Federal Democratic Republic of Ethiopia
Ministry of Health

National Malaria Program Monitoring and Evaluation Plan 2014 - 2020

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Acronyms

ACT	Artemisinin-based Combination Therapy
ARM	Annual Review Meeting
CHIS	Community Health Information System
CSA	Central Statistical Agency
DHO	District Health Office
DHS	Demographic and Health Survey
EFY	Ethiopian Physical Year
eHMIS	Electronic Health Management Information System
eIDSR	Electronic Integrated Disease Surveillance and Response
ePHEM	Electronic Public Health Emergency Management
EPHI	Ethiopian Public Health Institute
FMOH	Federal Ministry of Health
GF	Global Fund
HC	Health Center
HDSS	Health and Demographic Surveillance System
HEP	Health Extension Program
HEW	Health Extension Worker
HF	Health Facility
HH	Household
HIO	Health Information Officer
HMIS	Health Management Information System
HSDP	Health Sector Development Program
IDSR	Integrated Disease Surveillance and Response
IPLS	Integrated Pharmaceuticals Logistics System
IRS	Insecticide Residual Spraying
ISS	Integrated Supportive Supervision
KAP	Knowledge, Attitude and Practice
LLIN	Long Lasting Insecticidal Net
M&E	Monitoring and Evaluation
MESST	Monitoring and Evaluation System Strengthening Tool
MIS	Malaria Indicator Survey
MPR	Malaria Program Review
NGO	Non - Governmental Organization
NMCP	National Malaria Control Program
PHEM	Public Health Emergency Management
PMI	President's Malaria Initiative
PPD	Policy and Planning Directorate
RBM	Roll Back Malaria
RDT	Rapid Diagnostic Test
RHB	Regional Health Bureau
TCC	The Carter Center
WHO	World Health Organization
ZHD	Zonal Health Department

1. Introduction

An effective and robust monitoring and evaluation (M&E) system is required to measure the success of the Ethiopian malaria strategic plan at achieving the stated goals and ensuring the use of evidence for decision making. M&E of implementation is based on periodic reporting and reviews of information generated by the health management information system (HMIS) and other data sources. M&E aims at tracking continuously progress towards achieving targets set in the annual plans and supports managers to make evidence-based decisions.

The overall purpose of the national M&E plan for malaria control in Ethiopia is, therefore, to provide reliable information for appropriate decision making and monitoring of progress towards achieving targets. The objectives of the national M&E plan for malaria control include the following:

- o   To coordinate collection, processing, analysis and management of malaria data;
- o   To verify whether activities have been implemented as planned;
- o   To provide feedback to data providers, relevant authorities and partners to improve decision making and future planning;
- o   To monitor progress towards malaria program goals and objectives;
- o   To evaluate impacts of anti-malaria interventions;
- o   To reorient activities and interventions, if required.

Monitoring involves the routine tracking of the key elements of programme performance through record keeping, regular reporting from the HMIS, surveillance systems and periodic surveys. Monitoring is used to verify step-by-step progress of the activities in order to verify whether activities have been implemented as planned, ensure accountability, detect problems and constraints, and promote evidence-based planning through timely feedback to the relevant authorities. Monitoring is crucial for program managers to determine which areas require greater effort and may pinpoint areas that might contribute to an improved response. Indicators of inputs, processes, and outputs will be used for assessing successful implementation of all activities at the program level. Input indicators are used to measure the level of resources available for program implementation, appropriate policy formulation to facilitate malaria control, and coordination of partners involved with malaria program. Process indicators are used to verify that program areas have been implemented as planned. It is expected that inputs and processes will lead to desired changes in output indicators, which are used to measure benchmarks of program-level performance. An impact evaluation is typically used to determine and document the extent to which any population-level results are attributable to the malaria program, as measured through changes in outcome and impact indicators. Outcome indicators will be used to measure medium-term population-level results, such as the level of long lasting insecticidal nets (LLINs) coverage among a target population.

This malaria program M&E plan outlines major activities to be accomplished, key indicators selected, data sources, the data flow structure, data quality and supervision, coordination mechanism and an implementation timeline.

2. Indicator Definitions and Measurement

M&E is an important tool for improving program planning, implementation and decision-making and to measure progress towards achieving targets. Different sets of indicators will be used to monitor progress and measure results of anti-malaria interventions. Indicators to be considered for M&E generally include input, process, output, outcome and impact. Input indicators measures inputs that trigger the process and impact indicators measure the end result. In between there are intermediary indicators that help monitoring the progress towards achieving program goals and objectives (Figure 1).
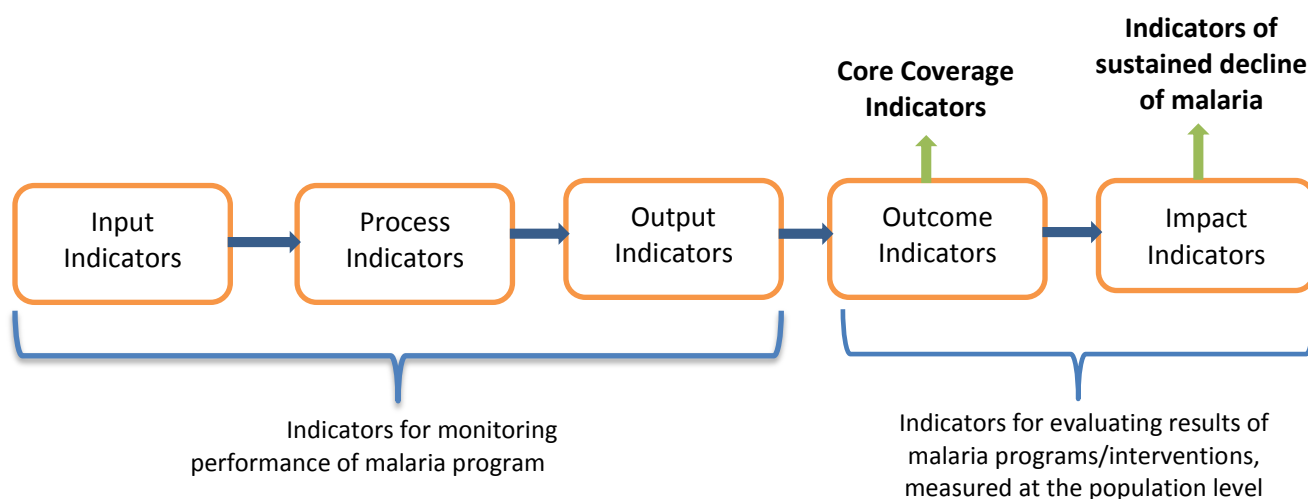

Figure 1. Indicator Framework for Malaria M&E (adapted from RBM: Level and Function of M&E Indicators)

A list of key indicators to be collected under the malaria program M&E system with targets, proposed data collection methods, data collection frequency and responsible entity are summarized in Annex 1. Standard indicators to be collected through HMIS include morbidity attributed to malaria, facility based malaria deaths, malaria positivity rate, proportion of target household provided with LLINs and proportion of households covered by indoor residual spraying (Annex 2).

The indicators included in the performance framework of the NSP are aligned with the indicator framework contained in the M&E plan; i.e. all indicators for which data are collected by the malaria program are included.

3. Routine Data Collection

To provide a comprehensive account of strategic information for malaria M&E, several sources of routine data and information will be used. These sources include the following:

Health Management Information System: The goal of HMIS is availing reliable, timely and complete information to make evidence–based decision making possible at each level. The newly re-designed HMIS has been implemented since 2007 (EFY 2000). The new system is designed to provide one standardized set of health indicators nationally, across all regions and across all health posts, health centers (HC) and hospitals in Ethiopia. In EFY 2005 (2012/2013), it was implemented in 122 hospitals (98% of the total) and in 2,697 HCs (87%). The implementation rate has, therefore, improved in the recent years. At national level, a team responsible for HMIS is already established. At each health facility, there is at least one health information officer (HIO), i.e. a data manager/statistician working solely on HMIS who ensures the completeness of the data. Data are to be analyzed and used at all levels down to the health facility. Accordingly, through the efforts made so far, the timeliness, completeness and reliability of data have improved and it has been possible to use the data for planning and performance monitoring purposes. Further, HMIS data are utilized for resource allocation, program activities, policy making at all levels of the health system down to the health post.

Public Health Emergency Management/ Surveillance: Malaria M&E is also being facilitated through the Public Health Emergency Management system (PHEM), which encompasses reporting of morbidity and mortality data from health posts, health centers and hospitals. It is a unique reporting system intended to improve the surveillance and control of 18 diseases which are either epidemic prone, targeted for eradication or of public health importance, including malaria which is one of the weekly reportable diseases. There is a distinction between diseases which are immediately reportable (e.g. polio, measles); those which are reportable weekly and those reportable monthly. Malaria indicators comprise a significant proportion of the PHEM indicators. Malaria cases are reported including clinical malaria (outpatient and inpatient), confirmed malaria by species and severe malaria. The advantage of this system is that it is a simple direct channel reported weekly. Responsibility for the PHEM system is transferred from the FMOH IDSR to the Ethiopian Public Health Institute (EPHI) PHEM. There are a clear guidelines and specific targets for timeliness and completeness of reporting.

Integrated Pharmaceuticals Logistical System (IPLS): The IPLS has been developed to track all health commodities from procurement to distribution to the Woredas level. The IPLS is implemented under the Pharmaceutical and Fund Supply Agency (PFSA). The IPLS produces data for process and output level indicators for tracking the distribution of LLINs, ACTs and RDTs to the Woreda level. The IPLS may then be supplemented for tracking LLINs below the Woredas level to the health post by Health Extension Program (HEP) database that has been established. This database lists all health facilities in the country and summarizes a range of facility-specific characteristics including infrastructure, human resources and capacity, equipment, clinical and laboratory materials, drugs and LLINs.

Activity and Performance Reports: inputs, processes and outputs are important for tracking program performance, and ensuring availability of financial, human and other resources. Similarly, monitoring outputs is crucial for determining the level of service delivery that is achieved during implementation efforts. As outlined in the Health Sector Development Program (HSDP) Harmonization Manual, quarterly monitoring reports are used to serve the management information needs of woreda, zonal and regional health authorities that have the day-to-day responsibility for implementing program activities. The importance of this information is to identify problems early enough to be able to initiate corrective measures related to implementation, in order to achieve the expected annual performance. These reports are the responsibility of the Regional Health Bureaus (RHB), District Health Offices (DHOs) and health facilities (HFs). All regions are also responsible for annual reporting on progress with key indicators. The annual performance report should also be published based on this report.

Sentinel Site Surveillance: A key component of the M&E with regard to malaria prevention and control will be the establishment of facility-based surveillance sites that collect and report complete and high quality information on important aspects of malaria prevention and control. Initially, a network of 10 sentinel surveillance sites established in Oromia in 2009 to help capture high quality routine data beyond the routine and limited data from the HMIS, as well as track morbidity and mortality to evaluate program effectiveness. The selected health facilities will report monthly indicators for inpatient and outpatient malaria cases. These data, collected at a small set of health facilities, will be used to demonstrate trends in malaria morbidity and mortality with the following supportive objectives: 1) inform programmatic decision-making, 2) predict demand for services and service provision needs, 3) advocate for malaria control resources, 4) describe broad trends across selected facilities, 5) provide detailed information on malaria morbidity and mortality with supplementary data from specific evaluations, and 6) contribute to the development of a standard set of indicators for malaria surveillance. Data collected from this system will be used to corroborate trends identified using point estimates generated from population-based surveys and HMIS. It is envisioned this system will be used in parallel with the HMIS; data generated from this system can be used to report on key output indicators related to inpatient and outpatient malaria related morbidity and mortality, provide a system for data quality assurance across health facilities, and provide a system for measuring the frequency of commodity stock-outs. Further, there a plan to establish additional 30 sentinel sites for monitoring insecticides susceptibility (see Section 5).

Indoor Residual Spraying Program Data: Each Policy Planning Directorate (PPD) is responsible for collecting yearly program-level data on the number of households sprayed and the number of households planned for spraying (targeted). These data will be used for estimating the coverage indicator for the proportion of households adequately sprayed in the last 12 months.

Community Health Information System (Family Folder): Community Health Information System (CHIS) has been designed to make the information system and decision making effective and successful at the grassroots level. Registration of family health information on family folders is being carried out. HEWs at HEP are responsible for recording all health and

demographic-related information of all families within their *Kebele*/community, including all births, deaths, migrations, illnesses and treatments. As such, this is essentially a national health and demographic surveillance system (HDSS). These data are incorporated into the system for evaluation purposes.

4. Data Management

Several levels of data are being collected using standardized data collection tools as part of the malaria program M&E system: household, community, health facility, and special studies. Data are entered into computer, cleaned and analyzed. Then information are being stored safely and/ or shared with appropriate levels.

Information collected through HMIS is organized under the following data flow structure for all health related data according to the national HMIS guidelines: health posts and health centers (PHCU) report to the woreda. Woreda-based hospitals report to the woreda in which they are located. Other hospitals report to the zone or to the region. Woredas report to the zone or the region. Zones report to regions. Regions report to the FMOH (Figure 2).
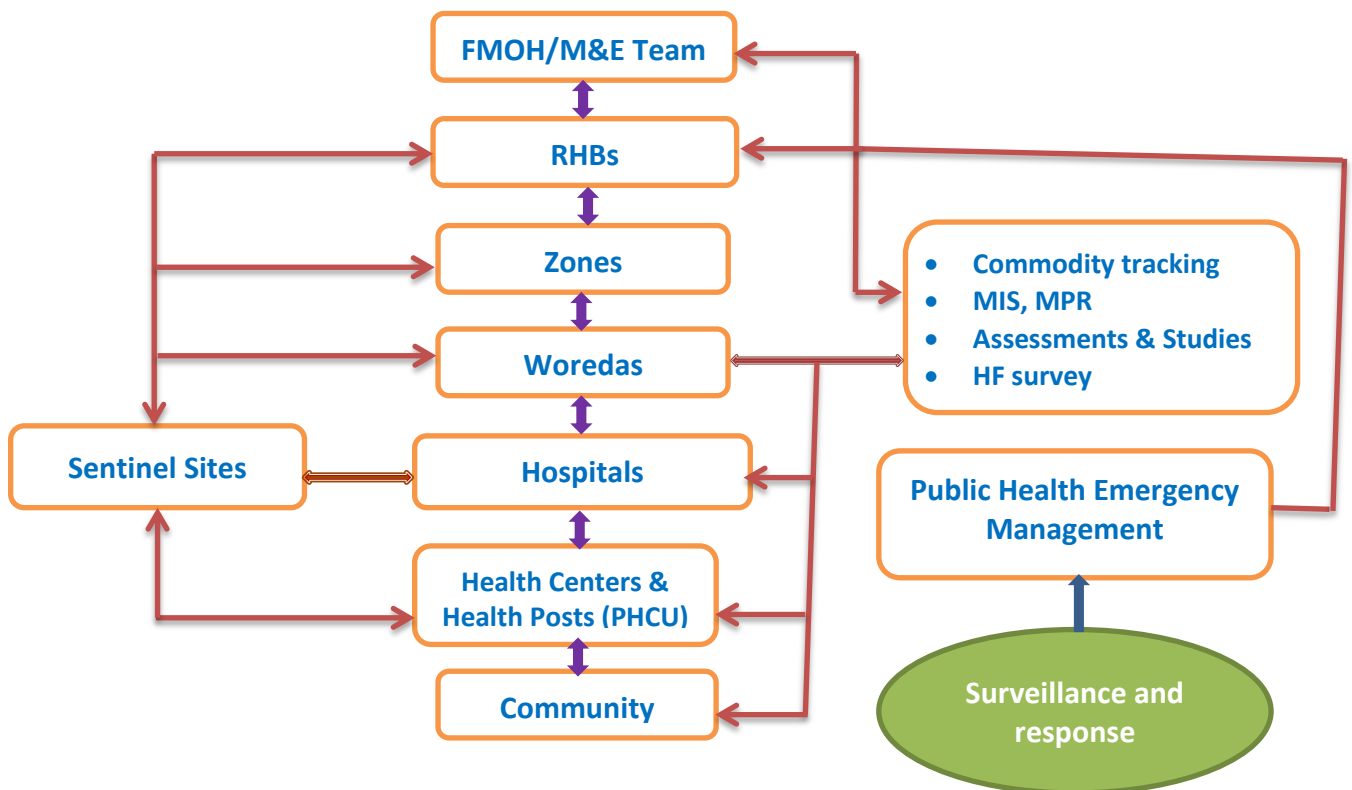

Figure 2. Overview of data source, flow and use in malaria M&E system

Sentinel sites will gather malaria morbidity and mortality data directly from communities, as well as from health posts and health centers. Demographic health survey (DHS), malaria indicator survey (MIS) and special studies are used collect community-level data on various

coverage, outcome and impact indicators. These data are analyzed and shared with the malaria programs at national and regional levels for decision-making. Health facility surveys and other health-system level special studies are important collect program-level data, as well as malaria morbidity and mortality data, from various levels of the health system at the level of Woreda hospitals to health centers and health posts. These data are analyzed and shared with participating health facilities, the malaria programs at national, regional zonal and Woreda levels for decision-making. It is important to note that no data from malaria surveillance are collected for the sole purpose of M&E. Rather, surveillance data are used at the peripheral health facilities/health posts for direct action for control epidemics and case investigations.

Special weekly malaria data collection through the PHEM surveillance system, which is part of the country's health-sector reform to strengthen the management of epidemic diseases and other health hazards, is has now expanded the data collection to the health post level and data is collected continuously. These data are mainly for immediate actions. As the country has committed to head towards elimination of malaria, this system together with active case surveillance will help to rapidly identify and investigate cases in malaria elimination districts

The electronic HMIS (eHMIS) is a comprehensive system which includes also PHEM eHMIS addresses the growing need for a timely, complete and accurate reporting across the health system. In 2012/2013 (EFY 2005), a total of 2,781 computers and accessories were distributed to health centers, hospitals, DHOs, ZHDs and RHBs. A total of 3,806 professionals were also trained on eHMIS/ePHEM system. The system has been implemented in most public health centers and hospitals throughout the country.

5. Program Review, Evaluation and Surveys

Program reviews, evaluations and surveys are important tools for measuring malaria program's overall performance, including its effectiveness, outcome and impact. The following review or evaluation and surveys are planned as part of this M&E plan.

Malaria Program Review: Malaria Program Review (MPR) is an exercise that allows the country to undertake a detailed review of achievements, examine the enabling factors and bottlenecks, and define the gaps between what was planned and what was implemented and achieved. The overall purpose is to provide evidence for improving performance and possible re-orientation of the program's strategic direction or approaches for achieving a greater impact. MPR involves all stakeholders and is undertaken every three-five years. The last review was held in 2011 and next one is in 2016.

Malaria Indicator Survey (MIS): The Ethiopia MIS is recommended to be implemented every 2-3 years, the last of which was implemented in 2011 with the next one scheduled for 2015. The MIS is a nationally representative, population-based sample surveys undertaken to collect data on key malaria program coverage and outcome/impact indicators. Importantly, the MIS is designed to produce data that are comparable over time. The MIS includes a household register for the ascertainment of the age, sex, and relationship to the head of household for all

individuals within selected households. The MIS also includes biomarkers for ascertaining impact indicator of parasite prevalence. The 2007 and 2011 MIS produced relatively precise population-level estimates of the key malaria coverage, outcome and impact indicators by urban/rural residence.

Demographic and Health Surveys: The Ethiopia DHS is implemented every five years, the last of which was implemented in 2011 with the next one scheduled for 2016. The DHS is a nationally representative, population-based sample surveys undertaken to collect data on a wide variety of demographic and health indicators. Importantly, the DHS is designed to produce data that are comparable over time. The Ethiopian Central Statistical Agency (CSA) is the primary implementer of the DHS.

Health Facility Surveys: Health facility surveys are useful for determining detailed information within the health system where routine reporting from HMIS is insufficient, thereby supporting routine HMIS data collection. Health facility surveys provide information on: 1) quality of care delivered by health professionals for outpatient and inpatient services; 2) quality of inpatient severe malaria case management; 3) level of stock outs and levels of malaria-related drugs, commodities and laboratory equipment available; 4) quality and timeliness of epidemic response as per national guidelines; and 4) inpatient and outpatient morbidity, mortality and epidemic response data for M&E purposes. Health facility surveys are linked geospatially to available household survey data.

Monitoring susceptibility of insecticides: Effectiveness of IRS depends on the continued susceptibility of Anopheles mosquitoes to insecticides in use. Insecticides efficacy monitoring is being done in collaboration with EPHI at 25 selected entomological sentinel sites every year according to standard WHO protocols.

Monitoring efficacy of anti-malaria drugs: To ensure continued effective case management, resistance to currently recommended anti-malarial drugs needs to be monitored regularly. A drug efficacy study is being carried out by EPHI every two years based on standard WHO protocols in collaboration with in-country partners.

Monitoring longevity of LLINs under field conditions: In order to determine LLIN longevity, both in terms of physical integrity as well as insecticidal residual efficacy, a sample of LLINs will be collected. The results of the study will be critical in the development of a national LLIN replacement strategy and education.

Study on distribution, dynamics and behaviors of specific malaria vectors: It is very important to assess the resting and biting behaviors of malaria vectors. This study will be carried out by EPHI, in collaboration with local research institutions and universities, within areas of continued malaria transmission.

Sero- epidemiology survey: Sero-epidemiological surveys with the seasonal nature of malaria and low transmission, determining true prevalence is a requirement. Sero-epidemiology in addition helps to determine the transmission pattern and intensity over time.

6. Data Quality Assurance Mechanisms and Related Supportive Supervision

Data quality assurance involves characterizing the operational definitions for all data collected, documenting how these definitions may change as the needs change over time, and assessing the quality of data generated within health facilities at various levels. Health facility surveys are used to assess cross-checking diagnosed cases, and an assessment of the current utilization strategies at each tier of the health system in Ethiopia and to measure the impact of interventions. Important outcomes include recommendations on how data quality can be improved, as well as recommendations on how to maximize the use of health facility data to guide malaria programming.

Data quality assessments should be performed at selected health facilities each year. As well, monitoring activities related to drug resistance and insecticide resistance will be performed in support of data quality assessments. Data verification should be performed to compare the reported numbers from the health facilities or sentinel sites to the number reported in health facility log books and registries.

Integrated Support Supervision (ISS) from the national level down to the HEWs has been implemented. The objective of the ISS is to provide continue supervision at all levels of the health system to ensure continuous high quality data are reported for M&E purposes. Under the ISS, Woredas staffs are posted at health centers for active supervision and quality control. Additionally, each health center has a data manager responsible for management of the HMIS data entry and management.

7. Monitoring and Evaluation Coordination

Usually there are multiple stakeholders who often are involved in managing, implementing, or using M&E systems. To avoid duplication of efforts and discourage parallel systems, there should be a coordination mechanism. This section, therefore, describes the coordination mechanisms, including management structures, role of partners, and M&E review or follow-up mechanisms.

The FMOH Policy and Planning Directorate is responsible for coordination of all national-level health M&E activities. This directorate reports all the information needed by the programs to the specific programs. The RHBs are responsible for coordination of all regional M&E activities. As outlined in Figure 2, there is an established structure of data flow, reporting and use at the national level.

Having one national system to collect, analyze and use M&E data reduces the reporting burden for all levels of the health system and is a cost-effective approach. It also improves the quality and consistency of information. In line with, there will not be duplication or parallel reporting

within the M&E plan as all relevant partners of FMOH have signed an agreement to stick to one plan, one budget and one report. In addition, the indicators chosen for reporting in this M&E plan are those that are agreed to be collected from the existing systems and approaches (e.g. HMIS, MIS, PHEM surveillance) by all implementing partners. Data collected through the routine system from health facilities and Woreda and data collected through program-specific studies and surveys will be used for the M&E of program activities, coordinated by the malaria program at different levels.

The FMOH National Malaria Program holds annual program review meetings involving all malaria stakeholders. These meetings help in monitoring malaria program activities, disseminating program data and reaching national consensus on future strategies. Similarly, review meetings are held at regional (annually) and zonal (bi-annual) levels in order to micro-plan program activities as well as provide program feedback from central level to regional and/or zonal level.

8. Capacity Building

In the last decade, efforts to strengthen Ethiopia's health M&E systems have yielded significant progress and improved harmonization of M&E related activities. However, certain weaknesses in monitoring and evaluation have persisted. In terms of monitoring, data that are routinely collected are often not analyzed to the level expected to inform program management at local levels. Appreciating this problem, major steps have been taken in terms of the standardizing, simplifying and integrating the program- oriented, parallel systems into a single data channel in an effort to improve the M&E component of the health system. The new system had been effective in improving the quality of data generated and the frequency of reporting. However, some challenges still persist (Annual Performance Report, FMOH, 2013).

- Limited capacity in analysis and information use for decision making purposes;
- Multiple reporting systems;
- Limited involvement of private and NGO facilities in HMIS implementation;
- Physical and logistic constraints in health facilities hindering HMIS implementation (dimension of card rooms, space for filing records, etc.);
- Lack of data warehouse that incorporates all data sources (population-based and facility-based).

Table 1: Major gaps in M&E system capacity and ongoing system strengthening activities

M&E system gaps	Ongoing systems strengthening
Multiple reporting systems; and limited capacity in analysis and information use for decision making purposes	The FMOH has already started implementation of HMIS strategic plan which targets use of integrated reporting system and the establishment of electronic networking of districts. Training of health information officers is also part of the plan. Data managers at district and regional levels are being receiving extensive training on M&E to ensure

	data quality, timeliness and use. Capacity building efforts will continue. Malaria surveillance will use the advantage of the existing capacity and electronic networking of HMIS system at district level.
Limited involvement of private and NGO facilities in HMIS implementation	The Ministry is highly committed to ensure involvement of all relevant stakeholders in HMIS plan and implementation. Negotiation and collaboration with private and NGOs will continue to bring them on board in HMIS implementation.
Insufficient information on operational aspects of key malaria interventions	Operational studies or assessments will be conducted at regular intervals to inform the program on the efficacy of drugs and insecticides, longevity of LLINs and community KAP of key malaria interventions. These monitoring activities will be carried out at regular intervals in 25 selected sentinel sites. In addition monitoring the longevity of LLINs collected around all sentinel sites will be done.
Insufficient tracking and logistics information system for anti-malaria commodities	In line with the Logistics Master Plan developed by the FMOH, malaria commodities tracking system will be strengthened. Guidelines, formats and databases are used to ensure appropriate commodities tracking system for malaria related supplies.

9. Monitoring and Evaluation of Costed Work Plan

Malaria program related M&E activities, including efforts to strengthen M&E systems are included under this section. The costs included in the M&E budget are consistent with activities in the M&E plan. Adequate budget for surveys, assessments of impact and outcome and for conducting national program reviews and evaluations is considered. Resource needs and contributions are reflected in the costed work plan. The M&E work plan should be regularly monitored and reviewed and updated. This M&E work plan covers seven years, i.e. 2014 - 2020.

In this work plan, each M&E activity includes implementation timeline, responsible body and estimated budget. The M&E plan also describes the mechanisms in place to track and report on M&E activities.

10.Monitoring and Evaluation Budget

This section includes a summary budget that outlines cost estimates for the life of the M&E plan, i.e. it covers seven years in conformity with the national malaria strategic plan. This budget can be divided into the major categories. It includes estimated contributions from the government and partners, as well as any outstanding gaps in funding. M&E activities with estimated budget are summarized in Annex 4.

11.Information Products, Dissemination and Use

Throughout the malaria program strategic framework timeline, continual monitoring of the M&E plan and progress will be conducted. Annual reviews will take place to ensure key

activities are rolling out as planned. Programmatic reviews will take place as part of this process as outlined in section 5. There is also an annual review meeting of the FMOH partners to assess the state of malaria control and the malaria program, resulting in the Proceedings of the Annual Review Meeting on Malaria Prevention and Control in Ethiopia. This annual workshop has the following objectives: Reviews national and regional malaria prevention and control activities; assess and document the level of implementation of the malaria program; identifies action points to be implemented; updates RHB and partners on the latest technical issues on malaria prevention and control interventions.

Once malaria data are collected and analyzed, the information will be used to inform decision-making and monitor the progress of the program. Figure 2 shows a general overview of how primary data will flow and be used in the malaria program M&E system. Within the FMOH, the M&E team is responsible for health-related M&E activities, including malaria.

The results of the analysis should be disseminated to all relevant stakeholders and shared with implementers through a systematic feedback mechanism. In collaboration with the FMOH and partners, all reports and documents resulting from routine and non-routine data collection systems (e.g. HMIS, MIS and health facility surveys) will be approved and disseminated in a timely manner to facilitate evidence- based decision-making. Dissemination mechanisms include organizing workshop, posting of periodic abstracts and reports on websites, publishing and distributing meeting proceedings; and publishing survey/study findings in peer reviewed journals. In addition, in order to enhance the use of information by all relevant health sector stakeholders "Annual Review Meeting Bulletin" incorporating malaria program information will be published by the Ministry of Health. The bulletin will be disseminated during annual review meeting (ARM) of health sector development program to inform participants on major updates, best practices, new initiatives, and summary of articles on key operational researches, surveys and program evaluations carried out. In addition, annual 'health and health related indicator' booklet is also published and distributed to every important stakeholders of the health sector.

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3. Guidelines for core population-based indicators, the RBM partnership, January 2009.

4. National monitoring and evaluation plan for malaria: 2010 – 2015, Federal Ministry of Health of Ethiopia, Addis Ababa.

5. M&E Toolkit available at *http://www.theglobalfund.org/en/performance/monitoring_evaluation/*

6. Guidance for the development of national M&E plans are available at: http://www.rollbackmalaria.org/toolbox/toolbox_MonitoringAndEvaluation.html?subsection=Monitoring%20and%20Evaluation

7. Malaria Indicators, HMIS 2014, Federal Ministry of Health of Ethiopia, Addis Ababa.

Annex 1. Malaria Monitoring & Evaluation Framework

Indicator name	Baseline	Target	Data source	Frequency of collection	Responsible entity
Number of malaria deaths	2464 (2012)	370 (2020)	PHEM surveillance, HMIS,	Weekly, Monthly	EPHI, PPD
Malaria death rate (per 100,000 popn at risk)	4.0 (2012)	0.6 (2020)	HMIS, PHEM surveillance	Annually	PPD, EPHI
Malaria parasite prevalence	1.3 (2011)	<1 (2020)	MIS	2-3 years	EPHI
Number of malaria cases (in million)	5.28 m (2012)	2.72 m (2020)	PHEM surveillance, HMIS,	Weekly, Monthly	EPHI, PPD
Number of districts started malaria elimination	NA	50 (2020)	Administration Report	Annually	RHB,FMOH
Number of districts with zero local falciparum cases	NA	50 (2020)	Administration Report	Annually	RHB, FMOH
% of children U5 with a fever who sought treatment from a facility/health provider the first 24 hours onset of fever	51.3% (2011)	85% (2020)	MIS	2-3 years	EPHI
% of women who reported mosquito bites as the cause of malaria	71.2% (2011)	100% (2020)	MIS	2-3 years	EPHI
% of women who reported mosquito nets as a prevention method of malaria	63.4% (2011)	100% (2020)	MIS	2-3 years	EPHI
Testing rate	93% (2013)	100% (2020)	HMIS, PHEM surveillance	Annually	PPD, EPHI
% of confirmed malaria cases that are treated according to the national guidelines	NA	100% (2020)	HMIS	Annually	PPD
Average number of nets per household	0.7 (2011)	2 (2020)	MIS	2-3 years	EPHI
% of targeted households with at least one LLIN	55.2% (2011)	100% (2020)	MIS	2-3 years	EPHI
% of children U5 who slept under LLIN in HH that owns at least one LLIN the night preceding the survey	64.5% (2011)	90% (2020)	MIS	2-3 years	EPHI
% of children U5 who slept under LLIN the night preceding the survey (from target)	38.0% (2011)	80% (2020)	MIS	2-3 years	EPHI
% of pregnant women who slept under LLIN in HH that owns at least one LLIN the night preceding the survey	64.2% (2011)	90% (2020)	MIS		
% of pregnant women who slept under LLIN the night preceding the survey	34.7% (2011)	80% (2020)	MIS	2-3 years	EPHI
% of targeted households sprayed in the last 12 months	46.6% (2011)	100% (2020)	Administrative report	Annually	PPD
% of targeted population	70%	100%	Administrative report	Annually	PPD

Indicator name	Baseline	Target	Data source	Frequency of collection	Responsible entity
protected by IRS	(2013)	(2020)			
% of overall protection by IRS and/or LLIN	71.8% (2011)	100% (2020)	MIS	2-3 years	FMOH, EPHI
Reporting completeness rate	83% (2013)	100% (2020)	PHEM Surveillance, HMIS	Annually	EPHI, PPD
% of epidemic contained within two weeks	NA	100% (2020)	PHEM surveillance	Annually	EPHI
% of HMIS or other routine reporting units submitting timely reports according to national guidelines	NA	100% (2020)	HMIS, PHEM surveillance	Annually	PPD, EPHI
Number of annual review meeting conducted at central level	1 (2013)	1 (2020)	Meeting proceedings	Annually	FMOH
Number of annual review meeting conducted at regional level	1 (2013)	1 (2020)	Meeting proceedings	Annually	RHBs
% of reported foci identified, fully investigated (imported, reintroduced, indigenous), classified (by species and origin) and managed	NA	100% (2020)	Administrative report	Annually	HFs, DHOs, RHBs, EPHI, PPD
% of index cases traced and followed up	NA	100% (2020)	Administrative report	Annually	HFs, DHOs, RHBs, EPHI,PPD

NA: not available; HF: health facility; DHO: district health office; RHB: Regional Health Bureau; EPHI: Ethiopian Public Health Institute; PPD: Planning and Programming Directorate

Indicator 1. Morbidity attributed to malaria

Definition	Malaria cases per 1000 population
Formula	Number of new malaria OPD + IPD cases (All malaria cases, of any species, should be included – whether clinical or laboratory diagnosis) X 100 Total population in the catchment area
Interpretation	Malaria case counts are quite sensitive and specific indicators for probability of encountering an epidemic. According to epidemic prevention and control guidelines, malaria cases should be plotted and reviewed weekly. When the epidemic threshold is reached, the higher level should be notified and more frequently monitoring may be required. Further, followed over years, the trends in morbidity should show the effects of improved prevention and control efforts. Compared across geographic locations, malaria morbidity can help identify priority areas for intervention. Disaggregated by species, the morbidity patterns can suggest the emergence of increasing drug resistance.
Source	Patient register at HP; outpatient/ inpatient service-based registers
Frequency of Reporting	Monthly

Indicator 2. Facility-based malaria deaths

Definition	Percentage of all deaths due to malaria (according to confirmed malaria diagnosis)
Formula	*The total number of all inpatient deaths* *With lab-confirmed malaria* X 100 *Total number of deaths reported at health facilities during the reporting period*
Interpretation	An increase in the deaths due to malaria should be investigated promptly to see if response measures are needed
Source	Inpatient register at health centers and hospitals
Frequency of Reporting	Monthly

Indicator 3. Malaria positivity rate

Definition	Percentage of slides or rapid diagnostic tests found positive among all slides and rapid diagnostic tests performed.
Formula	*Number of slides or RDT positive for malaria* X 100 *Total number of slides or RDT performed for malaria diagnosis*
Interpretation	The slides or RDT positivity rate assesses the proportion of slides/RDT positive for malaria among slides or RDT from febrile patients. The slide or RDT positivity rate is usually computed for a specified period of case detection activities. In areas with unstable malaria, an increasing slide or RDT positivity rate is one of the warning signs of a possible epidemic.
Source	Laboratory register at health centers and hospitals, patient register at HP

Frequency of Reporting	Monthly

Indicator 4. Proportion of targeted HHs provided with LLINs in the last 12 months

Definition	Proportion of targeted households (HHs) provided with of LLINs in the last 12 months
Formula	Number of targeted HHs received at least one LLIN in the last 12 months X 100 Total number of HHs that need LLIN in the last 12 months in targeted districts
Interpretation	LLINs are the principal strategy for preventing malaria. LLINs have shown to reduce malaria-related morbidity and mortality in areas with high and moderate endemicity and to reduce malaria-related morbidity. Annual target is prepared every year; hence the annual evaluation is made against the target set for that particular year. However, every year the overall high net coverage should be maintained to impact on malaria transmission
Source	Administrative report
Frequency of Reporting	Annually

Indicator 5. Proportion of targeted households (HHs) covered by IRS in the last 12 months

Definition	Proportion of HHs in IRS targeted areas that were sprayed in the last 12 months.
Formula	Number of unit structures sprayed X 100 Total number of unit structure in the target area for IRS
Interpretation	This indicator is directly related to operations: for houses sprayed with insecticide among those targeted houses and increase level of prevention of malaria in the entire population. The indicator requires that program-level data be collected about each house sprayed at each spraying event in the target area. Careful attention should be given to identify houses not considered as part of the target area. None targeted houses are excluded from the calculation. Ideally, (1) all dwellings and relevant structures in the target areas should be sprayed; (2) all sprayable surfaces in the dwelling or structure should be covered; (3) insecticide application should be uniform across surfaces; and (4) spraying should be done at intervals consistent with the manufacturer's guidelines for specific insecticides. Collectively, these ideal activities comprise the level of adequacy referred to above. *(N.B on average one HH is equivalent to 1.5 unit structure)*
Source	Administrative report
Frequency of Reporting	Annually

Data source	Cost details	Funding source, scope, total cost of data collection, amount of funding secured							Impact/outcome indicators to be monitored
		2014	2015	2016	2017	2018	2019	2020	
Malaria indicator survey (MIS)	Total Cost	-	$1,500,000	–	$1,500,000	–	–	$1,500,000	• % of children with a fever who sought treatment from a facility/health provider within 24 Hrs onset of fever • % of people who slept under LLIN • % of children under five years old who slept under LLIN • Parasite prevalence
	Secured funding amount & source	-	$600,000 (GF), $900,000 (PMI)	–	$600,000 (GF), $900,000 (PMI)	–	–	$900,000 (PMI)	
	Funding Gap	-	0	–	0	–	–	$600,000	
	Implementing Agency	-	EPHI	–	EPHI	–	–	EPHI	
	Coverage of data collection	-	National	–	National	–	–	National	
Malaria program review (MPR)	Total Cost	–	–	$70,000	–	–	–	$70,000	• Coverage of anti-malaria interventions
	Secured funding amount & source	–	–	$70,000 WHO/RBM	–	–	–	$70,000 WHO/RBM	
	Funding Gap	–	–	0	–	–	–	0	
	Implementing Agency	–	–	FMOH/NMCP	–	–	–	FMOH/NMCP	
	Coverage of data collection	–	–	National	–	–	–	National	
Sentinel sites strengthening & establishment	Total Cost	–	$80,000	$120,000	–	–	–	–	• Proportion of sentinel sites strengthened • Proportion of sentinel sites established • Proportion of sentinel sites generating useful evidence
	Secured funding amount & source	–	$80,000 GF	$120,000 PMI	–	–	–	–	
	Funding Gap	–	0	0	–	–	–	–	
	Implementing Agency	–	EPHI	EPHI	–	–	–	–	
	Coverage of data collection	–	National	National	–	–	–	–	
Monitor efficacy of anti-malaria drugs	Total Cost	$150,000	$150,000	–	$150,000	–	$150,000	–	• Proportion of drugs efficacy tests completed • Proportion of findings disseminated • Proportion of findings influenced a policy change
	Secured funding amount & source	GF, PMI	GF, PMI	–	GF, PMI	–	GF, PMI	–	
	Funding Gap	0	0	–		–	0	–	
	Implementing Agency	EPHI	EPHI	–	EPHI	–	EPHI	–	
	Coverage of data collection	National	National	–	National	–	National	–	
Monitor distribution and behavior of vectors	Total Cost	–	$100,000	–	–	–	–	–	• Proportion of monitoring activities completed • Proportion of findings
	Secured funding amount & source	–	PMI	–	–	–	–	–	

	Funding Gap	–	0	–	–	–	–	–	disseminated • Proportion of findings influenced a policy change
	Implementing Agency	–	EPHI	–	–	–	–	–	
	Coverage of data collection	–	National	–	–	–	–	–	
Monitor susceptibility of insecticides	Total Cost	150,000	150,000	150,000	150,000	150,000	150,000	150,000	• Proportion of susceptibility tests completed • Proportion of findings disseminated • Proportion of findings influenced a policy change
	Secured funding amount & source	PMI, GF	PMI, GF	PMI, GF	PMI, GF	PMI	PMI	PMI	
	Funding Gap	0	0	0	0	0	0	0	
	Implementing Agency	EPHI	EPHI	EPHI	EPHI	EPHI	EPHI	EPHI	
	Coverage of data collection	National	National	National	National	National	National	National	
Assess durability/ longevity of LLINs in the field	Total Cost	–	50,000	–	–	–	–	50,000	• Proportion of monitoring activities completed • Proportion of findings disseminated • Proportion of findings influenced a policy change
	Secured funding amount & source	–	GF	–	–	–	–	PMI	
	Funding Gap	–	0	–	–	–	–	0	
	Implementing Agency	–	EPHI	–	–	–	–	EPHI	
	Coverage of data collection	–	National	–	–	–	–	National	
Demographic and health survey (DHS)	Total Cost	DHS is going to be conducted primarily by Central Statistical Agency (CSA) in collaboration with national and international organizations. Detailed cost including amount and source cannot be found at FMOH/NMCP. The DHS is not part of malaria M&E, though data and information from this source will be used to measure the impact of malaria program.							• Infant mortality rate (IMR) • U5 mortality rate • Maternal mortality rate (MMR)
	Secured funding amount & source								
	Funding Gap								
	Implementing Agency	CSA	CSA	CSA	CSA	CSA	CSA	CSA	
	Coverage of data collection	National	National	National	National	National	National	National	

Annex 4. Monitoring & Evaluation work plan and budget for 2015

Activity	Timeline				Responsible unit/ implementing agency	Collaborating agencies	Budget	Source of funding	Link with MESST Action plan or with other recommendations	Expected outcome
	Q1	Q2	Q3	Q4						
Conduct malaria indicator survey (MIS)	x	x	x	x	EPHI	All RBM partners	$1,500,000	PMI, GF	Linked with HSDP, malaria NSP and also recommended by RBM partnership	Detailed review of the achievement of the anti-malaria interventions coverage and depicting areas for further improvement
Strengthening and establishment of malaria surveillance sentinel sites			x	x	EPHI, NMCP	All RBM partners	$80,000	GF	Linked with HSDP, NSP and also recommended by MPR and ARM	Improved data and information on efficacy of drugs & susceptibility of insecticides
Insecticide susceptibility test	x	x	x	x	EPHI, NMCP	WHO, RHBs Abt/PMI, universities	$150,000	PMI/GF	Linked with HSDP, NSP and also monitoring of vectors' resistance was recommend by MPR, ARM	Updated data and information on the level of susceptibility of insecticides
Drug efficacy test	x	x	x	x	EPHI, NMCP	RHBs, ICAP/PMI universities	$150,000	PMI/GF	Linked with HSDP, NSP and also monitoring of efficacy level was recommend by MPR, ARM	Updated data and information on drug efficacy level
Monitoring duration/longevity of LLINs under field conditions	x	x	x	x	EPHI, NMCP	Abt /PMI, universities	$50,000	PMI/GF	Linked with HSDP, NSP and also recommended by MPR and ARM	Updated information on longevity of LLINs in field setting
Study on distribution and dynamics and behaviors of specific malaria vectors	x	x	x	x	EPHI, NMCP	Abt /PMI, universities	$100,000	PMI/GF	Linked with HSDP, NSP and also recommended by MPR and ARM	Updated information on vector dynamics and behaviour for improving targeting of interventions
Conduct annual federal level review meeting				x	NMCP, FMOH	All RBM partners	$16,725	GF	Linked with HSDP, NSP and also recommended by MPR	Improved national level information sharing and monitoring of national achievements
Conduct annual regional review			x		RHBs, FMOH	All RBM	$618,500	GF	Linked with HSDP,	Improved regional level

Activity	Timeline				Responsible unit/ implementing agency	Collaborating agencies	Budget	Source of funding	Link with MESST Action plan or with other recommendations	Expected outcome
	Q1	Q2	Q3	Q4						
meeting						partners			NSP and also recommended by MPR and ARM	information sharing and monitoring of regional achievements
Procure and distribute laptop computers for improving data management in elimination targeted districts	x	x			NMCP/FMOH	Finance & procurement Directorate	$50,000	GF	Linked with HSDP and malaria NSP	Improved data storage, analysis and use/sharing to appropriate level
Preparation and printing of data collection tools for elimination targeted districts	x	x			NMCP/FMOH	RBM partners	$6,875	GF	Linked with HSDP and malaria NSP	Improved data collection
Covering air time cost for surveillance officers in elimination districts	x	x	x	x	NMCP/FMOH	Finance & procurement Directorate	$37,500	GF	Linked with HSDP and malaria NSP	Improved data and information sharing or reporting
Training of trainers (TOT) for the 50 elimination targeted woredas, zones, regions and central level staff		x			NMCP/FMOH	RBM partners	$19,350	GF	Linked with HSDP and malaria NSP	Improved skills and capacity for cascading training
Cascade training to all health extension workers in 50 elimination targeted woredas		x	x		RHBs/DHOs	RBM partners	$51,875	GF	Linked with HSDP and malaria NSP	Improved skills in timely investigation, detection, management and reporting of malaria cases in 50 woredas
Printing and distribution of monitoring chart for 50 woredas	x	x			NMCP/FMOH	RHBs, DHOs	$70,000	GF	Linked with HSDP and malaria NSP	Improved monitoring of confirmed cases
Conduct supervision on elimination related activities in 50 woredas			x	x	NMCP/FMOH, RHBs/DHOs	RBM partners	$30,000	GF	Linked with HSDP and malaria NSP	Improved capacity in handling of cases and submitting of reports