THE NATIONAL MALARIA CONTROL PROGRAM

MID TERM PROGRAM REVIEW (MTR)

MID TERM PROGRAM REVIEW REPORT

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LIST OF ACRONYMS

AA	Artesunate-Amodiaquine
ACT	Artemisinin-Based Combination Therapy
ADR	Adverse Drug Reaction
AGAMal	Anglogold Ashanti Malaria
AL	Artemeter Lumefantrine
AMDP	Antimalarial Drug Policy
AMFm	Affordable Medicines Facility-Malaria
ANC	Antenatal Care
ART	Anti-Retroviral Therapy
AS-AQ	Artesunate Amodiaquine
BMC	Budget Management Centre
CBAs	Community Based Agents
CBO	Community Based Organization
CD	Continuous Distribution
CHIM	Centre for Health Information Management
CHO	Community Health Officer
CHPS	Community Health Planning Services
CFR	Case Fatality Rate
CMS	Central Medical Store
CRF	Case Reporting Form
CSIR	Council for Scientific and Industrial Research
CSO	Civil Society Organization
CSRIPM	Center for Scientific Research into Plant Medicine
DCE	District Chief Executive
DCO	Disease Control Officer
DFID	Department for International Development
DHAP	Dihydro atemisinin piperaquine
DHS	Demographic and Health Survey
DHMIS	District Health Management Information Systems
DMS	District Medical Store
DOT	Directly Observed Therapy
DSD	Disease Surveillance Division

EPI	Expanded Programme on Immunisation
FDA	Food and Drugs Authority
FHD	Family Health Division
GF	Global Fund
GHS	Ghana Health Services
GNDP	Ghana National Drugs Programme
GRMA	Ghana Registered Midwives Association
HBC	Home-Based Care
HFRA	Health Facilities Regulatory Agency
HIO	Health Information Officer
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
HMM	Home Management of Malaria
ICD	Institutional Care Division
IDSR	Integrated Disease Surveillance and Response
IEC	Information, Education and Communication
IMaD	Improving Malaria Diagnostics
IMNCI	Integrated Management of Neonatal and Childhood Illness
IPTp	Intermittent Preventive Treatment of Malaria in Pregnancy
IRS	Indoor Residual Spraying
ITNs	Insecticide Treated Nets
ISD	Information Services Department
LLIN	Long lasting Insecticide Treated Nets
LMIS	Logistic Management Information System
M&E	Monitoring and Evaluation
MDGs	Millennium Development Goals
MICS	Multiple Indicator Cluster Survey
MIP	Malaria in Pregnancy
MIS	Malaria Information System
MMV	Medicines for Malaria Venture
MOH	Ministry of Health
MOFEP	Ministry of Finance and Economic Planning
MTR	Mid Term Review
NCCE	National Commission for Civic Education

NGO	Non-Governmental Organization
NHIS	National Health Insurance Scheme
NIRMOP	National Insecticide Resistance Monitoring Partnership
NMCP	National Malaria Control Programme
NMIMR	Noguchi Memorial Institute of Medical Research
OPD	Outpatient Department
PBC	Produce Buying Company
PBO	Piperonyl Butoxide
PMI	President's Malaria Initiative
PPA	Public Procurement Authority
PPME	Policy Planning Monitoring and Evaluation
PSM	Procurement and Supply Management
QA	Quality Assurance
RCC	Regional Coordinating Council
RBM	Roll Back Malaria
RDT	Rapid Diagnostic Test
RMS	Regional Medical Store
SMC	Seasonal Malaria Chemoprophylaxis
SOP	Standard Operating Procedure
SP	Sulfadoxine-pyrimethamine
SPMD	Society of Private Medical and Dental Practitioners
SSDM	Stores Supply Drug Management
STG	Standard Treatment Guidelines
TORs	Terms of References
UC	Universal Coverage
UNDP	United Nations Development Programme
USAID	United State Agency for International Development
UNICEF	United Nations Children's Education Fund
WAHO	West African Health Organization
WHO	World Health Organization
WHOPES	WHO Pesticide Evaluation Scheme

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1.0 INTRODUCTION

1.1 Background

The Republic of Ghana extends inlands from the Gulf of Guinea and is bordered on the south by the Atlantic Ocean, Togo to the east, Burkina Faso to the north, and La Cote D'Ivoire to the west. It covers a surface area of 238,837 sq kms and a coastline of 540 kms, most of which is relatively flat and lies below an altitude of 150 kms, but several peaks in the east rise to above 800 kms. Ghana has a tropical climate, warm to hot all year through, and can be divided into two broad geographical zones; the south and centre are moist while the north is savannah in nature and drier. It is bisected by the Greenwich Meridian and lies entirely within the northern tropics between 40N to 110N at the equator. Northern Ghana has a wet climate from April to October; the rest of the period is hot and dry with temperatures up to 38.0 degree celcius. In southern Ghana, the rains last from April to June, and also from September to October. There are drier months in between these periods. Generally, temperatures are between 21 -31 degree celcius in the south (Ghana Tourist Board website,2016).

Ghana is a democracy with a presidency, cabinet, parliament and an independent judiciary. The country is divided into ten regions: Ashanti, Brong-Ahafo, Central, Eastern, Greater Accra, Northern, Upper East, Upper West, Volta and Western Regions. Each region is headed by an appointed Regional Minister who represents the Head of State (the President of the country).

The Regional Minister is assisted by a deputy regional minister and a Regional Coordinating Council (RCC) to co-ordinate and formulate integrated district plans and programmes within the framework of approved national development policies and priorities. Each district is headed by a District Chief Executive (DCE), who is nominated by the President and approved by the District Assembly. The District Assembly is the highest political and administrative authority in the district. The districts are also sub-divided into unit areas and are headed by elected executives.

Ghana's main exports include cocoa, timber, pineapple, and gold as one of its principal revenue source. The recent discovery of petrol reserves in the country will boost the economy with a new source of revenue. Since 2009, Ghana has started exporting oil in commercial quantities, at approximately 70,000 barrels every year (Ghana EPI Final Review Report 2012, 2012).

Figure 1: Regional Map of Ghana, 2016

1.2 GOAL AND OBJECTIVES OF NATIONAL MALARIA CONTROL PROGRAMME

1.2.1 GOAL

The Goal of malaria control in the third National Strategic Plan (2014-2020) is to reduce the malaria morbidity and mortality burden by 75% (using 2012 as baseline) by the year 2020

1.2.2 The Objectives and Strategies to attain the objectives are as follows

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

Strategies:

- Distribution of LLINs through mass campaigns
- Continuous distribution of LLIN

- Indoor Residual spraying predominantly in 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

Strategies:

- Provide quality malaria diagnosis to all suspected cases at all levels
- Build infrastructure and capacity for malaria diagnosis at all levels of care
- Improve access to diagnosis and treatment in the private sector and enforce adherence to guidelines
- Strengthen capacity building for malaria case management at health training institutions and health facilities
- Management of severe malaria at all health facilities
- Increase access of health care delivery to deprived communities where there is no CHPS through the integrated community case management
- Supportive supervision of health workers at all levels

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

Strategies

- Conduct regular 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 in 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

- Align Ghana Malaria NSP into the West Africa Health Organization Strategic Plan for Malaria
- Improve transport and logistics Management Information system for malaria commodities

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

Strategies

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

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

Strategies

- Advocate for adherence to test treat and track initiative
- Sustain behavioural change communication on malaria prevention at all levels
- Strengthen Community social mobilization to enhance uptake of malaria interventions
- Develop a comprehensive accelerated malaria control communication strategy

1.2.3 Justification for the Mid Term Review (MTR)

Since the development and implementation of the third National Malaria strategic Plan (2014-2020) there have been a number of reviews, including the Ghana Demographic Health Survey (GDHS, 2014) and the Malaria Indicator Survey (MIS, 2016). The year 2017 is therefore taken

as opportune to undertake a midterm review of the entire programme to assess progress with implementation, chart a new course for the future and to develop strategies for accelerated scale up.

1.3 GOAL AND OBJECTIVES OF THE MTR

1.3.1 Goal

The goal of the midterm review of the 2014-2020 Strategy is to assess the progress made with regards to the current malaria burden and trends in the context of the Sustainable Development Goals (SDGs), the Global Technical Strategy (GTS) and in the light of the changing environment and new development in malaria control.

1.3.2 Objectives

The objectives of the midterm review are:

- To analyse current data and information on malaria epidemiology with regards to burden and trends.
- To assess progress towards MDG/SDGs and Global Technical Strategic (GTS) targets as well as national strategic goals.
- To review the malaria policy and programming framework, organization, structure and management within the health system and national development agenda.
- To determine program achievements by thematic areas considering the weaknesses, strengths, threats and opportunities.
- To define the next steps to improve program performance and/or redefine the strategic direction and focus including a revised stratification where necessary and /or revision of the Strategic Plan.

2.0 METHODS FOR THE MID TERM REVIEW

2.1 PHASE I: PLANNING

The midterm review (MTR) was conducted in four phases with specific steps (Table 1)

Phase One: Planning and Preparation

The first phase of planning started in December 2016. During this phase, there were consultation meetings with stakeholders to define the need for the review and to develop terms of references (TORs). Different structures of the MTR were put in place: i) Selection of the MTR Coordinator; ii) Agreement on the secretariat of the MTR; iii) Recruitment of a national consultant; iv) Selection of members of the 8 thematic desk review teams. The team members were multi-sectorial comprising health workers, research institutions and NGOs. The plan and budget were developed and submitted to the RBM, the Malaria Unit and other partners for funding. Meanwhile a technical assistance request was sent to WHO/IST – West Africa.

Phase Two: Thematic Desk Reviews

The second phase started in February 2017 and ended March 2017. This phase involved selecting and developing tools for the field review and conducting thematic desk reviews. Thematic review teams were met thrice every week and all existing documents were found and filed at the WHO office and shared with all partners. Two retreats were organized at the NMCP office to finalize thematic review reports. A checklist was developed to track activities and updated gradually as need arose. This desk review consisted of a summary of recent progress in achieving set targets for access, coverage, quality, use and impact. The objective of this phase was to gather information on weaknesses and gaps to inform the external review process in the field review.

Phase Three: Field Review

The third phase was conducted from 27th March, 2017 and ended on 2nd April, 2017. It was done according to the guidelines and it involved briefing of external review team to ensure team-building between internal and external review teams, consensus-building on findings of thematic desk review and familiarization with data collection tools for field visits. The field visits started with visits to national institutions and organizations whiles other teams undertook regional, district and community field visits to malaria service delivery points. After which, teams re-converged and shared their reports through plenary presentations on key findings.

The thematic review reports were updated with the field review information to ensure completeness of data collected during the desk review. This was followed by the preparation of drafts of the review report and slide presentation of key findings and recommendations.

Phase 4: Follow-Up

Phase four will officially start from 3rd May 2017 and will involve the following key actions:

1. Stakeholders meeting

2. Finalization and publication of the report.

3. Dissemination of the report.

4. Implementation of the recommendations.

5. Monitoring implementation of the recommendations.

5. Updating plans and redesigning the programme, if necessary.

Members of the local, desk review and field teams were:

i. **Local Team**

- Dr Constance Bart-Plange – Team Lead
- Dr Kezia Lawrencia Malm – Deputy Team Lead
- Dr Nana Yaw Peprah – Focal Person, NMCP

ii. **Desk Review Teams**

Epidemiology

- Mr Abraham Nettey
- Dr Nana Yaw Peprah
- Mr Sammy Oppong

Integrated Vector Conrol (LLINs+IRS), SMC

- Mrs Otubea Ansah Mante
- Mr Sammy Oppong
- Dr Samuel Dadzie

Case Management, MIP, Diagnostics, Malaria Vaccine

- Dr Akosua Gyasi
- Dr Felicia Owusu-Antwi
- Mrs Patricia Bentil
- Mr Alexander Asamoah

IEC/BCC

- Mrs Eunice Mintah Agyeman
- Mr Kwame Gakpey

Program Management (Governance, Coordination, Resource Mobilization etc)

- Ms Vivian Aubyn

PSM

- Mr James Frimpong

iii. **Field Teams**

Upper East

- Dr Felicia Owusu-Antwi
- Dr Akosua Gyasi
- Mr. Prince Owusu

Ashanti Region

- Dr Nana Yaw Peprah
- Dr Justice Sylverken
- Dr Felicia Amoo-Sakyi

Volta Region

- Mrs Patricia C. Bentil
- Obed Ebo Asamoah

National level

- Prof. Edwin Afari/ SPH/UG
- Dr. Samuel Dadzie/(NOGUCHI)
- Dr. Joseph Somuah Akuamoah/LOCAL TA
- Mrs. Eunice Mintah Agyemang/NMCP
- Mr. Sammuel Oppong/NMCP
- Mrs. Otubea Owusu Akrofi/NMCP

Table 1: Phases and Timelines of MTR,2017

PHASE	ACTIVITY	OUTPUT	TIMELINE	RESPONSIBLE

Phase 1	Preparations	Protocol Teams in place TA requirements and resources secured	Dec, 2016 – 19th February, 2017	Dr Felicia Owusu-Antwi Dr L. K. Malm Dr N. Y. Peprah
Phase 2	Desk Review	Desk analysis and report TA for Desk analysis	20th February – 24 March, 2017 22nd -25th March	Dr N. Y. Peprah Dr Felicia Owusu-Antwi Dr Joseph Somuah Akuamoah - Local consultant Dr Abderhamane Kharchi Tfeil WHO-IST
Phase 3	Field visits Stakeholders meeting Finalization of report	Field report Validated MTR report Stakeholders' planning meeting	27 March – 01 April, 2017 18th April, 2017 3rd May, 2017 10 May, 2017	External Consultant Local consultant Focal Persons

2.2 PHASE II: INTERNAL THEMATIC REVIEW

To facilitate the desk review, the team of experts assisted the consultants with retrieving relevant reports as well as answering questions related to their areas of expertise.

2.3 PHASE III: EXTERNAL VALIDATION

External Review Team

- Dr Abderahmane Kharchi Tfeil - WHO –IST/AFRO
- Dr Joseph Somuah Akuamoah – External Consultant.
- Dr Felicia Owusu-Antwi – WHO, Ghana
- Dr Justice Sylverken – KATH
- Mr Prince Owusu
- Dr Samuel Dadzie-NMMIR
- Prof. Edwin Afari-SPH

Table 2: Places Visited and Persons Interviewed

NATIONAL LEVEL		ORGANIZATION	PERSON INTERVIEWED
	Ministry of Health Headquarters	Head of Medical stores	Mr. Lazarus Dery
	Ghana Health Service Headquarters	Deputy Director General	Dr Gloria Quansah
	Ghana Health Service Headquarters	PPME	Dr Awoonor Williams-Director
	Ghana Health Service Headquarters	Director, SSDM	Mrs Araba Kudiabor
	Ghana Health Service Headquarters	NMCP Manager	Dr Mrs Constance Bart-Plange
,	School of Public Health, Legon	Head of Epidemiology	Prof Edwin Afari
	Noguchi Memorial Research Institute		Prof Kojo Koram
	Coalition of NGOs for Malaria	Head	Mr Evans Opata
	Public Health Reference Laboratory (Korle-bu)	Head	Dr David Opare
	Cape Coast Teaching Hospital	Clinical coordinator	Dr Ansomana Bokari
	USAID		

REGIONAL LEVEL		ORGANIZATION	PERSON INTERVIEWED
UPPER EAST	Regional Health Administration	Regional Director	Dr Issah
		Regional Malaria Focal Person	Mr Sydney Abilba
		Regional Disease Control Officer	Miss Justina Dittoh
	Regional Hospital	Medical superintendent	Dr Atobra
		Laboratory i/c	Mr Ibrahim Mohamed
,		OPD i/c	Mr Isaac Wenegah
		Nursing Officer	Madam Mariam Fuseini – NO
		Maternity, i/c	Mr Gottfred
		Paediatric Ward i/c	Akanfenab
	Regional Medical Stores	Regional Supply Officer	Mr Israel Ahor
		Essential Medicines i/c	Mr Seidu Issifu
	Food and Drugs Authority	Regional Head, FDA	Mr Zakariah Braimah
	WAR Memorial Hospital	Medical Supt. i/c	Dr. Majeed Alhassan
		Hospital Administrator	Mr Cletus Timbambiye
		Nursing Officer i/c Administration	Madam Laijata Bayon
		Pharmacy Technician	Mr Kwadwo Frimpong
		Head, Laboratory	Mr Ramsay Abugri
		Laboratory Officer	Mr Matthew Akila
		Health Information Officer	Mr Salifu Alhassan
		NO i/c Paediatric Ward	Matilda Sando-Sebiyam

REGIONAL LEVEL		ORGANIZATION	PERSON INTERVIEWED
ASHANTI	Regional Health Administration	Deputy Director (PH)	Dr Ewusi Yeboah
		Deputy Director Clinical	Dr. Adomako Boateng
		Malaria Focal Person	Mr. Bernard

			Oppong
	Regional Hospital	Medical superintendent	Dr. Kwame Ofori Boadu
		Clinical Coordinator	Dr Omari Sasu Gyimah
,		DDNS	Philomina Kwayie
		Laboratory unit	Dr Egremont Boakye
		Malaria Focal Person	Adjei Isaac Yaw
		Pharmacist	Esther Commey
		OPD In charge	Philomina Osaa
	Ejisu Municipal Health Directorate	District Director	Mrs P. Ahorsu
	Ejisu Government Hospital	Medical Superintendent	Dr Kwasi Baffour Gyimah
		Pharmacist	Esther Akyerekoh
		Health Information	Mawumenyo Aku Kwawukume
		Labour/Maternity Ward	Ms. Juliana Addae
		Antenatal Unit	Philomina Appiah
		Male's Ward	Jennifer Asante
		Children's Ward	Theresa Gyasi
		Laboratory Unit	Solomon Wireko
		Out-Patient Department	Phoebe Ntoah
	Atwima Mponua Health Directorate	District Director	George kwadwo kyei-fram
		Malaria focal persons	Samuel Ampofo Twumasi
	Kotokrom Health centre	In Charge	Stephen Barfi
	Krumahkrom CHPS & Community	Midwife	Mavis Gbeve
	Kotokrom Health Centre	Community Health Nurse	Ms Dorothy Oteng

		Community Health Nurse in Charge	Ms Mercy K. K Tetteh

REGIONAL LEVEL		ORGANIZATION	PERSON INTERVIEWED
Volta	Regional Health Administration	Regional Malaria Focal Person	Mr. Roland Glover
		Health Information Officer	Ignatius Aklikpe
		Head of Procurement	Emmanuel Barnes
	Regional Medical Stores	Supply Manager	Mr. Michael Annor
	Volta Regional Hospital	Medical Director	Dr John Tampuori
,		Head of Public Health	Dr. Emmanuel Kasu
		Head of Health Information	Mr Benjamin Amedume
		Head of Pharmacy	John Kobuvi
		Head of Laboratory	Charles Agade
		Head of OPD	Monica Asase
	Ho Municipal hospital	Disease Control Officer/Malaria Focal Person	Prosper Amegadzie
		Accountant	Douglas Agboada
	North Tongu District Hospital	District Director of Health Service	Evans Attivor
		District Health Information Officer	Humphrey Fosu Sekyere
		District Store Keeper	Eric Agbo
		District Finance Officer	Charles Danku
		District Disease Control Officer	Rejoice Vuvor
		Health Promotion Officer	Mauricia Adongo
	Volo Health Center	In-charge	Ms. Theresa Otu
	Fakpoe CHPS	In-charge	Ofosua Constance
		Community Health Nurse	Ocrah Jacinta
		Community Health Nurse	Sanefu Christable
		Community Health Nurse	Funu Regan

2.3 PHASE IV: RECOMMENDATIONS FOR STRENGTHENING MALARIA PROGRAM

MOH/GHS/Partners

- There is need for the country to look for domestic resources of funding malaria activities instead of over relying on donors
- MICC should be given high level profile-Presidential commission to reach the attention of cabinet.
- lobby with Parliament select committee on health to deal with issues of tax exemption especially on equipment and insecticides used for indoor residual spraying.
- There is need for more research on the use of herbal preparations in the treatment of malaria.
- Need for a national Logistics Management Information System (LMIS) to ensure proper quantification, adequate storage and effective management of commodities to avoid stock outs
- WHO and Partners to support with guidance on cross-border collaboration
- Standard treatment guidelines should be revised in line with the Malaria Case management guidelines
- Ensure availability of OPD registers.
- The internal audit unit of the GHS/MOH is to support regular auditing of the logistics management and commodities.
- Ensure inter-sectorial collaboration with the Ministry of Lands and Mineral resources and others for better law enforcement to reduce the risk of environmental degradation

NMCP

- Need to leverage resources and facilitate activities of the Malaria Foundation
- Link up with CHPS program to facilitate implementation of the Home based Care strategy.
- Reactivate and expand membership of the Integrated Community Case Management (ICCM) committee to include partners from the Family Health /Policy, Planning, Monitoring and Evaluation (PPME) divisions of the Ghana health Service who are responsible for coordinating CHPS activities in the country.
- Minimize printing of posters /leaflets for distribution at health facilities. The Posters should be modified (e.g. hang-ups) and laminated to ensure their longevity
- With limited resources, focus should be on mass media and community driven strategies such as local FM, engagement of community radio networks

- Adapt the growing use of technology & social media to support Social Behavioural Change Communication strategy.
- Ensure availability of anti-malarial logistics particularly RDTs at all levels
- Liaise with the Family Health Division of the Ghana Health Service to plan and monitor the current directive of using RDTs to test for malaria parasites before SP is given to pregnant women at ante natal clinics.
- Reintroduce the Peers RUN to help increase usage of LLINs
- Engage partners to ensure adequate LLINs availability for the mass campaign to be done in phases over a year
- Introduce new generation nets that incorporate the use of synergist e.g. PBO nets to reduce resistance
- Need to explore new insecticides, implement a resistance management plan and strengthen collaboration with Agricultural institutions to help mitigate the threat of resistance
- Provide back-up systems for facility data (need to supply External Drives to regions and districts)
- Strengthen monitoring and supervision of malaria activities in the regions
- The NMCP should supply laptops to all facilities where facilities data are stored with easy retrieval and avoid individuals using their personal laptops to store institutional data.
- The NMCP will need to have district based malaria epidemiology maps to know where they have to put in more efforts as Ghana moves towards Malaria Elimination.
- Objective 2 of the MSP will need to be readjusted as follows: ***To provide appropriate diagnosis to all suspected malaria cases and prompt and effective treatment to 80% (instead of 100%) of confirmed malaria cases in accordance to treatment guidelines by 2020***.

This is because its strategy to Increase access of health care delivery to deprived communities where there is no CHPS through the integrated community case management seems to be out of its control

RHMT and DHMT

- Train key staff in Malaria Control (Malaria case management and malaria data management).
- Train regional and district focal persons on basic malaria entomology
- Data management strengthening activities should be carried out at all levels by the regional health directorate regularly.
- Strengthen partnership and coordination at district levels
- Health Information Officers and Disease Control Officers at the district should be able to support facility level (especially Hospitals) in data management
- Need to strengthen monitoring and supportive supervision at the district level (both desktop and On-site)
- In service training should be on-site and targeted to the needed skills
- Use mass media TV and radio for health education within the health facilities to intensify BCC activities in the regions

3.0 FINDINGS OF THE REVIEW

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

3.1.1 INTERVENTION 1: Vector Control

3.1.1.1. Background

An Integrated Malaria Vector Control approach is an essential component of malaria control programmes and takes into account the available health infrastructure, resources and integrates all available and effective measures, whether chemical, biological, or environmental.

The National Malaria Control Programme developed an Integrated Malaria Vector Control Policy in 2009 which outlines key integrated Malaria vector management interventions including the use of Insecticide Treated Materials, Adulticiding (Indoor Residual and Space Spraying), Larviciding (through use of Biological and Chemical insecticide) and Environmental Management. Other measures in the policy include the use of Biological Control through the use of larvivorous fish, the Sterile Insect Technique and Repellents. Prior to that in 2002, an ITM policy had been developed.

Ghana started using ITNs and distributed to targeted groups through multi-pronged distribution systems in 1998 alongside Public Private Partnership involving social marketing strategies. Nets used were conventional nets bundled with insecticides till 2004 when the country started using Long Lasting Insecticidal Nets (LLINs). Distribution had been targeted till 2009 when with the adoption of the Universal Coverage (UC) strategy (1 net for 2 persons in a household); the country started its implementation in 2010 with door-to-door distribution and hanging of nets in recipients' sleeping places. The mass campaigns as a catch up strategy was aimed at

making up for the low LLINs access in the household to reach Universal Coverage. The continuous distribution strategy (health-facility and schools' distribution) was instituted in 2012 to maintain and sustain gains made in ownership and utilization coverage during the mass distribution campaigns.

3.1.1.2. Progress of implementation

3.1.1.2a: <u>Strategy 1:</u> Distribution of LLIN through campaigns

Table 3: Long Lasting Insecticides Nets distributed through Mass Campaigns from 2014-2016

LLNs Distribution Campaigns	**Year**			
	2014	**2015**	**2016**	Total
LLINs distributed in Campaign 1 (Volta & Eastern Regions)	1,371,993	1,419,264	1,762,766	4,554,023
LLIN distributed Campaign 2 (Where)	1,617,288	1,238,200	1,972,082	4,827,570
LLIN distributed Campaign 3 (Where)	0	1,394,852	454,360	1,849,242
LLIN distributed Campaign 4 (Where)	0	2,816,441	695,061	3,511,502
Total distributed per year	**2,989,281**	**6,868,751**	**4,884,269**	**14,742,307**

***Source: NMCP Annual report 2014, 2015 and 2016

3.1.1.2b: Strategy 2: Continuous distribution of LLIN

Table 4: LLIN distributed through routine distribution from 2014-2016

Health Facility Based	**Year**

	2014	2015	2016	Total
Population >1 year (18months)	731,480	807,012	827,956	2,366,448
LLIN distributed to >1 year(18months)	460,586	388,652	440,694	1,289,932
Performance (%) (18 months)	***62.9%***	***48.2%***	***53.2%***	***54.5%***
ANC registrants	960,702	944,712	954,924	2,860,338
LLIN distributed to Pregnant Women	349,125	309,839	389,397	1,048,361
Performance (%) ANC registrants	***36.3%***	***37.8%***	***40.7%***	***36.6%***
School Based				
Children in P2 and P6	1,373,670	0	936,357	**2,310,027**

***Source: DHIMS-2 and NMCP ITN distribution data, 2017

3.1.1.2c. Strategy 3: Indoor Residual Spraying for areas with high parasite prevalence

Indoor Residual Spraying in the country is implemented in all 11 districts (Jirapa, Lambussie, Lawra, Nadowli, Sissala East, Sissala West, Wa East, Wa Municipal, and Wa West) in the Upper West region and one district (Obuasi Municipal) in the Ashanti region by the AngloGold Ashanti Malaria Control Programme. Abt Associates are funded by the PMI to implement IRS in 5 districts (East Mamprusi, Bunkpurugu-Yunyoo, West Mamprusi, Mamprugu Moaduri, and Kumbungu) in the Northern Region. The tables below describe the achievement of the two programmes implementing IRS in the country:

Table 5: Indoor Residual Spraying Performance (PMI)

Indicators **(PMI AIRS)**	**Year**		
	2014 **No. (%)**	**2015** **No. (%)**	**2016** **NO.**
Percentage of population in target areas protected through indoor residual spraying in the last 12 months	570,572 (89.1%)	553,954 (94.6%)	570,87197.5%
Number and percentage of structures in targeted districts sprayed by indoor residual spraying in the last 12 months	205,230 (83.2%)	205,935 (91.7%)	211,283 (92.7%)
Number of districts implementing IRS	4	5	5

*** Source: IRS End of spray report 2014, 2015 and 2016

Table 6: Indoor Residual Spraying performance for AGAMAL

Indicators (AGA MAL)		Year		
	2014 Round 1	**2014 Round 2**	**2015**	**2016**
Percentage of population in target areas protected through indoor residual spraying in the last 12 months	64%	67%	80%	85%
Number and percentage of structures in targeted districts sprayed with indoor residual spraying in the last 12 months	1,497,408 (94%)	1,392,412 (92%)	788,516 (97%)	763,084 (108%)
Number of districts implementing IRS	15	13	10	10

*** Source: IRS End of spray report 2014, 2015 and 2016, AGAMAL

3.1.1.2d: Strategy 4: Larval Source management

Even though limited larviciding is one of the interventions outlined in the strategic plan it is not widely applied in the country. Labiofam a Cuban company (with the support of the MOH) was implementing a limited larviciding program in the urban areas of Accra, Sunyani and Kumasi.

This project however has come to an end (when did it come to end). There was no independent evaluation of the Labiofam project to validate its claim of success. The only project currently running on larviciding is done by Zoomlion which target all mosquitos and does not specifically target the *An. gambiae* larvae. Thus, there is no specific *An. gambiae* targeted larviciding program in the country.

3.1.1.2e: Strategy 5: Entomological Monitoring

Entomological monitoring is done to assess the effectiveness of the main vector control tools; LLIN and IRS in the country. Also, due to increase in interventions that use insecticide for both public health and agricultural purposes, entomological monitoring is necessary. In areas where IRS is done in the country, entomological monitoring is carried out in various sentinel sites to assess the impact of IRS on vector transmission (Figure 2)

Insecticide Resistance Monitoring Plan for Ghana has been placed under a partnership called National Insecticide Resistance Monitoring Partnership (NIRMOP). The partnership brings together researchers and partners within Ghana to generate and monitor insecticide resistance data in the country. One of the main aims of the partnership is to provide the framework for sharing data on insecticide resistance in a collaborative way to support disease control strategies especially those that require the use of insecticides. The partnership is constituted from members of the Malaria Vector Control Oversight Committee (MaVCOC) of the National Malaria Control Programme (NMCP). In view of this, twenty (20) entomological sentinel sites have been set up across the country, two (2) sites in each region (Figure 2).

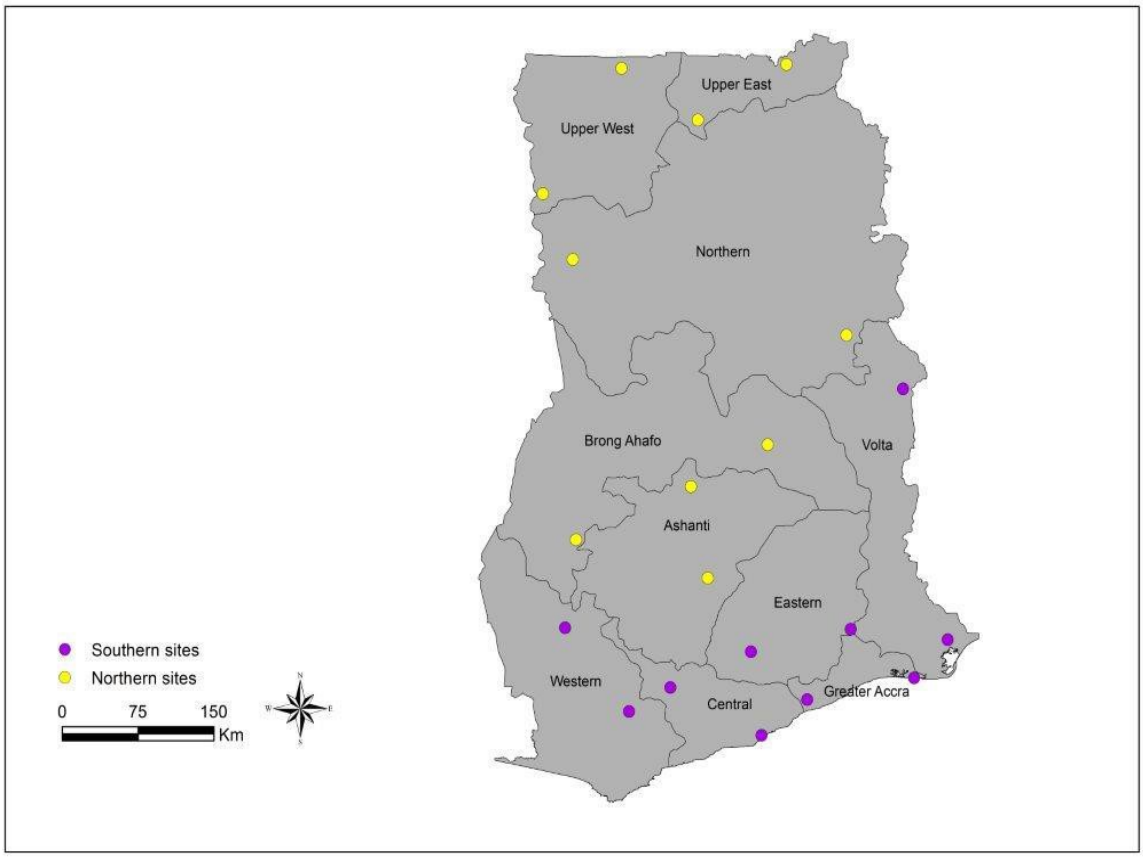

Figure 2: Distribution of entomological sentinel sites in Ghana

A minimum of nine (9) insecticides are recommended in the Standard Operating Procedures (SOPs) of NIRMOP to be tested against *An. gambiae* s.l. mosquitoes from the sentinel sites. The insecticides were selected to cover the four main classes; that is, Pyrethroids, Organophosphate, Carbamates and Organochlorines. In addition, Insecticide papers impregnated with Piperonyl Butoxide (PBO) synergist was also performed for deltamethrin and permethrin insecticides.

The PBO is a synergist that inhibits oxidase, one of the enzymes responsible for metabolic resistance in *An. gambiae* s.l.

Pyrethroid resistance was detected in all sites surveyed, consistent with studies of Boakye et al, 2011, which showed wild *An. gambiae* mosquitoes in all the 6 districts surveyed are resistant to DDT and all the pyrethroids tested. Figure 2 shows mortality of wild An gambaie tested at all of sites below the WHO recommended 98% mortality ranging from 90% in Prestea for Permethrin to about 8% for Permethrin in Gomoa Obuasi in the southern sector. In the Northern sector, Figure 3 shows mosquitoes are resistant to all pyrethroids tested; Deltamethrin

and permethrin with mortality levels as low as 2% for Wulensi and Konongo in the Northern and Ashanti Regions respectively. Comparing 2015 to 2016, resistance increased over the years though more data will have to be collected in subsequent years before a concrete conclusion can be drawn on this.

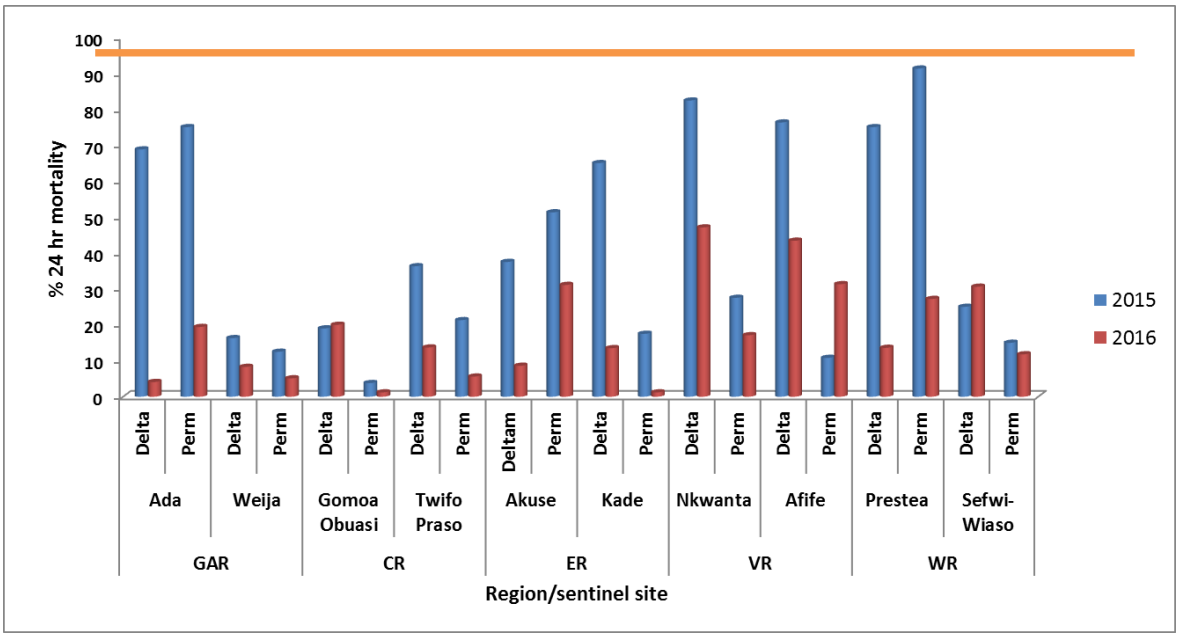

Figure 3: Susceptibility of *An gambiae* to pyrethroids in the southern sector 2015 -2016

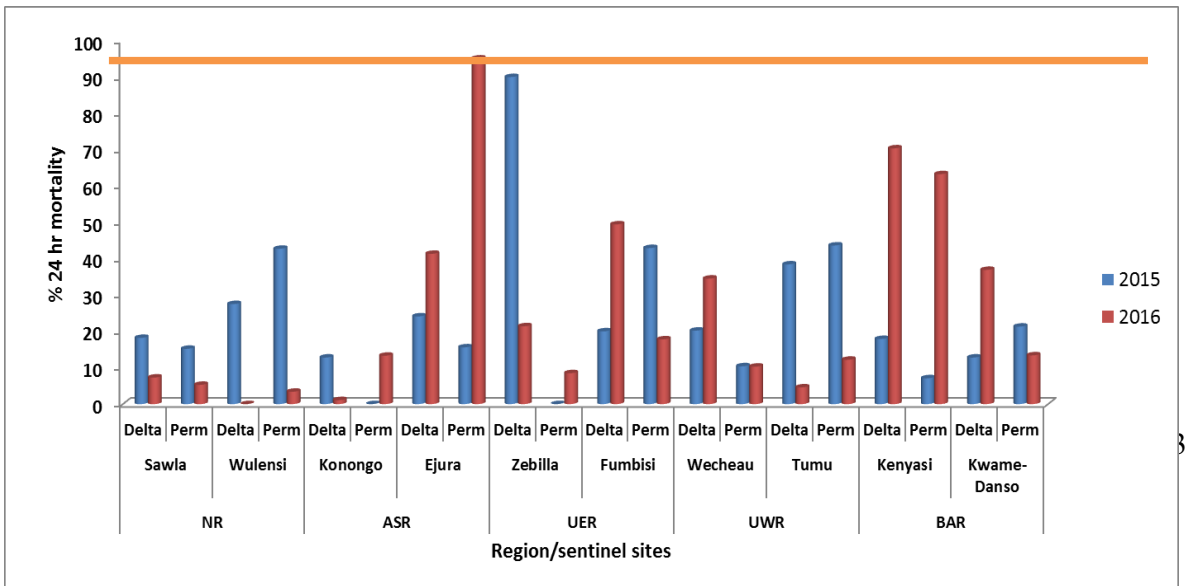

Figure 4: Susceptibility of *An gambaie* to pyrethroids in the northern sector,2015 - 2016

Studies in all 20 sites also indicated a High frequency of *kdr-w* resistance allele at all sites and a low frequency of Ace-1 mutation at most sites, the synergist papers used gave some indication of metabolic mechanism (oxidase enzymes) being involved in the development of resistance to some pyrethroids in all sites. However, susceptibility was observed with the use of PBO synergist for Deltamethrin and Permethrin in most cases. For the carbamates tested, Bendiocarb and Malathion were effective at most sites with reduced efficacy of Bendiocard at some sites. Pirimiphos methyl was effective in most sites

Table 7: Enabling and Constraining factors of the Vector Control Strategies

Strategy	Enabling factors	Constraining factors	Proposed solutions
Strategy 1: Distribution of LLIN through campaigns	•	• Long duration of nation-wide campaigns • Accountability/proper documentation of net quantities • Ownership does not culminate into use • Distribution in urban areas a challenge • Development of Resistance by vector • Early and late biting,	• Shorten life cycle of campaigns by implementing in a number of regions at the same time • Improve documentation, put in place punitive measures for net accountability • Increase IEC/BCC and more innovative ways of using a bed net • Reintroduce Peers -Run to advocate for net use • Propose a new strategy for distribution in urban areas • Research into changing biting

		outdoor biting and transmission	pattern and transmission
Strategy 2: Continuous distribution of LLIN	• High acceptance of intervention by the target groups	• Proper documentation of nets given out to target groups is a challenge • Data capture on enrolment information in the education system a challenge	• Sensitize key personnel on need for better data capturing practices • Start data capture extremely early before start of campaign
Strategy 3: Indoor Residual Spraying for areas with high parasite prevalence	• High rate of community acceptance of program	• High refusal in urban areas • Conflict in some areas (Northern region) therefore no spraying	• Increase IEC/BCC
Strategy 4: Larval Source management	Proposals to establish an biolarvicide producing factory in country	No direct larviciding project in country	Funding to implement targeted larviciding in the country
Strategy 5: Entomological Monitoring	• Good collaboration between the Ghana Health Service staff and the NIRMOP staff.	• No large stakeholder engagnement/dissemination after entomological monitoring	• Engage stakeholders to understand and use data generated

3.1.1.4. Challenges and Lessons learnt

Mass Campaign

Lessons learnt

- Planning meetings with regions was a good opportunity to agree on timelines and budget items
- Provision of allowance for volunteers helped improve volunteer motivation for the exercise
- Early pre-validation of data before nets are sent to districts reduces risk of diversion and ensured data accuracy

Challenges

- Low coverage in registration of households and collection of nets in urban areas
- In some cases, households registered could not be physically traced
- Lack of ownership of data at sub-district and district levels was a challenge
- Most communities did not buy into the distributing using the universal coverage concept thus spots of disagreements were observed at some distribution points
- Poor commitment of regional level staff – competing programs for some regional staff assigned for post validation
- Non adherence to implementation guidelines resulting in poor accountability of nets distributed
- Inadequate vehicles mostly a challenge
- Diversion of nets resulting mostly from storage at unapproved places

Continuous distribution

Challenges

- Stock out of nets arising from poor forecasting
- Failure of facilities to notify district officers of stock outs
- Poor documentation in Nets given at ANC not entered in ANC register
- Nets given to children entered in EPI register but not in CWC register (exercise books are used sometimes)

Indoor Residual Spraying

Challenges

- Sometimes the project is not allowed to enter and spray some communities due to conflicts in some parts of Northern Ghana
- Locked structures were a challenge. Many residents of compounds with locked structures continued to report that the owners of the structures have migrated to

other areas, especially southern Ghana, to work and took their keys with them. This is despite efforts to minimize the number of locked structures through targeted IEC messages.

- Interactive engagement with community both at planning and implementation phases improved the success of the project

3.1.1.5. Recommendations for the remaining period of the MSP (2018-2020)

- The duration of the mass campaigns in the country needs to be shortened
- The supply chain and stock management should be enhanced to ensure effective distribution
- There should be improved documentation of LLINs received and distributed and precise measures must be put in place to ensure accountability of LLINs at all levels.
- The ITS(include in acronyms) projects to work with all projects on LLINs to strategize to ensure that messages clearly distinguish the IRS campaign from the net distribution
- Improve capacity of staff at districts for Entomological monitoring
- Assess the feasibility of deploying other measures such as larviciding and the use of PBO nets in areas with documented high insecticide resistance

3.1.2. INTERVENTION 2: Malaria In Pregnancy (MIP)

Malaria In Pregnancy (MIP)

3.1.2.1. Background

Pregnant women are part of the vulnerable groups that need to be properly protected from developing malaria and quickly treated when they get the disease. It had been well documented that though a pregnant woman might feel well, yet she may be harbouring loads of malaria parasites at the placenta level where red blood cells which carry oxygen and essential nutrients are destroyed, thereby leaving the mother and even the foetus anaemic and causing either premature labour to set in, delivery of low birth weight babies or congenital malaria in the new born baby.

Intermittent preventive treatment during pregnancy using SP (IPTp-SP) had been shown to be very safe and effective in clearing the malaria parasites from the placenta level when given in therapeutic doses from the second trimester of pregnancy till delivery, and also very cost effective. Antenatal care setting was thus adopted to be the point of delivery of providing this intervention to the every pregnant woman using directly observed therapy (DOT).

3.1.2.2. Progress of implementation

Implementation of IPTp is on-going nationwide, and is well integrated through antenatal clinics where pregnant women are given SP under a directly observed process by trained health workers, from the 16th week of pregnancy till delivery. It is expected that every pregnant woman takes a minimum of three doses of IPTp during pregnancy. For those pregnant women that are unable to take SP, advice on other methods of malaria prevention are given. Every registrant receives free LLIN at the ANC, and they are encouraged to sleep under them every night. Both SP and LLIN are provided free of charge to pregnant women at ANC visits.

3.1.2.2a: <u>Strategy 1</u>: IPTp during ANC

Focus antenatal is on-going in almost every facilities offering ANC services. Water is provided for the pregnant women to take IPTp-SP, after through screening would have been done to determine if the woman is qualified to take IPTp-SP.

SP Delivery: In 2015, due to the fire outbreak at the Central Medical Stores, Ghana experienced shortage of SP. The Ministry of Health Procured SP, towards the end of 2015, but quality issues was a challenge. Finally, by mid-2016, PMI supplied Ghana with three million doses of SP, and also, the initial SP by Ministry of Health was also replaced. So, there is sufficient SP in Ghana for IPTp-SP to be delivered to every eligible pregnant woman at ANC nationwide.

Health Worker Training on revised manuals and New Policy of IPT

The training manual and slides were revised, following the revision of Malaria in Pregnancy Treatment Guidelines in 2014. A total of 5,679 health workers, including Doctors and Physician Assistants, were trained in malaria Case Management, including Malaria in

Pregnancy (MiP), and diagnostics in 2015, and in 2016, a total of 5,781 Midwives and other Health Workers were trained in MiP as part of Case Management; Trainer of Trainees for 18 Regional Coordinators of GRMA was carried out, and they collaborated with Regional Malaria Focal Persons to train private midwives.

Table 8 Uptake of IPTp from 2014 to 2016

IPTp Uptake	**Year**		
	2014	**2015**	**2016**
(a) Expected pregnant women	1,090,972	1,118,871	1,147,525
(b) ANC 1 (Registrants)	879,577	944,712	954,937
(c) IPTp1	464,491	651,986	611,765
(d) IPTp2	330,100	548,213	492,288
(e) IPTp3	209,433	390,370	350,363
(f) ANC1 Coverage (b/a) %	80.6	84.4	83.2
(g) IPTp1 Uptake (c/b) %	52.8	69.0	64.1
(h) IPTp2 Uptake (d/b) %	37.5	58.0	51.6
(i) IPTp3 Uptake (e/b) %	23.8	41.3	36.7
(j) Differential ANC 1 - IPTp 1 (b-c)	415,086.0	292,726.0	343,172.0
(k) Differential IPTp1-IPTp3 (c-e)	255,058.0	261,616.0	261,402.0
(l) % Differential ANC 1 - IPTp 1 (j/b)	47.2	31.0	35.9
(m) % Differential IPTp1-IPTp3 (k/c)	54.9	40.1	42.7

Sources: GHS DHIMS 2

A research on the efficacy of SP is being conducted by Kintampo Research Institute to update the programme for decision making. This study will be completed in 2017

3.1.2.2b: **Treatment of malaria in pregnancy**

A new Malaria in Pregnancy Treatment Guideline was printed in July 2014, and every pregnant woman suspected of malaria was to be tested, and treated if diagnosis was positive for malaria.

According to the Policy Guideline, uncomplicated malaria in the first trimester of pregnancy was to be treated with oral quinine at 10mg/kg body weight) three times daily for seven days. Clindamycin at 5mg/kg body weight, in combination with quinine at 10mg/kg body weight, three times daily for three days could also be used. In 2015, WHO Treatment Guideline stated that the combination of quinine with clindamycin should be given for seven days, and we are yet to update the guideline.

In the second and third trimester of pregnancy, Artemisinin-based Combination Therapy (ACTs) or quinine are recommended for uncomplicated malaria. The options were: Artesunate-Amodiaquine (100mg/270mg) two tablets daily for three days, or Artemether-Lumefantrine (20mg/120mg) four tablets at 0 hours, 8 hours, 24 hours, 48 hours and 60 hours respectively.

Severe malaria in first trimester of pregnancy was to be managed with IV or IM Quinine until the woman can tolerate oral medication. In the second and third trimester IV/IM Artesunate was to be administered 3 doses in the first 24 hours (0 hours, 12 hours and 24 hours), and then once every 24 hours until the pregnant woman and tolerate oral medication. Full course of treatment with ACTs was to be given after IV/IM Artesunate.

However, a new WHO Treatment Guideline was released, which states that Artesunate Injection should be used for management of severe malaria in all trimesters of pregnancy. Ghana is implementing this new policy, though it is yet to revise the Guideline in line with Policy.

3.1.2.3. Enabling and Constraining factors of the MIP strategies

Table 9: Enabling and Constraining factors of the MIP strategies from 2014-2016

Strategy	**Enabling factors**	**Constraining factors**	**Proposed solutions**
Strategy 1: IPTp	-Focus ANC	-Lack of midwives in some CHPS	-Send midwives to all CHPS
	-High ANC attendants (above 80%)	-Unwillingness of some health providers (private) to implement IPTp-SP	-Advocacy
	-Monthly administration of SP	-Poor data management at facility level	-Data validation before reporting into DHIMS-2
		-Non reporting of some health	-Advocacy and uniformity of

	-Free ANC and SP	institutions into DMHIS-2 -Occasional shortage of SP partly due to delays at FDA during quality assessment. -Some health workers not complying to DOTS strategy	reporting soft wares -Strengthening of supply chain all levels; and streamlining processes of quality assessments at FDA. -Training of all Health Worker in SBCC; SBCC in the communities
Strategy 2: Continuous distribution of LLIN	-Focus ANC -Continuous free distribution of LLIN to ANC registrants -Health Talk on LLIN use	-Compliance of pregnant women (most are not sleeping under LLIN) -Heat generation under LLIN due to non-circulation of air -Occasional shortage of LLIN at ANC	-Community advocacy -Intensify health talk at facilities -SBCC -Strengthening of supply chain at all levels

3.1.2.4. Challenges and Lessons learnt

Challenges

- Weaknesses in the area of data management, stock availability and SBCC (at facility and community levels).
- Inadequate finances MIP strategies at all levels.

Lessons learnt

- There is need for regular monitoring, supervision and provision of on the job training for ANC staff and those providing supportive services in the communities and advocacy on IPTp-SP at all levels.
- There is the need for training of NGOs to monitor pregnant women and support them by providing advocacy, communication and social mobilization activities at the community level in collaboration with CHOs.

3.1.2.5. Recommendations for the remaining period of the MSP (2018-2020)

- More finances should be made available by NMCP and Partners to ensure that the lessons learnt are implemented.
- FDA should streamline procedures at its end for faster assessment of medicinal products.

3.1.3. INTERVENTION 3: Seasonal Malaria Chemoprevention (SMC)

3.1.3.1. Background

Following the WHO recommendation of SMC as an intervention, Ghana adopted it in 2013 and included it in the NSP for implementation using the recommended medicine Amodiaquine plus Sulphadoxine-Pyrimethamine (AQ+SP) (NSP,2014; pg.41&54, 2014). The target population is children aged between 3 and 59 months living in the Northern Savannah area covering the Upper West, Upper East and Northern regions. This choice of these regions was influenced by two major factors: The seasonality of transmission and high burden as initially demonstrated in the 2011 MICS.

3.1.3.2. Progress of implementation

SMC was implemented in the Upper West region in 2015 as a pilot, targeting 148,107 children 3-59 months old and was scaled up to the Upper East region in 2016 targeting 215,845 children between 3 and 59 months. In 2015, 78% of the targeted population was reached with four rounds of doses of AQ+SP. In 2016 however an average of 82.1% of the target populations were reached in both regions with 2 rounds of doses due to challenges encountered with the supply of the medicines.

In 2015 the DFID supported the implementation by procuring the medicines for the Upper West region. In 2016 however, the inability of the GF supplier to deliver the medicines in a timely manner affected the schedule of dosing, resulting in the implementation of two out of the four rounds planned.

3.1.3.2 a: SMC coverage 2015-2016

Table 10: SMC Coverage 2015-2016

I SMC Coverage	**2015**	**2016**
(a) Coverage of SMC targeted districts	11	24
(b) Number of targeted children	148,107	363,952
(c) Number of children reached for the 1st round	111,593	292,216
(d) Number of children reached for the 2nd round	113,382	313,722
(e) Number of children reached for the 3rd round	118,053	0
(f) Number of children reached for the 4th round	118,208	0
(g) Coverage of the 1st round (c/b)	75%	80.3%
(h) Coverage of the 2nd round (d/b)	77%	86.2%
(i) Coverage of the 3rd round (e/b)	80%	N/A
(j) Coverage of the 4th round (f/b)	80%	N/A
% of children reached by the 4 rounds	78%	***83.3%

Source: SMC implementation report 2016

3.1.3.2b: SMC Campaign in 2016

Table 11: SMC Coverage per round,per targeted District, 2016, Upper West region

Health District	Targeted children	1st round coverage (%)	2nd round coverage (%)	Partners
Daffiama Bussie Issa	7,004	65.1	67.5	**GF**
Jirapa	19,002	52.5	54.1	**DFID**
Lambussie-Karni	11,103	61.1	61.8	
Lawra	11,959	53.0	55.0	
Nadowli-Kaleo	13,285	68.6	70.3	
Nandom	9,737	60.9	62.1	
Sissala East	12,151	91.4	91.4	
Sissala West	10,656	85.9	88.8	
Wa East	15,493	78.0	80.6	
Wa Municipal	23,046	99.7	103.4	
Wa West	17,486	92.1	96.2	

Source of data: SMC implementation report 2016

Table 12: SMC Coverage per round,per targeted District , Upper East region,2016

Health District	Targeted children	1st cycle coverage (%)	2nd cycle coverage (%)	Partners
Bawku Mun	20,322	85.9	92.1	
Bawku West	19,392	84.5	92.2	
Binduri	12,702	81.9	93.2	
Bolgatanga Mun	27,132	83.4	97.4	
Bongo	17,436	90.9	94.2	
Builsa North	11,646	81.1	80.3	
Builsa South	7,530	59.2	83.4	
Garu Tempane	26,814	88.9	96.9	
KNM	22,674	76.6	75.3	
KNW	14,574	68.3	81.7	
Nabdam	6,978	103.6	108.0	
Pusiga	11,898	87.7	92.7	
Talensi	16,746	75.3	93.8	

Sources of data: SMC implementation report 2016

3.1.3.2c: SMC Pharmacovigilance

Pharmacovigilance has been a key part of the SMC implementation. Dedicated teams made of officers from the Ghana Health Service and the Ghana Food and Drugs Authority (FDA) monitored and followed up on all cases of adverse drug reaction (ADR) reported by volunteers and caregivers following the administration of SMC medicines. As a result of the effective monitoring most ADRs were identified and followed up on.

Table 13: ADR for SMC 2015-2016

Number of Adverse Drug Reactions (ADRs) reported by volunteers	**2015**	**2016**
(c) Number of ADRs reported for the 1st round	59	298
(d) Number of ADRs reported for the 2nd round	103	140

(e) Number of ADRs reported for the 3rd round	47	0
(f) Number of ADRs reported for the 4th round	56	0

3.1.3.3. *Enabling and Constraining factors of the SMC strategies*

Table 14: Enabling and Constraining factors of the SMC strategies

Strategy	**Enabling factors**	**Constraining factors**	**Proposed solutions**
Strategy 1*: SMC *Campaign (coverage)	High level of dedication from health sector and other partners	Inadequate drug supply Lack of other incentives for volunteer, e.g., raincoats and wellington boots	Lobby other partners and government of Ghana to procure adequate medicines for the strategy
Strategy 2*: *SMC pharmacovigilance	Good collaboration exist between officers from the Ghana Food and Drugs Authority and the Ghana Health Service	Most of the forms were not filled properly hence proper training of filling of the forms should be carried out. Most of the forms did not contain the strength of the drug hence making it difficult to categorize the ADR'S as per the SMC'S scheduled. The ages and weight were not filled for most forms hence it becomes difficult to categorized the ADR'S into ages or weight.	Adequate training to be given to volunteers on how to complete the ADR forms and Strengthen supportive supervision

3.1.3.4. Challenges and Lessons learnt
Challenges

- Late arrival of logistics from the National level affected the distribution to the sub-districts. Volunteers could not also have a firsthand experience on the use of the register and this resulted in some registration errors during the exercise.

- Inadequate number of registers and this resulted in the pairing of volunteers to use one register thus slowing the pace of the exercise.
- Some suspected cases of ADRs were not reported by volunteers and caregivers since they considered not serious enough to be reported. E.g. itching was one of the common complaints by children but some volunteers overlooked and did not report.

Lessons learnt

In the second round of SMC in Upper West region, the TB control programme partnered the NMCP to undertake active TB case search in the communities. This resulted in new cases of pediatric TB being identified. The integration of other programs with SMC could help improve active case search of other communicable disease.

3.1.3.5. Recommendations for the remaining period of the MSP (2018-2020)

There will be the need to look at sub regional Parasitemia as we move towards elimination

All efforts should be made to ensure 4 rounds of SMC dosing is implemented in targeted districts

3.2. Objective 2: To provide parasitological diagnosis to all suspected malaria cases and provide prompt and effective treatment to 100% confirmed malaria cases by 2020

3.2.1. Background

Case management is one of the main interventions to reduce malaria morbidity and particularly mortality. In the national strategic plan, case management falls under the second objective which seeks to provide appropriate diagnosis to all suspected malaria cases and prompt and effective treatment to 100% of confirmed malaria cases by 2020. Case management has two main components viz:

Diagnosis and Treatment

Ghana has been implementing the new WHO treatment guidelines for the use of ACT for uncomplicated malaria since 2004. The first line treatment is with Artesunate amodiaquine with alternate first lines being Arthemether-Lumefantrine and Dihydro-artemisinin

Piperaquine. Since 2012, following new evidence of injection artesunate as being superior to injection quinine in managing severe malaria, the national guidelines have been revised.

3.2.2. Progress of implementation

3.2.2.a: Strategy 1: Provide quality malaria diagnosis to all suspected cases at all levels

As an effort to improve upon testing which was as low as 38.9% in 2012, Ghana adopted the T3 approach of Test, Treat and Track. Routine laboratory confirmation has been by microscopy and Rapid Diagnostic Tests (RDTs). During the period under review, there was infrastructure strengthening through the procurement of microscopes, supply of RDTs, capacity building for laboratory personnel, provision of SOPs for laboratory and OTSS.

Table 15: Supply of equipment and commodity for malaria diagnosis, 2014-2016

Equipment/Commodity	2014	2015	2016
Microscopes	**0**	**0**	**0**
Reagents for public laboratory	0	0	0
Distributed RDTs	9,309,200	3,778,325	4,773,248
RDTs stock-outs	3764	4146	4388

Sources : DHIMS 2

Table 16: Malaria diagnosis indicators from,2014-2016

Items	Year		
	2014	2015	2016
(a) Number of suspected cases	8453557	10186510	10449489
(b) Number of cases tested by RDTs	4195490	5466464	5576600
(c) Number of cases tested by microscopy	2017874	2035702	2582961
(d) Total of cases tested by RDT or microscopy (b + c)	6213364	7502166	8159561
(e) % of tested cases (d/a*100)	73.5	73.6	78.1
(f) total confirmed malaria	3223540	4319919	4608427
(g) Test positivity rate (f/d*100)	51.9	57.6	56.5

Source: ***GHS DHIMS 2***

3.2.2.b: Strategy 2: Strengthen health worker capacity for malaria case management

During the period under review, there were annual trainings of health workers in both public and private facilities There were distribution of treatment guidelines, manuals and algorithms

to guide provider in case management. Curricula of health training institutions were updated. To ensure compliance to guidelines, regular supportive supervision were conducted.

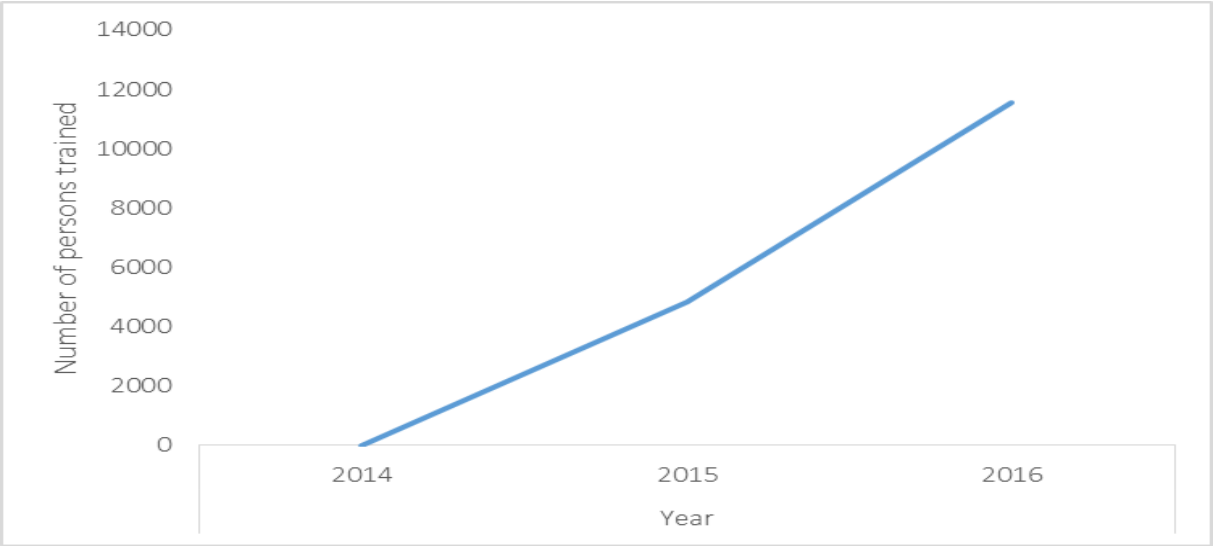

Figure 5: Training on case management including the diagnosis conducted, 2014-2016

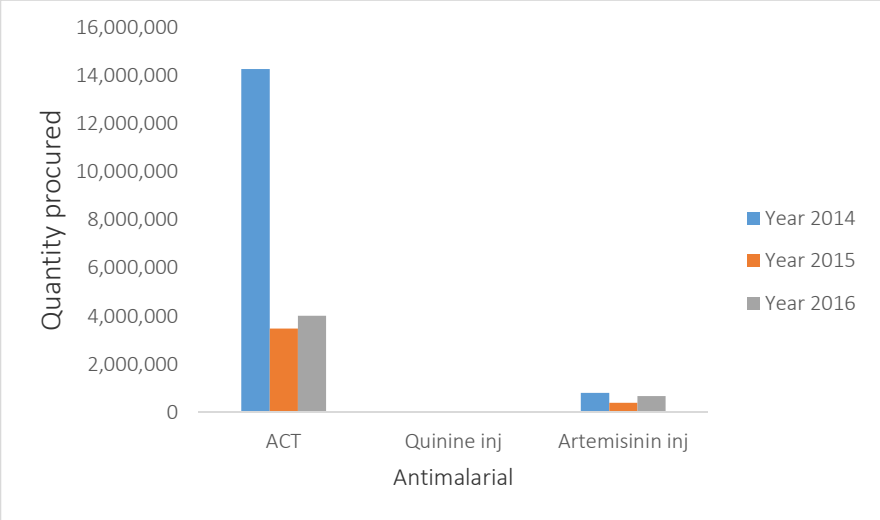

Figure 6: Commodity procurement, 2014-2016

Table 17: Case management indicator Progress 2014-2016

Items	**Year**			
	2014	**2015**	**2016**	Total
(a) Number of malaria cases reported	8,453,557	**10,186,510**	**10,441,515**	29,081,582

(b) Number of confirmed cases	3,223,540	4,319,919	4,532,705	**12,076,164**
(c) Total malaria cases who received ACT treatment	6,957,277	5,845,998	5,749,734	**18,553,009**
(d) Total confirmed malaria cases who received ACT treatment	3,223,540	4,319,919	4,532,705	**12,076,164**
(e) Total number of severe malaria who received injectable treatment with Quinine	-	-	-	-
(f) Total number of severe malaria who received injectable treatment with artemisinin	-	-	-	-
Total number of severe malaria who received injectable treatment with artesunate/Quinine	430,446	409,947	379,986	**1,220,379**

Sources : NMCP Annual Reports

4.2.2c: Strategy 3: Management of Severe Malaria at Health Facilities

The strategy was strengthening the management of uncomplicated and severe malaria at the health facilities. This was done through training, triaging of cases and the provision of quality assured medicines and logistics to health facilities.

Stock management has improved significantly through capacity building for quantification, however there were some documented stock outs of SP in particular. There has been over 60% reduction in case fatality from the 2012 baseline. The proportion of deaths attributable to malaria decreased from 7.2% in 2014 to 4.2% in 2016

There is improvement in compliance to the T3 policy. Since 2012, the proportion of OPD malaria cases, tested by microscopy or RDT, has been increasing. From a low figure of 38.9% in 2012, this has risen to 77.3% in 2016. In 2016, number of suspected malaria cases put on ACTs dropped to 55.1% from 82.3% in 2014. This reduction in the use of ACTs is due to increase in the parasitical diagnosis of suspected malaria cases thus reduction in the over use of ACTs. The latest monitoring results showed efficacy of AA at 99.2% [95% CI (97.4 – 99.8%)] and AL at 95.9% [95% CI (92.4% – 97.9%)].

3.2.3. Challenges and lessons learnt

Challenges

- Occasional non-availability of injection Artesunate at some health facilities

- Frequent shortage of rectal Artesunate at primary level/CHPS for pre-referral treatment
- Delay of severe malaria cases accessing treatment from receiving facilities due to geographic and economic reasons.

Lessons learnt

- Health workers are willing to follow the T3 policy once all commodities especially, RDTs are available.

3.2.4 Strategy 4: Increase access to Community Management of Malaria through integrated community case management (CHPS)

The Malaria Home based care strategy has been integrated with the CHPS concept by the Ghana Health Service (GHS). Training manuals for Community Health Officers (CHOs) have been revised in line with this new directive and the GHS has devised strategies to train all CHO in the country.

3.2.5 Strategy 5: Improve access to diagnosis and treatment in the private sector and enforce adherence to guidelines in the private sector

The NMCP in partnership with the Society of Private Medical and Dental Practitioners (SPMDP) have trained all prescribers in malaria diagnosis and treatment. In addition health facilities are supplied with the recommended ACT's to improve availability of medicines. Periodic supportive supervision are conducted by the SPMDP facilitators and Ghana Health Service trainers.

3.2.6. Enabling and Constraining factors of the Case management strategies

Table 18 Enabling and Constraining factors of the Case management strategies from 2014-2016

Strategy	Enabling factors	Constraining factors	Proposed solutions

Strategy 1: Provide quality malaria diagnosis to all suspected cases at all levels	Availability of trained/skilled HCP at most health facilities	Supply chain management of logistics eg RDT, reagents Lack of functional microscopes at some health facilities Inadequate number of trained malaria microscopists	Improve on supply chain management, procurement of RDTs and quality lab reagents Provision of functional microscopes Training in malaria microscopy and basic maintenance of microscopes
Strategy 2: Strengthen health worker capacity for malaria case management	Availability of updated treatment guidelines, SOPs Availability of skilled, motivated facilitators/trainers	Printing and dissemination of treatment guidelines, SOPs Inadequate transfer of skills and knowledge acquired between health staff	Funding for printing and dissemination of treatment guidelines, SOPs Strengthen supportive supervision
Strategy 3: Management of Severe Malaria at Health Facilities	Change in policy to use of Injection Artesunate as drug of choice for the treatment of severe malaria	Supply chain management challenges related to the stocking and distribution of Inj. Artesunate and rectal Artesunate. Delay in recognition and inadequate monitoring of complications in severe malaria	Provide training in early recognition of complication and acute care to critically ill patients Improve supply chain management related to the stocking and distribution of Injection Artesunate and rectal Artesunate
Strategy 4: Increase access to Community Management of Malaria through integrated community case management	Change in policy to place community based management under the CHPS programme	CHPS program not directly under the NMCP thus affecting fast implementation	NMCP should liaise with GHS agency responsible for CHPS to fasten the process.
Strategy 5: Improve access to diagnosis and treatment in the private sector and enforce compliance to guidelines	strong partnership with SPMDP	Some big private facilities not members of the SPMDP so not benefitting from training	Health Facilities Regulatory Authority (HFRA) to inspect evidence of prescribers training

in the private sector			before accreditation.

3.2.7. Challenges and Lessons learnt

Challenges

- Inefficient communication within the supply chain management system
- Short shelf life of some ACTs
- Inadequate number of printed copies of treatment guidelines at the facilities

Lessons learnt

- Supportive supervision increases compliance to treatment protocols

3.2.8. Recommendations for the remaining period of the MSP (2018-2020)

- To intensify the training of prescribers to test all suspected cases of malaria and compliance to test results in treatment using interpersonal relations and other advocacy measures to attain compliance.
- To intensify diagnostic refresher trainings for Laboratory professionals to ensure quality of testing.These trainings would involve professionals in pre-service institutions and lecturers alike
- Conduct Onsite Training and supportive supervision and Proficiency Testing schemes for the detection of malaria parasites, identification of the parasite species and quantification of the parasites also known as parasite count or density.
- Training of health staff in early recognition of complications and provision of intensive care to critically ill patients
- To liaise with FHD/PPME who are coordinating CHPS activities to accelerate the training of CHOs in the home based care management of malaria.
- To continue collaboration with SPMDP to provide supportive supervision to prescribers and also ensure availability of ACT's in private facilities.
- To liaise with HFRA to insist on inspection of evidence of staff training before accreditation is given to private facilities

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

3.3.1: Background and Progress of Implementation

The NMCP is under the Disease Control Division of the Public Health Directorate. The current placement of the NMCP in the Ghana Health services' organogram is good but activities of the NMCP should be given a much bigger prominence. This could be done through the Malaria Interagency Coordinating committee (MICC). The MICC held annual meetings in period under review and these meetings were jointly held with the PMI stakeholders' annual meeting. The following working groups were active during the period under review

- The Malaria Vector Control Oversight Committee. (MAVCOC)
- Case management
- Malaria In Pregnancy
- Research and innovation
- Malaria Vaccine Technical Working Group

The Integrated Community Case Management (ICCM) working group is not functional because ICCM has been absorbed under the Community based Health Planning and services (CHPS) programme which is being implemented by the PPME division of the Ghana Health Service. The Cross-Border Collaboration committee has not drawn out clear plans for any activities to begin.

All regions have designated focal persons for malaria and all districts have assigned personnel for malaria. Operational planning for malaria is done at the regional level. At the district and sub district levels, integrated planning is done but with well-defined malaria components.

- There are regional and districts malaria targets

- However, there are no clearly outlined targets at the lower levels (below the district level)
- Guidelines for case management, SOPs for laboratory diagnosis, MIP guidelines, LLINs distribution- documents were not easily traceable
- IEC materials were inadequate and the few that are available were (torn, defaced)
- All the regions had regional trainers however, training for health staff at the regional level is coordinated from the national level
- Many health workers have not received malaria training in the last 12 months particularly in the hospitals

3.3.2 Partnerships and collaboration

The NMCP collaborates with several partners at the national level. Tables 19 and 20 show the partners and the areas of collaboration with the NMCP

Table 19: Partners and area of support in Ghana, 2014 -2016

Partner	Intervention						
	CM	SMC	IPTp	LLIN/IRS	BCC	SME&R	Advocacy
DFID		X					x
UNICEF			x				x
USAID/VectorWorks				X	x		

USAID/Communicate for Health					x		
USAID/People for Health							x
USAID/Systems for Health	x		x				
USAID/Evaluate for Health						x	
USAID/Malaria Care	x						
USAID/SHOPs	x						
WHO (TA)	X	X			X	X	X

Table 20: Partners and area of support in Ghana-2, 2014 -2016

Partner	Intervention					
	CM	IPTp	LLIN/IRS	BCC	SME&R	TA/Advocacy
PATH	x					
PMI/Abt Associates			x			

AGA Mal			x			
JHPiego	x	x				
NMIMR					x	
Dodowa HR					x	
Kintampo HR					x	
Navrongo HR					x	

In the regions, the Regional Malaria Focal Persons coordinate and supervise malaria activities in the districts by collaborating with the district Malaria Focal Persons. In the district where health partners exist they collaborate with the District Health Management teams (DHMTS) and sometimes are invited to the district's half year/end of year review meetings but are not usually invited to quarterly DHMT meetings.

3.3.2a: <u>Strategy 1:</u> Regional and national malaria reviews

The NMCP participates in annual regional program reviews of the Ghana Health Service; these reviews provide opportunity to provide update to regions and the various districts and sub districts that make up the region on malaria control interventions, new policies and directives

and to learn from the regions any best practices in implementing malaria control policies as well as challenges.

3.3.2b: Strategy 2: Improve capacity for programme management at all levels

The NMCP together with partners built the capacity of key national staff particularly in vector control and entomological capacity through the WHO sponsored training. This, however is yet to be extended to some of the regional and district malaria focal persons. Key staff from the NMCP and some regional and district focal persons participated in relevant training meetings, seminars and conferences at national and international levels. There is the need to ensure that all regional and district focal persons are given the opportunity for this training.

3.3.2c: Strategy 3: Facilitate Biannual Malaria Interagency Coordinating Committee and working group meetings

The various technical working groups under the Malaria Interagency Coordinating Committee continued to hold scheduled meetings to discuss issues that are critical to implementation success. The Malaria In Pregnancy Working Group for example during one of their meetings decided to embark on a person to person/facility to facility advocacy campaign to encourage facilities to implement new IPTp guidelines and to find out challenges with uptake of IPTp. The Diagnosis working Group have been working on 'improving the skills of Microcopists' and developing a Diagnosis assessment guidelines

3.3.2d: Strategy 4: Advocate at corporate and parliamentary levels for increase resource allocation to malaria control activities

To achieve this objective the National Malaria control programme organized a series of stakeholder engagements to be able to get stakeholder inputs and engender ownership by all. The Parliamentary Select Committee on health was part of the stakeholder engagements. At the end of these engagements stakeholders agreed that a public-private partnership to establish a malaria foundation will facilitate the raising of funds to support malaria control. Subsequently, a private sector-led Ghana Malaria Foundation (GMF) has been set up to lead the process of raising domestic funds for malaria. The GMF is registered as a company limited by guarantee

and it is governed by a Board of Trustees. The Foundation was launched during the 2017 World Malaria Day commemoration.

3.3.2e: Strategy 5: Develop and implement a financing sustainability plan for accelerated malaria control

In collaboration with stakeholders a Financial Sustainability and Resource Mobilization Plan has been developed. One of the strategies under the Plan is to engage the capacities of the private sector in resource mobilization; to foster this, the GMF was established. Also, the NMCP in collaboration with Produce Buying Company (PBC) one of the main buyers of Cocoa in the country carried out a situational analysis of the use of malaria intervention in the central and western regions among cocoa farmers to assess their need for malaria control interventions. The objective of the situational analysis was to facilitate a corporate based set of malaria control interventions that would benefit the PBC cocoa farmers and the communities in which they operate.

Challenge – although the report has been shared with PBC; the organization is yet to make a firm commitment to starting a corporate based malaria program with support and advice from the malaria control program.

3.3.2f: Strategy 6: Ensure efficient and effective procurement and logistics management

Ghana‘s public sector has a comprehensive integrated supply system, which is served by a Central Medical Store (CMS) and ten (10) Regional Medical Stores (RMS). The flow of malaria commodities from the central level to the service delivery points in the public sector follows a 3- tier system:- Central medical Store, Regional Medical Store and District Medical Store. Lower level health facilities, especially the health centres and CHPS compounds rely on the District Health Administration for the transportation of their commodities. The NMCP has a focal person for Procurement who has additional duties of working with the MOH Procurement Unit. Morbidity data is still used to determine logistic needs and the flow of commodities monitored by an electronic system.

During the review, Stocks of ACTs and LLINS were fairly stable over the period. RDTs and SP stock outs were regular phenomenon in the hospitals where in certain instances this same commodities (RDTs and SP) were available in the regional or district medical stores. There is the need to develop a robust standardized logistic management information system across all levels which will use consumption data instead of morbidity data. There is also the need for regular auditing of logistics management and commodities and the need for change in attitude of all staff across all levels.

3.3.2g: Strategy 7: Ensuring Alignment with West Africa Health Organization Malaria Strategic Plan and Cross-Border Collaboration

The NMCP with other West African countries are yet to work with the West African Health Organization (WAHO), to prepare a Regional Strategic Plan for sustaining and accelerating regional malaria control towards elimination.

To strengthen cross border collaboration, the program will have to collaborate with WAHO to develop with other African Countries, a cross-border strategy to accelerate malaria control towards attaining pre-elimination/elimination in the sub-region.

3.3.3

Table 21: Enabling and Constraining factors on Program Management

Strategy	Enabling factors	Constraining factors	Proposed solutions
Regional and national malaria reviews	These meeting are planned and held regularly	There are other competing diseases needing attention	Continue to advocate for prioritization of malaria as a Public health concern.
Improve capacity for programme management at all levels	Availability of WHO, RBM, NMCP and other Malaria training programs	Inadequate funds Staff unavailability due to competing programs	Ensure that key regional and district focal persons are trained in malaria
Facilitate Biannual Malaria Interagency Coordinating Committee	Malaria is seen by all to be a priority disease deserving	Meeting held with PMI and all its partners. Agenda for	Need to separate MICC meetings from PMI/partners meetings

and working group meetings	necessary attention	PMI may be overshadow by MICC	
Advocate at corporate and parliamentary levels for increase resource allocation to malaria control activities	GMP has been launched	GMF has its own trustees but could also have sectional interest which could defeat the purpose.	Need for the GMF to properly interface with the NMCP resource mobilization working group.
Develop and implement a financing sustainability plan for accelerated malaria control	Financial Sustainability and Resource Mobilization Plan has been developed	Inadequate funds and other competing programs	Collaborate with National Health Insurance Authority and other Health Insurance Schemes in Ghana to improve financial access
Ensure efficient and effective procurement and logistics management	There is a NMCP focal person for Procurement who links with MOH Procurement unit	MOH procurement unit serves all other programmes in The Ghana Health Service	Develop a national LMIS Regular auditing of the logistics management and commodities
Ensuring Alignment with West Africa Health Organization Malaria Strategic Plan and Cross-Border Collaboration	Readiness of neighbouring countries to agree on strategies for cross border activities	NMCP already works with WAHO	Use WAHO to push the agenda thereby bringing all countries on board

3.4 Objective 4: To strengthen the system for the surveillance, monitoring and evaluation in order to ensure availability of quality, consistent and relevant malaria data at all levels by 2020

3.4.1. Background

Monitoring and evaluation forms an essential aspect of the program and ensures that results (outputs, outcome, impact) at all levels provide the basis for accountability and decision-making at program and national levels. The strategic plan 2014-2020 for Malaria Control is supported by an M&E plan, which aims at reinforcing the information system for Malaria control in Ghana. This will provide timely, accurate, reliable and valid data for planning, management and decision-making. The programme will develop a grid of core indicators for regular monitoring of malaria status in the country.

3.4.2. Progress of implementation

3.4.2.a <u>Strategy 1:</u> Operations Research to inform programme direction

The programme was to establish a strong collaborative initiative with research institutions, research working group and together define a malaria operational research agenda for which resources will be mobilized. The programme was to provide a forum for research results dissemination/sharing.

At the same time, the strategy was to see to the introduction of a malaria vaccine after 2015 following recommendation for its roll out. The most clinically advanced candidate is undergone phase 3 evaluation in young African children across 13 clinical sites in eight African countries including Ghana. There are two sites: Agogo and Kintampo being used for the trials which was completed in 2015. WHO recommended for piloting to begin in 2016 and subsequently the Government of Ghana put in an expression of interest and was selected among three countries to do the pilot. Since October, 2016, there have been a series of in-country consultations with policy makers and stakeholder and technical working group sessions for Site selections, Plans for clinical surveillance (assessment of sentinel hospitals) and Communication strategies among others.

3.4.2b: <u>Strategy 2:</u> Enhance routine surveillance and Use

In collaboration with the Policy, Planning, Monitoring and Evaluation Department of the GHS, NMCP has supported the strengthening of DHIMS 2, which continues to improve functionality of the DHIMS in terms of improved visibility of national data, reporting rate and reduction in down time of the reporting system. In 2014 the NMCP adopted the use of the OPD morbidity form as the main form for reporting OPD malaria indicators and this involved updating the form with all relevant OPD malaria indicators. The use of the monthly case reporting form (CRF) was therefore discontinued. The reporting rate for the Monthly OPD morbidity (through DHIMS) was 90% in 2016, and timelines improved from 62.6% to 82.5%. There were improved efforts at increasing data quality and strengthening of data validation and verification in the DHIMS across the country with additional support from the zonal data managers.

Quarterly malaria bulletin was institutionalized to give feedback to regions and partners on data and activities of the NMCP

Stakeholders: There is a Monitoring and Evaluation Technical Working Group (METwG) for monitoring and evaluation. 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.

- Objectives of the Routine System

  - 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
  - To create and maintain thirty malaria prevalence surveillance system

Indicators

The following lists the key impact outcome, and output indicators to be monitored.

Impact

Under five, all-cause child mortality

Malaria incidence rate

Malaria parasite prevalence

Severe anaemia prevalence among children

Outcomes

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

Outputs

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 (%)

Data collection

- 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

3.4.2c: <u>Strategy 3:</u> Enhanced coordinated monitoring of programme progress

There has been close collaboration with regional and district malaria focal persons over the years. Two annual review sessions have been held with regional malaria focal persons as a way of harmonizing regional level activities and also to orient them on new developments at the national level.

In a bid to improve monitoring and evaluation systems at district and regional levels, laptops, desktop computers and printers were supplied to all district health directorates over the period. This has enabled district officers to have multiple platforms to enter and verify data from lower levels.

3.4.2d Strategy 4: Support Population-based Surveys and Dissemination

Two major population based surveys were conducted between 2014 and 2016; DHS 2014 and MIS 2016. Results from the DHS 2014 revealed improvements in coverage and utilization of malaria control interventions. There was also a marginal decrease in malaria prevalence from 27.5% in MICS 2011 to 26.7% in 2014. Results from MIS 2016 are yet to be released. In collaboration with NMIMR the programme has thirty facilities (sentinel sites) across the country for malaria prevalence studies year by year. Other surveys commissioned and completed were the study of malaria on Businesses in Ghana, BCC impact study, evaluating the impact of Seasonal Malaria Chemoprevention, Factors contributing to malaria mortality in the Northern region, Ghana and Durability studies on LifeNet LLINs. A Rapid Impact assessment (RIA) was carried out and is about to be published. As part of the piloting of SMC in Upper West region, an impact evaluation study was commissioned in 2015. Results from the evaluation study guided the NMCP to scale up to Upper East region in 2016. A quarterly malaria bulletin was institutionalized to give feedback to regions and partners on data and activities of the NMCP.

3.4.2e: Strategy 5: Conduct mid and end of term reviews

A mid-term review of the strategic plan has commenced. Recommendations from the review will advise the NMCP to either develop an addendum which takes into consideration new targets or revised the national strategic plan altogether. An end term review is however being planned for 2020.

3.4.2f: Strategy 6: Rapid Response To Malaria In Emergency Situation

Discussions are still ongoing with the Disease Surveillance Department of the Ghana Health Service to review the current Integrated Disease Surveillance and Response plan. The discussion is mainly on the need to gather more data at sub-national levels to identify areas where epidemics of malaria have occurred due to natural disasters or climate change effects.

3.4.3.

Table 22*:* Enabling and Constraining factors of strategies for Surveillance, Monitoring and Evaluation

Strategy	Enabling factors	Constraining factors	Proposed solutions
Strategy 1: Operations Research to inform programme direction	Available research institutions working with the NMCP	Other competing programmes from research institutions	Set up clinical (sentinel) sites for assessment.
Strategy 2: Enhance routine surveillance and Use	Malaria data collected as part of DHMIS	Non-availability of lap top computers at the sub-districts	NMCP to continue to train sub-district staff and provide them with laptops to improve malaria data
Strategy 3: Enhanced coordinated monitoring of programme progress	There is close collaboration with regional and district malaria focal persons.	Non-availability of key malaria focal persons at the sub-district levels	District focal persons to identify key malaria focal persons at the sub-districts for improved monitoring
Strategy 4: Support Population-based Surveys and Dissemination	Partners willingness to support surveys, DHS 2014 and MIS, 2016 conducted	Established research institutions have other tasks from other partners	NMCP to use available/existing research institutions to ensure all surveys are conducted.
Strategy 5: Conduct mid and end of term reviews	WHO willing to provide support for MTR and ETR	NMCP at the same time writing a proposal to seek Global Fund support during the MTR	NMCP to develop an addendum which takes into consideration new targets for the MSP
Strategy 6: Rapid Response To Malaria In Emergency Situation	NMCP has strong relations with the Disease Surveillance department of the GHS.	Need to gather more data at sub-national levels to identify areas where epidemics of malaria have occurred due to natural disasters or climate change effects.	Review the current Integrated Disease Surveillance and Response

3.4.4. Challenges and Lessons learnt

Challenges

- Supply of reporting forms and registers not regular
- Poor supervision at the lower levels (Sub-Districts)
- Inadequate supervision from regional to district and facility level
- Quarterly malaria bulleting not updated regularly on the NMCP website

Lessons learnt

- There are several private research institutions which can be brought on board to take up short term contracts to ensure that all planned activities are done.

Recommendations for the remaining period of the MSP (2018-2020)

- NMCP to Back-up systems for facility data (External Drives)
- The NMCP should supply laptops to all facilities where facilities data are stored with easy retrieval and avoid individuals using their personal laptops to store institutional data.
- HIO/DCO at the District levels should support facility level (especially Hospitals) in data management.
- RHMT and DHMT are to strengthen monitoring and supervision at regional and district level (Both Desktop and On-site)
- In service training should be on-site and targeted to the needed skills
- It is about time for the NMCP to have district based malaria epidemiology maps to know where the NMCP would have to put in more efforts as Ghana moves towards Malaria Elimination.

3.5 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

3.5.1. Background

Principal activities on Social and Behaviours Change Communication was to focus on achieving increased awareness and effective utilization of preventive (LLINs, IPTp, IRS, Larviciding and environment) interventions, and malaria case management (facility, community levels). SBCC activities were also to address issues such as: Late and inconsistent ANC attendance; IPTp acceptance and uptake; IRS household acceptance and other vector control interventions; Usage, Maintenance and care for LLINs; Adherence to treatment and case management protocols by prescribers; Patient demand for proper diagnosis before treatment and Uptake of health care at the community level (iCCM)

3.5.2. Progress of implementation

3.5.2.a Strategy 1: Develop a comprehensive national malaria communication strategy

Social and Behaviours Change Communication (SBCC) activities have been informed and guided by a holistic national strategy. The strategy has been revised to reflect the emerging global policies, changing trends in communication and lesson learnt from implementing activities. The review of SBCC strategy has been based on evidence generated through the MICS (2011), GDHS (2014) PMI MOP 2014 for Ghana as well as annual reports from the NMCP, and is closely linked to the National Strategic Plan for Malaria Control (2014-2020). The strategy is also guided by three social and behaviour change theories; Diffusion of Innovation, Stages of Change and Social Ecological Model.

The strategy focuses on seven intervention areas including malaria vaccine and SMC and outlines various segment of audiences, behaviour analysis and prioritization, communication channels, messages as well as tools to be used to carry out the SBCC activities.

Informed by the additional findings, the SBCC strategy, specifically, addresses the gaps on key benefits to target groups and barriers to positive malaria control behaviours, medium of dissemination and indicators for evaluating and monitoring.

Partners have been guided by the national document drawing on their unique specific advocacy, theoretical frameworks, best practices such as using a combination of approaches and channels to reach identified target groups. Collective campaign planning has served as an effective platform to ensure target audience alignment, strategy affirmation and standardization of messages.

Impact assessment of TV and radio BCC studies was started in 2016 and results after its finalization in the year 2017 will inform design and implementation of subsequent SBCC campaigns.

4.5.2b: <u>Strategy 2:</u> Advocacy for sustained malaria control

The National Communication committee sub-committee has been working closely with resource mobilization subcommittee in devising strategies for engaging political leaders, policy makers, opinion leaders and corporate bodies for support for malaria control to sustain malaria control efforts The goal of this advocate for domestic funding and support and its line with the country's Resource mobilization Plan. Periodically, updates, feedback and progress reports to government, partners on national scale up campaigns and stories of interest are given.

A documentary and brochure have been developed in this regard which focuses on projecting the specific needs, gaps and suggested areas for support. This will be widely circulated after it's official launch.

Regional Health Promotion Officers and malaria focal points are responsible for malaria advocacy, SBCC activities at the regional level. Each region at least has one health promotion officer responsible for all health promotion activities, covering all technical areas, including malaria, at the regional level. There is also a close collaboration with the National Health Promotion and the NMCP to ensure activities/messages are synchronized. These are supported usually by the regional malaria focal persons/ officers. However at the district levels, there are few districts with professional health promotion officers. Other health workers such as public health/community health nurse or information/disease control/nutrition officer are assigned the responsibility of facilitating SBCC interventions. Where available the team is supported by partner supported project officers, and NGOs.

4.5.2.c Strategy 3: Advocacy for test, treat and track among health workers

There have been a few challenges with some health workers' compliance to the diagnosis and treatment guidelines. Advocacy to improve the ability to test, adhere to test results and treat correctly will be pursued. It will explore addressing some of the reasons preventing clinicians' adherence to malaria test results for good prescriber compliance. Also the communication skills of health workers will be improved through periodic orientation and supervision and the use of quality assured diagnostics and antimalarial medicines for the population.

As part of efforts to improve health workers' compliance to diagnosis and treatment guidelines, an advocacy documentary was produced and aired on selected TV stations across the country. The documentary engaged respectable senior leaders in the health service to encourage young and practising health professionals to adhere to the test before treatment policy. The length of the documentary could not allow for extensive airing; however the content is still relevant and should be aired to achieve to sustain the advocacy. The content of the documentary is still relevant to achieving the goal of this advocacy .There has also been radio and TV advertisement on demand for testing, airing on selected media houses, in English and 7 local languages throughout the country. The objective of this multiple approach is to reinforce the message on test, treat and track.

3.5.2.d: Strategy 4: Sustained education on malaria prevention at all level

There have been multiple implementations of SBCC interventions to promote and sustain malaria preventions at all levels. Community mobilization has been key in the implementation of LLIN mass campaigns. Through mass media campaigns and community level activities, the general population have been educated on LLIN care and usage but there is still the challenge with the continuous utilization of LLINs for malaria control. This strategy seeks to ensure that the general population uses LLINs daily for prevention during all seasons.

Risk factors and behaviours towards malaria control interventions will be identified through scientific approach. Then all the current strategies being used will be evaluated against the identified factors. Specific community mobilization campaigns will be built in with each intervention, such as LLINs mass distribution or IRS campaigns. Malaria prevention and control media campaigns and news articles will be produced and disseminated.

3.5.2e: Strategy 5: Community mobilization to enhance uptake of malaria interventions

There has been continuous engagement and motivation of key stakeholders to rollout National Communication Campaigns at district and community level. School teachers, pupils, traditional leaders and religious leaders have been engaged in the promotion of LLIN usage. The programme has also engaged and assigned NGOs to districts a package of evidence - based interventions have been to develop IEC& SBCC materials to ensure delivery of consistent messages to target audience.

Table 23:**Enabling** and **Constraining factors** of strategies

Strategy	**Enabling factors**	**Constraining factors**	**Proposed solutions**
Strategy 1: Develop a comprehensive national malaria communication strategy	1.Partners have been guided by the National SBCC Document, drawing on their unique specific advocacy, theoretical frameworks, best practices such as using a combination of approaches and channels to reach identified target groups.	Lack of commitment of people in charge of store to distribute document for use at all levels	Advocate for the use of the SBCC as the guide to message development to ensure consistencies
Strategy 2: Advocacy for sustained malaria control	1. Existence of partner supported programmes like USAID PMI, UNICEF, DFID, WHO, CSO/NGOs etc. that support malaria advocacy. 2.Engagement of traditional and community leaders during the nets distribution/ and NGOs community sensitization activities	Multiple media sources sending out several and sometimes conflicting messages.	Continuous and sustained advocacy and Partner with the resource mobilization committee & malaria foundation to lobby and advocate for domestic funding. periodic updates
Strategy 3: Advocacy for test, treat and track among health workers	Commitment of partners to the Malaria Strategic Plan.	1. Non availability of RDTs. 2. Limited resources to intensify advocacy activities	1. Multiple approaches including mass media campaigns, engagement of health workers through trainings, briefings and data sheets.

		3.Competing and conflicting messages on malaria treatment by herbal and traditional sellers	2. Continue engagement of CSO/NGOS to intensify advocacy
Strategy 4: Sustained education on malaria prevention at all level	Existence and functioning communication subcommittees		
Strategy 5: Community mobilization to enhance uptake of malaria interventions	1.Coordination of partners in doing BCC/Social mobilization 2. Harmonization of all malaria materials done to ensure message consistency 3.The current strategy to deploy health promotion officers to district levels to support SBCC activities. 4. Support from Health professionals at the various levels in SBCC activities. 5. Willingness of some CSOs/ NGOs to work in the lower levels	1. Juggling of various health programmes which are of equal priority by the same staff 2. Inadequate staff (Health Promoters) at DHMT level and below 3. Distribution and utilization of printed materials at the region to the lower level is weak 4. Limited/ Inadequate funding for community mobilization 5. Lack of supervision & monitoring	1. Continue with engagement of community and traditional leaders, traditional leaders, Local Government, Partners and Programmes. Collaborate with Ghana education Service and Ministry of Information staff to help improve access to communities.

3.5.5. Challenges

- Several facilities have worn out or torn posters on their walls.
- Several competing Malaria messages on radio and television stations tend to confuse the population.

Lessons learnt

- There are several community information centers and FM stations which can be used to improve access to quality behaviour change messages on Malaria.

3.5.6. Recommendations for the remaining period of the MSP (2018-2020)

- With limited resources, focus should be on mass media and community driven strategies such as local FM, engagement of community radio networks

- NMCP should improve collaboration with key stakeholders such as NCCE, ISD, NGOs, CSOs & religious and Traditional groups
- NMCP should minimize printing of posters /leaflets for distribution at health facilities and rather advocate for use of TVs within the health facilities for health education.
- NMCP should intensify its collaboration with the FDA to ensure adherence to policies and Approval for placement of Adverts of medicines should be done in consultation with the NMCP.

4.0 ASSESSMENT OF PROGRESS TOWARDS EPIDEMIOLOGICAL AND ENTOMOLOGICAL IMPACT

4.1. Progress towards epidemiological impact of the MSP

4.1.1. MSP epidemiological indicators and targets

Table 24: Impact indicators as captured in the NSP 2014-2020

ITEMS	INDICAT0RS	Regions	Value	Year	Source	ANNUAL TARGETS		
						2014	2015	2016
						Year 1	Year 2	Year 3
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%
	All-cause under 5 mortality rate	All	80 per 1000LB	2008	DHS/DHS+ (Demographic and Health Survey)	45/ 1000lb		35/ 1000 lb
	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%
	Confirmed malaria cases (microscopy and RDT) per 1000 population per year	All	186	2013	HMIS	166	146	126
	"Inpatient malaria cases tested (microscopy and RDT) per 1000 population"	All	17	2013	HMIS	15	13	12

ITEMS	INDICAT0RS	Regions	Value	Year	Source	ANNUAL TARGETS		
						2014	2015	2016
						Year 1	Year 2	Year 3
	Inpatient malaria deaths per 100,000 persons per year	All	9	2013	HMIS	8	7	6
	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%

MICS: (Multiple Indicator Cluster Survey)
MIS: Malaria Indicator Survey
DHS: Demographic and Health survey
HMIS: Health Information Management Sysytem

4.1.2. Progress towards MSP malaria morbidity impact targets

Prevalence

Though there has been a reduction in ***prevalence of malaria infection/parasitaemia*** among children under five in Ghana over the years the target for all the years have not been achieved (figure 5)

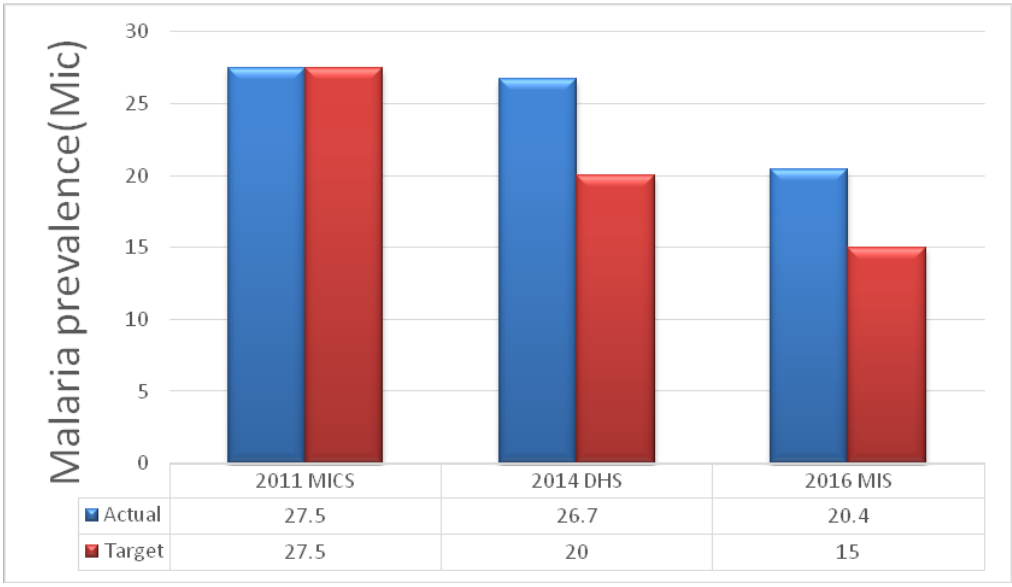

Figure 7: ***Malaria prevalence results and targets; 2011,2014 &2016***

Sources:MICS, DHS, MIS

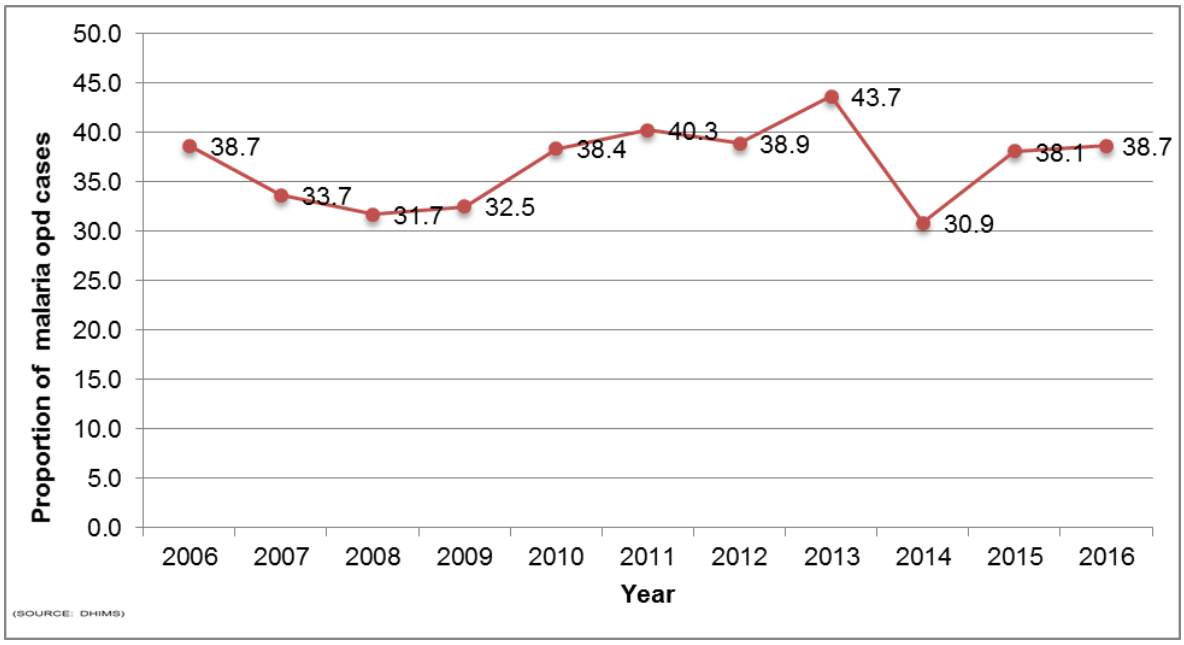

Figure 8: Proportion of OPD Cases Attributable to Malaria from 2006-2016

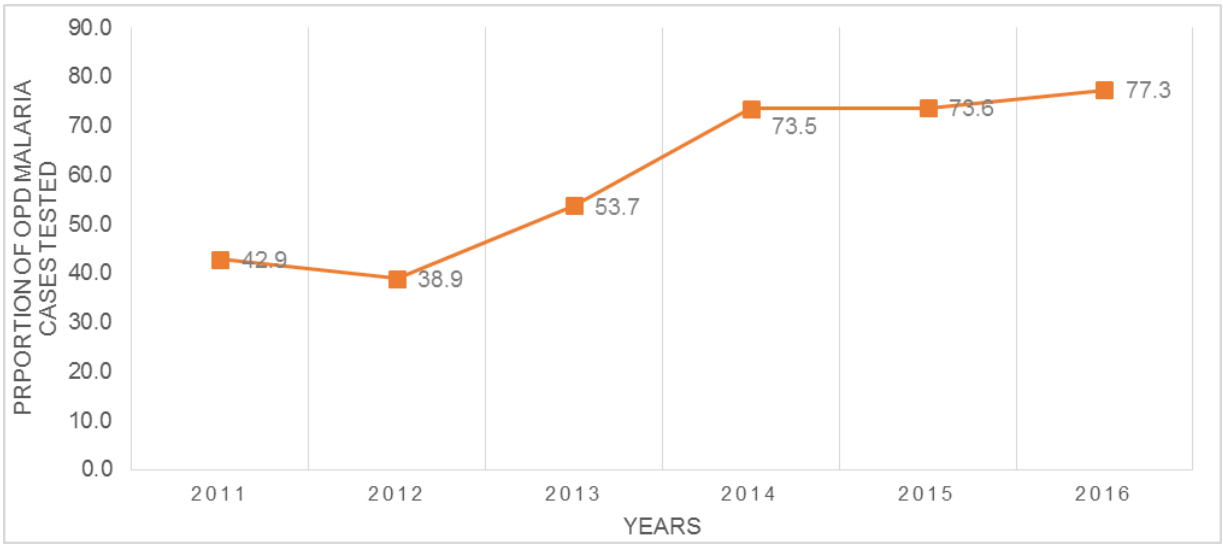

Figure 9: Proportion of OPD Malaria Cases Tested, 2015- 2016

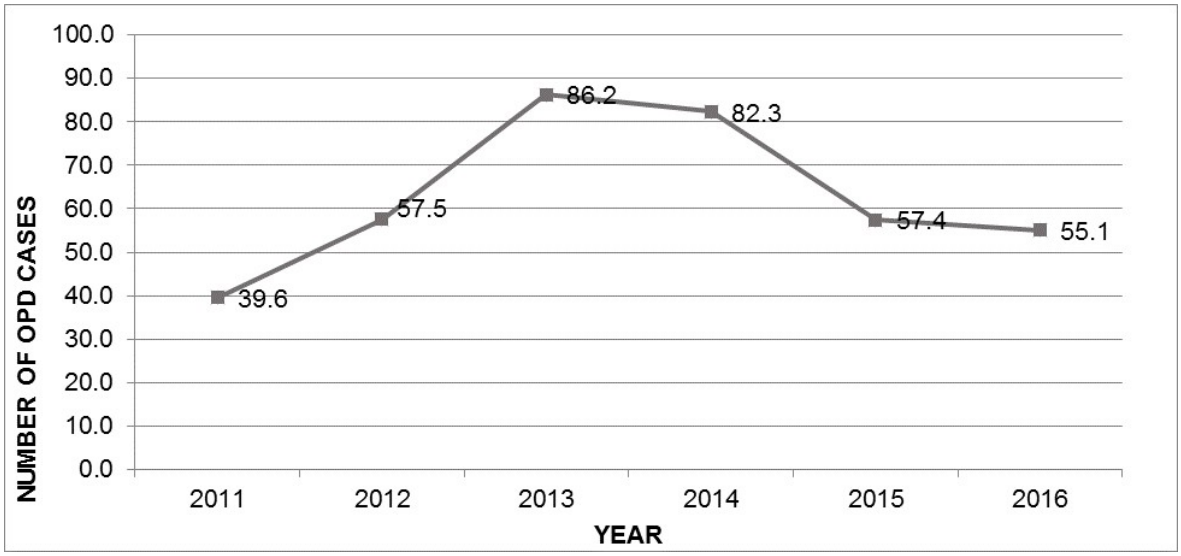

Figure 10: Proportion of OPD Malaria Cases Put on ACTs, 2011-2016

The use of ACTs to treat uncomplicated malaria cases was adopted in 2004. Since then it has been of interest to track its use in both public and private health sectors. The proportion of OPD malaria cases treated with an ACTs decreased from approximately 57% in 2015 to 55% in 2016 as a result of improved testing rates in the 10 regions.

This reduction in the use of ACTs is due to increase in the parasitological test of suspected malaria cases and adherence to the Test, Treat and Track policy

Admissions for malaria decreased from 429,940 in 2014 to 409,446 in 2015 and further decreased to 379,986 in 2016. (Figure 6). Among children under five years, 182,438 were admitted due to malaria in Ghana in 2016 (Table 24)

4.1.3. Progress towards MSP malaria mortality impact targets

It is also worth noting that the country recorded a sharp systematic reduction in the proportion of deaths due to malaria, as recorded at the In-Patient Departments of facilities in the country. The total number of deaths attributable to malaria in 2016 was 1,264 representing a reduction of about 40.9% over total number of deaths attributable to malaria (2,133 deaths) in 2015. Out of these malaria deaths, 590 occurred among children-under-5-years in 2016 compared to 1,037 in 2015 (Table 24).

The trends in in-patient malaria deaths from year 2000 to 2016 is presented in Table 24. Figure 7 shows in-patient proportionate malaria deaths, 2010-2016, which a decrease in number of malaria deaths over the period, despite the fact that total deaths on admission have been on the increase from 2011. It is also observed that in the eleven years preceding the year under review, malaria related deaths in children-under-five years were less than that in persons five-years-and-above (DHIMS)

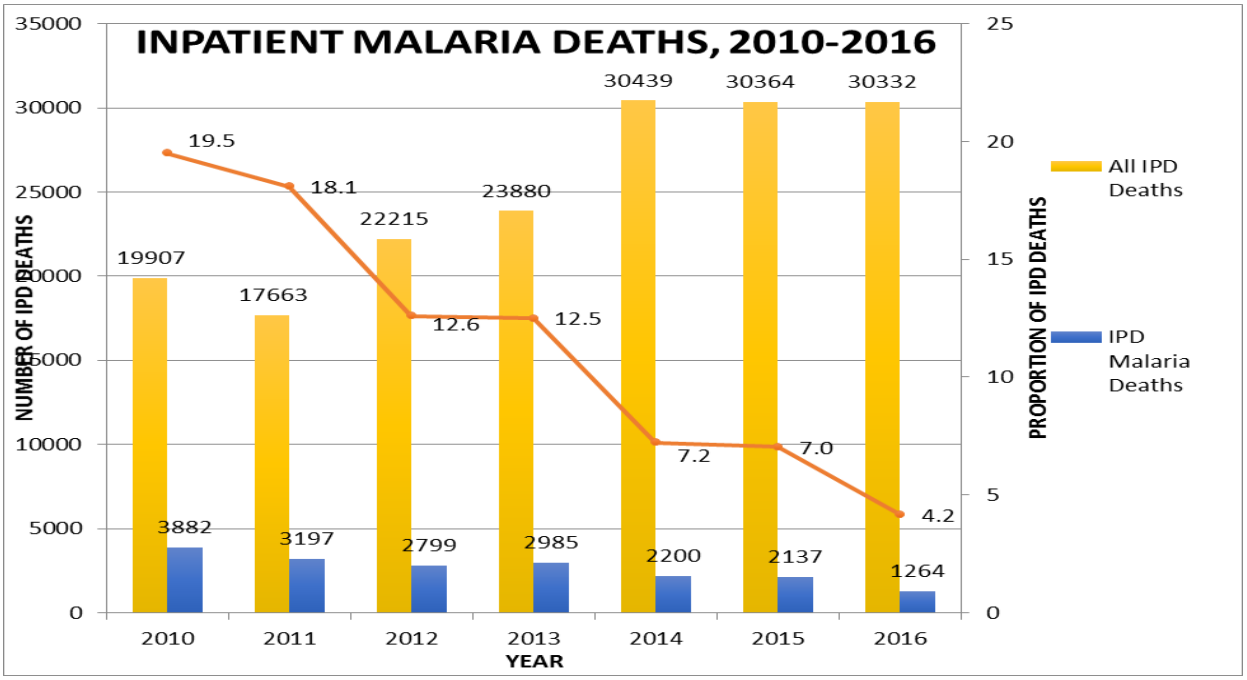

Figure 11: In-patient malaria deaths, 2010-2016

Source:DHIMS

There was a reduction in the Case Fatality Rate recorded from approximately 0.51 in 2014 to 0.32 in 2016 (fig 9). In 2016, Upper East region recorded the highest case fatality (0.51) and the least by Ashanti Region (0.13).

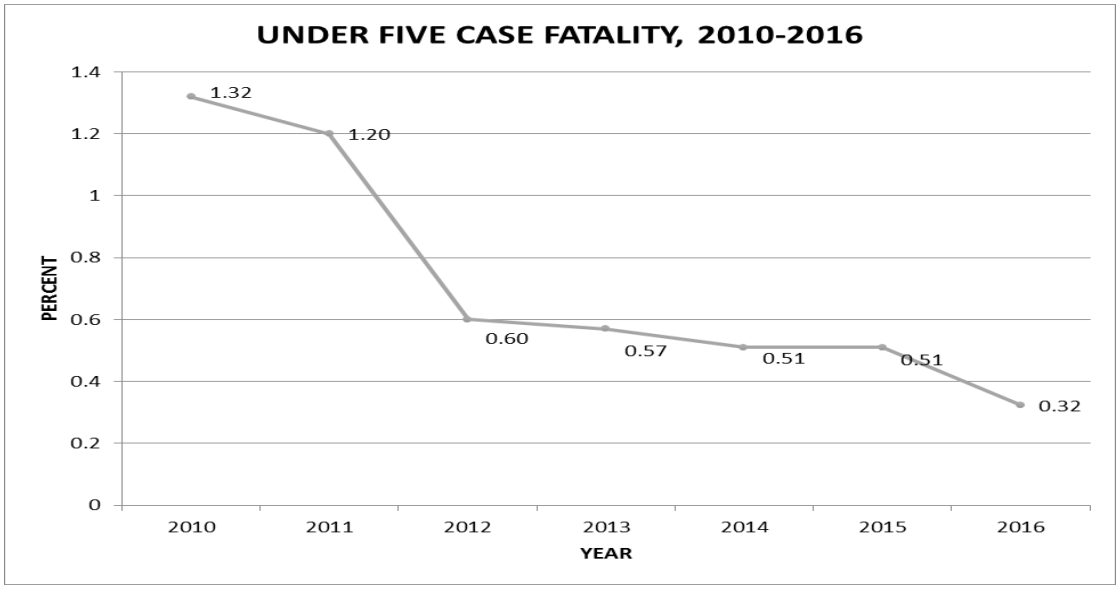

Figure 12: Trends in Under five case fatality rate, 2010-2016

Source: DHIMS 2017

4.1.4. Changes parasite species distribution

Parasite species has not changed over the years with the predominant plasmodium species being P. *Falciparum* (figure 14).

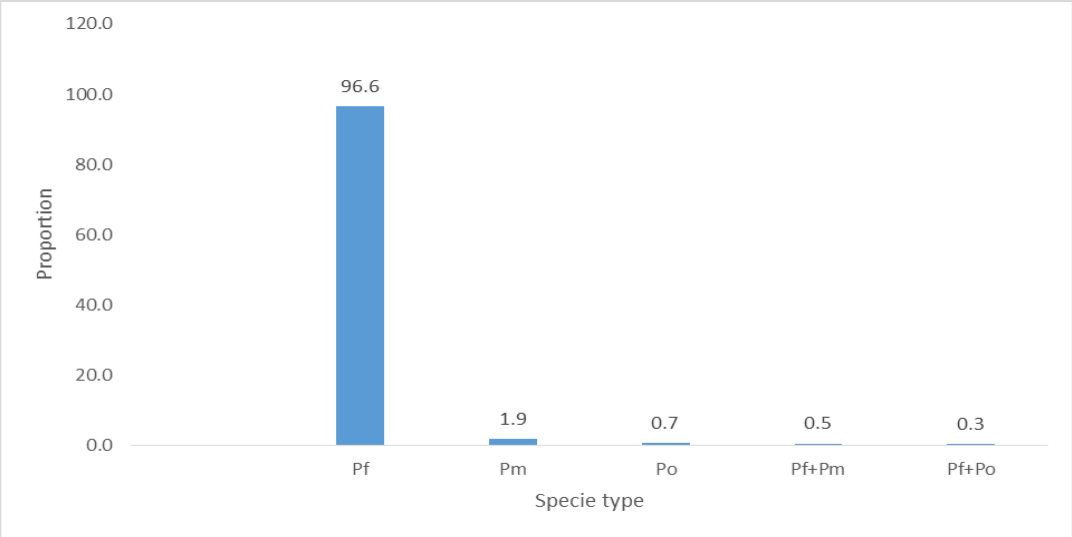

Figure 13: Parasites species distribution in all Malaria Prevalence Sentinel sites in Ghana 2016

Source: Malaria Prevalence Sentinel site data 2017

4.1.5. Malaria transmission risk map and stratification

Regional distribution had seen varying picture over the years with some decreasing and others increasing. In 2014 Northern region recorded the highest prevalence of 40% whiles Greater Accra recorded the lowest of 11.2%. Eastern region recorded the highest of 31.1 which is an increase over the 2014 figure of 11%.

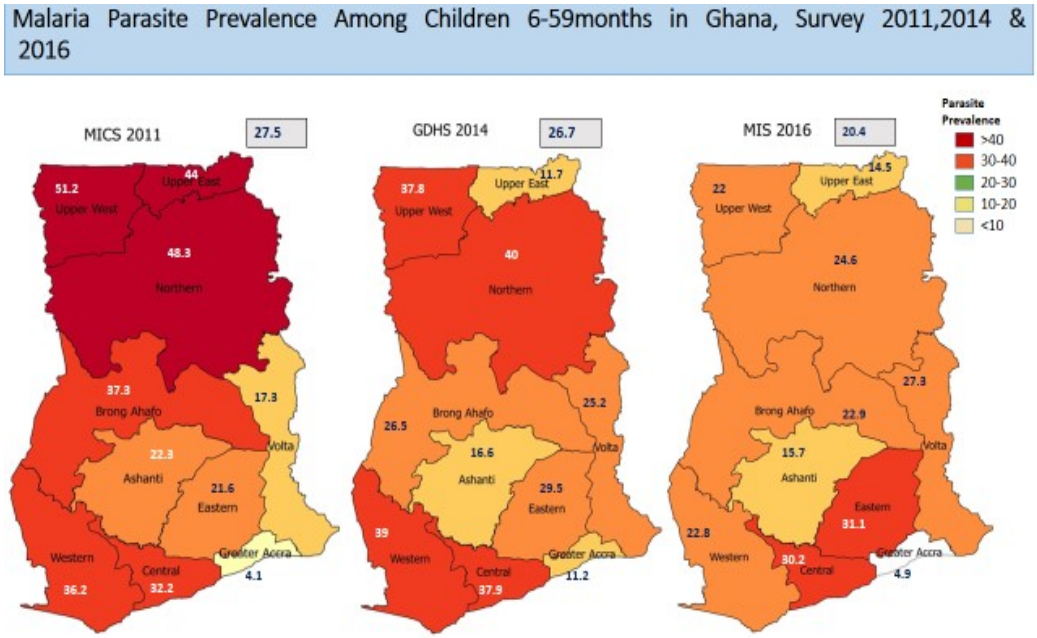

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Figure 14: Malaria parasite prevalence studies among children under five,MICS 2011,DHS 2014,MIS 2016 in Ghana

Table 25: Profile of Malaria Control in Ghana

Indicator	Characteristics	Sources
Parasite Prevalence	20.4 (Children 6months – 59months)	MIS 2016
Incidence (Morbidity) Health Facility Attendances	• 38.7% of OPD cases (suspected malaria) • 43.4% of suspected cases confirmed as malaria(77.3% testing rate) • 1.42% of malaria (pregnant women)	DHIMS 2017
Mortality	• 4.2% of institutional due to malaria • 46.7% of malaria mortality (Children <5 years) • 0.32 malaria case fatality rate (Children under five)	DHIMS 2017
Vectors	• Efficient and stable anopheline activities	
Parasite	• Most cases due to P. falciparum	
Income Levels	(Lower middle income Country)	
Health System • Accessibility of Service • Staff/patients Ratio • Stockouts of Supplies o RDTs o Medicines	• Moderate • Low • Infrequent stockout	

5.0 PROGRAMME FINANCING

5.1 Malaria programme funding landscape analysis

5.1.1Trends of resources mobilization and utilization

Table 25 shows the budget required by the NMCP based on its strategic plan and how much the program was able to mobilize and use (spend) during the period of review. The rate of Resource mobilization was about 70% and the rate of absorption was 91%.

Table 26: Resource Mobilization and Utilization In Ghana from 2014-2016

Items	**Year**			
	2014	**2015**	**2016**	Total
Total MSP per year	258,923,452.68	267,604,462.08	293,127,027.90	819,654,942.66
Total mobilized	169,713,541.30	193,307,003.40	208,144,755.90	571,165,300.60
Rate of mobilisation	**65.55**	**72.24**	**71.01**	**69.68**
Total expenditures	117,973,021	199,189,155.40	204,164,236.42	**521,326,412.82**
Rate of absorption	**69.51**	**103.04**	**98.09**	**91.27**

5.1.2 Trends of partners contribution to malaria programming

Table 27 shows the contribution of Government and other partners for malaria programming during the period under review. The central Government, Global Fund and the President's Malaria Initiative (USAID) happen to be the big donors for NMCP activities.

Table 27: Partners contribution to malaria programming

Items	**Year**			
	2014	**2015**	**2016**	**Total**
Gov	65,960,981	100,806,127.40	124,594,204.90	291,361,313
WHO	300,000	300,000	300,000	900,000
GF	63,043,661.30	31,629,989	40,576,366	135,250,016
PMI	35,200,000	56,320,000	40,000,000	131,520,000
DFID/UNICEF…….	5,208,899	4,250,887	2,674,185	12,133,971
Total	**169,713,541**	**193,307,003**	**208,144,756**	**571,165,301**

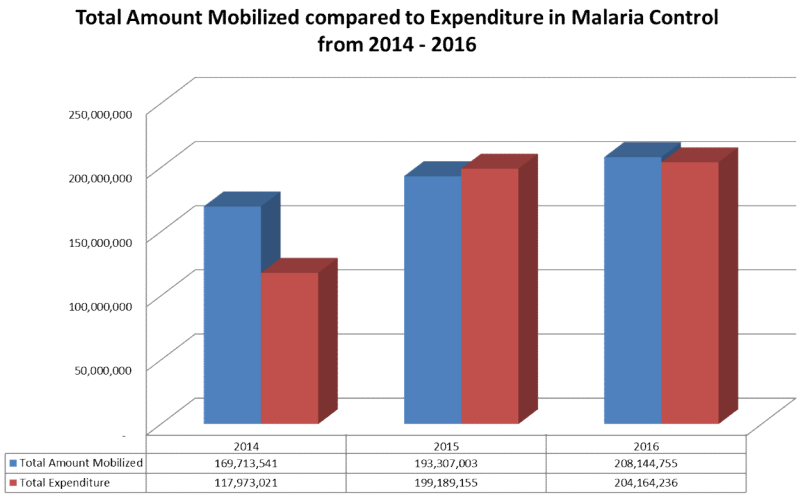

Figure 15: Amount mobilized compared to expenditure from 2014-2016

Lessons learned

- Private sector engagement within the period has led to the establishment of a Ghana Malaria Foundation (GMF)
- GMF has been registered as a company limited by guarantee and it is governed by a Board of Trustees.
- The Ghana Malaria Foundation was launched on April 24, during the 2017 World Malaria Day commemoration.

5.3 Partnerships and collaboration

5.3.1 National level partnerships

At the national level there are several partners working with the NMCP in the various thematic areas as shown in table 19&20.

5.3.2 Regional level partnerships

- Regional Malaria Focal Persons coordinate malaria activities in the districts by collaborating with the district Malaria Focal Persons
- They also supervise district activities and reports
- Regions and districts are aware of the presence of partners however, there are no clear engagement mechanisms at the regional and particularly at district levels
- Some partners are only invited (sometimes) to the half year/end of year review meetings
- Partners are not usually invited to quarterly DHMT meetings.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

6.1.1. Political commitment

- Malaria was mentioned as a top most priority disease in the country affecting children, pregnant women and the entire population
- All respondents (Policy makers and opinion leaders) rated malaria as a priority
- Majority (about 80%) of respondents felt a lot is being done in the control of malaria in the country.
- Reducing the burden of malaria according to interviewees will also free the already scanty resources for other health priorities in the country.

- Interviewees indicated and mentioned various ways they use in advocating for malaria control. These are done at meetings and during budgeting.
- All interviewees mentioned that the current placement of Malaria Control Programme in the Ministry's organogram was good but activities of the NMCP should be given a much bigger prominence (cabinet attention similar to the role of the National Aids Commission)
- The Malaria Interagency Coordinating Committee (MICC) needs to be given more power akin to that of the Aids commission.

6.1.2. Coordination

At the National level there is the Malaria Interagency Coordinating Committee which held annual meetings in the review period and these meetings were jointly held with the PMI stakeholders' annual meeting. Several working groups have been formed with the majority functional except a few.

1. Functional Working groups
    - Malaria Vector Control Oversight Committee. (MAVCOC)
    - Case management
    - Malaria In Pregnancy
    - Research and innovation
    - Malaria Vaccine Technical Working Group
    - Surveillance, Monitoring & Evaluation

2. Non functional Working group
    - Integrated Community Case Management (ICCM)

3. No clear plan / activities yet
    - Cross-Border Collaboration

Coordination in the Regions and districts hinges around the regional focal persons.

- All regions have designated focal persons for malaria and all districts have assigned personnel for malaria
- Operational planning for malaria is done at the regional level. At the district and sub district levels, integrated planning is done but with well-defined malaria components.

- Malaria was mentioned as a priority in all regions
- There are regional and districts malaria targets
- However, there are no clearly outlined targets at the lower levels (below the district level)
- Guidelines for case management, SOPs for laboratory diagnosis, MIP guidelines, LLINs distribution- documents were not easily traceable
- IEC materials were inadequate and the few that are available were (torn, defaced)
- All the regions had regional trainers however, training for health staff at the regional level is coordinated from the national level
- Many health workers have not received malaria training in the last 12 months particularly in the hospitals
- Many of the facilities visited in the Upper East had OTSS done and very familiar with the process.

6.2 Recommendations:

The following recommendation will help improve the NMCP achieve its objectives as outlined in the MSP

6.2.1 MOH/GHS/Partners

- There is need for the country to look for domestic resources of funding malaria activities instead of over relying on donors
- MICC should be given high level profile;Presidential commission to reach the attention of cabinet.
- Lobby with Parliament select committee on health to deal with issues of tax exemption especially on equipment and insecticides used for indoor residual spraying.
- There is need for more research on the use of herbal preparations in the treatment of malaria.
- Need for a national Logistics Management Information System (LMIS) to ensure proper quantification, adequate storage and effective management of commodities to avoid stock outs
- WHO and Partners to support with guidance on cross-border collaboration

- Standard treatment guidelines should be revised in line with the Malaria Case management guidelines
- Ensure availability of OPD registers.
- The internal audit unit of the GHS/MOH is to support regular auditing of the logistics management and commodities.
- Ensure inter-sectorial collaboration with the Ministry of Lands and Mineral resources and others for better law enforcement to reduce the risk of environmental degradation

6.2.2 NMCP

- Based on the achievement of set targets there was a need to review remaining target to 2020 (Annex)
- Need to leverage resources and facilitate activities of the Malaria Foundation
- Link up with CHPS program to facilitate implementation of the Home based care strategy.
- Reactivate and expand membership of the Integrated Community Case Management (ICCM) committee to include partners from the Family Health /Policy, Planning, Monitoring and Evaluation (PPME) divisions of the Ghana health Service who are responsible for coordinating CHPS activities in the country.
- Minimize printing of posters /leaflets for distribution at health facilities. The Posters should be modified (e.g. hang-ups) and laminated to ensure their longevity
- With limited resources, focus should be on mass media and community driven strategies such as local FM, engagement of community radio networks
- Adapt the growing use of technology & social media to support Social Behavioural Change Communication strategy.
- Ensure availability of anti-malarial logistics particularly RDTs at all levels
- Liaise with the Family Health Division of the Ghana Health Service to plan and monitor the current directive of using RDTs to test for malaria parasites before SP is given to pregnant women at ante natal clinics.
- Reintroduce the Peers RUN to help increase usage of LLINs
- Engage partners to ensure adequate LLINs availability for the mass campaign to be done in phases over a year

- Introduce new generation nets that incorporate the use of synergist e.g. PBO nets to reduce resistance
- Need to explore new insecticides, implement a resistance management plan and strengthen collaboration with Agricultural institutions to help mitigate the threat of resistance
- Provide back-up systems for facility data (need to supply External Drives to regions and districts)
- Strengthen monitoring and supervision of malaria activities in the regions
- The NMCP should supply laptops to all facilities where facilities data are stored with easy retrieval and avoid individuals using their personal laptops to store institutional data.
- It is about time for the NMCP to have district based malaria epidemiology maps to know where the NMCP would have to put in more efforts as Ghana moves towards Malaria Elimination.

6.2.3 RHMT and DHMT

- Train key staff in Malaria Control (Malaria case management and malaria data management).
- Train regional and district focal persons on basic malaria entomology
- Data management strengthening activities should be carried out at all levels by the regional health directorate regularly.
- Strengthen partnership and coordination at district levels
- Health Information Officers and Disease Control Officers at the district should be able to support facility level (especially Hospitals) in data management
- Need to strengthen monitoring and supportive supervision at the district level (both desktop and On-site)
- In service training should be on-site and targeted to the needed skills
- Use mass media TV and radio for health education within the health facilities to intensify BCC activities in the regions

BIBLIOGRAPHY

- Ghana EPI Final Review Report 2012. (2012). Disease Surveillance System, Ghana Health system.
- Ghana Tourist Board website 2016. *Ghana demography*.
- NSP,2014; pg.41&54. (2014). National Strategic Policy, National Malaria Control Programme Ghana,2014; pg.41&54 (pp. 41&54).

ANNEX: Revised Malaria Control Performance Framework, 2017-2020

	INDICAT0RS	Baseline			ANNUAL TARGETS				REMARKS
		Result	Year	Source	2017	2018	2019	2020	
Impact	Parasitemia prevalence: children aged 6–59 months with malaria infection (by microscopy) (percentage)	20.4%	2016	MICS (Multiple Indicator Cluster Survey) /DHS			14		Revised: As at time of development of the 2014-2020 NSP, there were only two data points, mara modeling 2002 (75%-50%) and MICS 2011 (27.5%). Currently we have three data points from population surveys (MICS 2011, GDHS 2014 & MIS 2016) using same methodology to enable us set more realistic targets for 2018-2020. If the intervention during the year 2014-2016 are maintained or scale up, then a 2.1 annual reduction in parasite prevalence can be attained. This requires an increased investment to avoid compromising the gains attained in 2016.
	All-cause under 5 mortality rate	60/1000 LB	2014				45/1000 LB		Maintained
	Malaria test positivity ratio	26%	2016	HMIS	25.3	24.3	23.2	22.1	Revised: The 2013 baseline that was used for NSP was from all facilities reporting in DHIMS. Currently, there is 3 years trend data from sentinel sites which is more realiable measure of test positivity in the country. Based on this 3 years trend, an annual reduction of 1.07 was applied using 2016 result as baseline.
	Inpatient malaria deaths per 100,000 persons per year	4.4	2016	HMIS	3.4	2.9	2.5	2.0	Revised: Between 2015-2016 there was a imporvement in data quality, thus the reduction in reported malaria deaths. With the plan to maintain

									the improvement in data quality, an average rate of change 0.46 (change between 2014 and 2016) was applied to 2018-2020 . This indicator is measured per 100000 per person per year (and not per 1000 persons per year as stated in the drop down)
	Under five Malaria Case fatality rate (from 0.6 in 2012 to 0.41 by 2020)	0.32	2016	HMIS	0.26	0.23	0.20	0.17	Revised: Between 2015-2016 there was a imporveement in data quality, thus the improvement in reported malaria cases. This intervention will partly contribute to change in 2017 and then, maintained in the subsequent years. Thus the average rate of change 0.06 (change between 2014 and 2016) was applied for 2017 and subsequent years has been reduced by 0.03.
	Confirmed malaria cases (microscopy or RDT): rate per 1000 persons per year	158.0	2016	HMIS	163	168	184	204	New: The ideal situation should be that all suspected cases should be tested. However, as at 2016 only 77% of suspetced cases were tested. This is an improvement over the previous years (37.9%-2012, 48.7%- 2013, 73.5%-2014 and 73.6%-2015). The number of confirmed cases is determined by rate of testing which currently is depicting an increasing trend; 80% in 2017, 82% in 2018, 90% in 2019 and 100% in 2020. Based on this, the trend of confirmed malaria cases is estimated to be 163 in 2017, 168 in 2018, 184 in 2019 and 204 in 2020.

	Proportion of households with at least one insecticide-treated net for every two people	50.3	2016	MIS	52.85	55.4	57.95	60.5	New: Based on GDHS 2014 and MIS 2016 results, average change between 2014-2016 (5.1) was applied to 2017 and half of the average change (2.55) applied to the remaining years.
	Percentage of households with at least one insecticide-treated net	77%	2016	MICS/ DHS/MIS			82.4		Revised: Universal coverage will only be achieved in the non-IRS regions (Because of areas of IRS where LLINs distribution will not be carried out). Thus, average change between 2014-2016 (4.7) was applied to 2017 and half of the average change (2.35) applied to the remaining years.
Outcome	Percentage of children under 5 years old who slept under an insecticide-treated net the previous night	62%		MICS/ DHS/MIS			67.3		Revised: Based on baseline results from 2016 MIS, rate of change was maintained at 5 points increase per year
	Percentage of pregnant women who slept under an insecticide-treated net the previous night	59%	2016	MICS/ DHS/MIS			65		Revised: Based on baseline results from 2016 MIS, rate of change was maintained at 5 points increase per year
	Percentage of individuals who slept under an insecticide-treated net the previous night	60%	2016	MICS/ DHS/MIS			65.3		Revised: Based on baseline results from 2016 MIS, rate of change was maintained at 5 points increase per year
	Proportion of population using an insecticide-treated net* among the population with access to an insecticide-treated net	52.6	2016	MICS/ DHS/MIS			59.7		Revised: Based on baseline results from 2016 MIS, annual rate of change of 2.37 (GDHS 2014 and MIS 2016) was maintained per year
	Percentage of pregnant women who received 3 doses of intermittent preventive treatment for malaria during	60%	2016	MICS/ DHS/MIS			75		Revised:

	ANC visits during their last pregnancy								
Coverage Indicators	Number of Long Lasting Nets (LLNs) distributed to delivery points health facilities, schools,(Routine)	1,757,166	2016	School Health report and DHIMs	1,794,941	1,803,017	3,091,054	3,318,248	Revised: This measures population at risk to be reached through continuous distribution at EPI, and ANC and Schools. Source will be DHIMs for the EPI and ANC nets and oprational reports for the school distribution.There will be no school distribution in the regions when mass campaign has taken place.
	Number of LLINs distributed to population at risk through mass campaign	4,194,621	2016	Campaign report		15,729,344			Revised: Mass campaign will be conducted in 2018. There will be no mass campaing in 2019 and 2020.
	Proportion of Population at risk potentially covered with Long Lasting Nets (LLNs) distributed through mass campaign	90%	2016	Campaign report		90%			Maintained
	Percentage of suspected malaria cases that received a parasitological test(RDTs or microscopy)	77.3 (8073792/10,439,686)	2016	DHIMS	80% (8448384/10560480)	85% (8793786/10345630)	92% (9755929/10604271)	97% (10869378/10869378)	Maintained
	Percentage of uncomplicated malaria cases (clinical and confirmed) treated with ACT at health facilities.	55%	2016	DHIMS	47%	38%	29%	20%	Maintained
	Number and percentage of uncomplicated malaria cases (tested positive) treated with ACT at health facilities.	100% (2968994)	2016	DHIMS	100% (2703482)	100% (4488970)	100% (3745853)	100% (3228205)	Maintained

	Percentage (%) of pregnant women on Intermittent preventive treatment (at least three doses of SP) according to national policy	36.4	2016	DHIMS	46.3	51.3	56.3	61.3	Revised: NSP targets for 2017 to 2020 have been revised based on 2015 result of 41.3%.
	Percentage of children aged 3–59 months who received the full number of courses of SMC (3 or 4) per transmission season in the targeted areas	85.5	2016	Administrative Report	90%	90%	90%	90%	New: Target is 90% of expected population of children in the targeted regiosn