to assess the outbreak in North Pokot district; establish the magnitude and extent of outbreak, as well as the district's EPR capacity; sensitize the DHMTs and assess preparedness of the neighboring districts (Pokot Central, West, Trans-Nzoia and Uasin-Gishu); and establish the essential courses of actions and support needs.

The outbreak in Pokot County, particularly in North Pokot, was exacerbated by the long heavy rains in April 2012. Long distances to health facilities limited geographical access of health services, and hence many people with infections were not treated promptly; however, no deaths were attributed to the outbreak. Early in the year, DOMC, with support from partners, had undertaken IRS in hotspots in 10 epidemic-prone districts, including the whole of West Pokot

County. A reasonable coverage of nets were available due to mass net distribution less than 10 months previously; however, health workers and some community members alluded to low usage of nets in the community, partly because of sleeping arrangements, housing type, and community attitudes.

The outbreak team implemented a quick response (within 4 days of report) with medical supplies, strengthened health care services, and created public awareness, all of which directly contributed to no mortality and quick containment of the outbreak. The annual EPR planning contributes significantly to fast and coordinated response at the district level; however, these plans need to be funded.

Figures 14–18 show other graphs that the team examined in their assessment of the North Pokot outbreak.

Figure 14: Malaria TPR in Kacheliba, North Pokot district
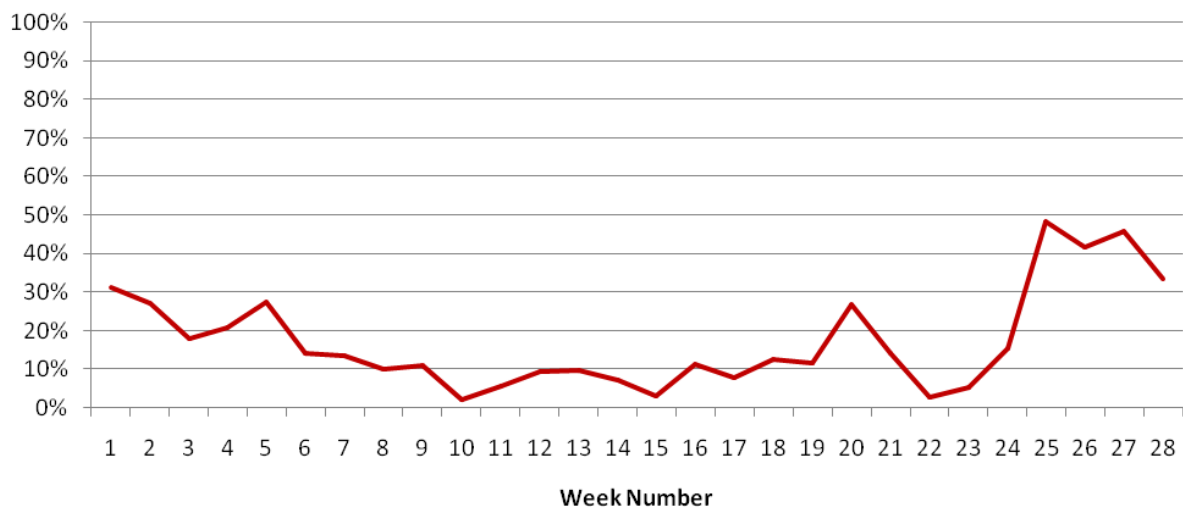

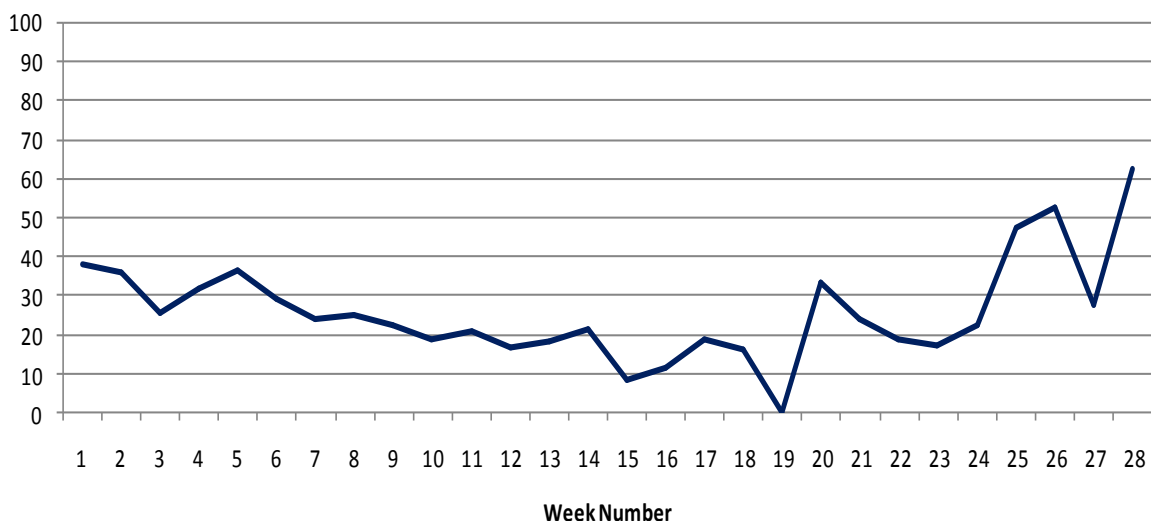**Figure 15: North Pokot District malaria TPR, January–July 2012**

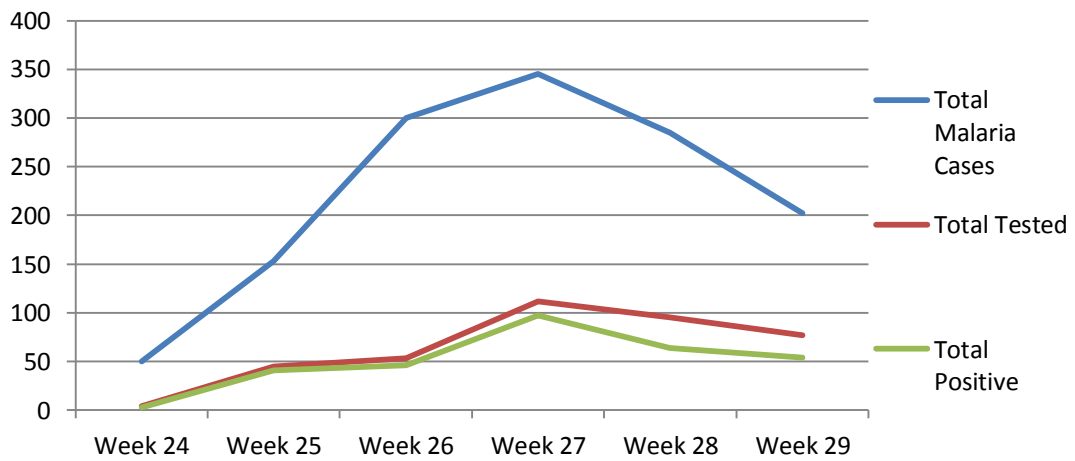**Figure 16: RDT TPR for Orolwa Dispensary, North Pokot district, 2012**

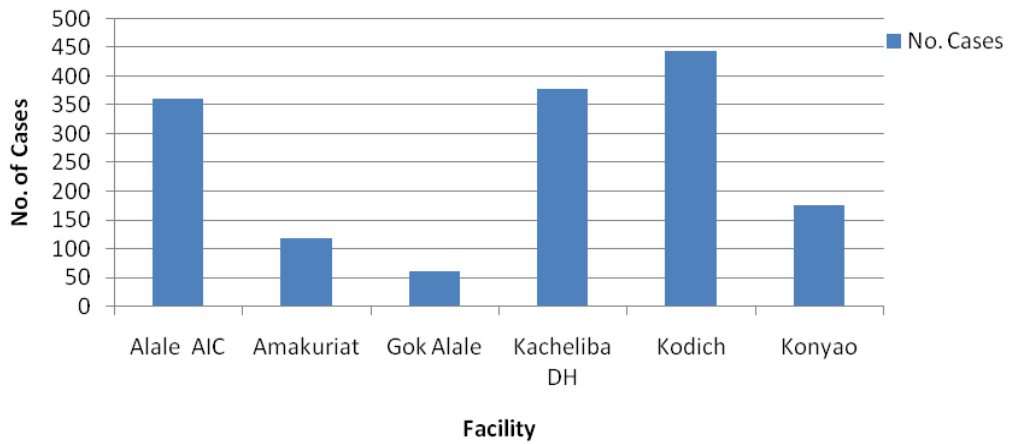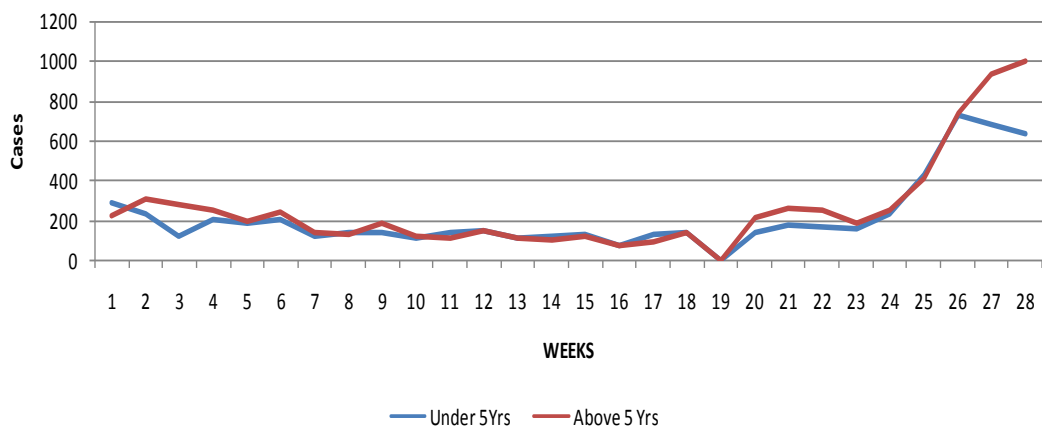**Figure 17: Number of cases per facility in North Pokot district, weeks 1–28, 2012**

Figure 18: Malaria cases, North Pokot district, children age under 5 years and all over 5 years, 2012

Surveillance, Monitoring, Evaluation, and Operations Research

Objective: By 2011, to strengthen surveillance and monitoring and evaluation systems so that key malaria indicators are monitored routinely and evaluated in all malaria risk districts.

Strategies:

- Capacity strengthening for malaria surveillance.
- Strengthen facility- and school-based malaria sentinel surveillance.
- Strengthen malaria data management systems.
- Conduct and support community surveys.
- Conduct and facilitate health facility surveys.
- Conduct operational research and translation.
- Build human resource capacity in surveillance and monitoring and evaluation.

Planned Activities: For the 2012–2013 period, capacity strengthening for malaria surveillance was to be achieved by working in collaboration with Integrated Disease Surveillance and Response (IDSR) and HMIS to scale-up malaria surveillance, conduct relevant monitoring and supervision activities, and hold regular M&E TWG meetings; however, all malaria program supervision was integrated and conducted in support of all the program interventions. Although planned, the malariometric surveys were not done due to lack of funding; however, monitoring of quality of malaria data was done in some targeted districts. Planned activities to strengthen malaria data management systems included scale-up and update of malaria databases and strengthening of the requisite ICT infrastructure at all levels and data security. Community surveys planned for implementing during the 2012–2013 reporting period included pharmacovigilance for malaria medicines; post marketing surveillance and quality assessment studies; and drug efficacy, vector susceptibility, and entomological studies. At the health facility level, operational assessments and health facility surveys were to be conducted. Operational research and translation was to be achieved through coordination and guidance provided by the malaria control operational research working group, provision of operational research grants, and the holding of the annual national malaria research to policy conference. HR capacity was to be built through training of DOMC M&E staff in surveillance, GIS, and data management. The overall performance against M&E-specific indicators is shown in Table 13.

Table 13: Surveillance, monitoring, evaluation, and operational research indicators and targets, 2012

Indicator	Target	Achievement	Comments
Proportion of target groups trained on M&E guidelines	100%	0	A malaria surveillance curriculum package was completed, but not disseminated
Proportion of scheduled surveys and studies successfully conducted	100%	100%	Two QoC surveys and PMLLIN II completed
Proportion of scheduled operational research studies successfully conducted	100%	100%	Drug efficacy, vector susceptibility, and entomological studies done
Proportion of surveys for which results were printed and disseminated within 6 months of survey completion	100%	50%	Only results for QoC 4 and 5 were disseminated
Proportion of target districts reporting on malaria disease surveillance	100%	90%	Average reporting rate for DHIS, the main source of malaria routine data
Number of DOMC staff trained in surveillance, GIS, and data management	2	>14 (>100%)	Various staff were trained on SPSS, STATA, DD&U, and M&E
Proportion of planned SMEOR TWG meetings held	4	4 (100%)	
Annual research to policy conference held	1	0	It was agreed that this task will be undertaken once every two years, not annually

CAPACITY STRENGTHENING FOR MALARIA SURVEILLANCE

The malaria program continued to use the passive data collection model to collect the essential malaria surveillance data from existing routine data reporting systems that include DHIS-2, Logistic Information Management System (LMIS), and DDSR. Based on this data, the malaria program continued to produce quarterly surveillance bulletins that are intended to be a scorecard of the progress made toward achieving the set targets in the National Malaria Control Strategy. The bulletins are used to report on key malaria indicators that are necessary to boost the program's ability to predict, respond to, and monitor malaria situations in the country. Data on these indicators is presented using the essential surveillance graphs, as recommended by WHO and adopted by the DOMC. In addition, the bulletin is also intended to provide a unique opportunity for counties to showcase their progress in performance in malaria control efforts.

Some of the results obtained from analysis of this surveillance data are illustrated in Figures 19–20d.[2]

Figure 19: Number of outpatient confirmed malaria cases per 1,000 people
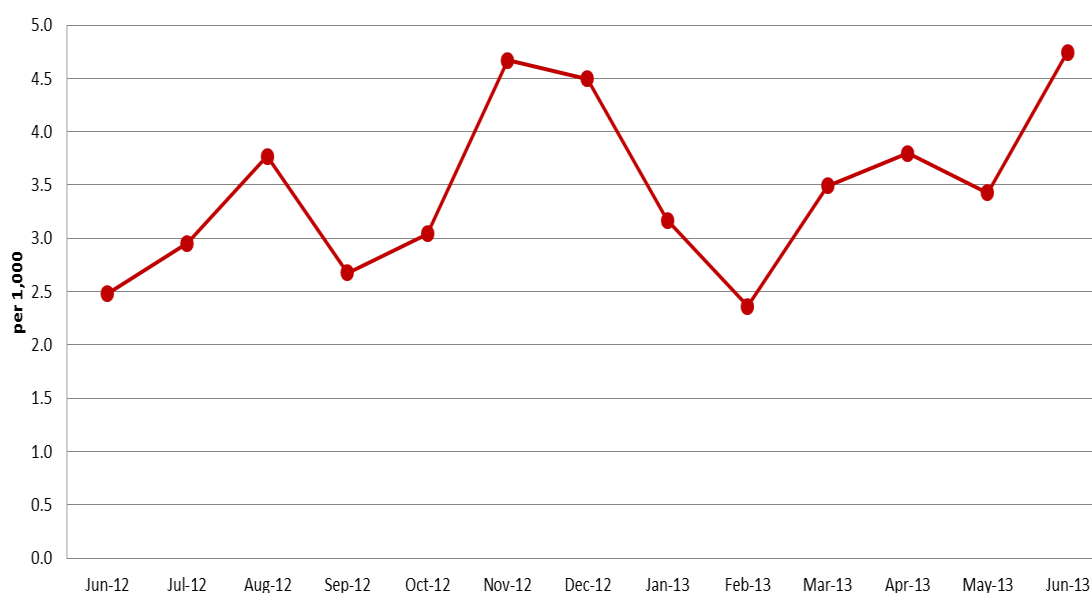
Source: DDSR, HMIS, Census 2009

Figure 19 shows the trend in the proportion of outpatient suspected malaria cases that were confirmed to have the malaria parasite by microscopy or RDT per 1,000 people. From the trend it would seem that the number of aggregated confirmed outpatient malaria cases countrywide rose from about 3.0 cases per 1,000 people in July 2012 to more than 4.5 cases per 1,000 people in June 2013. This could be explained by a corresponding increase in the availability of malaria diagnostic resources due to the wider availability of RDTs countrywide.

Disaggregation of this data by the four epidemiological zones confirmed that the endemic regions (lake and coastal endemic) presented the highest increase in confirmed malaria cases, from about 6 cases per 1,000 people in June 2012 to 20 cases per 1,000 people in June 2013. On the other hand, the proportion of confirmed malaria cases remained relatively stable in the other three

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[2] See Malaria Surveillance Bulletin, Issue 5 for details.

zones, and no sudden upsurge was observed in these zones during the 2012–2013 reporting period.

Figure 20a: Confirmed outpatient malaria cases by epidemiological and endemic zones, 2012-2013
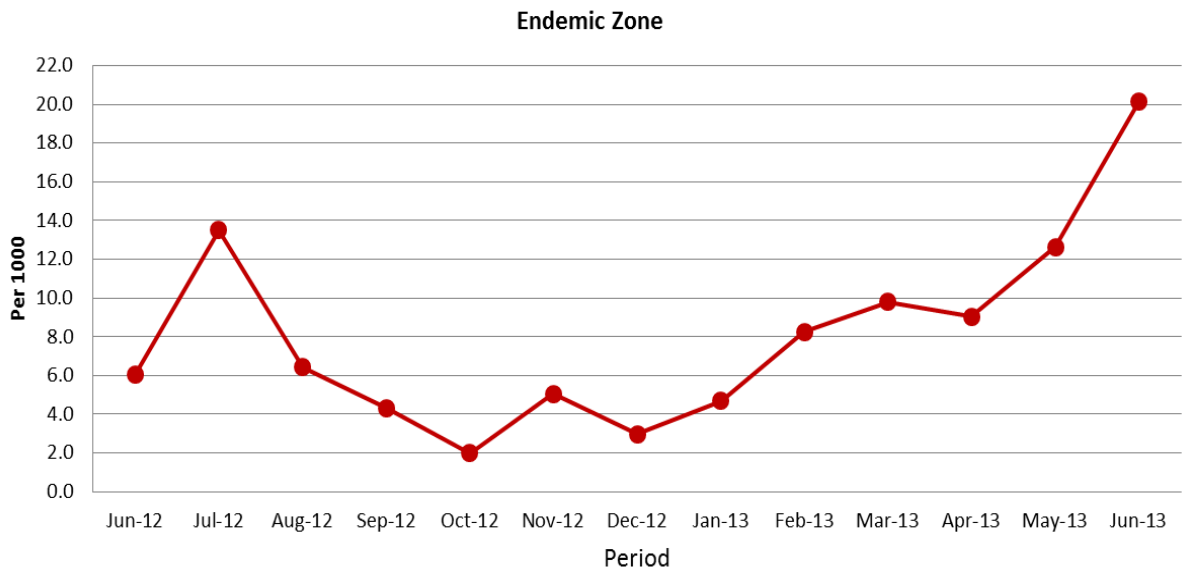
Endemic Zone

Figure 20b. Confirmed outpatient malaria cases, seasonal transmission zone, 2012–2013

Seasonal Transmission Zone
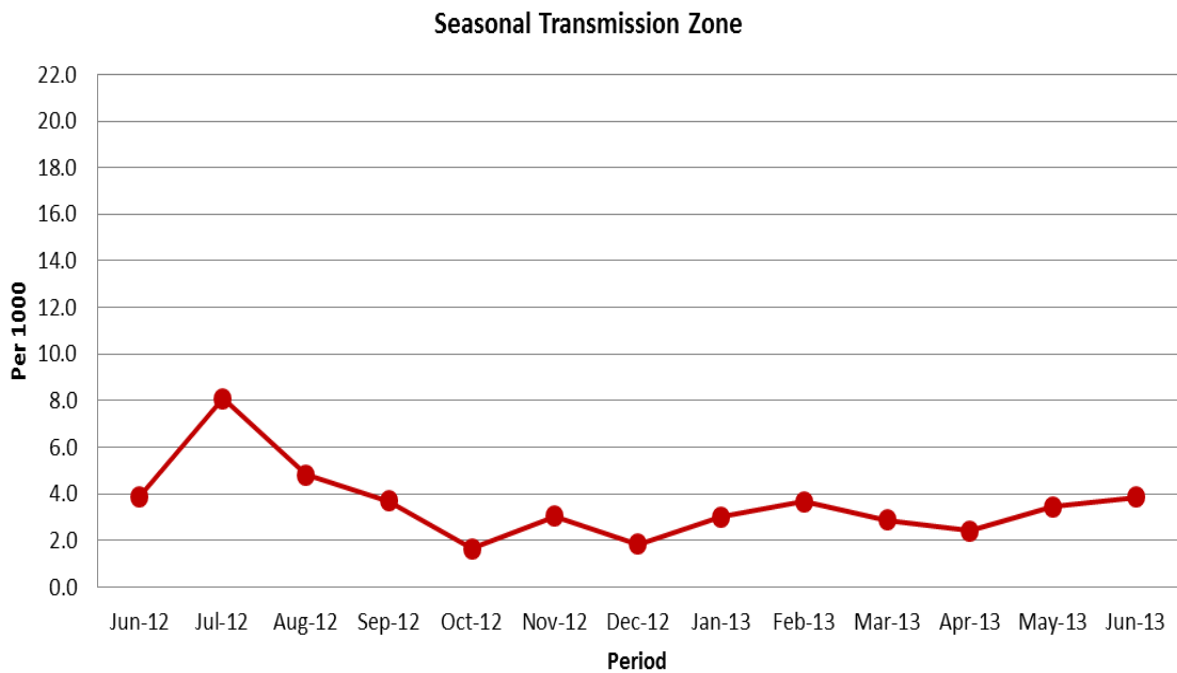
Figure 20c. Confirmed outpatient malaria cases, highland epidemic zone, 2012–2013

Highland Epidemic
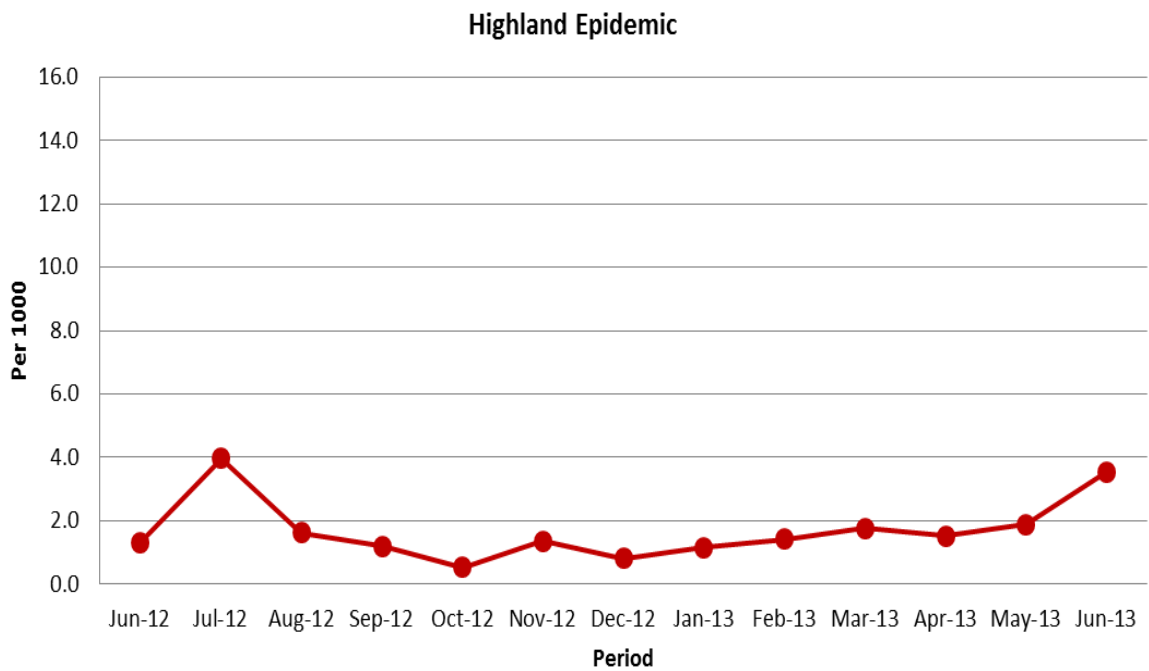
Figure 20d. Confirmed outpatient malaria cases, low-risk zone, 2012–2013

Low Risk
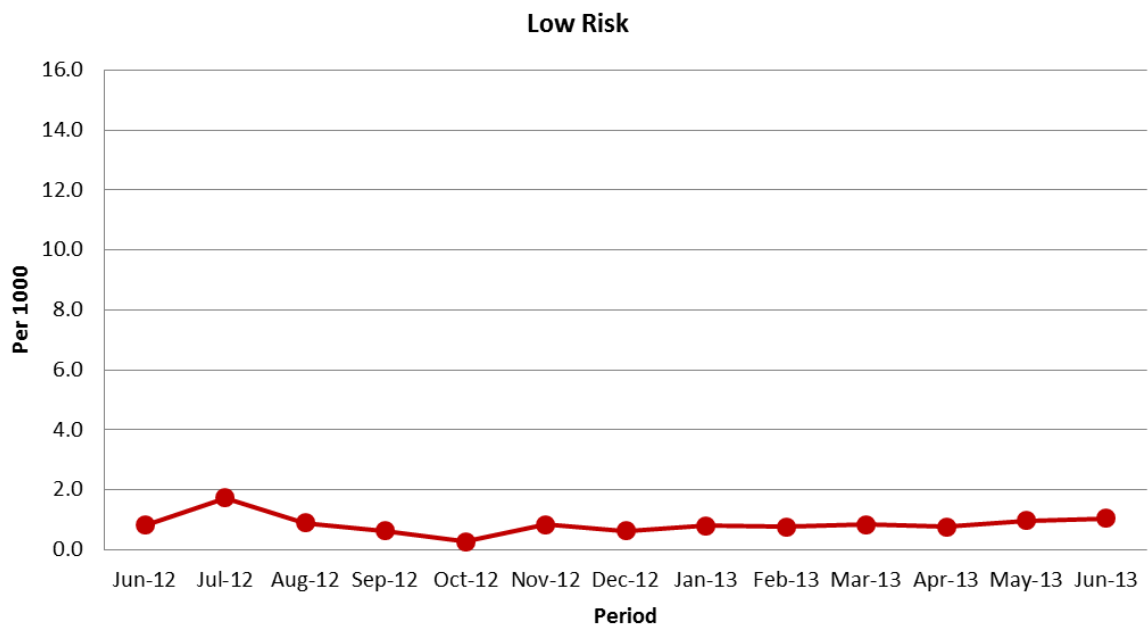
SUSPECTED MALARIA CASES TESTED WITH PARASITE-BASED TEST

Another indicator monitored with the surveillance graphs was the diagnostic capability of health facilities in the country, which is expressed as a percentage of the suspected malaria cases among outpatients that underwent a laboratory diagnosis. As illustrated in Figure 7, this indicator improved steadily over the reporting period. This increase in testing rate could be attributed to increased use of RDTs, which were rolled out in October 2012. Previously the diagnostics capability of health facilities in Kenya was low because the number of facilities that could perform microscopy was low.

The testing rate (percentage of suspected malaria cases tested using a parasite-based test) according to routine surveillance data rose steadily, from about 60% in June 2012 to remain slightly above 100% by the end of the reporting period. This high testing rate is not consistent with the fifth Quality of Care survey findings, which showed a testing rate of about 50%. This discrepancy perhaps can be attributed to possible double counting of tests undertaken using both microscopy and RDTs in the DDSR reports.

Another indicator monitored by the surveillance graphs is the outpatient TPR. A gradual increase in outpatient TPR for children ages 5 years and under and all ages was observed during the last quarter of FY2012–2013. On average, TPR for all ages increased from about 30% to 35% during the period. When the TPR data were disaggregated to the four different epidemiological zones, the TPR showed very slight gradual increase for the malaria endemic and highland epidemic-prone regions (the last quarter is the beginning of the high transmission period in Kenya), but the rate remained stable in the seasonal and low malaria transmission areas.

DEVELOP MALARIA SURVEILLANCE CURRICULUM

A malaria surveillance curriculum package, consisting of a curriculum implementation guide and participants and facilitators manuals was developed, internally reviewed, and presented to the M&E TWG. The external review process for the curriculum package also was completed. The Ministry of Health has approved the final curriculum package for rollout to train health care workers. The curriculum is expected to strengthen malaria surveillance and malaria monitoring and evaluation systems in all four malaria epidemiological zones, beginning with the ASAL areas, by equipping health care workers with the knowledge and skills to carry out the surveillance activities. Although malaria surveillance has focused mainly on the epidemic-prone districts, the rollout of a standard, uniform malaria surveillance training curriculum nationally is expected to increase availability of comprehensive malaria data to inform the midterm review of the NMS and attendant work plan cycles.

STRENGTHEN FACILITY- AND SCHOOL-BASED MALARIA SENTINEL SURVEILLANCE

A lack of funding minimized the number of activities undertaken under this strategy.

CONDUCT MALARIA DATA QUALITY AUDIT

Three data quality audits were completed in 2012–2013 in 10 districts in Nyanza region, 7 districts in Busia County, and 4 districts in Bungoma County. System assessment and data verification helped improve data quality on malaria indicators selected, and an analysis was done for each district. Generally, data verification showed discrepancies in over- or under-reporting. The districts scored well in the system assessment for data collection and reporting forms and tools, the linkage with the national reporting system, and the indicator definition and reporting guidelines. The districts had a weakness in data management processes and M&E structure and capabilities.

The use of AL reported in the counties showed over-reporting during the data verification, which probably resulted because some doses of AL dispensed to patients were not entered in the dispensed register, and AL summaries were generated from AL bin cards, not from the dispensed register. Other data discrepancies also were evident. For example, a majority of the health facilities' morbidity registers did not distinguish clinical malaria from confirmed malaria, which led to over- or under-reporting of malaria cases. Most facilities do not have designated personnel to review data for accuracy before submission to the next level. Also, net data were collected in the net free-pack register and not in the CWC and ANC registers, which are standard for recording the nets indicator; this made data verification difficult. Figure 21 shows an example overall data management assessment from Bungoma conducted in 2012. West. Findings revealed a need to improve the data management processes. The strongest areas of data collection in Bungoma West were data collection and reporting forms and tools, indicator definition, links with the national

reporting system, and M&E structure, functions, and capabilities. Data management processes were the weakest link. The same findings applied to Busia County, as shown in the Figure 22.

Figure 21: Bungoma West overall data management assessment, 2012
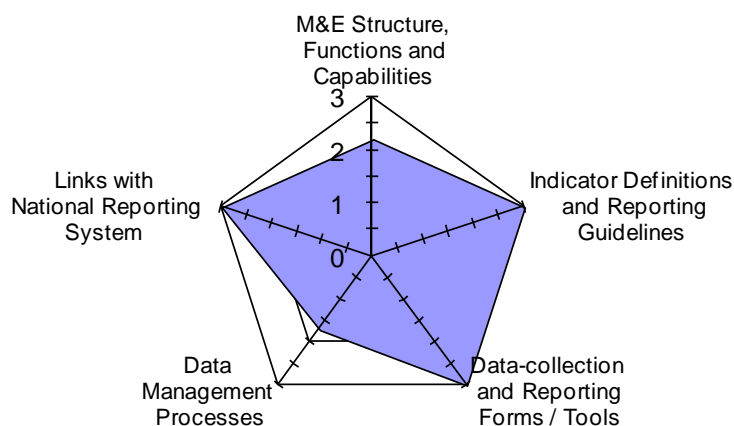
Figure 22: Busia County overall data management systems assessment, 2012
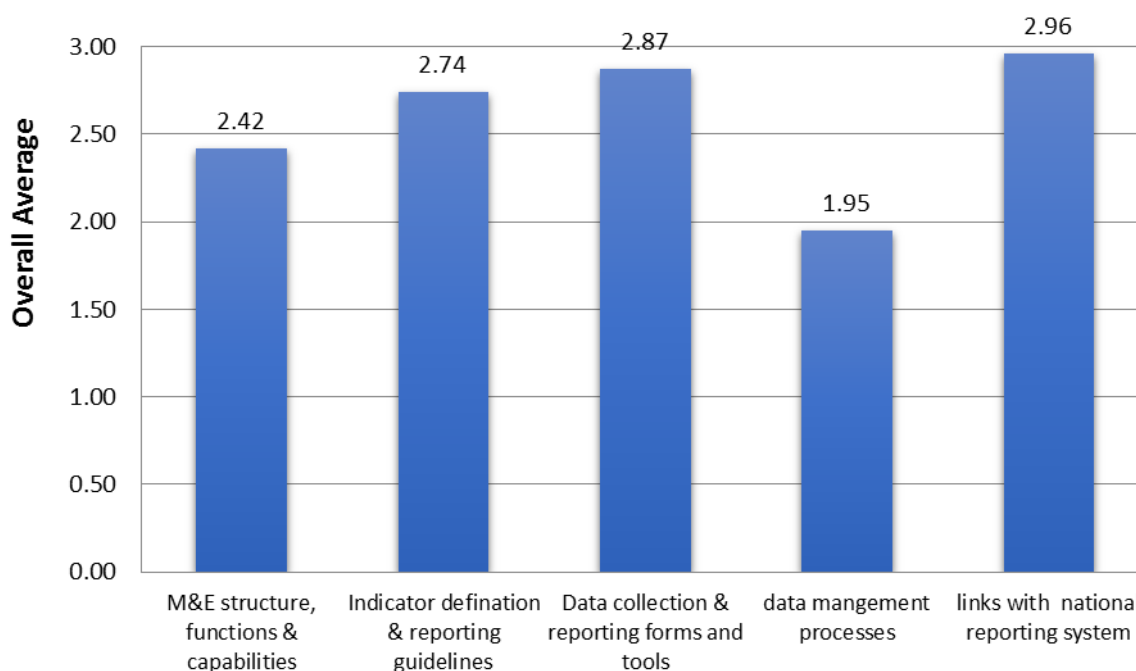
The data verification assessment results for the seven malaria indicators in Homabay showed that some of the indicators assessed had been under- or over-reported. The over-reported indicators included AL doses consumed, over by 10%; number of nets distributed to children under age 1 year, over by 51%; number of nets distributed to pregnant women, over by 10%; confirmed malaria cases for children under 5 years, over by 23%; confirmed malaria cases for all ages over 5 years, over by 33%; and clinical malaria cases for children under age 5, over by 13%. The number of pregnant women that received IPT2 was under-reported by 25%. Figure 23 shows an example from the Homabay data verification of the overall average by indicator in 2012.

Figure 23: Homabay data verifications overall average by indicator, 2012
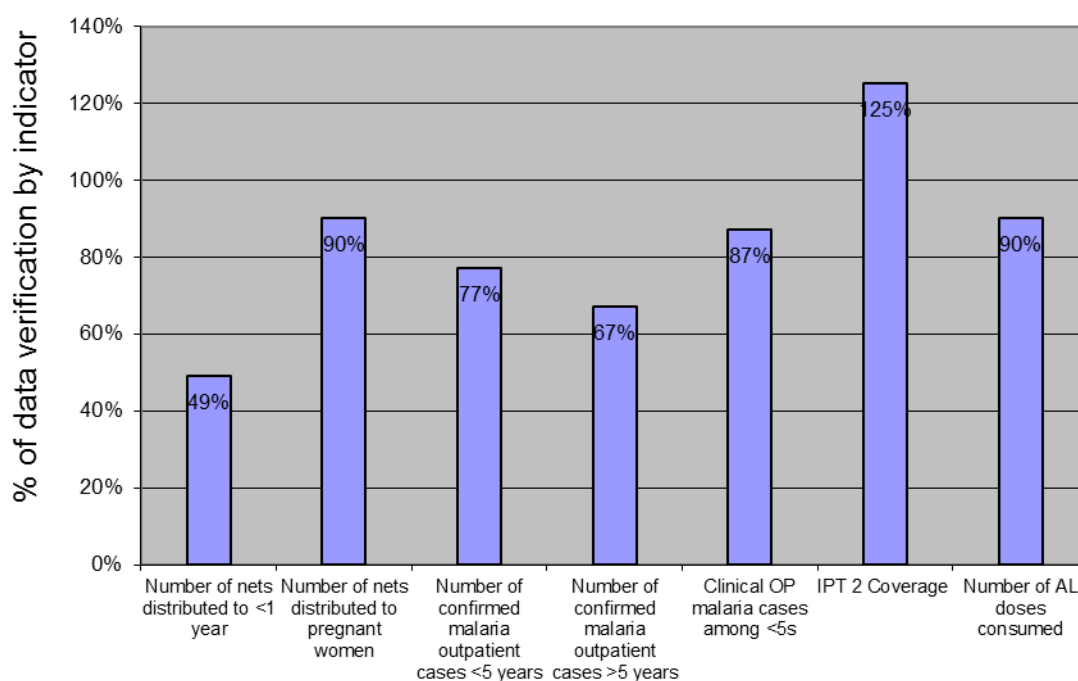
The results of the data quality assessments were to be disseminated to the counties concerned in 2013//2014.

STRENGTHEN MALARIA DATA MANAGEMENT SYSTEMS

Malaria surveillance, monitoring, and evaluation (SM&E) data are derived from various routine data reporting systems that include the DHIS, DDSR, LMIS, and Laboratory Information Management System. Figure 24 compares June 2012–June 2013 reporting rates for DHIS, IDSR, and LMIS, where the rates were derived from the number of health facilities that send in monthly reports compared with the number expected to report every month. The IDSR data are an average of the weekly data that was reported during the reporting months.

The DHIS-2 reporting rate remained consistently high during the reporting period, at about 90%. The IDSR reporting rate fell from over 90% to slightly below 70%, and the LMIS reporting rate increased steadily from about 40% to settle at between 65–70% after it was moved from KEMSA to the DHIS reporting platform. PMI provided the required funding for the county and sub-county pharmaceutical facilitors to collect the commodities data from health facilities and upload it on DHIS-2. The decline in the IDSR reporting rate can be attributed to the migration from a manual system to an electronic e-IDSR system. The IDSR reporting rate is expected to improve as the system stabilizes.

Figure 24: Reporting rates for the malaria SM&E data sources, 2012–2013
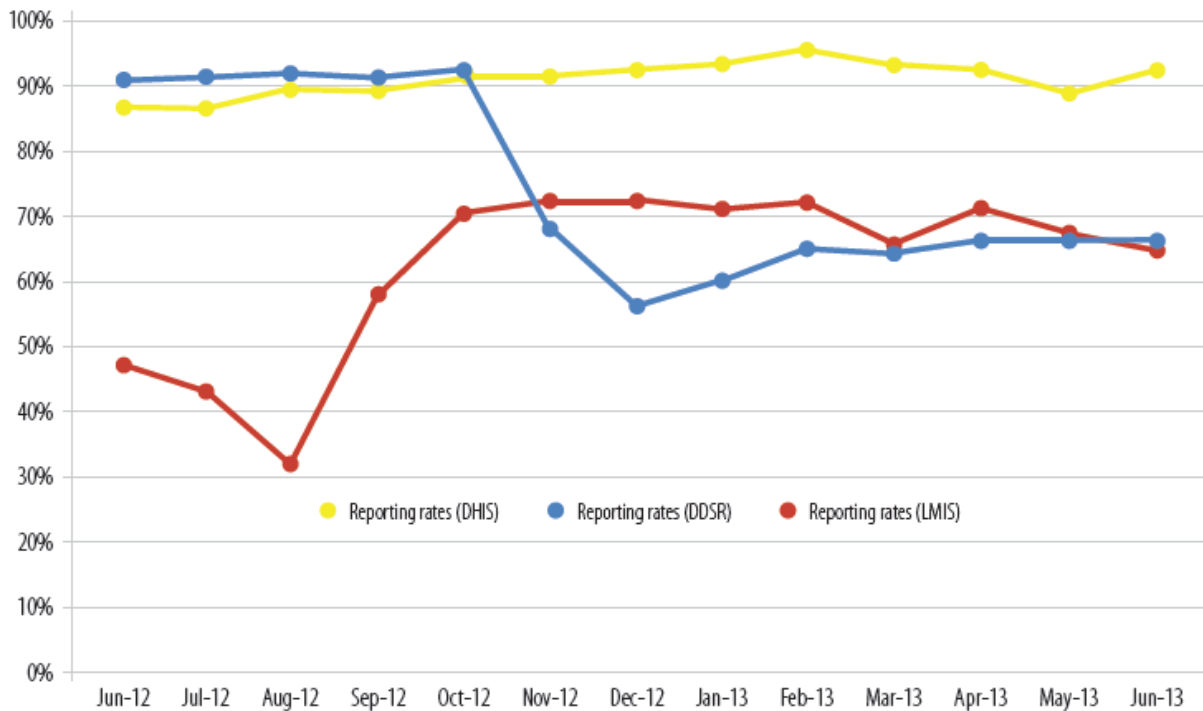
Source: DHIS, DDSR, and LMIS

The Malaria Information Acquisition System (MIAS) is intended for management of program information, including support for development of the program's annual operational plans and activities. As part of its rollout, a data manager was recruited to join the M&E team during the reporting period and inducted on the use of MIAS by the system developer.

Unfortunately, a lack of funding to support the planned upgrade of ICT infrastructure, including the DOMC mail system, resulted in persistently out-of-service operations. Similarly, the planned rollout of MIAS to district levels was not done and may not be feasible in the near feature, considering the context of the ongoing nationwide devolution of systems and services.

CONDUCT AND SUPPORT COMMUNITY SURVEYS

Conduct Phamacovigilance and Post-market Surveillance: Pharmacovigilance and post market surveillance continued to be done on schedule in collaboration with the Pharmacy and Poisons Board and the National Quality Control Laboratory. During the 2012–2013 reporting, eight pharmacovigilance supervisions and one pharmacovigilance surveillance were done.

Monitor Malaria Drug Efficacy: Malaria drug efficacy monitoring was planned for three sites, Msambweni District Hospital in Kilifi, some sites in Busia, and Kisumu sentinel sites. In a World Bank-sponsored study, data collection in Msambweni started in March 2013, with scheduled completion by July 2013.

Conduct Entomological Surveys and Insecticide-resistance Monitoring: DOMC recognizes the crucial role of routine monitoring of susceptibility of malaria vectors to insecticides used for IRS and in insecticide-treated nets to ensure judicious use of these insecticides. During the Malaria Program Performance Review conducted in 2009, DOMC and its partners identified gaps in vector surveillance and insecticide-resistance monitoring and recommended capacity building at national and sub-national levels to conduct these activities. In 2008, WHO, through the Bill and Melinda Gates Foundation, supported DOMC and KEMRI to build this surveillance and monitoring capacity. A number of personnel were trained and equipment was procured, and mosquito surveys and insecticide susceptibility studies were carried out at several sites. As a result of these

activities, the first-ever Kenya entomological profile was developed and vector distribution maps generated. The profile clearly identified the gaps where data was lacking for sound vector control decision making. KEMRI centers in Nairobi (CBRD), Kilifi (CGMR-C), and Kisumu (CGHR) were identified as reference centers to support these activities, particularly the highly specialized procedures.

Regular entomological surveys and insecticide resistance monitoring continued during the 2012–2013 period, and information was made available for program planning. Some of the studies revealed high resistance to pytheroids in areas of high malaria burden. Some level of resistance to carbamates and organophosphates also has been shown in certain locations. The major malaria vectors in all high-burden malaria locations still show high resistance to DDT. Table 7 lists the major malaria vectors and their resistance to certain chemicals.

Table 7: Vector resistance to various insecticides, 2012–2013

Species	Location	DDT	Permethrin	Deltamethrin	Alpha-Cypermethrin	Lambda-Cyhalothrin	Bendiocarb	Malathion
A. gambiae. s.l.	Bungoma	√	X	x	NA	NA	NA	NA
	Busia	√	√	√	NA	NA	NA	NA
	Kakamega	√	X	X	NA	NA	NA	NA
	Kisumu W.	√	X	X	NA	NA	NA	NA
	Teso	√	√	√	√	√	NA	NA
	Nyando		X	x	x	√	©	©
	Rachuonyo	NA	√	x	x	√	©	©
	Rarieda	NA	√	√	√	√	NA	NA
	Bondo	NA	√	√	NA	NA	©	©
	Malindi	©	NA	©	NA	©	x	NA
	Kilifi	©	NA	x	NA	X	©	NA
	Taveta	©	NA	x	NA	©	√	NA
A. gambiae. s.s.	Bungoma	√	√	√	NA	NA	x	©
	Busia	√	√	√	NA	NA	√	©
	Kisiani	√						
A. arabiensis	Rarieda	©	X	x	NA	NA	©	©
	Budalangi	©	√	x	NA	NA	x	©
	Busia	©	X	©	NA	NA	x	©
	Kakamega	©	X	©	NA	NA	x	©
	Kisian	©	X	x	NA	NA	©	©
	Nyando		NA	x	NA	NA	©	
	Rachuounyo		NA	x	NA	NA		
	Mwea	x	√	√	NA	NA	√	√
An. Funestus s.s	Mbita	√	√	√	NA	NA	NA	NA
	Ahero	NA	√	√	√	√	©	©
	Asembo	NA	√	√	NA	NA	NA	NA
	Bungoma	NA	√	√	NA	NA	NA	NA
	Teso	NA	√	√	NA	NA	NA	NA
An. f. revulorum	Mbita	©	√	x	NA	NA	NA	NA

Key: x = Probable resistance; √ = Resistance; © = Susceptible; NA = Not available

Consequently, a draft insecticide resistance management strategy was developed and is awaiting approval for adoption. This Strategic Plan will guide implementers on the best possible ways to prolong the usefulness of the available insecticides for public health in Kenya.

CONDUCT AND FACILITATE HEALTH FACILITY SURVEYS

Quality of Care Surveys: Biannual health facility surveys monitoring the quality of out-patient malaria case management were launched in 2010 as part of program monitoring and evaluation. The objective of the surveys is to monitor health worker practices and adherence to malaria case management guidelines and circumstances that influence treatment practices. Six surveys have now been carried out since the launch; the baseline survey in January 2010, and subsequent

surveys in November 2010, July 2011, March 2012, November 2012, and June 2013. The objectives of the quality of care surveys are to determine trends in the national availability of recommended and non-recommended antimalarials and malaria diagnostics in public health facilities and to determine the levels and trends in health workers' adherence to outpatient guidelines for malaria diagnosis and treatment, including counseling and drug dispensing practices in public health facilities countrywide.

During the 2012–2013 reporting period, the report of the fourth round of the QoC study was finalized. It noted a gradual increase in the composite indicator measuring health worker practices. Overall, the report stressed the need to pay close attention to the quality and completeness of the data collected. In addition, the fifth QoC was completed and the findings were disseminated at the national and sub-national levels. The training of research assistants and fieldwork aspects of the sixth QoC survey were completed, with data analysis and report writing activities to be completed in the first quarter of FY2013.

Key Findings from the Fifth QoC Survey, November 2012: The findings revealed that nearly all key indicators around test-and-treat policy for malaria have shown significant improvements since initiation of the QoC surveys in January 2010. The composite performance, defined as "febrile patient tested and treated in accordance with national guidelines," improved from 16% to 50% at all study facilities and from 28% to 55% at facilities with diagnostics and AL in stock. At the latter facilities, significant improvements also were observed in testing of febrile patients (43% to 63%), recommended treatment for test-positive patients (83% to 90%), and in adherence to the test-negative results (47% to 83%). The health workers performed significantly better at facilities where both RDTs and malaria microscopy were available, with composite performance at these facilities at 66%, while 76% of febrile patients were tested. Significant improvements also were observed in parasitological capacity of health facilities, considering that the availability of at least one malaria diagnostic service increased from 55% to 90%, mainly due to a massive increase in RDT availability.

Health Workers Adherence to Treatment Guidelines: Figure 25 reports health workers case-management practices at facilities where malaria diagnostics and AL are available as an indicator of the health workers adherence increased from 28% to 55%. The changes in individual case-management components at these facilities were as follows: (1) testing rates increased from 43% to 63%, (2) treatment of test-positive patients with AL increased from 83% to 90%, and (3) antimalarial treatment of test-negative patients decreased from 53% to 17%.

Figure 25: 2010–2012 national trends in health workers diagnostic and treatment adherence to national case management guidelines
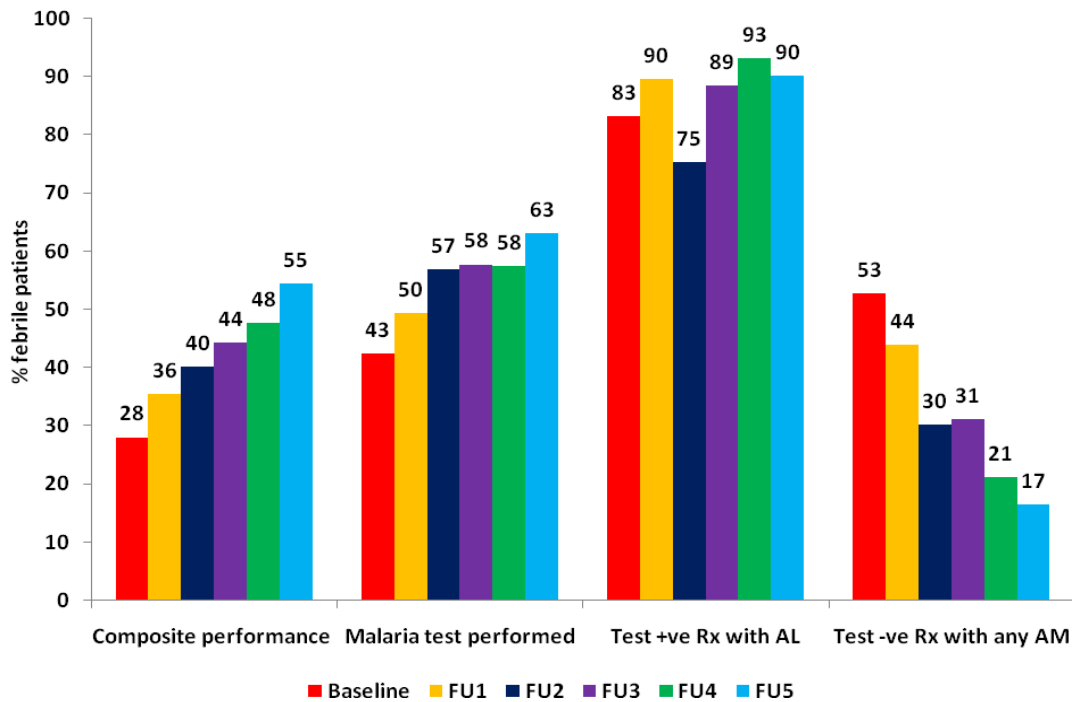
Source: Fifth QoC Survey Report

Stockouts of AL: A substantial decline in AL stockouts was observed during the monitoring period. The latest results showed that in the period 3 months before the survey, only 7% of facilities experienced total AL stockout, while 22% were stocked out of one or more AL packs over the period of 7 or more consecutive days. These commodities are still rarely available at public health facilities as a result of the national policy change for second-line therapy (DHA-PPQ) and the treatment of severe malaria (parenteral artesunate).

Figure 26: National trends in the retrospective AL stockout indicators, 2010-2012
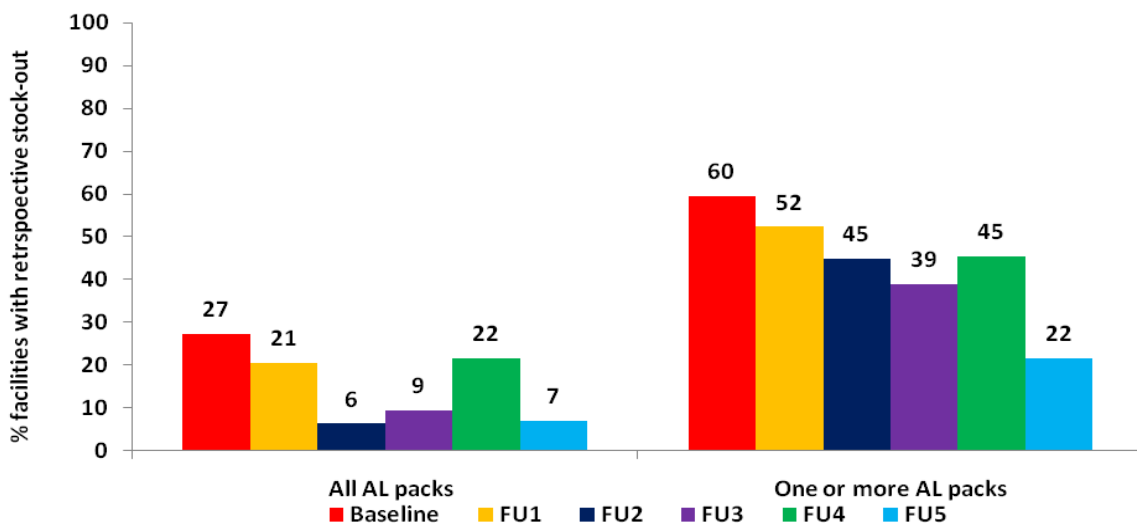
The operation research (OR) unit continued to convene quarterly meetings to review the national malaria OR agenda and coordinate malaria research activities.

Seek Grants to Research Institutions: The OR TWG earmarked questions as priority study areas during Year 5. The group received and reviewed research protocols for these studies before they were presented to DFID for funding. DFID committed to fund three of these studies, and review of the last two is ongoing.

Hold Annual Malaria Research to Policy Conference: The initial plan was to hold this conference annually; however, subsequently it was agreed that the conference should be held once every two years. The second conference was scheduled for October or November 2013.

Build H.R. Capacity in Surveillance, Monitoring, and Evaluation: Strategy to build human resource capacity in SM&E focused on training, as described in the following paragraphs.

Provide Training on Research to Policy Translation: During the year training was conducted on research findings to policy translation with support from the Malaria Vaccine Initiative. A total of nine participants were trained, with three from DOMC and six from partner organizations.

Provide Training in M&E, GIS, and Data Management: Table 8 lists training workshops during 2012–2013 to strengthen the capacity of DOMC staff, especially staff from the M&E unit, to undertake more efficient routine surveillance and program evaluation.

Table 8: M&E trainings provided for DOMC, 2012–2013

	Training	Training Dates	Venue	Organizers	Number Trained
1	STATA workshop	September 24–28, 2012	Kenyatta University	MEASURE Evaluation	20 (10 DOMC and 10 sister departments)
2	Regional M&E workshop	June 2012	Accra University Ghana	MEASURE Evaluation	2 DOMC, 1 North Eastern Province
3	Data demand and use workshop	July 2–4, 2013	Nairobi	Futures Group	2 DOMC
4	SPSS data analysis workshop	February 2013	Kenya School of Government	PSI	2 DOMC

Advocacy, Communication, and Social Mobilization

Objective: By 2014, strengthen advocacy, communication, and social mobilization capacities for malaria control to ensure that at least 80% of people in malarious areas have knowledge on prevention and treatment of malaria.

Strategies:
- Strengthen capacity for advocacy, communication, and social mobilization.
- Support priority implementing partners.
- Develop appropriate advocacy for uptake of specific malaria interventions.

Planned Activities: The program planned to hold quarterly meetings of malaria ACSM groups at all levels to strengthen overall capacity for advocacy, communication, and social mobilization. Activities also were planned to support priority implementing partners by providing them with information, education, and communication (IEC) and behavior change communication (BCC) support; support provincial- and district-level ACSM activities; commemorate World Malaria Day; and publish quarterly and annual advocacy bulletins. Support for the uptake of specific malaria interventions was to be accomplished by providing IEC and BCC support for IRS campaigns; conducting advocacy, social mobilization, and BCC for MIP; and mobilizing and advocating for the AMFm program.

An activity to document malaria control best practices was planned for execution during the reporting period with support from Global Fund Round 10 funding; however, the disbursed funds were too little for the activity, and it was postponed. The activity planned to support the malaria good will ambassador also did not take place because of lack of funding. Unfortunately, the person designated as the malaria goodwill ambassador also passed on during this period. Mobilization and advocacy for appropriate case management for the private sector under the AMFm program was planned, but failed to be conducted because of lack of funding. Other IEC materials produced and distributed through various channels also focused on AMFm, particularly on case management. Table 12 shows performance against targets set for the period.

Table 9: Advocacy communication and social mobilization indicators and targets

Indicators	Target N	Achievement N (%)	Comments
Proportion of targeted districts with updated ACSM guidelines	56	56 (100%)	
Proportion of targeted health workers and other service providers trained on updated ACSM guidelines	1000	905 (90.5%)	
Proportion of health facilities supplied with updated ACSM materials	0	0	
Proportion of districts conducting World Malaria Day activities	265	15 (5.7%)	
Proportion of districts conducting malaria field days	265	0	No reports received from districts
Number of quarterly and annual advocacy bulletins produced	4	1	
Number of media campaigns conducted	3	3	
Proportion of meetings with partners, stakeholders planned and held	15	12 (80%)	

STRENGTHEN CAPACITY FOR ACSM

Integrated joint supervision for all malaria interventions were undertaken under SMEOR activities, which included supportive supervision for ACSM activities. The program also planned to hold quarterly meetings of malaria ACSM groups at all levels to strengthen overall capacity for advocacy, communication, and social mobilization; however, this activity was not funded in 2012. Some districts on their own initiative undertook limited activities under the general health ACSM activities.

SUPPORT PRIORITY IMPLEMENTING PARTNERS

Provide IEC and BCC Support: Technical support was provided to priority implementing partners undertaking malaria ACSM, mainly in message development and guidance on malaria ACSM activities. DOMC mainly supported PSI, RTI, and AMREF. The budgets for this activity were borne mainly from partner plans as support was needed.

Support Provincial- and District-level ACSM Activities: Limited funding cancelled support for elaborate community-based ACSM activities, including field days. Some districts did, however, undertake some limited community activities under the community health strategy. In addition, the districts and provinces were supported to undertake the following activities:

- Community education training in Nyanza, Western, and Coast regions used the newly published community education and training manual and Essential Malaria Actions (EMAs) Guide.
- Supportive supervision was undertaken jointly by the provinces and the national level.

Commemorate World Malaria Day 2013: World Malaria Day (WMD) offers a chance to shine a spotlight on the global effort to control malaria. Each year, Roll Back Malaria (RBM) partner organizations unite around a common World Malaria Day theme. "*Invest in the future: defeat malaria*" is the theme partners chose for the sixth World Malaria Day and the next 3 years to call attention to the big push needed to reach the 2015 Millennium Development Goals and defeat malaria in the future. The Kenyan customized slogan is *"Pamoja tuendelee kuangamiza malaria,"* which is in line with the RBM theme. It also emphasizes the importance of strengthening

partnerships, inter-sectorial, national, and global commitments in the fight against the deadly disease.

The country commemorated April 25, 2013, with the national event at Moi Girls Kipsitet High School grounds in Kericho County. The chief guest at the national function, His Excellency the Deputy President Hon. William Samoei Ruto, was represented by the Permanent Secretary in the Ministry of Public Health and Sanitation, Mr. Mark Bor. Development partners and UN agencies, as well as implementing partners and other malaria stakeholders, also were represented at the function.

While acknowledging that significant gains have been made in the fight against malaria in Kenya, speaker after speaker noted that among others, one key challenge that remains is sustaining and scaling-up the successful malaria interventions, which requires availability of sustainable financing.

Figure 27: Testing and treatment during World Malaria Day in Kericho County

Publish Quarterly and Annual Advocacy Bulletins: Despite the plan to publish quarterly bulletins, only one was published in the 2012–2013 period because of limited or non-submission of articles.

DEVELOP APPROPRIATE ADVOCACY FOR UPTAKE OF SPECIFIC MALARIA INTERVENTIONS

Provide IEC and BCC Support for IRS Campaigns: DOMC produced IEC materials in support for all interventions during the year. IEC and BCC activities also were undertaken in support of the various malaria interventions through the airing of the following radio spots and TV commercials:

- Support to IRS was through print and radio infomercials targeted for Migori, Homabay, and Kisumu counties that were implementing IRS.
- IEC through print, radio, and TV commercials, as part of WMD pre-main event activities.
- Other partners, including PSI and AMREF provided IEC and BCC support for case management at community and facility levels through interactive interpersonal communications in lake endemic areas and parts of Coast regions, with PSI focusing extensively on IEC and BCC for LLINs.

- Messages, particularly print and interpersonal communication with health workers and CHWs, were done in lake endemic regions through support from the MCHIP project.
- BCC on MIP as part of community education meetings were addressed in Nyanza, Western, and Coast regions.

Program Management

Objective: By 2013, strengthen capacity in program management to achieve malaria programmatic objectives at all levels of the health care system.

Strategies:

- Strengthen capacity for planning, partnerships, and coordination at NMC program.
- Strengthen malaria program management at the district and provincial levels.
- Strengthen infrastructure at the national, provincial, and district levels.
- Strengthen activity and performance monitoring.
- Strengthen resource mobilization capacity to improve malaria control financing.
- Strengthen human resource capacities in malaria endemic area.
- Strengthen procurement and supply management systems for malaria drugs and commodities.

Activities: The main functions of the unit are resource mobilization for malaria control activities and coordination of the program partners in planning, implementing activities, and monitoring performance. It also coordinates the decentralization of oversight and coordination of malaria control activities to provincial and district levels, while working with partners to support the decentralized operations. During the reporting period, the unit planned to strengthen capacity for planning, partnership, and coordination at the central level, which included support to integration of malaria control into the health sector annual operational planning process; continue managing quarterly MICC meetings and coordinating TWG meetings; and continue participating in regional and international conferences and meetings.

Plans also were in place to train malaria focal point personnel at the provincial and district levels on malaria control and program management and to provide office equipment and operational support at all levels. Activity and performance monitoring for the program was to be strengthened through quarterly program review meetings for DOM; biannual planning and review meetings with partners, mid-term review of the NMS, and production and dissemination of the annual business plan. Plans also included moves to strengthen the program's resource mobilization capacity by recruiting a planning officer; hold quarterly roundtable meetings with donors; and develop resource mobilization proposals. Human resource capacities in malaria endemic areas were to be achieved through training, recruiting priority health workers, and collaborating with training institutions on curriculum updates. Activities planned for strengthening procurement and supply management included to conduct quantification of malaria medicines, LLINs, and laboratory and other medical supplies. Support also was to continue being available for implementation of LMIS for malaria commodities. Table 13 lists indicator and targets set for the period and performance.

Table 10: Program management indicators and targets, 2012–2013

Indicators	Target	Achievement	Comments
Proportion of malarious districts with current national malaria control strategies reflected in their annual plans	80%	100%	The health sector annual operational plans are fed from the NMCP business plan
Proportion of malarious districts with a formally designated and trained malaria focal point	80%	0	None of the focal point personnel was trained because of a lack of a training manual

Proportion of malarious districts supported with office equipment	80%	0	This activity was not funded
Proportion of districts supervised according to guidelines	65%	86%	The districts in Nyanza were not supervised
Proportion of activities in the Strategic Plan that have been financed	80%	69%	See Technical Performance Table in the Annex
Proportion of malarious districts using LMIS	80%	100%	LMIS has been integrated into DHIS, and all counties are now reporting

STRENGTHEN CAPACITY FOR PLANNING, PARTNERSHIPS, AND COORDINATION AT NATIONAL MALARIA CONTROL PROGRAM

Coordinate and Integrate Malaria Control into the Health Sector Annual Operation Plan Process: Annually the Malaria control program develops a National Malaria Control Program (NMCP) business plan that should be reviewed biannually. The health sector annual operational plans are fed from this NMCP business plan. This activity was completed for FY2012, and review meetings were held in the first half of FY2013 with the counties at both the national and regional levels. These meetings provided key priority areas of interventions in malaria control for incorporation at the county and national Annual Work Plans.

Conduct Quarterly MICC and TWG Meetings: The Malaria Interagency Coordinating Committee (MICC) is a multi-sectorial body that includes non-health partners that are responsible for making decisions on policy and providing oversight and guidance for the implementation of malaria interventions. The MICC, chaired by the Director of Public Health or a designated person, meets quarterly to review the output of TWGs and subcommittees. Six program TWGs and a Global Fund technical committee are scheduled to meet at least quarterly and report to MICC. Table 11 shows the number of MICC and TWG meetings held and the key outputs from these meetings.

Table 11: MICC and TWG meetings, 2012–2013

Agency	Target	Meetings held	Key outputs
MICC	4	4	• Guided the undertaking of the midterm review of the NMS, which included a situation analysis of malaria control impact and technical and financial performance of the service delivery and support systems and making recommendations for improved delivery of results • Oversaw the application process for the GFTAM Round 10 Phase II, malaria
Case Management TWG	4	4	• Effective supply chain management • AMFm coordination • Planning for QoC • Reviewing previous quarter activities • Planning for quarterly Case Management activities
Vector Control	4	4	• Critical review of insecticides suitable for use in IRS in Kenya • Developed and documented the Vector Resistance Management Strategy • Developed a policy brief recommending that Kenya cease use of pyrethroids for IRS
M & E TWG	4	4	• Consensus on suitable period for holding the next Kenya Malaria Indicator Survey • Reactivation of the OR TWG as a separate entity from the M&E TWG • Endorsement of plan for development of a surveillance curriculum

Agency	Target	Meetings held	Key outputs
Malaria in Pregnancy TWG	4	2	• Approval for dissemination of MIP Standards-based Management and Recognition (SBM-R) tool to antenatal care service providers • Approval for rollout of the MIP IEC materials translated in local dialects • Recommendation to re-distribute SP for MIP from low malaria transmission areas to endemic areas • Recommendation to ICC to consider approval to implement IPTp at health facilities in fringe zones where some clients come from malaria endemic areas
ACSM TWG	4	2	• Ratification of net use campaign pilot results • Ratification of post mass net distribution survey results • Review of progress reports from DOMC and partners (PSI, AMREF, CHAI, KENAAM) • Planning for World Malaria Day commemoration
Research TWG	4	4	• Reviewed and analyzed available insecticides resistance data • Guided the pilot on use of pyrethroids compared with non-pyrethroids to inform the policy brief on IRS • Reviewed the key OR questions identified at earlier TWG meeting and selected three key questions for initial funding by DFID

Participate in Regional and International Conferences and Meetings: In the review period, two malaria program officers and one regional officer participated in M&E training in Ghana, while two officers participated in a planning and managing malaria control programs training in Ethiopia.

Maintain Current Core Staff at DOMC: This activity was achieved through the government and GF Malaria funding

Strengthen Malaria Program Management at the District and Provincial Levels: The activity planned for FY2012 was to train malaria focal point personnel at the provincial and district levels on malaria control and program management; however, this activity was not accomplished, mainly due to a change of governance as a result of devolution. Most of the counties have identified focal persons to handle malaria, in addition to other diseases. Capacity still needs to be built among the county malaria focal personnel, specifically on malaria control and program management.

Strengthen Infrastructure at the National, Provincial, and District Levels: Provision of office equipment and operational support was done only for the national level. Funds were inadequate to achieve this activity at the regional levels.

Strengthen Activity and Performance Monitoring: Several activities were planned under this strategy and accomplished, as detailed later.

Conduct Quarterly Program Review Meetings (DOMC Technical) at National Level: Only one quarterly meeting was conducted during the review period; however, weekly management meetings that check on performance and unit updates were held regularly. This activity needs to be institutionalized with a standard structure of review based on targets and milestones of specific quarterly periods.

Conduct National Biannual Planning and Review Meetings with Partners: One planning meeting was held during the 2012–2013 period, one in January 2013 and the second in July 2013. A technical and financial review was accomplished during the first meeting, and the 2012–2013 draft business plan was revised and completed. The meeting also drafted the 2013–2014 business plan. The second meeting held in July focused on orienting the county health directors on key malaria control policies, strategic direction, and the county malaria profiles that were to provide a framework for planning; that is, to identify priority intervention areas based on the epidemiology.

Conduct Midterm and End Term Review of the NMS and Update NMS: A mini management performance review was done in July 2013; however, this exercise was not completed and is scheduled for completion in FY2013–2014.

Facilitate Quarterly Performance Review and Planning Meetings at Provincial Level: Facilitation of quarterly performance review meeting was done in the Western and Nyanza regions.

Produce and Disseminate Annual Business Plans: This activity was accomplished for the 2012–2013 period.

STRENGTHEN RESOURCE MOBILIZATION CAPACITY TO IMPROVE MALARIA CONTROL FINANCING

Under this strategy, the program continued to maintain and remunerate a planning officer as one of its core staff. The planned quarterly round table meetings with development partners were not held, but efforts are being made to establish and operationalize the Resource Mobilization TWG.

Resource Mobilization: During the 2012–2013 reporting period, GF Malaria Phase II proposal-developed preparatory activities proceeded on course. PMI accomplished the annual preparation of the Malaria Operation Plan through collaborative deliberations with DOMC and other stakeholders. PMI, World Bank, and DFID funds committed for various activities were disbursed.

Financing for Malaria Activities: Table 12 lists estimated funding allocations for malaria control activities in 2012–2013 in Kenyan shillings and Figure 28 shows the expenditures. The figures are derived from budgets and expenditures using an exchange rate of Kshs. 85.27 for USD $1 and Kshs 131 per British pound. The bulk of the malaria financing for the year was from PMI, DFID, and Global Fund. Procurement of anti-malarial medicines and the vector control interventions (LLINs and IRS) were allocated approximately 60% of the entire budget. The government's financial contribution to the malaria budget remained comparatively low.

Table 12: Malaria financing, FY 2012–2013

Malaria Financing by Year		2011–2012 (≈Millions US $)	2012–2013 (Millions Kshs)	2012–2013 (≈Millions US $)
Government Contributions	Total Government Budget	13,749.0	1,107,863	12,991.86
	Recurrent Government budget	9,369.0	1,003,200	11,764.49
	Health budget	762.0	85,029	997.13
	Malaria budget	2.7	118	1.39
External Contributions	Global Fund (Both PRs)	12.5	1,428	16.74
	World Bank (TOWA Project)	9.0	97	1.13
	USAID-PMI	36.5	2,921	34.26*
	DFID-WHO	17.5	1,814	21.28**
	UNICEF	0.3	-	-
	Others (NGOs, foundations)	0.2	-	-

* USAID-PMI budgets for FY 2013; ** DFID Kenya Operational Plan, FY2012–2013 budget

Source: DOMC data, Global Fund PR1 and PR2 reports, PMI malaria operational plan and DFID Kenya Operational Plan

Figure 28: Share of total malaria expenditure, FY 2012–2013*

Strengthen Human Resource Capacities in Malaria Endemic Area: During the period, the program logistician, who is a key officer in implementation of this activity, resigned, which has resulted in a need to recruit another one. The activity to recruit priority health workers was not implemented because it was no longer considered a program priority.

Support for Annual Malaria Program Management and Planning Course: Some members of the malaria control program are nominated annually to attend the malaria planning and management course conducted by WHO in Ethiopia. In FY 2012–2013, three participants from Kenya participated in the training.

Collaborate with Training Institutions on Curriculum Updates: This activity, which entails collaboration with medical training institutions to ensure that malaria is mainstreamed into the training curriculum for health workers, was not accomplished in FY2012–2013.

STRENGTHEN PROCUREMENT AND SUPPLY MANAGEMENT SYSTEMS FOR MALARIA COMMODITIES

Quantify Malaria Commodities: The annual forecasting and quantification for antimalarial commodities, including AL, SP, dihydroartemisinin - piperaquine, quinine, artesunate, and diagnostics was conducted by members of the Drug Supply Management subcommittee. The team used consumption data from the logistics information management system, morbidity data, and gap analysis report for 2011–2016. Quantification for LLINs for mass net distribution based on an estimated population and routine distribution based on the estimated number of pregnant women and infants born in targeted areas.

Support Implementation of LMIS for Malaria Commodities: During the year, reporting for malaria commodities logistics management information was shifted from the LMIS database at KEMSA to the DHIS-2 platform. Subsequent to this transition, the malaria LMIS reporting rate increased steadily from about 40% to settle at between 65–70%. This improvement has enabled the malaria program to undertake quantification of malaria medicines using consumption data, a situation that was previously not feasible.

DISCUSSION

To achieve the NMS goal of reducing morbidity and mortality caused by malaria in the various epidemiological zones by two-thirds of the 2007–2008 level by 2017, the malaria program defined six objectives with very ambitious achievement targets. The strategies for achievement of these objectives were also clearly spelled out and used to define the key activities necessary for implementation in each fiscal year. The clarity of goals, objectives, strategies, and activities has proved advantageous in ensuring that all stakeholders involved in the program work in a common framework. It also makes it easier to assess progress in activities implementation and to achieve the stated targets.

While significant progress in implementation of some of the planned activities over the years has been achieved, it is apparent that implementation of some other activities in the NMS may not be achieved, most because of the continued lack of resources, delays in disbursement of committed resources, and occasional delayed delivery of the required commodities, such as the RDTs. Even where activities have been implemented, sometimes the targeted outcomes have not been achieved because factors such as reluctance to change behavior among recipients of certain interventions, such as LLINs. The findings of the mid-term review of the NMS that was carried out July 21–27, 2013, provide a succinct summary of the findings presented in the annual report on the achievement of the NMS technical objectives.

The strategies applied under the malaria prevention objective have been successful in achieving more than 80% net ownership in malaria endemic and epidemic-prone areas. This translates to about 0.86 LLINs per 2 people at risk, which means that the target for universal coverage with LLINs in those regions has almost been achieved. Despite this impressive coverage for LLINs, evaluation studies confirm that net use remains low at 32% (DOMC, 2012). It is important to keep strategies in place to sustain the more than 80% net ownership between mass campaigns, including free distribution to pregnant women and children under age 1 year and small-scale distribution through social marketing to general population in peri-urban and rural areas. Much more critical now is that intensive continuous advocacy and community mobilization should be conducted using all appropriate channels to bridge the gap between ownership and usage.

In accordance with the current malaria policy, IRS continued to be implemented as a malaria burden reduction strategy in areas of high transmission and as a response to potential epidemics in low transmission areas. Consequently, in the 2011–2012 period, IRS was undertaken in three high-burden counties (Kisumu, Migori, and Homabay) to protect about 2.5 million inhabitants. More than 90% coverage was achieved in the sprayed areas, while no spraying was conducted in epidemic-prone areas. In all areas where IRS is implemented, regular entomological surveillance, including insecticide-resistance monitoring also has been conducted. Results indicate high levels of pyrethroids resistance among the major vectors species, but minimal resistance to carbamates and organophosphates has been detected. The insecticide resistance management strategy consequently was developed to guide all implementers on the best possible ways to prolong the usefulness of the available insecticides for public health in Kenya. The IPTp strategy continued to be implemented during the year by providing a comprehensive antenatal care package for all pregnant women. While coverage with LLINs for ANC mothers remained at 90% and higher during the reporting period, the actual coverage with IPTp1 and IPTp2 was difficult to ascertain because of erroneous IPT data aggregation at the health facility level.

Despite Kenya having adopted the T3 strategy of Test, Treat, and Track, the reporting period recorded up to fivefold use of ACTs over the expected target (number of malaria cases with confirmed laboratory diagnosis). This shows a very high percentage of suspected malaria cases are receiving anti-malarial AL treatment without proper diagnosis through microscopy or RDTs, according to the national guidelines. This clearly indicates a need to consistently sensitize health workers on the updated treatment guidelines. The last quarter in the reporting period did show a

promising decrease from 400% in April to 200% over treatment by June 2013, a positive trend that could in part be attributed to increased testing capacity of in health facilities because of increased availability of RDTs in the country. With continued expansion of RDT uptake at all health facilities in the country and continued RDT trainings, it is reasonable to expect that this discrepancy in the number of AL dispensed and the number of confirmed malaria cases will continue to be minimized. The AMFm pilot was successfully completed and achieved its stated objectives of increasing access, affordability, and market share of ACTs in the private sector. The major challenge, however, is to sustain the successes of this model if continued support for AMFm disappears. Under the HMM strategy, the proportion of districts that implement community strategy that includes HMM was targeted at 100%; however, the actual achievement was only 29%. The planned supervision of this activity by DOMC was not done during the reporting period as planned because funding disbursement for the activity was delayed.

The capacity for epidemic preparedness and response continued to work well for the EPR districts, but similar capacity needs to be built in the seasonal transmission areas because they are prone to epidemics too. At the same time, capacity needs to be built in EPR for the new county-level teams. On the other hand, the strategy for building disease surveillance capacity was not as successful because of the lack of active implementation of malaria surveillance. The Kenya malaria burden is still high, and the aim of the malaria control program is to reduce malaria cases and death through passive health facility surveillance.

Monitoring and evaluation of malaria interventions remains essential for the measurement of performance against stated programmatic goals and quality data central to M&E. Morbidity and mortality data are updated monthly in the DHIS-2 system that is managed by the HMIS division. Malaria inpatient and mortality data that are reported in DHIS-2 is still not accurate or reliable because of inaccurate data coding at the source. All facility inpatient and mortality data need to be recoded to ensure conformity to the ICD-10 system of coding. Malaria commodity data also are reported through DHIS-2, which works better than using the LMIS system. During the 2012–2013 reporting period, the malaria program continued to use the passive data collection model to collect essential malaria surveillance data and produce quarterly surveillance bulletins intended to be a scorecard of the progress achieved toward the set targets in the National Malaria Control Strategy and Millennium Development Goals. The bulletins are used to report on key malaria indicators that measure the program's ability to predict, respond to, and monitor malaria situations in the country. Malaria data quality audits and verification continued to be conducted in selected districts. Sentinel surveillance, community surveys, and health facility surveys also continued for program monitoring and evaluation.

CHALLENGES AND WAY FORWARD

CHALLENGES

The main threat facing the malaria program in Kenya is the risk that the significant investments and resulting gains in malaria control may not be sustained, and worse, may even be reversed. If the following specific challenges are not addressed in a timely manner, Kenya could see the following results.

Inadequate Funding for Malaria Program Activities. The Kenya malaria program relies heavily on external donor funding and resources to implement the planned interventions and activities. In addition, almost all of external funding comes from a small number of sources. If this funding is reduced, either as a result of global economic recession or political or other factors, then it would be impossible to sustain the gains the program has achieved.

Poor Uptake of Various Interventions by the Affected Communities. Various malaria program evaluations have revealed low LLIN usage and low uptake of IPTp, despite the huge amount of financing and human and logistical resources expended to ensure availability of these interventions right down to household levels. Intensive and sustained advocacy and community mobilization using all appropriate channels is needed to bridge the gap between LLIN ownership and usage and the uptake of IPTp.

Increasing Levels of Insecticide Resistance. Results from recent studies conducted by the Kenya Medical Research Institutes in areas with high malaria transmission showed high-level resistance to pyrethroid-based insecticides, with very low resistance to organophosphate and carbamate-based insecticides. This prompted the Ministry of Public Health & Sanitation to recommend the use of carbamates for IRS in areas with perennial malaria transmission during the 2013–2014 spraying cycle.

Uncertainties of Devolution, Program Management Capacities. The malaria program planning and implementation remains highly centralized, despite the continuing calls for strengthening the program decentralization to the county and sub-county levels. It is important that the new county governments be actively engaged in efforts to decentralize program management. Their involvement will enhance appropriate evidence-based targeting of interventions at the county and sub-county levels. Devolution is suffering from unclear guidance and program capacity challenges. One risk is that malaria control interventions might not be a priority for county governments.

Health Worker Lack of Adherence to Policy Changes. Although Kenya has adopted the 3T strategy, the 2012–2013 reporting period recorded up to five-fold use of ACTs over the expected target (number of malaria cases with confirmed laboratory diagnosis), which indicates that a high percentage of suspected malaria cases receive anti-malarial AL treatment without proper diagnosis by microscopy or RDTs, according to the national guidelines. This clearly indicates a need to consistently sensitize health workers on the updated treatment guidelines.

Private Sector's Adherence to Malaria Program Guidelines. The problem of health worker lack of adherence to policy changes is even worse in the country's private sector as a result of inadequate enforcement and regulation. In addition, no policy exists for the use of RDTs in the private sector.

Unverified Quality of Malaria Surveillance Data. The malaria program relies on passive data collection of essential malaria surveillance information. This means data for the program indicators are obtained from existing databases—DHIS-2, LMIS, and DDSR—without contact with health facilities. On the basis of this data, the malaria program continued to produce quarterly surveillance bulletins intended as a scorecard of progress toward achieving set targets in the National Malaria Control Strategy and Millennium Development Goals. It is important to conduct

regular data quality audits and data verification exercises to ensure fair representation of achievements. A further need is to improve the flow of entomological, laboratory, and in-patient data.

Lengthy Procurement Procedures. Lengthy government procurement procedures followed by delayed disbursements affect the timely acquisition of crucial malaria commodities, such as malaria medicines and LLINs, which creates an unpredictable supply chain. Tied with different funders' financial cycles and funding procedures, the result is unnecessary stockouts of essential commodities.

WAY FORWARD

The following strategies will be strengthened in the context of the NMS 2009–2017 to address threats to gains made in controlling malaria in Kenya.

Advocacy and Community Mobilization. The low LLIN usage needs to be addressed with intensive, continuous advocacy and community mobilization using all appropriate channels to bridge the gap between ownership and usage. Existing channels need to be diversified with routine distribution outlets to maintain over 80% LLIN coverage between campaigns.

Insecticide Resistance Management Strategy. For the remaining period of the NMS 2009–2017, IRS implementation will be guided by the already developed business plan. The insecticides of choice will be rotated every two years, according to the insecticide-resistance management strategy. Capacity-building activities for IRS implementation and surveillance, including insecticide-resistance monitoring, will be undertaken in the counties.

Mainstreaming of Malaria Control Content in School Curriculum. Schools will become an integrated part of all community activities for vector control. The Ministry of Health will work closely with relevant government departments to ensure that malaria control content is mainstreamed into the school curriculum in line with the school health policy.

Increasing IPTp Intake. IPTp implementation policy will be reviewed based on the results of the Kenya Malaria Indicator Survey and the Kenya Health Demographic Survey. Actions, such as sensitization of communities, will be carried out based on the reviews. Meanwhile, it is recommended that FBOs and urban health facilities in malaria endemic areas be supplied with effective medicine for IPTp to be administered free of charge to pregnant women, and for relevant data to be reported through DHIS-2. Community advocacy for IPTp in targeted areas should be intensified.

Improved Malaria Case Management. Numerous health workers still need to be trained in malaria case management to reach human capacity in health facilities to correctly apply malaria treatment guidelines. Strengthening of management capacity for severe malaria, especially at the hospital level, is also needed. Improving quality of diagnosis will be of primary importance in the next phase, and it is recommended that QA and QC of malaria diagnoses be implemented as a standalone strategy.

Tying the Gains from AMFm. A private-sector case management strategy is needed to build on the success of AMFm, and private-sector stakeholders need to be coordinated through a public-private partnership to be more structured and regular for better accountability.

Malaria Surveillance. Because the malaria control program relies entirely on routine surveillance data to measure program performance, passive malaria surveillance needs to be established and strengthened in all regions. Establishment of structures for an active surveillance system in areas with low and very low malaria transmission can be explored after the passive system is established.

Facility-based Surveys. Capacity building for county health management teams is needed to conduct quality of care surveys following devolution of health care service delivery to counties.

Improvement is also needed in conducting school-based malariometric surveys in epidemic prone and endemic areas to monitor malaria prevalence in the cohort of children ages 6–14 years.

Community-based Surveys. Pharmacovigilance and post-market surveillance and drug efficacy testing need to continue with collaborating institutions. The usefulness of a Kenya Demographic Health Surveys re-analysis should be explored to consider a strengthened routine monitoring system and regular Kenya Malaria Indicator Surveys. The re-analysis, together with other surveys, could be used to update county profiles. Entomological surveys should be increased, and the capacity of the Division of Vector Borne Disease needs to be strengthened to participate fully in this activity. Timely reports are needed to inform policy on the insecticides for use during insecticide-resistance monitoring.

Regular Program Performance Review. Focused and more frequent assessment of performance is needed to compare with targets, and M&E indicators need to be tracked annually. Primary activities at the national level will be to hold semi-annual review and planning meetings and build program management capacity. The program at the county level will provide technical assistance and capacity building in performance management and support counties in holding semi-annual review meetings.

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ANNEX A: INFORMATION SOURCES FOR THE 2012–2013 MALARIA REPORT

- National Malaria Strategy (2009–2017)
- National Malaria M&E Plan
- Program implementation reports
- Report on Evaluation of the 2011 Mass Long-Lasting Insecticide Treated Net (LLIN) Distribution Campaign
- Malaria Surveillance Bulletins, Issues 1 to 5
- DDSR data on clinical and confirmed malaria cases
- HMIS data on clinical and confirmed malaria cases and service delivery indicators (antenatal clinic attendance, IPTp uptake, LLINs delivered to pregnant women and infants)
- Quality of Care Survey reports, 2010, 2011, 2012, and 2013
- Malaria EPR Surveillance Data for January–December 2012
- NMS Mid-Term Review Report (Draft, July 2013)
- Program expenditure reports
- Disbursements from the Global Fund
- Malaria specific activity budgets from donor partners

ANNEX B: ANALYSIS OF THE KENYA MALARIA PROGRAM PERFORMANCE, 2012–2013

NMS OBJECTIVES	NMS STRATEGIES	TECHNICAL PERFORMANCE			REMARKS
		Number of activities planed	Number of activities implemented	Technical performance (% of planned activities implemented)	
1. By 2013, to have at least 80% of people living in malaria risk areas using appropriate malaria preventive interventions	1.1 Universal distribution of LLINs through appropriate channels (1 LLIN for 2 people)	2	2	100%	This strategy has been successful in achieving over 80% net ownership in malaria endemic and epidemic prone areas, translating to about 0.86 LLINs per 2 persons at risk, which means that the target for universal coverage with LLINs in those regions has almost been achieved. Despite this impressive coverage, evaluation studies confirm that net use remains low at 32%
	1.2 Indoor residual spraying in targeted areas	3	2	67%	No spraying was conducted in epidemic prone areas due to policy change
	1.3 Support malaria-free schools initiative	2	0	0	This activity was still not supported in FY 2012/2013
	1.4 IPTp at antenatal clinics and community levels	5	5	100%	All planned activities were funded and implemented
	OBJECTIVE-LEVEL PERFORMANCE	**12**	**9**	**75%**	
2. By 2013, to have 80% of all self-managed fever cases receive prompt and effective treatment and 100% of all fever cases that present to health workers receive parasitological diagnosis and effective treatment	2.1 Capacity building for malaria diagnosis and treatment at health facilities	5	4	80%	All planned activities were conducted except for the establishment of and review of a sustainable maintenance plan for microscopes and other equipment
	2.2 Access to affordable malaria medicines through the private sector	3	3	100%	All planned activities were conducted
	2.3 Strengthening home management of malaria using the community strategy through community health workers	2	0	0%	CHWs were not supplied with kits because of RDTs weren't yet available and yet the policy on test treat and track had already been adopted. Supervision activity was also not done during the reporting period due to delayed disbursement of funding for the activity. The activity was rescheduled to FY2013.
	OBJECTIVE-LEVEL PERFORMANCE	**10**	**7**	**70%**	

NMS OBJECTIVES	NMS STRATEGIES	TECHNICAL PERFORMANCE			REMARKS
		Number of activities planed	Number of activities implemented	Technical performance (% of planned activities implemented)	
3. By 2010, to ensure that all malaria epidemic-prone districts have the capacity to detect and preparedness to respond to malaria epidemics annually	3.1 Capacity building for epidemic preparedness and response	3	2	67%	Training of health workers at the facility level still not done
	3.2 Disease surveillance capacity	10	7	70%	Funding not available during the planning period for planned training of disease surveillance officers on active surveillance of malaria; procurement of supplies to screen members of households in index cases of confirmed malaria, and provision of communication support for disease surveillance in epidemic-prone and low-transmission areas
	OBJECTIVE-LEVEL PERFORMANCE	**13**	**9**	**69%**	
4. By 2011, to strengthen surveillance, monitoring and evaluation systems so that key malaria indicators are routinely monitored and evaluated in all malarious districts	4.1 Capacity building for malaria surveillance	3	3	100%	
	4.2 Strengthen facility- and school-based malaria sentinel surveillance	2	1	50%	No financial support to conduct malariometric surveys
	4.3 Strengthening malaria data management systems	3	1	33%	No funding for planned upgrade of ICT infrastructure; planned rollout of MIAS to district levels not done and may not be feasible in near feature as a result of ongoing nationwide devolution of systems and services
	4.4 Conduct and support community surveys	5	5	100%	All planned activities under this strategy were conducted during the reporting period
	4.5 Conduct and facilitate health facility surveys	2	1	50%	Health facility operational assessment not done; this is a sector-wide activity needs to be integrated in the national and county health sector responsibilities
	4.6 Operational research and translation	3	2	67%	Annual malaria research to policy conference not done; consensus that this task should be undertaken once every two years
	4.7 Human resource capacity building in surveillance monitoring and evaluation	1	1	100%	DOMC officers trained on M&E
	OBJECTIVE-LEVEL PERFORMANCE	**19**	**14**	**74%**	
5. Vy 2014. to strengthen advocacy, communication and social mobilization capacities for malaria	5.1 Capacity strengthening for advocacy, communication and social mobilization	2	1	75%	Planned quarterly meetings of malaria ACSM groups at all levels not conducted due to lack of funding
	5.2 Support priority	6	3	50%	General non-prioritization for funding of routine ACSM

NMS OBJECTIVES	NMS STRATEGIES	TECHNICAL PERFORMANCE			REMARKS
		Number of activities planed	Number of activities implemented	Technical performance (% of planned activities implemented)	
control to ensure that at least 80% of people in malarious areas have knowledge on prevention and treatment of malaria	implementing partners				activities, resulting in non-implementation of many planned activities
	5.3 Development of appropriate advocacy for uptake of specific malaria interventions	3	3	100%	All the planned activities were conducted
	OBJECTIVE-LEVEL PERFORMANCE	**11**	**7**	**64%**	
6. By 2013, to strengthen capacity in program management to achieve malaria programmatic objectives at all levels of the health care system	6.1 Strengthen capacity for planning, partnerships, and coordination in the national malaria control program	5	5	100%	All planned activities were conducted
	6.2 Strengthen malaria program management at the district and provincial levels	1	0	0%	Provincial Malaria Control Coordinators and District Malaria Control Coordinators trainings not funded; no funding to support operational activities
	6.3 Strengthen infrastructure at the national, provincial, and district levels	1	0	0%	Only national level office equipment and operational support provided; funds were inadequate to achieve this activity at regional levels
	6.4 Strengthen activity and performance monitoring	5	3	60%	Most planned activities only partially done due to funding constraints
	6.5 Strengthen resource mobilization capacity to improve malaria control financing	3	2	67%	Planned quarterly roundtable meetings with development partners not held; efforts are underway to establish and operationalize the resource mobilization TWG
	6.6 Strengthen human resource capacities in malaria endemic area	4	1	25%	Logistician, who is a key officer in this activity implementation, resigned; another logistician needs to be recruited; recruitment of priority health workers no longer considered a program priority
	6.7 Strengthen procurement and supply management systems for malaria drugs and commodities	2	2	100%	Quantification activities were conducted successfully; LMIS integrated into DHIS; all counties are now reporting
	OBJECTIVE-LEVEL PERFORMANCE	**18**	**10**	**56%**	
	OVERALL PERFORMANCE	**89**	**61**	**69%**	

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