



**REPUBLIC OF GHANA
MINISTRY OF HEALTH**

NATIONAL MALARIA CONTROL PROGRAMME

**GHANA NATIONAL MALARIA CONTROL
MONITORING AND EVALUATION PLAN 2014-2020**

October 2014

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List of Abbreviations

ACSM	Advocacy Communication and Social Mobilization
ACT	Artemisinin-Based Combination Therapy
AGAMaL	Anglogold Ashanti Malaria Control Program Ltd
ANC	Antenatal Clinic
BCC	Behavioral Change Communication
BMC	Budget Management Centre
CBA	Community Based Agent
CCM	Country Coordinating Mechanism
CDC	Center for Disease Control
CDDs	Community Drug Distributors
CFR	Case Fatality Rate
CHAG	Christian Health Association Of Ghana
CHIM	Center for Health Information Management
CHO	Community Health Officer
CHPS	Community Health Planning Services
CMS	Central Medical Stores
DCD	Disease Control Department
DHD	District Health Directorate
DHIMS	District Health Information Management System
DHS	Demographic And Health Survey
DOT	Directly Observed Therapy
DQA	Data Quality Audit
EIRs	Entomological Inoculation Rates
EPA	Environmental Protection Agency
G6PD	Glucose-6-Phosphate Dehydrogenase
GFATM	Global Fund to Fight HIV/AIDS, TB and Malaria
GHS	Ghana Health Service
GSS	Ghana Statistical Service
HBC	Home Based Care
HFS	Health Facility Survey
HIO	Health Information Officer

HIPC	Highly Indebted Poor Countries
HLC	Human Landing Catches
HMIS	Health Management Information System
HRU	Health Research Unit
ICT	Information Communication Technology
IDRS	Integrated Disease Surveillance and Response
IEC	Information, Education and Communication
IPT	Intermittent Preventive Treatment
IRC	Indoor Resting Collection
IRS	Indoor Residual Spraying
ITMs	Insecticide Treated Materials
ITNs	Insecticide Treated Nets
IVM	Integrated Vector Management
KAP	Knowledge, Attitude, Practice
LC	Laval Collection
LCD	Liquid Crystal Display
LLINs	Long Lasting Insecticide Treated Nets
LQS	Lot Quality Sampling
MARA	
MDGs	Millennium Development Goals
METwG	Monitoring and Evaluation Technical Working Group
MICC	Malaria Interagency Coordinating Committee
MICS	Multiple Indicator Cluster Survey
MIP	Malaria In Pregnancy
MIS	Malaria Indicator Survey
MOH	Ministry Of Health
NGOs	Non-Governmental Organizations
NMCP	National Malaria Control Program
NMIMR	Noguchi Memorial Institute For Medical Research
NSP	National Strategic Plan
OPD	Out-Patient Department
OTSS	Onsite Training and Supportive Supervision
PDA	Personal Digital Assistants

PMI	President's Malaria Initiative
PPME	Policy, Planning, Monitoring And Evaluation
PSC	Pyrethrum Spray Catches
RBM	Roll Back Malaria Initiative
RDT	Rapid Diagnostic Test
RIA	Rapid Impact Assessment
SMC	Seasonal Malaria Chemoprevention
SOP's	Standard Operating Procedures
SPH	School of Public Health
SPMDP	Society of Private Medical and Dental Practitioners
SWOT	Strength Weakness, Opportunities and Threats
TOT	Training Of Trainers
UNICEF	United Nations Children's Education Fund
WHO	World Health Organization

Preface

Malaria is a major public health problem in Ghana. Even though the prevalence of malaria has reduced over the years to average of 27.5% (MICS 2012), it is a leading cause of morbidity and mortality, especially in children under five years of age and pregnant women.

The Government of Ghana through the Ministry of Health, the Ghana Health Service, and its partners in their continued effort to control malaria until it is no longer a public health problem, has revised the National Malaria Strategic Plan and along with it, has revised the Monitoring and Evaluation (M&E) Plan. The Malaria M&E Plan is an important component of the Ministry of Health's Sector Wide Approach M&E system.

In order to control malaria in the country, the Ministry of Health is focusing on maintaining and improving gains made in the last six years in malaria control; while introducing new interventions such as Seasonal Malaria Chemoprevention. The control of malaria continues to enjoy resources from marked partners, particularly the Global Fund, the U.S. President's Malaria Initiative, UNICEF, and the World Bank. A robust monitoring and evaluation plan, which harmonizes all M&E activities, is therefore critical if the malaria community is to demonstrate progress in achieving outcomes and impact of malaria control efforts. The plan builds on the gains achieved in the 2008-2015 M&E Plan and continues to contribute to a more efficient use of data and resources. With improved systems in place, it is hoped that data generated will be a reliable source of information for decision-making by programme or project managers, partners and other relevant stakeholders.

It is expected that since this has been a collaborative effort among stakeholders, its adherence will be high, thus enabling Ghana to further reduce the health and socioeconomic burden of malaria.

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This edition of the Monitoring and Evaluation Plan 2014-2020 was developed by the M&E Technical Working Group who reviewed the M&E Plan 2008-20015, assessed the current situation in the control of malaria and put in place this plan for the next five years, which gives direction to the National Malaria Strategic Plan 2014-2020.

This group had the following membership: Prof. E. A. Afari (Chairperson), School of Public Health University of Ghana; Dr. Erasmus Agongo Director PPME/ GHS; Dr. Ofosu, head of CHIM PPME/GHS Dr. Constance. Bart Plange, NMCP Program Manager NMCP/GHS; Peter Gyimah, Head, CMS/MOH; Dr. Frank Nyonator, former Director, PPME/GHS; Rep Family Health Division Dr. George Bonsu Program Manager EPI/GHS;; Denis Leonard Adalety, PPME/CHIM; Michael Adjabeng, DSD/GHS; Peter Takyi Peprah, GSS; Louis Agbe, CCM (then Chairman)/Ministry of Local Govt RDE; John A. Pwamang, EPA; Geoffrey V. Arthur, Food and Drugs Board; Ekow Biney, PHRL; Emefa K. Sepen, PHRL; Charles Acquah, Ghana Coalition of Health NGOs; Dr. Mark Young, UNICEF; Dr. Marius de Jong, DFID/EKN; George Wood, JICA, Dr. Philip Ricks, CDC/PMI; Dr. F. Owusu Antwi, WHO; Dr. Harry Opata, WHO, Kofi G. Osae, NMCP/GHS, Wahjib Mohammed, NMCP/GHS, Mrs. Aba Baffoe Wilmot, Mr. Frank Amoyaw AGAMal, Dr. Keziah Malm NMCP/GHS. The group met over a period of four weeks and was supported by NMCP staff as well as by WHO AFRO/ICP/WARN.

The documents were reviewed by Dr. Kyei Faried, (Head DCD/GHS) and Dr. Joseph Amankwah, Director Public Health Division, Dr. Ebenezer Appiah-Denkyira, Director-General Ghana Health Service. Mr. Frank Boateng (CCM) and NMCP staff also supported this work. In April 2013, a consensus meeting of stakeholders was convened to vet and validate the draft plan; a list of participants is given in the Appendices. Dr. Philip Ricks (CDC/PMI) worked closely with Mr. Kofi Osae, Mr. Wahjib Mohammed, Dr. Keziah Malm and other NMCP staff on the final review and editing of the draft document. The preparation of this document was supported by GFATM, PMI (Malaria Care), UNICEF, and the Government of Ghana.

In the finalization of the plan, Prof Edwin Afari (School of Public Health, University of Ghana), reviewed the draft document and refined it to its current state. He was supported by Dr. Keziah Malm, Mr. Wahjib Mohammed, Mr. Kofi Osaе, Mr Sammy Oppong, Mr. David Y. Mensah (from NMCP) and Mr. Andrew Quao from USAID/Malaria Care.

Executive Summary

The National Malaria Control Monitoring and Evaluation Plan 2014-2020 has been developed alongside the National Malaria Strategic Plan (NMSP) 2014-2020, in order to give a monitoring and evaluation (M&E) framework in which the NMSP is to be implemented. The NMSP provides a strategic direction for malaria control over the next five years; with the M&E Plan describing the monitoring and evaluation activities that will support the NMSP.

This M&E Plan provides a review of the following:

- Current malaria epidemiology and malaria risk in Ghana – demonstrating the changes in endemicity
- Current malaria control strategies; including the introduction of new strategies such as Seasonal Malaria Chemoprevention
- Updated goals and targets for malaria control in Ghana in the context of sustaining and improving gains attained in the last five years
- Updated data sources that can be used for monitoring of malaria control efforts; including modification of current consulting room registers
- Opportunities to utilize a spectrum of facility-based and population-based methods and tools for malaria M&E
- Details on:
 - Monitoring the inputs, processes, and outputs of control interventions
 - Evaluating the outcomes and impact of scale-up efforts
 - Operations research to focus on specific detailed of bottlenecks to current intervention implementation
- Identification of illustrative time frames for data collection, analysis and planned reporting.
- Descriptions of capacity strengthening requirements to respond to the needs of this M&E Plan
- New inputs including:
 - All routine surveillance data inputted into District Health Information Management System 2(DHIMS2); abolishing the parallel malaria surveillance system

- Expansion of drug efficacy sentinel sites from 10 to 26 and establishment of 20 vector resistance sentinel surveillance sites

Goal of M&E Strategy

To strengthen the systems for surveillance and M&E to ensure timely availability of high quality, consistent and relevant malaria data at all levels, in order to track the progress of the malaria control and prevention interventions towards the NMCP 2018 targets.

Specific Objectives

- To attain timely and complete monthly malaria morbidity and mortality reporting from at least 90% health facilities using DHIMS
- To generate quality data that can establish pre-elimination status at the district level
- To develop a Semi Annual bulletin at National and regional levels, that will provide data on the incidence of suspected malaria cases, total number of suspect cases tested, total confirmed cases, appropriate adherence to test results, and mortality
- To cover 75% of country with entomological surveillance

Strategies and Interventions

- To strengthen the technical capacity of monitoring and evaluation for malaria control at facility, district, regional, and national levels
- To strengthen the logistics structure for monitoring and evaluation at all levels
- To harmonize monitoring and evaluation systems among stakeholders
- To improve malaria quality assurance system at all levels
- To disseminate and report data in a manner that encourages evidence based decision-making for malaria control at all levels
- To improve coordination and collaboration among partners conducting malaria M & E

CHAPTER ONE: INTRODUCTION

1.1 Country Profile

1.1.1 Geographic and Administrative Data

The Republic of Ghana is centrally located on the West African coast inland from the Gulf of Guinea. It is bordered on the south by the Atlantic Ocean, Togo to the east, and Burkina Faso to the north, and La Cote D'Ivoire to the west. The country is bisected by the Greenwich Meridian and lies entirely within the northern tropics between 4⁰N to 11⁰N at the equator.

Ghana is a democratic nation, with a presidency, cabinet, parliament and an independent judiciary. It is divided into ten regions: Ashanti, Brong Ahafo, Central, Eastern, Greater Accra, Northern, Upper East, Upper West, Volta and Western Regions. Each region is divided into districts, with the total number of districts standing at 216 in October 2013. Ghana's population is currently estimated at 27,218,727 in 2014 (2000 and 2010 Population Census, GSS) with 41 percent of the population less than 15 years.

1.1.2 National Health System Organization

The Health sector in Ghana is comprised of both public and private institutions. Ghana Health Service (GHS) and Teaching Hospitals run the public sector, while the private sector is made up of faith-based and private-for-profit health institutions. The current health sector organization provides the leadership at the ministerial level and is supported by the following implementing agencies:

- Service delivery (Psychiatric hospitals, Ambulance Service, Blood Service, Christian Health Association Of Ghana (CHAG))
- Health training and research institutions
- National Health Insurance Authority
- Regulatory bodies.

GHS is a three-tier health delivery system of primary, secondary and tertiary levels. The primary level encompasses the district and sub-district divisions. The district level consists of a district hospital, with a Medical Doctor, who also serves health centres in the sub-districts, where a Physician Assistants is the person in charge. Some sub-districts include Community Health Planning & Services (CHPS) zones where Community Health Officers (CHOs) work with community volunteers to increase access to health care for distant or underserved populations. A typical district has a population of 100,000, one hospital, 5 health centres and 10-15 CHPS zones. The leadership of the district is the District Director of Health Services who works with a District Health Management Team and reports administratively to the District Chief Executive (Political Head) and technically to the Regional Director of Health Service.

The regional hospital forms the secondary level of the health care system taking care of referrals from the primary level. At this level, general practitioners and specialists provide services. . There are ten regional hospitals receiving referrals from districts and providing

specialist outreach support to districts in Ghana. The Regional Director of Health Services oversees all matters of health in the region, works with a team and reports administratively to the Regional Minister (Political Head) and technically to the Director-General of the Ghana Health Service who in turn, reports to the Minister of Health through the GHS Council.

Komfo Anokye, Korle-Bu and Tamale are the current teaching hospitals providing tertiary care and training of doctors. The Chief Executives of these teaching hospitals report to the Minister of Health through a Board.

The health sector has adopted an integrated approach to delivery of health interventions. Access, quality and coverage of health service, preventive care, clinical care and emergency services are all important aspects of health service delivery system. There is a National Health Insurance Scheme (under the National Health Insurance Act 650, 2003 and LI 1809, 2004) to take care of the cost of providing most of the services in health facilities. As part of the approach, public health interventions are packaged and delivered in communities as part of CHPS and outreaches, in health centres and in district, regional, and national levels.

Within the regions and districts are multi-purpose disease control technical officers that ensure integrated health service delivery. These officers report to their respective district and regional Directors of Health.

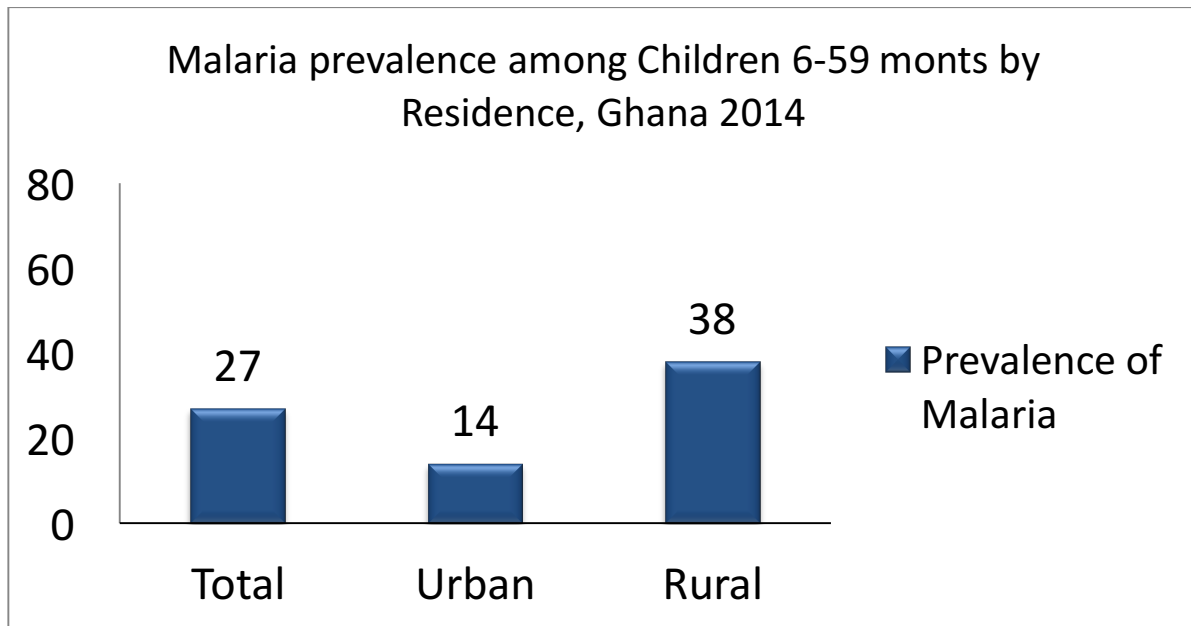
At the sub-district and CHPS compounds are Disease Control Technical Officers and Field technicians, community health nurses and medical assistants who carry out malaria control activities, supported by community volunteers.

1.2 Malaria Situation

1.2.1. Epidemiology

Malaria is considered to be endemic throughout Ghana with all populations at some risk for exposure. The main parasite species reported to cause malaria in Ghana are *Plasmodium falciparum* (80-90%), *P. malariae* (20-36%), and *P. ovale* (0.15%), with mixed infections of *P. falciparum* and *P. malariae* not being uncommon. *Anopheles gambiae s.l.* and *An. funestus* have been identified as the major vectors of malaria throughout Ghana. The geographic distribution of malaria incidence and transmission in Ghana mimics its ecologic zones with rates highest in the northern savannah areas, middling rates in the forest areas located in southern parts of the country, and lowest in coastal areas. Malaria prevalence is also influenced by urbanization; with parasite prevalence of 38%, rural Ghana shoulders three times as much burden compared to urban settings (14%) (Figure1).

Figure 1: Prevalence of Malaria by Residence



In contrast to the incidence of malaria, the length of the malaria transmission season is shortest in the north, 7 months, and increases southward to year-round transmission in the southwestern part of Ghana (Figure 2). This contradiction between malaria rates and length of transmission season is largely explained by differences in economic development, with the northern part of Ghana having less development, infrastructure, and healthcare services compared to the southern part of the country.

Figure 2: Ecological zones and Malaria Prevalence in Ghana by Regions, 2014

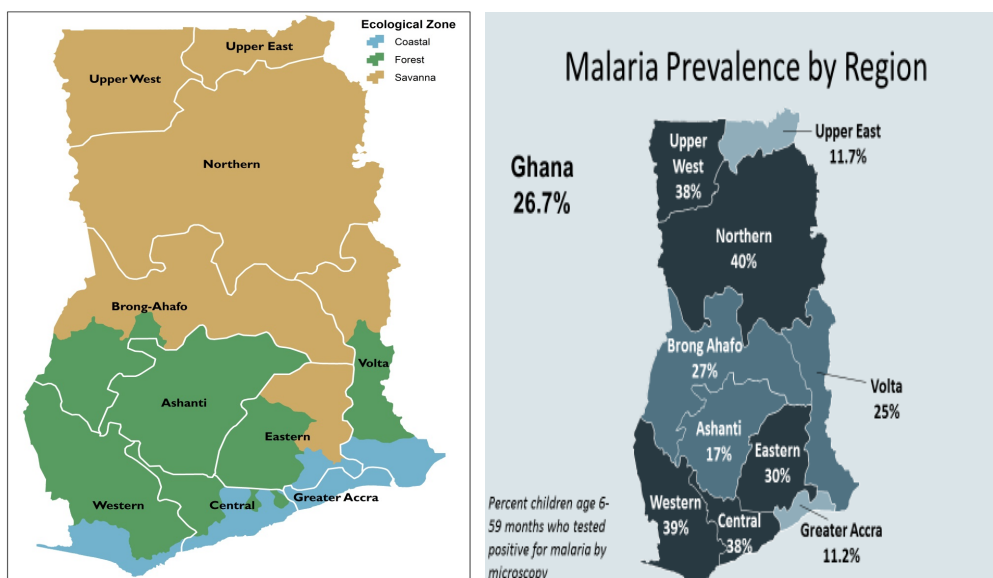
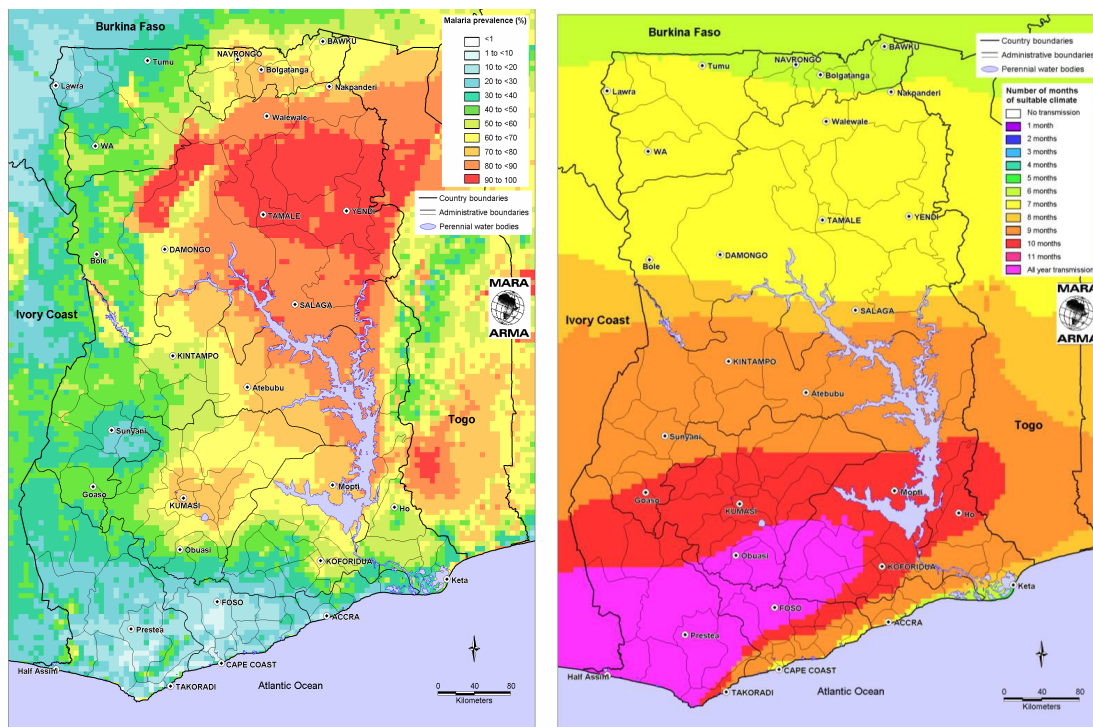


Figure 3: Malaria Prevalence and Transmission Duration Map for Ghana, 2002 – Source MARA/ARMA

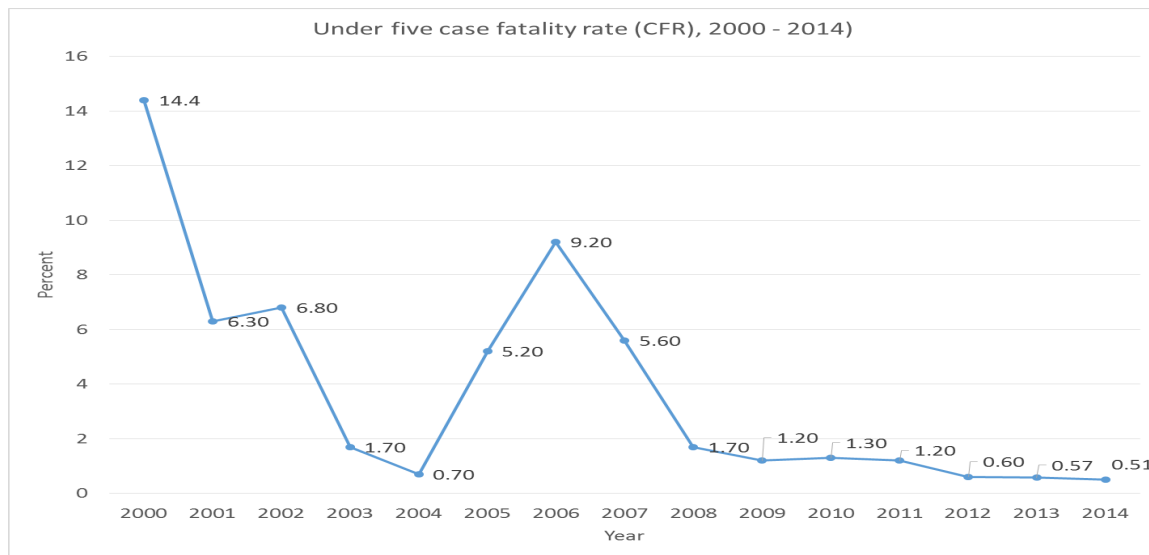


The major cause of morbidity and mortality in children under five years of age is malaria, accounting for 48.2% of their hospital deaths, 30.9% of all outpatient illnesses and 27.9% of all admissions as indicated in 2014 annual report.

The country has made gains in its malaria control efforts as shown by the drop in overall malaria parasite prevalence from over 50% in 2002 (per MARA/ARMA 2002 modeling) to 27.5% in 2011 (*MICS 2011*)¹ and 26.7% in 2014 (*GDHS 2014*). There has also been a reduction in the overall Case Fatality Rate (CFR) from 14.4% in 2000 to 0.51% in 2014 under-five malaria cases (Figure 4).

¹ Methodological differences exist between estimates from the Mara/ARMA modeling and the MICS/GDHS.

Figure 4: Under-Five Malaria Case Fatality (2000-2014)



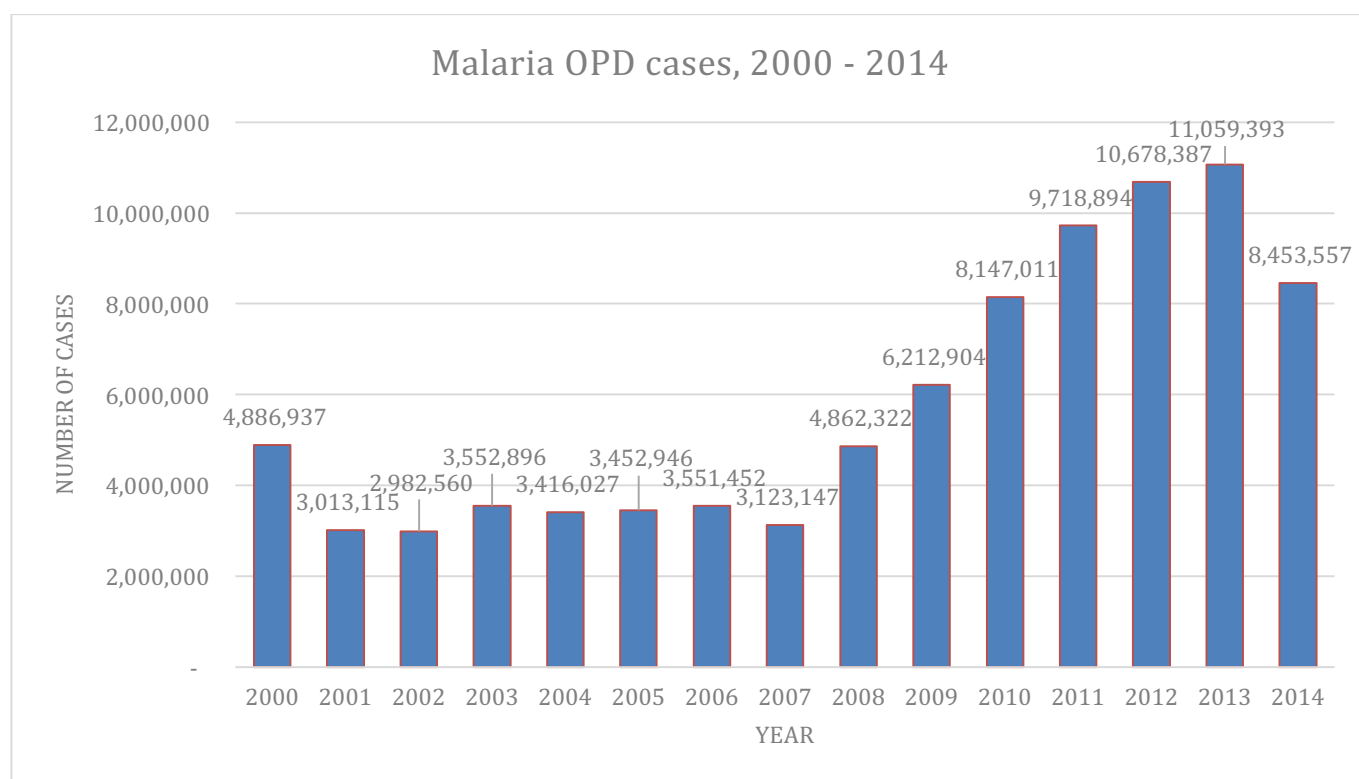
Source: HMIS/DHIMS

Though there has been a reduction in parasite prevalence and CFR, the number of cases being reported as malaria continues to increase with the total Out Patient Department (OPD) malaria cases moving from 4,886,937 in the year 2000 to approximately 8,453,557 cases in 2014 (Figure 5). The number of OPD malaria cases per 1000 population has also increased from 250 cases in year 2000 to about 310 cases per 1000 population in 2014.

This increase is a result of three main factors: 1) improved data capture at all levels of care, 2) improved access to healthcare due to the increased financial access provided by National Health Insurance and geographical access provided by Community Health Planning Services (CHPS) facilities, and 3) an increase in the presumptive diagnosis of malaria.

There has however been a tremendous improvement in parasitological diagnosis of malaria cases. The introduction of RDTs to augment microscopy in 2010 has increased the proportion of suspected malaria cases which are tested. From 2011, the proportion of OPD suspected malaria cases tested by both microscopy and RDTs have increase from 42.9% to 73.5% in 2014 translating into an increase of 41.6%.

Figure 5: Malaria OPD Cases 2000-2014



Source: DHIMS II

1.3 Scope and Impact of Previous Malaria Strategic Plans

1.3.1 National Malaria Strategic Plan (2008-2015)

The goal of Ghana's National Malaria Strategic Plan, 2008-2015, was to reduce the disease burden by 75% during the timeframe. This was to be accomplished through improved malaria prevention and access to prompt and effective malaria treatment, strengthened monitoring and evaluation, operational research, and health systems strengthening, and by creating and sustaining partnerships for malaria control. Malaria prevention was to be improved by scaling up LLIN distribution to achieve universal coverage, with 80% of the general population and 85% of children under-five and pregnant women sleeping under ITNs. Improved malaria prevention also included scaling up IRS to achieve 90% coverage of structures in targeted districts. Improved access to prompt and effective treatment would come from ensuring that all facilities were adequately equipped with malaria diagnostics and anti-malarial, that laboratory technicians and clinicians receive appropriate in-service training, and the scale up of community-based treatment in all districts. These interventions would ensure that 100% of health facilities were able to provide prompt and effective ACT treatments, 90% of uncomplicated cases would be correctly managed, 90% of children with fever would receive appropriate treatment within 24 hours, all communities would have community-based

treatment for uncomplicated malaria, and that all pregnant women would receive 2 doses of IPTp. The strategy also included strengthening the routine data collection system to capture reliable information, and undertaking regular operational research to provide evidence for decision making. Lastly, it included forging functional partnerships and mechanisms between departments, programmes within and outside the health sector.

The Health Sector has an integrated M&E Plan out of which Ghana Health Service (GHS) has developed its M&E framework. This includes the tracking of health and performance indicators, through the use of the routine health information system and national household surveys.

Since 2008, Ghana has made major strides in reducing malaria mortality rates from 14.4% in 2000 to 0.51% in 2014. Ghana has achieved steady gains in many of the key malaria intervention indicators, as indicated in Tables 1 and 2. Between 2003 and 2014, insecticide treated nets (ITN) ownership and use, uptake of intermittent preventive treatment in pregnant women (IPTp), and treatment with artemisinin-based combination therapy (ACTs) have all increased. In addition, targets for population and under 5 mortality have been met

Table 1: Ghana RBM/ MDG Indicator Coverages for Malaria Control

INDICATOR	RBM/MDG TARGETS BY 2015	2000	2014	Remarks
Death associated with malaria (all ages)	1527	6054	2200	Reduced by 64%
Under 5 years Malaria Cases Fatality Rate (CFR) (Severe Malaria admission)	3.5	14.4%	0.51	CFR Reduced by 96.5% - meaning more admitted malaria cases survive now than in the past.

Source: Indicators from Health Facilities Routine Data Collection in GHS/ DHIMS

Table 2: Indicator coverage from Surveys

INDICATOR	RBM/MDG TARGETS BY 2015	GDHS 2003	GDHS 2008	MICS 2011	GDHS 2014
Percentage of Households owing at least one mosquito net (both treated and untreated)	80%	18.0%	45.4%	48.9%	70%
Percentage of Households owning at least one treated net (ITN)	80%	3.0%	42.0%	49.0%	68%
Percentage of children under five years sleeping under a treated net (ITN) previous night	80%	3.5%	28.0%	40.0%	47%

INDICATOR	RBM/MDG TARGETS BY 2015	GDHS 2003	GDHS 2008	MICS 2011	GDHS 2014
Percentage of children under five years sleeping under an ITN previous night among household with at least one ITN	80%	-	-	39%	59%
Percentage of pregnant women sleeping under an ITN previous night	80%	3%	27.0%	33.0%	43%
Percentage of pregnant women sleeping under an ITN previous night among households with at least one ITN	80%	-	-	58%	54%
Percentage of all persons who slept under LLIN the previous night	80%	-	-	48.0%	36%
Proportion of Women who received at least 2 doses of SP/Fansidar during their last pregnancy.	80%	1.8%	-	64.4%	68%
Proportion of children under 5 with fever who are treated with appropriate anti malaria drugs (ACTS)	80%	0%	-	42%	78%
Parasite Prevalence (among 6 to 59month)	18.75%	75%	-	27.5%	26.7%

1.3.2 National Malaria Control M&E Plan (2008-2015)

The National Malaria Control M&E Plan was developed in conjunction with the National Strategic Plan and within the context of internationally accepted theoretical framework for M&E. This framework fostered the systematic collection of information on the input, process, output, outcome and impact indicators and the tracking of progress towards set targets.

The objectives of the 2008-2015 national malaria monitoring and evaluation plan were:

- Contribute to the strengthening of M&E systems in Ghana
- Monitor/track progress of the implementation of planned activities
- Evaluate the outcomes and impact of the control interventions
- Coordinate the dissemination of M&E information for use in the country

Strategies to achieve these objectives were:

- Improving routine data collection
- Strengthening surveillance at sentinel sites
- Improving data reporting through data quality audits.
- Improving data review meetings at all levels

- Improving monitoring of malaria commodities, including drugs and diagnostic tests
Strengthening partnerships/collaboration.

M&E Implementation

Health Information Management

During the 2008-2015 M&E Strategic Plan, the Health Sector developed and successfully deployed the District Health Information Management System (DHIMS) software in 2008 to facilitate the management and analysis of routine health facility service data for decision-making. The DHIMS is a web-based system centrally hosted by the Centre for Health Information Management (CHIM), a unit within Policy, Planning, Monitoring and Evaluation (PPME). DHIMS provides a platform for managing nationwide health facility service data that comes primarily from government facilities, and some private, faith-based and quasi-government facilities. In 2012 the platform was upgraded to DHIMS2 and rolled out nationally. DHIMS2 provided for improved functionality in terms of data analysis and data presentation. Health facility service registers are provided at service points in health facilities for collecting client demographic and health care information. These are the primary data sources for M&E within the service. Standard forms are used to manually summarize malaria data from the service registers monthly for transmission to the District level. At the District level, DHIMS2 is used as a platform for data entry to collate and analyze the data. Data in the DHIMS2, which includes data on malaria, can be accessed by users through the use of username and password. However the level of access depends on the user's rights and the proposed use of the data.

Although DHIMS2 was successfully implemented nationwide, the existing malaria reporting system remained in place until the data validity of DHIMS2 was deemed adequate. This system was the Centre for Health Information (CHIM) and Integrated Disease Surveillance and Response (IDSR) System.

Sources of Malaria Data

In addition to the facility level data that was fed into DHIMS2, there were numerous other sources of data used to monitor and evaluate malaria program performance.

National Household Surveys

Large national representative household surveys have been conducted to measure outcome and impact of malaria control and prevention interventions. Surveys in Ghana include the Demographic and Health Surveys (DHS), which are conducted every five years, with the most

recent DHS conducted in 2014. The DHS collects malaria indicators on ITN ownership and use, IPTp uptake, and ACT use in symptomatic children. In 2014 malaria biomarkers (anemia and malaria parasitemia) were also measured. Additional household surveys conducted every 2 – 3 years include the Multiple Indicator Cluster Survey (MICS) and Malaria Indicator Survey (MIS), by UNICEF and Health Research Unit/NMCP/GHS respectively. In 2011, the MICS measured anemia and malaria parasitemia among children under five. These surveys are normally conducted by external agencies, however the NMCP provides technical and programmatic input on the malaria indicators collected, in order to track malaria program performance.

Entomological, Vector, and Resistance Monitoring

Entomological surveys were conducted by qualified research institutions to provide data on vector transmission dynamics, insecticide resistance profiles, insecticide batch potencies, and the effectiveness of spray applications, efficacy of insecticides used for vector control activities, the elucidation of mechanisms of insecticide resistance and its impact on the control of malaria in the country. Institutions such as the AngloGold Ashanti Malaria Control Centre, the Noguchi Memorial Institute for Medical Research (NMIMR) in collaboration with the PMI, the Kumasi Center for Collaborative Research (KCCR) and the Navrongo Health Research Center have been conducting entomological monitoring and surveys in the country.

Vector monitoring uses standard WHO field collection methods including; pyrethrum spray catches (PSC), indoor resting collections (IRC), human landing catches (HLC) and larval collections (LC) to obtain mosquitoes to study their densities, diversities & distribution, biting & feeding behaviour, infectivity rates & entomological inoculation rates (EIRs) within the sentinel districts as well as their insecticide resistance profiles. A total of twenty (20) sentinel districts were involved in vector monitoring.

Effective resistance management depends on early detection of problems and rapid assimilation of information on the resistant insect population so that rational insecticide choices can be made. Baseline resistance testing was conducted in sentinel districts by implementing agencies working in collaboration with a suitably qualified and recognized research institution. Routine vector resistance monitoring were conducted at these sites as part of the insecticide resistance management plan.

Sentinel Surveillance for Monitoring Epidemiologic Malaria Data

Twenty six (26) health facilities (12 in the three northern regions and 14 in the remaining seven regions) have been established for tracking routine data on malaria mortality and morbidity and captured in the DHIMS. The reporting onto the DHIMS is done on a monthly basis as part of the routine reporting system. (See table 3 for complete list).

Drug Efficacy Testing

Ten (10) additional health facilities (Wa Hospital, Yendi Hospital, Navrongo War Memorial Hospital, Sunyani Hospital, Prampram Health Centre, Begoro District Hospital, Bekwai District Hospital, Ewim {Cape Coast} Health Centre, Hohoe District Hospital and Tarkwa Government Hospital) will continue the provision of information on malaria drug efficacy testing. In addition to the drug efficacy monitoring, studies are conducted to also define the characteristics of *P. falciparum* resistance to combinations therapies. This generates a database on clinical and parasitological response to anti malaria in the country.

Table 3: List of Entomological Surveillance, Insecticide Resistance and Therapeutic Efficacy Study (TES) Sites

Region	Sentinel Site	District	Entomological Monitoring	Resistance Monitoring	Epi/Sentinel Monitoring	TES Monitoring
Ashanti	Adwumakaase Health Centre	Afigya Kwabre			X	
	Bekwai Municipal Hospital	Bekwai			X	X
	St. Martin's (Amansie West) Catholic Hospital	Amansie West			X	
	Ejura	Ejura Sekyeredumase		X		
	Konongo	Asante Akim North		X		
	Obuasi	Obuasi Municipal	X	X		
Brong Ahafo	Prang Health Center	Pru			X	
	Sunyani Municipal Hospital	Sunyani Municipal			X	X
	Kenyase	Asutifi		X		
	Kwame Danso	Sene		X		
Central	Diaso Health Center	Upper West denkyira			X	
	Ewim Polyclinic	Cape coast			X	X
	Twifo Praso	Twifo Atti-Mokwa		X		
	Okyereko	Gomoa East		X		
Eastern	Pakro Health Center	Akwaipim South			X	
	Begoro Government Hospital	Fanteakwa			X	X
	Kade	Kwaebibirim		X		
	Akuse	Lower Manya Krobo		X		
Greater Accra	Danfa Health Center	La - Nkwantanang			X	
	Lekma Hospital	Ledzekuku			X	
	Obom Health Center	Ga south			X	
	Shai Osu Doku District Hospital	Shai Osu - Doku			X	
	Prampram Health Center	Ningo - Prampram				X
	Ada Foah	Dangme East		X		
	Weija	Ga south		X		

Region	Sentinel Site	District	Entomological Monitoring	Resistance Monitoring	Epi/Sentinel Monitoring	TES Monitoring
Northern	Buipe Polyclinic	Central Gonja			X	
	Kings Medical Center	Kumbungu			X	
	Gbullung/ Kumbungu	Kumbungu	X	X		
	Tinga Health Center	Bole			X	
	Yendi Government Hospital	Yendi			X	X
	Bunbuna/ Yunyoo	Bunkpurungu Yunyoo	X	X		
	Nalerigu	East Mamprusi	X	X		
	Nanton/ Tarikpaa	Savelugu Nanton	X	X		
	Dimabi/ Woribugu	Tolon	X	X		
	Kulaa/ Tugu	Tamale	X	X		
	Sawla	Sawla Tuna Kalba		X		
	Wulensi	Nanumba South		X		
Upper East	Talensi District Hospital	Talensi			X	
	Garu Health Center	Garu - Tempene			X	
	Bawku	Bawku West		X		
	Fumbisi	Builsa South		X		
	War Memorial Hospital	Kasena Nankana			X	X
Upper West	Jirapa Urban Health Center	Jirapa			X	
	Lawra Hospital	Lawra			X	
	Baazing	Lawra		X		
	Nandom Hospital	Nandom			X	
	Tumu/ Tumu Hospital	Sissala East		X	X	
	Upper West Regional Hospital	Wa Municipal			X	X
	Jonga	Wa Municipal		X		
	Busa	Wa Municipal		X		
	Wechiau Polyclinic	Wa West			X	
Volta	Dambai Health Center	Krachi East			X	

Region	Sentinel Site	District	Entomological Monitoring	Resistance Monitoring	Epi/Sentinel Monitoring	TES Monitoring
	Hohoe Municipal Hospital	Hohoe Municipal			X	X
	Nkwanta	Nkwanta South		X		
	Afife	Ketu North		X		
Western	Akontombra Health Center	Sefwi - Akontombra			X	
	Tarkwa Government Hospital	Tarkwa Nsuaem			X	X
	Wiawso	Sefwi- Wiawso		X		
	Bogoso	Prestea/Huni valley		X	X	

Data Use

At the facility, district, regional and national level, DHIMS data on malaria was analyzed to generate indicators and information that were important for monitoring trends in malaria burden and programme evaluation, which was done as part of the integrated monitoring and evaluation framework.

In addition to District level reviews, the progress of disease management was monitored through regular supervisory visits and review meetings, which included data validity and management assessments. At the national level, technical supervisory visits were conducted through the GHS Headquarters Integrated Monitoring. Programmes and health directorates organized technical visits. Review meetings were held at all the levels of the health system, usually twice a year. Through these meetings malaria indicators were captured as part of a broad performance-monitoring matrix. These analyses were used to generate annual and half year reports at all levels. These reports were shared with stakeholders including the Local Government authorities at the district level. Regional reviews organized annually to provide a platform for dissemination of service performance indicators. At these meetings, the various regional Budget Management Centres made presentations on health and social activities, which also included a discussion of challenges and possible solutions.

During the 2008-2015 M&E Strategic Plan timeframe, the following measures were used to improve the M&E system:

- Developing and distributing Standard Operation Procedures (SOPs) on data collection for use at all levels.
- Training of staff at all levels on SOP and data collection tools. The private sector will be involved in the training.
- Strengthening routine data generation and flow from public/private facilities and community based health providers to the DHIMS2 by supporting the upgrade and maintenance of the software.
- Supporting the monthly coordination meetings for data retrieval from communities/health facilities at district level.
- Facilitating supervision field visits at all levels to monitor and support implementation of malaria control activities. The visits were also used to monitor the use of the M&E tool for data collection to identify any deviation for corrective action to be taken. This provided the opportunity for supervisors to correct any wrong practices encountered at the lower level and thereby strengthen the system.

1.3.3 SWOT Analysis of the M&E System

Data surveillance and M&E data management system evolved from three parallel routine malaria surveillance systems. These are the system through the DHIMS2, the Integrated Disease Surveillance and Response (IDSR) system, and the vertical malaria surveillance system established by the NMCP. Currently, integration of the data reporting system has shown much improvement through migration to DHIMS2. However routine data quality is not optimal and some private sector health providers do not show much interest in data collection and reporting. There is also weak health information management system, i.e. capacity for data collation, analysis and use at district and sub-district level. There is also lack of information on routine malaria Advocacy Communication and Social Mobilization ACSM indicators

A number of strategies to address the weakness included: the refresher training of staff, formation of data quality improvement teams at various levels of care and provision of SOPs, registers and other logistics for data collections (SWOT for details).

The strengths, weakness, opportunities and threats of the M&E system during the implementation of the 2008-2014 strategic plan is shown in Table 4.

Table 4: SWOT Analysis, Surveillance, Monitoring and Evaluation

Thematic Area	Strengths	Weakness	Opportunities	Threats
<i>Malaria surveillance</i>	<ul style="list-style-type: none"> • DHIMS 1 improved upgraded to DHIMS 2 • DHIMS 2 contains internal data validation checks • Standard operating procedures have been developed to ensure standardization • Timelines for data submission have been defined • Performance indicators have been developed • There is an established working group to harmonize entomological data reporting across relevant partners 	<ul style="list-style-type: none"> • Lack of systematic and on-going data validation • Health practitioner non-adherence to policy guidelines for definition of suspected vs. confirmed cases • Malaria Data not effectively used at the district level • Multiple tools collecting same variables at the facility level • Poor timing for the introduction of tools • Lack of common structure for data sharing among partners • Private sector malaria control data is almost absent from the national aggregate • Less than 100% reporting of facility-required data elements • Tardiness of data submission at various levels. • Inadequate skilled staff for data collection in the health facilities and district health administrations. • Inadequate numbers of staff for monitoring and evaluation at all levels 	<ul style="list-style-type: none"> • District data already exists • District malaria focal person available • Existence of district information use manual available 	<ul style="list-style-type: none"> • Inadequate resources especially at the lower levels • Inadequate personnel for monitoring and evaluation
<i>Information</i>	<ul style="list-style-type: none"> • Standardized data collection tools have been developed • Official data sources have been identified 	<ul style="list-style-type: none"> • Inadequate funding for the DHIMS • Incomplete malaria reporting • Delayed reporting from the facility • Lack of collaboration between stakeholders, especially private sector data collection 		<ul style="list-style-type: none"> • Different organizations presenting have different reporting requirements

		<ul style="list-style-type: none"> • There are other challenges such as: limited local capacity to sustain DHIMS 2, capacity for data collation, analysis and use at district and sub-district level. There is no display of trends of malaria indicators in health administrations/facilities • Lack of linkage between commodity inventories and DHIMS 2 		
<i>Surveys</i>	<ul style="list-style-type: none"> • Good collaboration among NMCP and research Institutions 	<ul style="list-style-type: none"> • Results of quite a number of surveys are not widely disseminated to inform policy • Surveys not able to provide estimates at district level 		<ul style="list-style-type: none"> • Inadequate funding for surveys
<i>Operational Research (OR)</i>	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Inadequate Operational Research (OR) being carried out 	<ul style="list-style-type: none"> • Technical expertise is available in the country that can be used to carry out operational research 	

CHAPTER TWO: NATIONAL MALARIA STRATEGIC PLAN 2014-2020

2.1 *National Malaria Strategic Plan 2014-2020*

2.1.1 Goal

To reduce the malaria morbidity and mortality burden by 75% (using 2012 as baseline) by the year 2020.

Its objectives are:

- To protect at least 80% of the population with effective malaria prevention interventions by 2020
- To provide parasitological diagnosis to all suspected malaria cases and provide prompt and effective treatment to 100% of confirmed malaria cases by 2020
- To strengthen and maintain the capacity for programme management, partnership and coordination to achieve malaria programmatic objectives at all levels of the health care system by 2020
- To strengthen the systems for surveillance and M&E in order to ensure timely availability of quality, consistent and relevant malaria data at all levels by 2020
- To increase awareness and knowledge of the entire population on malaria prevention and control so as to improve uptake and correct use of all interventions by 2020

2.1.2 Proposed strategies

Objective 1: To protect at least 80% of the population at risk with effective malaria prevention interventions by 2020

- Distribution of LLINs through campaigns
- Continuous distribution of LLIN
- Indoor Residual spraying for areas with high parasite prevalence (MICS 2011)
- Larval Source Management
- Seasonal Malaria Chemoprevention
- Prevention of malaria in pregnancy

Objective 2: To provide appropriate diagnosis to all suspected malaria cases and prompt and effective treatment to 100% of confirmed malaria cases in accordance to treatment guidelines by 2020

- Provide quality malaria diagnosis to all suspected cases at all levels
- Strengthen of health worker capacity for malaria case management
- Management of Severe Malaria at Health Facilities
- Increase access to deprived communities where there is no CHPS through the integrated community case management
- Supportive supervision of health workers

- Improve access to diagnosis and treatment in the private sector and enforce adherence to guidelines in the private sector

Objective 3: To strengthen and maintain the capacity for programme management, partnership and coordination to achieve malaria programmatic objectives at all levels of the health care system by 2020

- Regional and national malaria reviews
- Improve capacity for programme management at all levels
- Facilitate biannual Malaria Interagency Coordinating Committee (MICC) meetings
- Facilitate quarterly MICC subcommittee and working group meetings
- Advocate at corporate and parliamentary levels for increase resource allocation to malaria control activities
- Develop and implement a financing sustainability plan for accelerated malaria control
- Ensure efficient and effective procurement and logistics management
- Alignment of Ghana Malaria NSP into the West Africa Health Organization Strategic Plan for Malaria)
- Improve transport and Communications for malaria activities

Objective 4: To strengthen the systems for surveillance and M&E in order to ensure timely availability of quality, consistent and relevant malaria data at all levels by 2020

- Enhance routine surveillance
- Ensure enhanced coordinated monitoring of programme progress towards pre-elimination
- Support population based surveys (DHS, MICS, MIS,)
- Conduct mid and end of term reviews
- Improve malaria data quality
- Disseminate report on surveys and surveillance activities using various channels of communication
- Conduct Operational Research to inform programmatic direction

Objective 5: To increase awareness and knowledge of the entire population on malaria prevention and control so as to improve uptake and correct use of all interventions by 2020

- Advocacy for conforming to test treat and track
- Sustained education on malaria prevention at all levels
- Community mobilization to enhance uptake of malaria interventions
- Develop a comprehensive accelerated malaria control communication strategy

This strategy guides the M & E Plan based on the principles of the “Three Ones”:

1. One national Malaria coordinating authority where implementation is a country lead process
2. One agreed comprehensive national plan for malaria control, including costed workplan.
3. One agreed country level monitoring and evaluation framework.

CHAPTER THREE: NATIONAL MALARIA M & E PLAN 2014-2020

3.1 Goal of M&E plan

To strengthen the systems for surveillance and M&E to ensure timely availability of high quality, consistent and relevant malaria data at all levels, in order to track the progress of the malaria control and prevention interventions towards the NMCP 2018 targets.

Objectives

- To attain timely and complete monthly malaria morbidity and mortality reporting from at least 90% health facilities using DHIMS2
- To generate quality data that can establish pre-elimination status at the district level
- To develop a Semi Annual bulletin at National and regional levels, that will provide data on the incidence of suspected malaria cases, total number of suspect cases tested, total confirmed cases, appropriate adherence to test results, and mortality
- To cover 75% of country with entomological surveillance

Interventions (detailed in Appendix1)

- Operational Research to inform program direction
- Enhance routine surveillance
- Enhanced coordinated monitoring of programme progress towards malaria elimination
- Support population based surveys (DHS, MICS, MIS, KAPs)
- Conduct mid and end of term reviews
- Improve malaria data quality
- Dissemination of survey and surveillance reports

3.2 Framework for monitoring and Evaluation of the National Malaria Strategic Plan

The malaria program monitoring and evaluation framework shown in Figure 5 and Table 5 is based on the M&E framework recommended by RBM and Global Malaria Action Plan.

Figure 6: Malaria program monitoring and evaluation framework

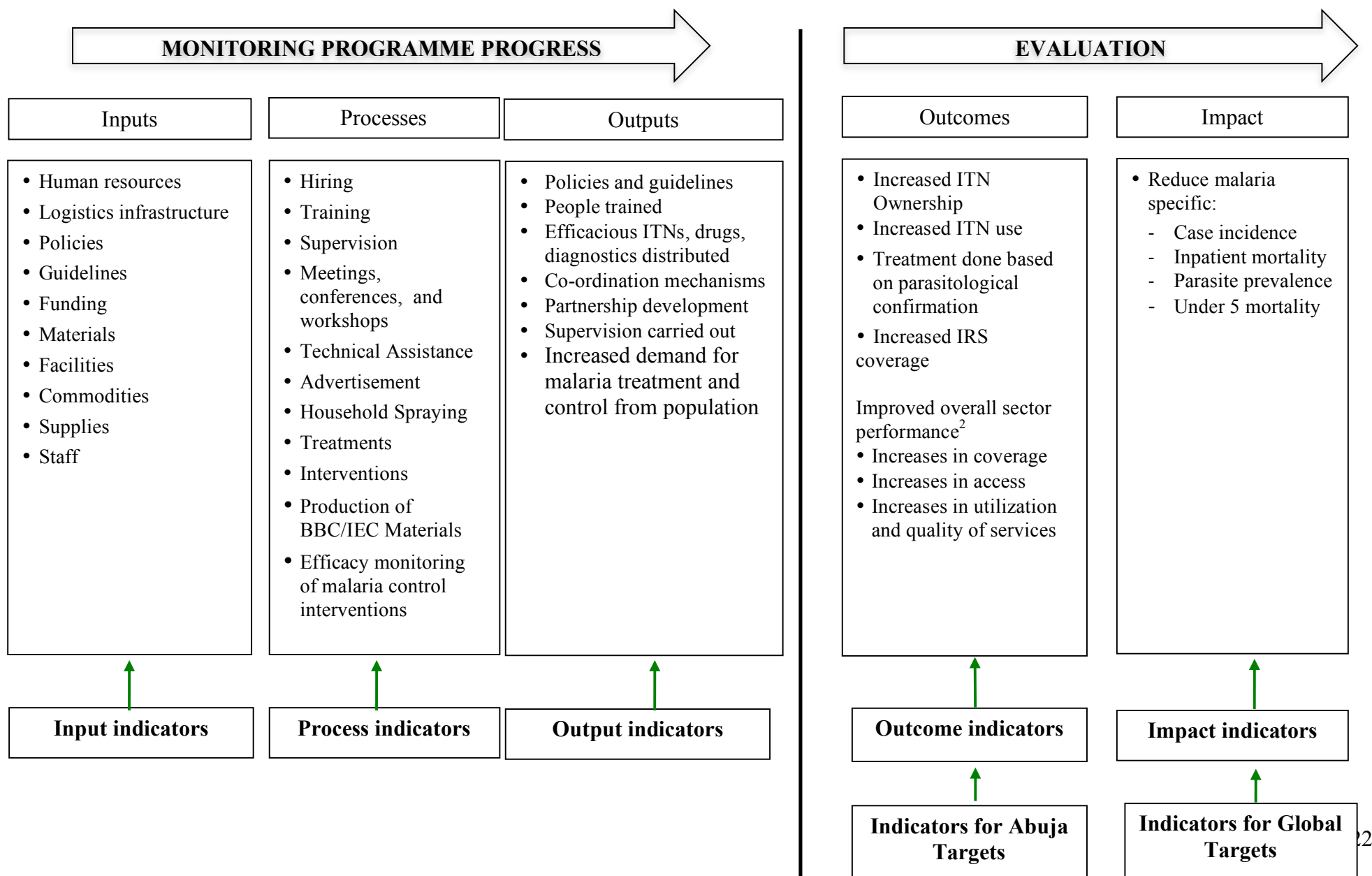


Table 5: Logical Framework

	INDICATOR	SOURCE	ASSUMPTIONS	PROCESS OF COLLECTION	FREQUENCY	LEVEL OF REPORTING
GOAL: To strengthen the systems for surveillance and M&E to ensure timely availability of high quality, consistent and relevant malaria data at all levels, in order to track the progress of the malaria control and prevention interventions towards the NMCP 2018 targets						
	Timeliness/Quality of health information	Administrative records	Availability of funds, and service providers	Periodic	once	National
OVERALL OBJECTIVE: To strengthen monitoring and evaluation of malaria activities at all levels by 2020.						
	Establish functional M&E units at all levels/ agencies/institutions.	NMCP/GHS	Availability of funds, and service providers	Periodic	Yearly	All Levels
STRATEGIES						
To strengthen the technical capacity in monitoring and evaluation for malaria control at all levels.	Number of staff trained in data management or general M&E at national and sub-national level Number of staff trained in Data Quality Assessments (DQA) Percentage (%) of health facilities submitting timely and complete reports(on malaria) to district level	Administrative records; Implementation report DHIMS2 Reports.	Availability of funds	Periodic	Quarterly	All Levels
To strengthen ICT for monitoring and evaluation at all levels.	Number of health facilities with functional information, communication, technology (ICT) Number of health facilities with improved ITC	Administrative records. Implementation report	Availability of funds	Surveys	Biennial	All Levels
To harmonize monitoring and evaluation systems among stakeholders.	Number of reporting tools harmonized Number of joint DQA conducted	Administrative records; Implementation report.	Availability of funds	Periodic	Yearly	All Levels
To improve malaria data quality assurance system at all levels.	Number of functional DQA teams established	Administrative records.; Implementation report.	Availability of funds	Periodic	Bi-annual	All Levels

	INDICATOR	SOURCE	ASSUMPTIONS	PROCESS OF COLLECTION	FREQUENCY	LEVEL OF REPORTING
	Number of DQA conducted					
To gather and disseminate data in a manner that encourages evidence based decision-making for malaria control at all levels	<p>Implement operations research agenda to improve malaria control performance</p> <p>Number of relevant health statistics and analytic reports of malaria control</p> <p>Number of district/health facilities using data for decision making</p>	<p>Research protocols;</p> <p>Administrative records;</p> <p>Implementation report.</p>	Availability of funds	Periodic	Yearly	All Levels
To improve coordination and collaboration among partners conducting malaria M & E.	<p>Implement integrated M&E framework</p> <p>Fully integrate private sector data into public system</p> <p>Improve collaboration with Ministries, Agencies, and Departments, MMDA, private providers, Parliamentarians, implementing partners and international donors in monitoring control programme</p>	<p>Administrative records;</p> <p>Implementation report.</p>	Availability of funds	Periodic	Quarterly	All Levels

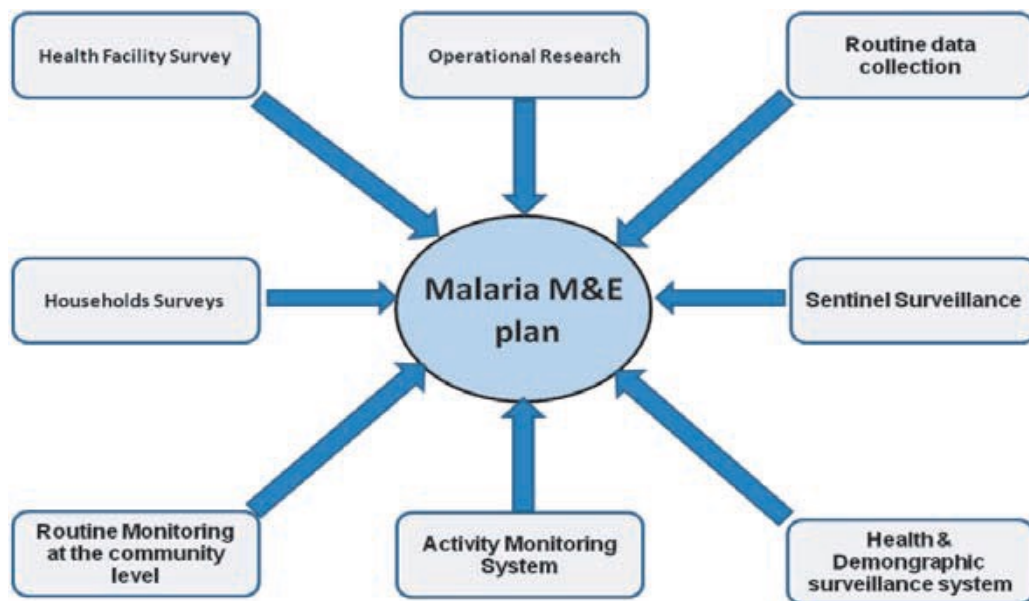
3.2.1 Core Malaria indicators to be monitored 2014 - 2020

The following table (Table 6) lists the key impact outcome, and output indicators to be monitored, operational definitions, sources, frequencies, and levels of measurement for these indicators can be found in Appendix 1.

Table 6: Core Malaria Indicators 2014-2020

Indicator
<i>Impact</i>
Under five, all-cause child mortality
Malaria incidence rate
Malaria parasite prevalence
Severe anaemia prevalence among children
<i>Outcomes</i>
Malaria cases with positive confirmed diagnosis (%)
Health care providers correctly diagnosing and treating (uncomplicated or severe) malaria (%)
Health facilities with no stock outs of antimalarial drugs for more than a week during the last 3 months (%)
Febrile children who received antimalarial treatment according to national policy within 24 hours (%)
Intermittent preventive treatment (IPT) for pregnant women through ANC visits (%)
Households with at least one insecticide-treated mosquito net (%)
Use of ITN among children under five the previous night (%)
Use of ITN among pregnant women the previous night (%)
Use of ITN among the general population the previous night (%)
Targeted structures sprayed for Indoor Residual Spraying IRS (%)
Breeding areas targeted with appropriate larvicides
Development and Implementation of the malaria vaccine intervention once it has been proven to be effective locally
<i>Outputs</i>
Number of epidemiological and entomological surveillance established
Number of insecticide-treated nets (ITNs) distributed
Volumes of insecticide used for vector control
Number of eligible structures sprayed
Number of pregnant women receiving IPT (1,2,3,4 or 5)
Number of malaria cases treated
Number of malaria microscopy slides taken
Number of malaria Rapid Diagnostic Tests (RDTs) taken
Awareness of malaria and its effective interventions through the deployment of malaria communication strategy with particular emphasis on using health workers and the electronic media
Number of BCC materials produced
Percentage of Health facilities reporting, timely, completes, and valid data through routine health information management systems, i.e. DHIMS
Promotion of research that informs the programme in terms of policy and operational issues
Malaria budget received (%)

Figure 7: Data sources for M&E Plan



3.2.3 Data Collection Methods

As shown in the above figure the systems in place for collecting data includes the routine data from service delivery points, sentinel sites, periodic population based survey such as DHS, drug monitoring systems, and special research activities.

3.2.3.1 Routine health facility surveillance

Routine systems of the Ghana Health Service will be used to collect data on malaria cases from government, private, faith-based and quasi-government facilities mission, quasi-governmental and private health facilities in the country. Routine data on malaria (including Integrated Disease Surveillance Response (IDSR) data) will be collected mainly through DHIMS2. DHIMS2 is an integrated web based system hosted by the Centre for Health Information (CHIM) of the Ghana Health Service.

Routine data collected from patient care are first recorded into standard registers. Data are then collated from these registers into standardized reporting forms. These reporting forms will be submitted to the District Health Directorate (DHD) on a monthly basis for entry into DHIMS2. Standardized reporting forms to be used for collecting malaria data from facilities source documents (such as the OPD, antenatal and inpatient registers) onto the DHIMS2 are the *Monthly OPD Morbidity Returns*, *Monthly Midwife Reporting Form* (also known as Form A), *Inpatient Summary Form*, CBA monthly reporting form, weekly and monthly IDSR reporting forms.

Health facilities in Ghana report on service utilization data according to agreed timelines. For IDSR reporting, the weekly reports will be received before the Tuesday of the ensuing week.

Monthly report will be sent from the facilities to the districts by the 5th of the ensuing month, to the Regions by the 15th and to the National level by the 25th. Quarterly reports will be sent by the 25th of the first month in the ensuing quarter. With the introduction of the DHIMS2, data are to be entered into the system and verified by the 25th of the ensuing month.

3.2.3.2 Sentinel surveillance

In collaboration with NMIMR, national malaria control programme will collect sentinel surveillance data on malaria prevalence and therapeutic efficacy of recommended antimalarials. In addition to the drug efficacy monitoring, studies will be conducted to also define the characteristics of *P. falciparum* resistance to combinations therapies. This will generate a database on clinical and parasitological response to anti malaria in the country. Entomological and insecticide resistance monitoring will also be undertaken through the use of sentinel surveillance.

3.2.3.3 Household Surveys

Large national representative household surveys are conducted to measure outcome and impact of malaria control and prevention interventions. Surveys in Ghana include the Demographic and Health Surveys (DHS), which are conducted every five years, with the most recent DHS conducted in 2014. The DHS collects malaria indicators on ITN ownership and use, IPTp uptake, and ACT use in symptomatic children. In some instances, anemia and parasitemia are measured as additional indicators of malaria prevalence. Additional household surveys conducted every 2 – 3 years include the Multiple Indicator Cluster Survey (MICS), Malaria Indicator Survey (MIS), by UNICEF and Health Research Unit/NMCP/GHS respectively. These surveys are normally conducted by external agencies, however the NMCP provides technical and programmatic input regarding the malaria indicators collected, in order to be use the data and track performance nationwide.

3.2.3.4 Post – Market Surveillance System

The Ghana Food and Drugs Authority is responsible for the post market surveillance to ensure quality and safety of recommended anti malarials on the Ghanaian market as well as the detection of counterfeit or substandard drugs in Ghana. The board also monitors consumer complaints, and the storage and stock levels of anti-malaria drugs.

3.2.3.5 Operational Research

The NMCP and other partners conduct operational research to overcome implementation bottlenecks, facilitate the scale-up of malaria control activities, and identifies the most cost-effective mix of currently and future recommended interventions in different malaria transmission settings. For 2014-2020, the following operations research projects are proposed:

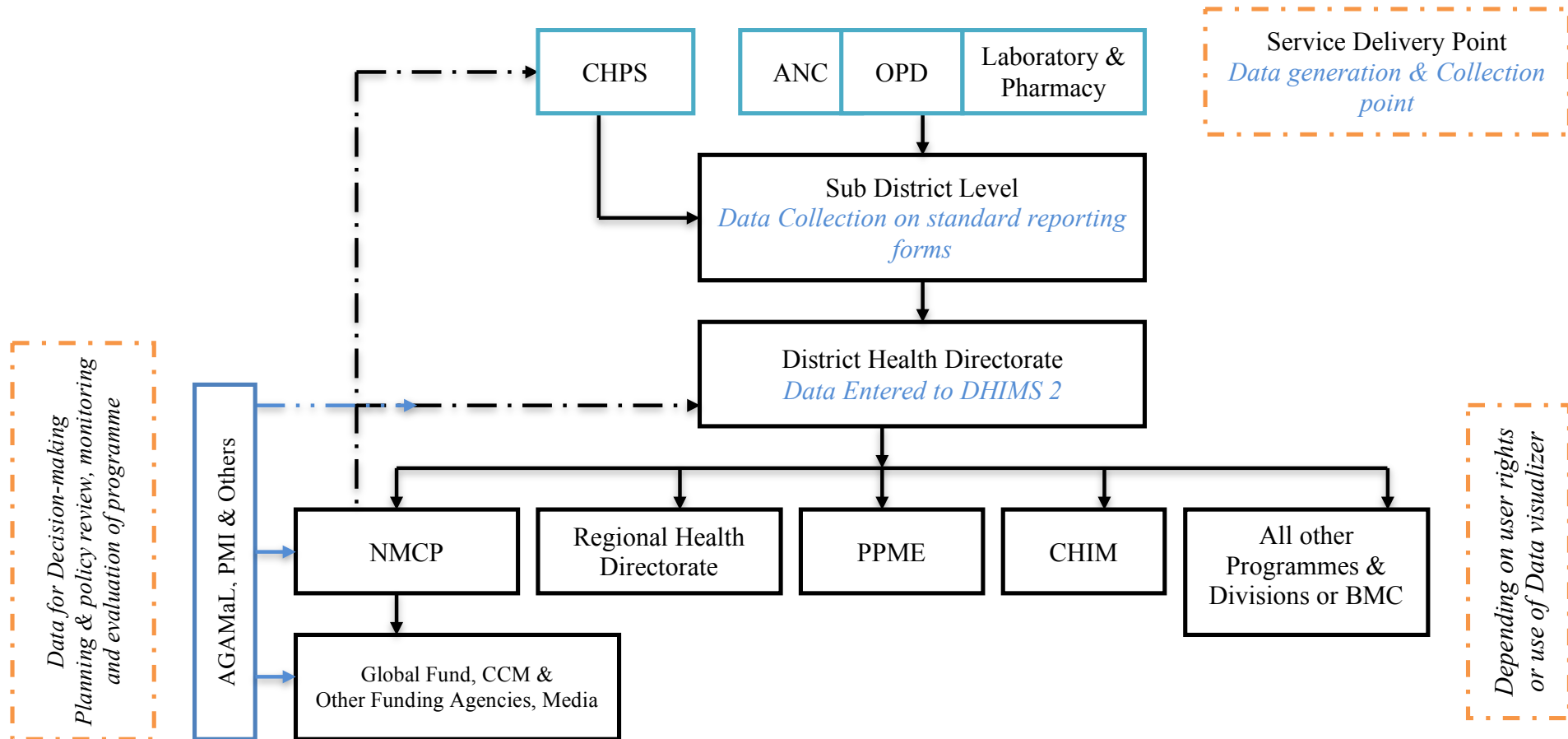
- Evaluation of Impact of Larviciding in -Country

- Factors that influence Adherence to test results and Treatment policy in relation to NHIA
- Feasibility of the Use of Children as the agent of Change in the Environmental Management of Malaria
- Assess the Impact of BCC Campaigns and the Knowledge, Attitude and Practice of Malaria Control Interventions
- Assess the Impact of IPTp on Pregnancy Outcomes
- Identify Reasons for low up take of IPTp 2 and 3
- Identify Reasons for Low Uptake of HBC
- Monitor the Impact of Environmental Management and Housing on Transmission
- Conduct research into repellants and coils and other natural products for reducing human vector contacts
- Assess the current economic burden of malaria in Ghana
- LLIN Acceptability Survey

3.2.3.5 Data flow

The process for data to be reported along the health system in the country is shown in Figure 6

Figure 8: Data communication flow chart in the GHS



3.2.3.6 Data processing

The DHIMS2 system has the capability for data capture, data cleaning, data security and generating customized reports based on inbuilt reporting formats. At the district, regional and national level, data on malaria will be analyzed to generate reports on indicators, which are important for monitoring trends and evaluation of the programme. At the district level, this is done as part of an integrated monitoring and evaluation framework. These analyses are used to generate annual and half year reports of district performances.

At the community level, broader patterns of these indicators will be assessed, such as historical trends and geographical clustering, and appropriate actions initiated (e.g., outbreak investigations, control activities, or development of guidelines). Spatial data generated from routine activities and surveys will be managed and analyzed separately using third-party systems i.e. ArcGIS with fully functioning extension package.

3.2.3.8 Data quality assurance

The capacity of health workers to properly complete out-patient and inpatient registers, as well as how to fill in the monthly data collection tools, is one of the major determinants of data quality. A standard operating procedure manual has been developed and distributed to ensure standardization of the data collection, reporting, and validation. Staff at all levels will continue to be trained in the use of DHIMS2 for data collection, collation, analysis and reporting. Maintaining and improving data quality assurance of DHIMS2 data is expected to result from conducting routinely scheduled data quality auditing, facilitative supervision, and data management training at all levels. The institution of automated data quality checks at all levels will also help to ensure the quality of data in the DHIMS. A data validation assessment of DHIMS2 is anticipated to take place in the near future.

The Ghana Statistical Service and partners will implement standardized periodic surveys such as DHS, MICS, and MIS. Therefore planning, implementation, monitoring, and oversight will include adherence to validated surveillance methodologies and data quality assurance standards. Likewise, Global Fund and PMI funded research and surveillance sites (the GF/NMCP drug efficacy and epidemiological sentinel surveillance sites, and the AGAMal and PMI entomological surveillance sites) will adhere to validated surveillance methodologies and data quality assurance standards.

Research and academic institutions are regulated by their respective Institutional Review Boards, which require adherence to validated data quality assurance standards.

3.2.3.9 Data Management

The database for DHIMS2 will be maintained by the Centre for Health Information Management, and backed up remotely on a daily basis and physically on a weekly basis. District and Regions have been instructed to copy their DHIMS2 data every month for archiving. All reporting forms are to be kept for life or archived electronically if there is need to destroy the hard copies. The District Health Directorate provides an archival system to ensure the storage of the registers from the facilities that might require it. The NMCP has provided some cabinets for the storage of registers and forms by the districts. This has enabled the District Health Directorates to ensure that facilities have adequate secure space for documents storage.

The databases for standardized periodic surveys such as DHS, MICS, and MIS, are maintained by the Ghana Statistical Service, and are designed according to accepted international standards to ensure data security and integrity. Likewise, Global Fund and PMI funded research and surveillance sites (the GF/NMCP drug efficacy and epidemiological sentinel surveillance sites, and the AGAMal and PMI entomological surveillance sites) must necessarily maintain acceptable data security and integrity. Unfortunately, these databases are currently not compatible, but working groups have recently been formed to develop a common database through which data can be shared in a secured manner. For data generated by other partners such as Noguchi or academia, data security and integrity meet the accepted standards as set forth by their Institutional Review Boards.

3.2.3.10 Data analysis

The following data analysis plan sets forth an extensive set of parameters that should be appropriately tailored for the specific administrative level, type of facility, or other relevant factors. Analyses should be used to describe appropriate trends, unusual increases or decreases in rates overall or among specific populations, to detect facilities, districts, regions with values that fall outside the appropriate range for their strata, i.e. outliers.

Level: Analyses of malaria data should be done at the facility, (sub) district, regional and national level, by the appropriate persons.

Timing: Analyses of malaria data should be done on a monthly basis, and aggregated by quarter and year. Additional analyses may be required due to outbreaks, special reports, and unusual trends or events.

Types of analyses: Routine analyses should include monthly trends of morbidity, mortality, percent of visits/patients diagnosed as malaria, percent tested, test positivity rates, and malaria admissions. These trends should compare sequential time periods (i.e. year to year, month to month, and quarter to quarter) and for monthly and quarterly data should also be compared to the same time period during the previous years. *In addition analyses should also determine if changes/comparison show a statistically significant change/difference.*

Stratification: Analysis should be stratified by age, gender, pregnancy, inpatient and outpatient status. At different administrative levels stratifications by different administrative/departmental levels will also be needed, e.g. comparison of districts within a region, comparisons among regions, or comparison to national averages.

Advanced Analyses: Where appropriate, more advanced multivariate analyses may be required, such as, logistic regression, interrupted time-series.

Context: The interpretation of any analysis should also include the consideration of events which can also impact on the outcome, such as bednet campaigns, IRS season, treatment/prophylactic/diagnostic stock outs, awareness/media campaigns, IEC, BCC, insurance coverage, and changes in policies and practices.

3.2.3.11 Malaria Information dissemination

The intended use of the data generated out of the surveillance systems at each level will be used for assessing programme performance. These assessments may lead to epidemiologic and/or outbreak investigations, operational research, re-allocation of resources, or further program monitoring and evaluation.

The information generated through surveillance will be reported to district health authorities. The annual regional reviews will provide a platform for dissemination of performance indicators. Mid-year and annual review meetings and reports will be coordinated by the NMCO, through which information on the malaria situation will be shared with all stakeholders.

3.3 M & E Implementation Plan

3.3.1 Adherence to Malaria Monitoring and Evaluation Framework

A monitoring and evaluation framework for the NMCP and all other partners must be agreed upon to ensure effective monitoring of performance.

3.3.2 Coordination and Partnerships

Joint planning, supervision, monitoring and evaluation processes will form the basis for promoting partnership coordination. Information regarding programme management, epidemiological and entomological data, and IRS operations will be shared with funding agencies, and implementing partners at all levels. This will enhance data exchange, information flow, and promote the sharing and discussion of critical performance indicators to help advance and improve the national programme. Quarterly progress reports will be submitted by all implementing agencies to NMCP.

The implementers shall also adhere to all guidelines provided by the programme and the Malaria Monitoring and Evaluation Technical Working Group (METwG) for monitoring and evaluation. In addition programme implementers, may also be required to respond to METwG specific information requests. These requests might include:

- Baseline reports from entomological and/or epidemiological surveys conducted prior to implementation of intervention within the country
- Surveys and operational research within the context of their activities

The METwG is a multi-stakeholder initiative bringing together the expertise of representatives of government, private sector, business and civil society in an effort to find joint solutions to complex issues; and identify new and improved solutions to advance policy direction. It will collaborate with all subcommittees under the program to ensure the full implementation of the M&E plan.

METwG

Objectives

- To advise on the routine data collection systems, disease surveillance and research and evaluation.
- To help ensure the delivery of evidence required for Malaria programme process in decision-making, planning and accountability.

Terms of Reference

The technical working group, which is chaired by a representative of the School of Public Health of the University of Ghana (UG), and takes a leading role in the following:

- Review joint annual work plan for surveillance, monitoring and evaluation
- Assess the progress of the planned M&E interventions
- Assess the need for corrective measures to achieve targets set in annual plans
- Monitor malaria indicators
- Make recommendations to the malaria programme on prioritization of indicators, which provide useful measures of performance
- Support development of a comprehensive M&E plan for the malaria control in the country
- Advice on strengthening integrated routine HMIS
- Advice on research agenda for malaria control in the country and help create a platform for sharing and dissemination of research findings
- Provide guidance on information aggregation and sharing by stakeholders
- Advocate for increased attention to and resources for surveillance monitoring and evaluation at all levels
- Undertake other activities pertinent to Surveillance Monitoring and Evaluation as requested by the Malaria Inter-Agency Coordinating Committee (MICC)

Representatives of the METwG include USAID/PMI, WHO, DFID, UNICEF, World Bank, MOH-PPME, GHS-PPME, Family Health, Expanded Programme on Immunizations, Food and Drug Authority, Ghana Central Lab Unit, Korle Bu Teaching Hospital, CMS –MOH, Health Research Institutions, AGAMaL, Environmental Protection Agency, Ghana Statistical Service, University of Ghana-School of Public Health, Noguchi Memorial Institute for Medical Research, Kintampo CC Research, NGOs in Malaria.

3.3.3 Roles and Responsibilities of Different Levels

The following outline of roles and responsibilities to be followed by all organizations that are undertaking malaria control activities in the country. This will include Ghana Health Service institutions, international and bilateral agencies, NGOs in malaria control, and private sector partners.

Ghana Health Services

National Level: The Ministry of Health, the Ghana Health Services Headquarters including PPME and NMCP will:

- Compile data from appropriate the levels/sources, prepare and disseminate progress report and share information with all levels and other partners on bi-annual basis, as well as using the information for planning and advocacy
- Organize program review and planning meetings on a mid-year and/or yearly basis
- Develop and maintain an updated database to track progress being made by all implementers, which will be shared with all levels and partners.
- Conduct data validation and provide feedback to lower levels to improve the data use and quality
- The NMCP will also monitor the following:
 - Procurement and distribution of commodities, drugs, and other logistics
 - Collection and management and use of information
 - Supervisory visits conducted by implementers
 - Quality and efficacy of first line (AA) and other anti-malaria drugs
 - The use of operational research results

Regional Health Directorate:

- Review and validate monthly data from lower levels to ensure completeness and accuracy
- Conduct regular supervision of implementation and on-going M & E activities within the region
- Establish measures to ensure timely submission of complete district data
- Conduct quarterly visits to districts for monitoring/support/supervision, using standardized tools
- Compile and review quarterly district monitoring reports and provide feedback to districts

District Health Directorate:

- Compile and validate data from the health facilities in the districts, and enter data into electronic DHIMS2
- Conduct monthly data quality auditing/validation and provide feedback to facilities

Sub district

- Compile and clean health data submitted by health facilities
- Conduct weekly/monthly reviews of data in the DHIMS2 to address timely submission facility data

Health Facilities (public and private):

- Generate monthly data from facility service departments and report directly to DHIMS2 or through district using standard reporting forms
- Provide activity reports to the Regional Health Directorate on a quarterly basis.
- Address feedback received from the district level on reported data
- Improve public-private partnership and increase reporting from private health facilities in compliance with the MOH/GHS requirements

Implementing Partners:

- Track the implementation of planned activities/processes and their outputs and inputs, and report on them monthly using forms provided by NMCP/GHS
- Provide quarterly update of activities planned, carried out and their outputs, challenges and enabling factors for implementation, innovations and best practices
- Submit annual and end of contract/project reports, financial summaries, and other reporting requirements, in accordance with the terms of the agreement with the NMCP

3.3.4 M & E plan review/update/Review of the M & E Plan

The Ghana National Malaria Control Monitoring and Evaluation Plan 2014-2020 should be reviewed and updated regularly to make adjustments to meet the needs associated with the revision of the Strategic Plan for Malaria Control in Ghana 2014-2020. The review should assess the performance and usefulness of the M & E plan, available resources, including partnerships, to support collection of high quality data. These assessments should also identify implementation challenges, strengths and weaknesses, and recommend actions to maintain the strengths and address weaknesses. The plan will be reviewed three (3) years after its operation.

3.3.5 Budget

Refer to appendix 3 for detailed budget by intervention and activity.

APPENDIX

Appendix 1: Detailed M&E Action plan 2014-2020

		2014				2015				2016				2017				2018				2019				2020			
Activity Number	ACTIVITIES PER INTERVENTION	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
A	INTERVENTION 1: Operations Research to inform programme direction																												
1	Sentinel sites studies for Antimalarial drug efficacy monitoring																												
2	Sentinel sites studies for Parasite prevalence tracking at 26 sites																												
3	Conduct cohort event monitoring studies to assess safety and quality of ACTs																												
4	Health Facility Survey and case management quality assessment																												
5	IPTp impact studies																												
6	Rapid Impact Assessment																												
7	Efficacy and Durability of LLINs Monitoring																												
8	Insecticide Resistance Monitoring through sentinel sites																												
B	INTERVENTION 2: Enhance routine surveillance																												

Activity Number	ACTIVITIES PER INTERVENTION	2014				2015				2016				2017				2018				2019				2020			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	Provision of Tablets/Laptops for Data entry at the facility level																												
2	Develop annual M & E work plan																												
3	Orientation of regional level staff / facilitators (TOT) on data management at national level																												
4	Updated training of district data managers by regional facilitators/data managers																												
5	Orientation of facility level staff on revised reporting tools (Public Sector)				X																								
6	Orientation of facility level staff on revised reporting tools (Private Sector and Teaching Hospitals)				X																								
7	Updating staff on new M&E via international courses																												
8	Consulting rom register training for prescriber																												
9	Provided closed user group telecommunication for M&E officers linked up to regional and district malaria focal persons - (Closed User Group)									X	X	X	X																

Activity Number	ACTIVITIES PER INTERVENTION	2014				2015				2016				2017				2018				2019				2020			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
10	Establish and maintain an archival system for NMCP data					X	X	X	X																				
11	Supervision of orientation of field staffs by national level staff																												
12	Training for new staff on DHIMS and reporting tools					X																							
13	Supervision of orientation of facility data managers by national level staff																												
	Supervision - Technical																												
14	<i>Public supervisory visits - National visiting regional</i>	X	X	X	X																								
15	<i>Public supervisory visits - Regional visiting district</i>	X	X	X	X																								
16	<i>Public supervisory visits - District visiting sub-district and facilities</i>	X	X	X	X																								
17	<i>Private Health Facilities Monitoring</i>	X	X	X	X																								
18	Meeting private health facility heads on reporting	x	x	x	x																								
C	INTERVENTION 3: Enhanced coordinated monitoring of programme progress towards malaria elimination																												
1	RSM&E Technical Working Group Meetings																												

		2014				2015				2016				2017				2018				2019				2020				
Activity Number	ACTIVITIES PER INTERVENTION	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
2	Annual review and planning meetings with health regions on malaria control programme																													
3	Annual review and planning meeting with all stakeholders involved in malaria control programme implementation (GHS, MoH services, NGOs, Partners, health regions)																													
4	Update IDSR to cover malaria in emergency situations																													
5	Monitoring of malaria patterns in collaboration with meteorological service department																													
D	INTERVENTION 4: Support population based surveys (DHS, MICS, MIS, KAPs)																													
1	Malaria Indicator Survey (stratify malaria endemicity by districts towards elimination)																													
2	NMCP contribution to DHS and MICS (stratify malaria endemicity by districts towards elimination) for Malaria Component			x	x		x	x	-	-																				
3	Household-based IRS acceptability survey																													

Activity Number	ACTIVITIES PER INTERVENTION	2014				2015				2016				2017				2018				2019				2020							
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
E	INTERVENTION 5: Conduct mid and end of term reviews																																
1	Conduct Periodic Data Review (in 10 Regions)																																
2	Malaria Program performance mid-term evaluation																																
3	Malaria Program Strategic Plan 2014-2020 final evaluation																																
	INTERVENTION: Improve malaria data quality																																
1	Conduct Routine Data quality audit																																
2	Develop/Update standardized M&E procedures, tools and guidelines																																
3	Printing of harmonized Malaria data reporting tools																																
4	Develop database for common reporting and data sharing(non-routine malaria activities)																																
5	Develop/update guidelines for data use/sharing (District Data Utilization Manual)																																
6	Print guidelines for data use/sharing																																

		2014				2015				2016				2017				2018				2019				2020			
Activity Number	ACTIVITIES PER INTERVENTION	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
7	Upgrade ICT infrastructure (Server, Applications and Accessories) to support DHIMS																												
8	Procure printers for District Management team for malaria control																												
9	Provision of Tablets/Laptops for data entry at facility level																												
10	Maintenance of ICT infrastructure at NMCP																												
11	Procure corporate antivirus software for the NMCP computers																												
12	Support District Data verification																												
13	Support regional Data verification																												
14	External / Flash drives for the M&E team at NMCP																												
G	INTERVENTION 7: Dissemination of survey and surveillance reports																												
1	Development and production of bulletin (feed into malaria watch magazine)																												

Activity Number	ACTIVITIES PER INTERVENTION	2014				2015				2016				2017				2018				2019				2020			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
2	Establish annual data use and dissemination exhibition by districts and regions at national level																												
3	Documentation of Best Practices																												
4	Malaria modelling and mapping for districts in Ghana (Develop and print national country malaria profile (Malaria Mapping))																												

Appendix 2: Malaria Programme Performance Measurement Framework

ITEMS	INDICATORS	Regions	Value	Year	Source	ANNUAL TARGETS						
						2014	2015	2016	2017	2018	2019	2020
						Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Goal: To reduce the malaria morbidity and mortality burden by 75% (using 2012 as baseline) by the year 2020	Parasitemia prevalence: children aged 6–59 months with malaria infection (by microscopy) (percentage)	All	27.50 %	2011	MICS (Multiple Indicator Cluster Survey)/DHS	20%		15%		10%		6.90%
	All-cause under 5 mortality rate	All	80 per 1000LB	2008	DHS/DHS+ (Demographic and Health Survey)	70/1000LB		60/1000LB		50/1000LB		40/1000LB
	Malaria test positivity ratio	All	50%	2013	HMIS	45%	39%	34%	29%	23%	18%	13%
	Confirmed malaria cases (microscopy and RDT) per 1000 population per year	All	186	2013	HMIS	166	146	126	106	86	66	47
	Inpatient malaria cases tested (microscopy and RDT) per 1000 population	All	17	2013	HMIS	15	13	12	10	8	6	4
	Inpatient malaria deaths per 100,000 persons per year	All	9	2013	HMIS	8	7	6	5	4	3	2
	Anemia prevalence: Percentage of Children aged 6–59 months with hemoglobin measurement of <8 g/dl (percentage)	All	7.40%	2011	DHS/MICS	5%		4%		3%		2%

INDICATORS		Baseline				ANNUAL TARGETS						
		Regions	value	Year	Source	2014	2015	2016	2017	2018	2019	2020
Objective 1: To protect at least 80% of the population with effective malaria prevention interventions by 2020	Percentage of households with at least one insecticide-treated net	All	33.7	2011	MICS (Multiple Indicator Cluster Survey)	66%		77%		89%		100%
	Percentage of children under 5 years old who slept under an insecticide-treated net the previous night	All	39%	2011	MICS (Multiple Indicator Cluster Survey)	53%		62%		71%		80%
	Percentage of pregnant women who slept under an insecticide-treated net the previous night	All	32%	2011	MICS (Multiple Indicator Cluster Survey)	48%		59%		69%		80%
	Percentage of individuals who slept under an insecticide-treated net the previous night	All	33%	2011	MICS (Multiple Indicator Cluster survey)	49%		60%		70%		80%
	Number of Long Lasting Nets (LLNs) distributed to delivery points health facilities, schools,(Routine)	All	85% (1,336,381/1,572,213)	2013	School Health report and DHIMs	1,297,574	682,734	2,724,209	1,794,941	2,165,225	2,896,526	2,961,028
	Proportion of Population at risk potentially covered with Long Lasting Nets (LLNs) distributed through mass campaign	All	90%	2012	Campaign report	50%	44%		50%	49%		100%
	Percentage of population in target areas sprayed with indoor residual spraying in the last 12 months	3	90%	2013	Administrative Records	91%	92%	92.50%	93%	94%	95%	95%
	Percentage of malaria case reduced in the IRS targeted areas from the 2012 cases	3	NA	2012	HMIS	42%	49%	55%	55%	60%	62.50%	65%
	Number and percentage of structures in targeted districts sprayed by indoor residual spraying in the last 12 months	3	98.5% (439937/446752)	2012	Administrative Records	85% (2168183/2550804)	85% (8806834/10360981)	85% (9027004/10620005)	85% (9252679/10885505)	85% (9483997/11157643)	85% (9786548/11513586)	85% (10089099/11869529)
	Number of districts implementing IRS	3	100% (7/7)	2012	Administrative Records	100% (29/29)	100% (40/40)	100% (50/50)	100% (50/50)	100% (50/50)	100% (50/50)	100% (50/50)

INDICATORS		Regions	value	Year	Source	ANNUAL TARGETS						
						2014	2015	2016	2017	2018	2019	2020
	Percentage of targeted breeding areas which received appropriate larvicides		NA	2013	Situation Analysis	70%		75%		85%		85%
	Percentage of pregnant women who received 3 doses of intermittent preventive treatment for malaria during ANC visits during their last pregnancy	All	NA	NA	DHS /MICS	50%		65%		70%		80%
	Percentage (%) of pregnant women on Intermittent preventive treatment (at least three doses of SP) according to national policy	All	41.39 %	2012	HIMS	50% (408281/ 816562)	55% (460337/ 836976)	60.7% (520745/ 857900)	65.5% (575973/ 879348)	70.4% (6634537/ 901331)	75.2% (694746 /923865)	80% (757569/ 946961)
	Proportion of children aged 3-59 months treated under SMC	3	NA	NA	Administrative records	80% (578385/ 722981)	80% (591884/ 739855)	80% 9605730/75 7162)	80% (619930/ 774912)	80% (634494/ 793118)	80% (649434/ 811792)	80% (664757/8 30947)
Objective 2: To provide parasitological diagnosis to all suspected malaria cases and provide prompt and effective treatment to 100% of confirmed malaria cases by 2020	Percentage of children under 5 years old with fever in the last 2 weeks who received antimalarial treatment according to national policy within 24 hours of the onset of fever	All	42.00 %	2011	MICS (Multiple Indicator Cluster Survey)	45%		64%		82%		100%
	Under five Case fatality rate (from 0.6 in 2012 to 0.41 by 2020)	All	0.60 %	2012	HMIS	0.55%	0.53%	0.51%	0.48%	0.46%	0.43%	0.41%
	Percentage of suspected malaria cases that received a parasitological test(RDTs or microscopy)	All	38%	2012	DHIMS	70% (12,891, 062/9,02 3,743)	75% (10,247, 550/7,68 5,662)	75% (12,662,224 /9,496,668)	80% (11,798, 604/9,43 8,883)	82% (11,304,2 78/9,269, 508)	90% (9,797,1 52/8,817 ,437)	100% (6,957,56 1/6,957,5 61)
	Percentage of uncomplicated malaria cases (clinical) treated with ACT at health facilities.	All	84.00 %	2013	DHIMS	75%	66%	57%	47%	38%	29%	20%
	Number and percentage of uncomplicated malaria cases (tested positive) treated with ACT at health facilities.	All	100%	2013	DHIMS	100% (406068 4)	100% (322797 8)	100% (3988601)	100% (371656 0)	100% (3560848)	100% (308610 2)	100% (2191632)

	Number of uncomplicated malaria cases among under 5 year children treated with ACT by community based health workers (CBA)	All	126,339	2013	DHIMS	129,179	264,817	407,156	556,446	712,947	730,771	749,040
INDICATORS		Regions	Value	Year	Source	ANNUAL TARGETS						
						2014	2015	2016	2017	2018	2019	2020
Objective 3: To strengthen and maintain the capacity for programmer management, partnership and coordination to achieve malaria programmatic objectives at all levels of the health care system by 2018	Number of service providers from targeted public and private health facilities given refresher training on malaria control (case management etc.)	All	23250	2011	Training Reports	24000			15000			10000
	Number of staff trained in managing malaria control planning at all level.	All	4	2012	Administrative records	4	4	4	4	4	4	4
	Number of meetings held by MICC and its subcommittee/working groups	All	21	2012	Administrative records	21	21	21	21	21	21	21
	Number of corporate bodies who have adopted malaria control programmes	All	4	2012	Administrative Records	6	10	15	20	22	24	26
	Number of strategic partners (financial and technical) identified and collaborated with	All	10	2008	Administrative Records	100	120	140	140	140	140	140
INDICATORS		Regions	Value	Year	Source	ANNUAL TARGETS						
						2014	2015	2016	2017	2018	2019	2020
Objective 4: To strengthen the systems for surveillance and M&E in order to ensure timely availability of quality, consistent and relevant malaria data at all levels by 2020	Number of Districts with functional M&E unit with data quality improvement teams.	All	10	2011	Administrative records	100	150	216	216	216	216	216
	Percentage (%) of health facilities submitting timely and complete reports (on malaria) to regional level	All	79%	2013	DHIMS	81.30%	83.60%	85.70%	88.10%	90.40%	92.70%	95%
	Promotion of research that informs the programmer in terms of policy and operational issues	All	2	2012	Administrative reports	6	8	6	6	6	7	8

	Number of sentinel sites established and functioning for epidemiological and insecticide monitoring	All	21	2011	Administrative reports	26	26	26	26	26	26	26
	Number of data sharing initiatives that promote evidence based decision making process on malaria control.	All	NA	NA	Administrative reports	2	2	2	2	2	2	2
Objective 5: To increase awareness and knowledge of the entire population on malaria prevention and control so as to improve uptake and correct use of all interventions by 2020	Quantities of ACSM materials(Manuals, posters, radio/TV spots, etc.) produced	All	12000	2012	Administrative Records	40000	35000	30000	30000	30000	30000	30000
	Percentage of people who know the cause of, symptoms of, treatment for or preventive measures	All	96%	2011	MICS 2011	96.70 %		97%		97.6%		98%
	Number of mass media spots promoting key messages on malaria case management	All	6533	2011	Media tracking report - 2011	15000	14000	13000	12500	12000	12000	12000

Appendix 3: Malaria M&E Plan Detailed Budget 2014-2020

MALARIA NATIONAL M&E PLAN 2014-2020												
Intervention	ACTIVITIES	BUDGET PER YEAR (USD)							7-YEARS TOTAL AMOUNT (USD)	INSTITUTIONS/SERVICES RESPONSIBLE	PARTNERS	
		2014	2015	2016	2017	2018	2019	2020				
To strengthen the system for the surveillance and monitoring and evaluation in order to ensure timely availability of quality, consistent and relevant malaria data at all levels by 2020												
1.0	Conduct Operations Research to inform programme direction											
	Sentinel sites studies for Antimalarial drug's efficacy monitoring	150,000.00	-	181,500.00	-	219,615.00	241,576.50	265,734.15	1,058,425.65	MoH	NOGUCH/PMI/DFII	
	Sentinel sites studies for Parasite prevalence tracking at 26 sites	150,000.00	150,000.00	150,000.00	150,000.00	150,000.00	150,000.00	150,000.00	1,050,000.00	MoH	NOGUCH/PMI/USAID	
	Conduct cohort event monitoring studies to assess safety and quality of ACTs	31,800.00	34,980.00	38,478.00	42,325.80	46,558.38	51,214.22	56,335.64	301,692.04	MoH	FOOD AND DRUGS AUTHORITY (FDA)	
	Health Facility Survey and Case Management Quality Assessment	100,000.00	-	120,000.00	-	144,000.00	-	-	364,000.00	MoH	RESEARCH UNIT/NMCP	
	IPTp impact studies	-	150,000.00	-	-	-	-	-	150,000.00	MoH	RESEARCH UNIT	
	Rapid Impact Assessment	-	-	-	120,000.00	-	-	-	120,000.00	MoH	RESEARCH UNIT/NMCP	

MALARIA NATIONAL M&E PLAN 2014-2020											
Intervention	ACTIVITIES	BUDGET PER YEAR (USD)							7-YEARS TOTAL AMOUNT (USD)	INSTITUTIONS/ SERVICES RESPONSIBLE	PARTNERS
		2014	2015	2016	2017	2018	2019	2020			
	Efficacy and Durability of LLINs Monitoring	220,000.00	-	-	286,000.00	-	-	-	506,000.00	MoH	NOGUCH/PMI/USAID
	Insecticide Resistance Monitoring through sentinel sites	150,000.00	165,000.00	181,500.00	199,650.00	219,615.00	241,576.50	265,734.15	1,423,075.65	MoH	NOGUCH/PMI/USAID
	Sub-total	801,800.00	499,980.00	671,478.00	797,975.80	779,788.38	684,367.22	737,803.94	4,973,193.34		
2.0	Enhance routine surveillance										
	Provision of Tablets/Laptops for data entry at facility level	-	50,000.00	-	60,000.00	-	-	-	110,000.00	MoH	PMI/USAID
	Develop annual M & E work plan	3,000.00	3,300.00	3,630.00	3,993.00	4,392.30	4,831.53	5,314.68	28,461.51	MoH	M & E WORK GROUP
	Orientation of regional level staff / facilitators (TOT) on data management at national level	\$20,200	\$0	\$22,220	\$0	\$24,442	\$0	\$26,886	93,748.20	MoH	PMI/USAID
	Updated training of district data managers by regional facilitators/data managers	\$109,028	\$0	\$119,931	\$0	\$131,924	\$0	\$145,116	505,998.95	MoH	PMI/USAID

MALARIA NATIONAL M&E PLAN 2014-2020											
Intervention	ACTIVITIES	BUDGET PER YEAR (USD)							7-YEARS TOTAL AMOUNT (USD)	INSTITUTIONS/SERVICES RESPONSIBLE	PARTNERS
		2014	2015	2016	2017	2018	2019	2020			
			Orientation of facility level staff on revised reporting tools (Public Sector)	\$239,820	\$0	\$289,740	\$0	\$318,714			
	Orientation of facility level staff on revised reporting tools (Private Sector and Teaching Hospitals) to increase private sector DHIMS reporting	\$0	\$53,339	\$0	\$64,007	\$0	\$76,808	\$0	194,153.96	MoH	PMI/USAID
	Updating National Level staff on new M&E strategies via international courses	\$21,000	\$23,100	\$25,410	\$27,951	\$30,746	\$33,821	\$37,203	199,230.59	MoH	PMI/USAID
	Consulting Room Register Training for prescribers	356,600.00	-	427,920.00	-	513,504.00	-	616,204.80	1,914,228.80	MoH	PMI/USAID
	Provide closed user group telecommunication for M&E officers linked up to regional and district malaria focal persons - (Closed User Group)	\$2,000	\$2,200	\$2,400	\$2,001	\$2,200	\$2,420	\$2,662	15,883.00	MoH	PMI/USAID
	Establish and maintain an archival system for NMCP data	\$0	\$80,000	\$20,000	\$20,000	\$0	\$0	\$0	120,000.00	MoH	PMI/USAID
	sub-total	\$751,648	\$211,939	\$911,251	\$177,952	\$1,025,922	\$117,880	\$1,183,972	4,380,564.41		
	Supervision - Technical										

MALARIA NATIONAL M&E PLAN 2014-2020											
Intervention	ACTIVITIES	BUDGET PER YEAR (USD)							7-YEARS TOTAL AMOUNT (USD)	INSTITUTIONS/ SERVICES RESPONSIBLE	PARTNERS
		2014	2015	2016	2017	2018	2019	2020			
			Public supervisory visits - National visiting regional	\$60,315	\$67,811	\$70,731	\$73,796	\$75,676			
	Public supervisory visits - Regional visiting district	\$202,800	\$208,080	\$133,888	\$147,277	\$154,641	\$190,034	\$259,038	1,295,757.44	MoH	PMI/USAID
	Public supervisory visits-District visiting sub-district and facilities	\$693,600	\$752,960	\$918,256	\$964,169	\$1,012,377	\$1,062,996	\$1,116,146	6,520,504.05	MoH	PMI/USAID
	Private Health Facilities Monitoring	\$26,500	\$29,150	\$32,065	\$35,272	\$38,799	\$42,679	\$46,947	251,411.69	PRIVATE MED ASS	PMI/USAID
	Meeting private health facility heads on reporting	\$62,260	\$68,486	\$75,335	\$82,868	\$91,155	\$100,271	\$110,298	590,672.05	MoH	PRIVATE MED ASS
	sub-total	\$1,045,475	\$1,126,487	\$1,230,275	\$1,303,382	\$1,372,648	\$1,475,204	\$1,615,653	9,169,123.12		
	sub-total for 4.2	\$1,797,123	\$1,338,426	\$2,141,526	\$1,481,333	\$2,398,570	\$1,593,084	\$2,799,625	\$13,549,688		
3.0	Enhance coordinated monitoring of programme progress										
	Surveillance, Monitoring and Evaluation Technical Working Group Meetings (quarterly)	24,000.00	24,000.00	24,000.00	24,000.00	24,000.00	24,000.00	24,000.00	168,000.00	MoH	M & E WORK GROUP

MALARIA NATIONAL M&E PLAN 2014-2020											
Intervention	ACTIVITIES	BUDGET PER YEAR (USD)							7-YEARS TOTAL AMOUNT (USD)	INSTITUTIONS/SERVICES RESPONSIBLE	PARTNERS
		2014	2015	2016	2017	2018	2019	2020			
	Annual review and planning meetings with regions on malaria control programme	31,374.00	31,374.00	31,374.00	31,374.00	31,374.00	31,374.00	31,374.00	219,618.00	MoH	NGO/Private Sector
	Annual review and planning meeting with all stakeholders involved in malaria control programme implementation (GHS, MoH services, NGOs, Partners, health regions)	45,180.00	45,180.00	45,180.00	45,180.00	45,180.00	45,180.00	45,180.00	316,260.00	MoH	STAKEHOLDERS
	Update IDSR to cover malaria in emergency situations	-	20,000.00	-	-	-	-	-	20,000.00	MoH	RBM/WHO
	Monitoring of malaria patterns in collaboration with meteorological services department	-	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	60,000.00	MoH	METEOROLOGICAL DEPT
	sub-total	100,554.00	100,554.00	100,554.00	100,554.00	100,554.00	100,554.00	100,554.00	703,878.00		
4.0	Support population based surveys										
	Malaria Indicator Survey (Stratify malaria endemicity by districts towards malaria elimination)	-	-	1,980,500.20	-	-	-	-	1,980,500.20	MoH	STATISTICAL SERVICE

MALARIA NATIONAL M&E PLAN 2014-2020											
Intervention	ACTIVITIES	BUDGET PER YEAR (USD)							7-YEARS TOTAL AMOUNT (USD)	INSTITUTIONS/SERVICES RESPONSIBLE	PARTNERS
		2014	2015	2016	2017	2018	2019	2020			
		NMCP contribution to DHS and MICS for Malaria Component (stratify malaria endemicity by districts towards elimination)	750,000.00	-	-	-	-	-			
Household-based IRS acceptability survey	-	100,000.00	-	120,000.00	-	-	-	220,000.00	MoH	RESEARCH UNIT	
sub-total	750,000.00	100,000.00	1,980,500.20	120,000.00	-	-	-	2,950,500.20			
5.0	Conduct mid and end of term reviews										
	Conduct Periodic Data Review (in 10 Regions)	232,900.00	232,900.00	244,545.00	256,772.25	269,610.86	283,091.41	297,245.98	1,817,065.49	MoH	PMI/USAID
	Malaria Program performance mid-term evaluation	-	-	120,000.00	-	-	-	-	120,000.00	MoH	RBM/WHO
	Malaria Program Strategic Plan 2014-2020 final evaluation	-	-	-	-	200,000.00	-	-	200,000.00	MoH	RBM/WHO
	sub-total	232,900.00	232,900.00	364,545.00	256,772.25	469,610.86	283,091.41	297,245.98	2,137,065.49		

MALARIA NATIONAL M&E PLAN 2014-2020											
Intervention	ACTIVITIES	BUDGET PER YEAR (USD)							7-YEARS TOTAL AMOUNT (USD)	INSTITUTIONS/SERVICES RESPONSIBLE	PARTNERS
		2014	2015	2016	2017	2018	2019	2020			
		sub-total	-	30,000.00	10,000.00	10,000.00	10,000.00	10,000.00			
6.0	Improve malaria data management and quality										
	Conduct routine data quality audits	377,960.00	405,993.64	436,331.60	469,964.76	506,961.24	547,657.36	592,423.10	3,337,291.69	MoH	PMI/USAID
	Develop/Update standardized M&E procedures, tools and guidelines	\$20,000	\$0	\$0	\$22,000	\$28,000	\$0	\$0	70,000.00	MoH	PMI/USAID
	Printing of harmonized Malaria data reporting tools	\$209,000	\$0	\$209,000	\$0	\$209,000	\$0	\$209,000	836,000.00	MoH	PMI/USAID
	Develop database for common reporting and data sharing by partners (non-routine malaria activities)	\$0	\$10,000	\$0	\$0	\$0	\$0	\$0	10,000.00	MoH	PMI/USAID
	Develop/Update guidelines for data use/sharing (District Data Utilization Manual)	\$0	\$10,000	\$0	\$0	\$0	\$0	\$0	10,000.00	MoH	PMI/USAID
	Print guidelines for data use/sharing	\$30,000	\$0	\$36,000	\$0	\$43,200	\$0	\$47,520	156,720.00	MoH	PMI/USAID
	Upgrade ICT infrastructure (Server, Applications and Accessories) to support DHIMS	-	50,000.00	-	60,000.00	-	-	-	110,000.00	MoH	ICT CONSULTANT/PMI

MALARIA NATIONAL M&E PLAN 2014-2020											
Intervention	ACTIVITIES	BUDGET PER YEAR (USD)							7-YEARS TOTAL AMOUNT (USD)	INSTITUTIONS/SERVICES RESPONSIBLE	PARTNERS
		2014	2015	2016	2017	2018	2019	2020			
	Procure printers for District Management team for malaria control	-	50,000.00	-	60,000.00	-	-	-	110,000.00	MoH	PMI/USAID
	Maintenance of ICT infrastructure at NMCP	12,000.00	11,000.00	12,100.00	13,310.00	14,641.00	16,105.10	17,715.61	96,871.71	MoH	ICT CONSULTANT/PMI
	Procure corporate antivirus software for the NMCP computers	2,000.00	2,200.00	2,400.00	2,600.00	2,800.00	3,080.00	3,388.00	18,468.00	MoH	ICT CONSULTANT/PMI
	Support district Data Verification Teams	-	324,000.00	324,000.00	324,000.00	324,000.00	324,000.00	324,000.00	1,944,000.00	MoH	PMI/USAID
	Support regional Data Verification Teams	-	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	90,000.00	MoH	PMI/USAID
	sub-total	650,960.00	878,193.64	1,034,831.60	966,874.76	1,143,602.24	905,842.46	1,209,046.71	6,789,351.40		
7.0	Dissemination of Survey and Surveillance Reports										
	Development and production of bulletin (feed into malaria watch magazine)	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	35,000.00	MoH	ACADEMIA
	Establish annual data use and dissemination exhibition by districts and regions at national levels	80,750.00	84,787.50	89,026.88	89,026.88	89,026.88	89,026.88	93,478.22	615,123.22	MoH	PMI/USAID

MALARIA NATIONAL M&E PLAN 2014-2020											
Intervention	ACTIVITIES	BUDGET PER YEAR (USD)							7-YEARS TOTAL AMOUNT (USD)	INSTITUTIONS/ SERVICES RESPONSIBLE	PARTNERS
		2014	2015	2016	2017	2018	2019	2020			
	Documentation of Best Practices	20,000.00	22,000.00	24,200.00	26,620.00	29,282.00	32,210.20	35,431.22	189,743.42	MoH	RBM/WHO
	Malaria modeling and mapping for districts in Ghana (Develop and print national country malaria profile (malaria mapping))	103,404.00	-	-	103,404.00	-	-	113,744.40	320,552.40	MoH	RBM/WHO
	Semi-annual seminars to disseminate research findings	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	140,000.00	MoH	RESEARCH UNIT
	sub-total	229,154.00	131,787.50	138,226.88	244,050.88	143,308.88	146,237.08	267,653.84	1,300,419.04		
	Total for Objective 4 (M&E)	4,562,491.00	3,311,841.14	6,441,661.48	3,977,561.09	5,045,434.77	3,723,176.38	5,421,929.16	32,484,095.00		
	TOTAL M&E BUDGET IN USD	4,562,491.00	3,311,841.14	6,441,661.48	3,977,561.09	5,045,434.77	3,723,176.38	5,421,929.16	32,484,095.00	-	-
	TOTAL M&E BUDGET IN Ghc	13,701,160.47	9,945,458.94	19,344,309.41	11,944,615.94	15,151,440.61	11,180,698.66	16,282,053.26	97,549,737.29	-	-

MALARIA NATIONAL M&E PLAN 2014-2020											
Intervention	ACTIVITIES	BUDGET PER YEAR (USD)							7-YEARS TOTAL AMOUNT (USD)	INSTITUTIONS/SERVICES RESPONSIBLE	PARTNERS
		2014	2015	2016	2017	2018	2019	2020			
		1USD = 3.003 (Bank of Ghana Rate, June 2014)									

Appendix 4: Core Malaria Indicators in the Malaria Strategic Plan

Indicator	Operational Definition	Source	Frequency	Level of measurement	
Impact					
Under five, all-cause child mortality	The probability of dying before the 5 th birthday, expressed per 1000 live births	Representative, household surveys (DHS, MIS, MICS)	Every ~5 years	National	
Malaria incidence rate	<i>Current definition:</i> Numerator: reported cases of malaria (<5 years, ≥5 years) Denominator: population, expressed per 1000	HMIS	quarterly	National, regional, district, facility	
	<i>Desired definition:</i> Numerator: reported cases of malaria (<5 years, ≥5 years) with a confirmed diagnosis using either microscopy or RDTs Denominator: population, expressed per 1000	HMIS	Quarterly (MIS/IDSR =monthly)	National, regional, district, facility	
Malaria parasite prevalence	Numerator: Number of children under five years with malaria parasites, tested either through microscopy or RDTs Denominator: Total number of children under five years surveyed within malaria-endemic areas	Representative, household surveys (DHS, MICS, MIS)	Biennial	National, regional	
Severe anaemia prevalence among children	Numerator: Number of children aged 6-30 months with severe (haemoglobin <8) Denominator: Total number of children aged 6-30 months surveyed within malaria-endemic areas	Representative, household surveys (DHS, MICS, MIS)	Biennial	National, regional	
Outcomes					
Malaria cases with positive confirmed diagnosis (%)	Numerator: number of clinical malaria cases with a positive confirmed diagnosis using either microscopy or RDTs Denominator: Total number of malaria attendance with clinical diagnosis	HMIS/IDSR	Quarterly /monthly	national, regional, district, facility	
Health care providers correctly diagnosing and treating (uncomplicated or severe) malaria (%)	Numerator: Number of health care providers correctly diagnosis and treating (uncomplicated or severe) malaria according to national policy. Denominator: Total number of health care providers surveyed	Health facility surveys	Biennial	National, regional	

Indicator	Operational Definition	Source	Frequency	Level of measurement	
Health facilities with no stock outs of antimalarial drugs for more than a week during the last 3 months (%)	Numerator: Number of health facilities with no stock outs of antimalarial drugs for more than one week during the last three months Denominator: Total number of health facilities reporting or surveyed	HMIS Health facility surveys.	Quarterly	national, regional, district, facility	
Febrile children who received antimalarial treatment according to national policy within 24 hours (%)	Numerator: Number of children under 5 years old with reported fever in the previous 2 weeks who received antimalarial treatment according to national policy within 24 hours of onset of the fever Denominator: Total number of children under five years with fever surveyed within malaria-endemic areas	Representative, household surveys (DHS, , MICS, MIS)	Biennial	National, regional	
Intermittent preventive treatment (IPT) for pregnant women through ANC visits (%)	<i>Routinely reported through facilities:</i> Numerator: number of antenatal clinic attendances given 1 st , 2 nd , and 3 rd dose SP Denominator: total number of first antenatal clinic attendances Expressed as percentage for each 1 st , 2 nd , and 3 rd dose IPT received separately	HMIS	Quarterly (MIS/IDSR =monthly)	national, regional, district, facility	
	<i>Household survey sample:</i> Numerator: Number of women at risk for malaria who took at least two doses of SP to prevent malaria during their last pregnancy that led to a live birth within the last 5 years. Denominator: Total number of women surveyed at risk for malaria who delivered a live baby within the last 5 years	Representative, household surveys (DHS, , MICS, MIS)	Biennial	National, regional	
Households with at least one insecticide-treated mosquito net (%)	Numerator: Number of households surveyed within malaria-endemic areas with at least one mosquito net which is a Long-lasting Insecticidal Net (LLIN) Denominator: Total number of households surveyed within malaria-endemic areas	Representative. household surveys (DHS, , MICS, MIS)	Biennial	National, regional	
Use of ITN among children under five the previous night (%)	Numerator: Number of children under 5 years old who slept under an ITN the previous night Denominator: Total number of children under five years surveyed in household with at least one ITNs	Representative. household surveys (DHS, , MICS, MIS)	Biennial	National, regional	

Indicator	Operational Definition	Source	Frequency	Level of measurement	
Use of ITN among pregnant women the previous night (%)	Numerator: Number of pregnant women who slept under an ITN the previous night Denominator: Total number of pregnant women surveyed in household with at least one ITNs	Representative. household surveys (DHS, , MICS, MIS)	Biennial	National, regional	
Use of ITN among the general population the previous night (%)	Numerator: Number of people who slept under an ITN the previous night Denominator: Total number of people surveyed in household with at least one ITNs	Representative. household surveys (DHS, , MICS, MIS)	Biennial	National, regional	
Targeted structures sprayed for Indoor Residual Spraying (IRS) (%)	Numerator: Number of eligible structures sprayed Denominator: Number of eligible structures targeted for IRS This indicator represents operational coverage for IRS efforts at districts and national level.	NMCP reports	Annual	National, 15 IRS districts	
breeding areas targeted with appropriate larvicides	Numerator: targeted larviciding areas being appropriately sprayed Denominator: Number of settings identified for environmental management (Larvicides)	Implementing Agency.	quarterly	National	
Development and Implementation of the malaria vaccine intervention once it has been proven to be effective locally	Suggested indicators will include Number of guidelines developed on malaria vaccine Number of implementation guidelines on malaria vaccine distributed Number of health staff trained to implement the malaria vaccine intervention Number of children doses with malaria vaccine	NMCP reports	Annual	National	
Outputs					
Number of epidemiological and entomological surveillance established	Numerator: Number of sentinel sites established for epidemiological and entomological surveillance Denominator: Planned number of sites for epidemiological and entomological surveillance.	Sentinel sites reports	Annual	National	
Number of insecticide-treated nets (ITNs) distributed	Includes both ITNs sold through subsidized net programmes in antenatal clinics and nets distributed free of charge to target populations through facility and community efforts; listed separately for PW through ANC	NMCP Reports NGO, partner etc Reports	Quarterly	National, regional, district level	

Indicator	Operational Definition	Source	Frequency	Level of measurement	
Volumes of insecticide used for vector control	Total volume of insecticides used for vector control, including indoor residual spraying, net retreatments, and other Integrated Vector Management activities.	NMCP Reports	Annual	National	
Number of eligible structures sprayed	Total number of eligible structures sprayed with indoor residual spraying (IRS)	NMCP Reports	Annual	National, 15 IRS districts	
Number of pregnant women receiving IPT (1,2,3,4 or 5)	Total number of pregnant women receiving IPT1, IPT2 and IPT3 through antenatal clinic visits, listed separately for IPT1, IPT2, IPT3, IPT4, IPT5	HMIS, (DHS, MICS)	Quarterly (Periodically 4-5 yearly)	National, regional, district, facility	
Number of malaria cases treated	Total number of treatments dispensed for treatment of malaria diagnosis.	HMIS Community health workers reports	Quarterly	National, regional, district, facility	
Number of malaria microscopy slides taken	Total number of slides taken for confirmation of clinical diagnosis of malaria	HMIS	Quarterly	National, regional, district, facility	
Number of malaria Rapid Diagnostic Tests (RDTs) taken	Total number of RDTs taken for confirmation of clinical diagnosis of malaria	HMIS	Quarterly	National, regional, district, facility	
Awareness of malaria and its effective interventions through the deployment of malaria communication strategy with particular emphasis on using health workers and the electronic media	Numerator: households with adequate knowledge of malaria and malaria control interventions Denominator: Total number of households surveyed.	Representative. Household surveys (DHS, MICS, MIS)	Biennial		
Number of BCC materials produced	Total number of IEC materials, including print, media, skits, dramas for malaria IEC/BCC activities	NMCP	Quarterly	National	
Percentage of Health facilities reporting, timely and completes,	Numerator: Number of Health facilities reporting, timely, and completes through routine health information management systems	HIMS	Monthly	National, regional, district, facility	

Indicator	Operational Definition	Source	Frequency	Level of measurement	
data through routine health information management systems, i.e. DHIMS	Denominator: Expected Total number of Health facilities reporting data through routine health information management systems ie DHIMS.				
Promotion of research that informs the programme in terms of policy and operational issues	Number of national surveys and operational research conducted to guide policy and decision making in malaria control.	NMCP	Quarterly	National	
Malaria budget received (%)	Numerator: Total amount of money received by the NMCP/country for malaria control Denominator: Total amount of money planned for malaria control in a year	NMCP	Annually		

NB: Malaria endemic areas¹: Households with at least one ITN

Appendix 5: Logical Performance Framework

Processes	Data to be Collected	Sources of Data	Frequency of Data Collection	Responsible Institution
Malaria Surveillance	Reported Malaria Morbidity And Mortality Data	Health Facility And Community Surveillance Records/Reports	Monthly	National Surveillance Unit And CHIM/HSDS
Monitoring The Implementation Of Planned Activities	Indicators To Measure Inputs, Processes And Output Objectives	Monthly And Quarterly Monitoring Reports	Monthly And /Or Quarterly	All Implementing Partners/Recipients
Evaluation Of Outcome (Coverage/ Usage) And Impact Of Control Interventions	Indicators To Measure Outcome (Coverage/Usage) And Impact Objectives	Special Committees And Health Facility Survey Reports	<ul style="list-style-type: none"> • Every 1-2 Year For Outcome Indicators • Every 2-3 Years For Impact Indicators 	<ul style="list-style-type: none"> • Ghana Statistical Service • HRU • Malaria Consort • Other • Research Institutions To Be Identified.