

2017 ANNUAL REPORT

**NATIONAL MALARIA CONTROL
PROGRAMME**

GHANA HEALTH SERVICE

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- Regional Coordinating Councils,
- Regional Health Directorates,
- Roll Back Malaria,
- The Country Coordinating Mechanism (CCM)
- UNICEF
- USAID (PMI, Malaria Care, GHSC-PSM, Systems for Health, & Communicate for Health),
- WHO
- World Bank

Abbreviations

ACSM	Advocacy Communication and Social Mobilization
ACT	Artemisinin-Based Combination Therapy
ADDRO	Anglican Diocesan Relief Organization
ADRs	Adverse Drug Reactions
AGA	Anglogold Ashanti
AGAMal	Anglogold Ashanti Malaria Control Program Ltd
AIDS	Auto Immune Deficiency Syndrome
AIRS	Africa Indoor Residual Spraying Project
AL	Artermether-Lumefantrine
AMFm	Affordable Medicines Facility-Malaria
ANC	Antenatal Clinic
AQ	Amodiaquine
AS	Artesunate
AS-AQ/AA	Artesunate +Amodiaquine
ATM	Aids Tuberculosis and Malaria
BCC	Behaviour Change Communication
CBAs	Community-Based Agents
CBO	Community-Based Organization
CCM	Country Coordinating Mechanism
CCM	Country Coordinating Mechanism

CD	Continuous Distribution
CDC	Centre for Disease Control and Prevention
CFR	Case fatality rate
CHAG	Christian Health Association of Ghana
CHIM	Centre for Health Information Management
CHN	Community Health Nurse
CHO	Community Health Officer
CHPS	Community Based Health Planning Services
CHQ	Chloroquine
CHV	Community Health Volunteers
CI	Confidence Interval
CLU	Clinical Lab Unit
CPPA	Community Pharmacist Practice Association
CS	Circuit Supervisors
CWC	Child Welfare Clinic
DDE	District Directors of Education
DDT	Dichlorodiphenyltrichloroethane
DHD	District Health Director
DHIMS	District Health Information Management System
DHMT	District Health Management Team
DHS	Demographic and Health Survey

DMFP	District Malaria Focal Person
DQA	Data Quality Audit
DSS	Demographic Surveillance Systems
ECAMM	External Competency Assessment in Malaria Microscopy
EDTS	Electronic Data Transmission System
EMR	Electronic Medical Records
EPA	Environmental Protection Agency
FDA	Food and Drugs Authority
FHG	Fionet Health Ghana
FLB	First Line Buyers
GES	Ghana Education Service
GF	Global Fund
GHS	Ghana Health Services
GSS	Ghana Statistical Service
HAMS	Hospital Accounting Management system
HBC	Home-Based Care
HF	Health Facility
HH	Household
HIO	Health Information Officer
HIS	Health Information Systems
HIV	Human Immunodeficiency Virus

HIV/AIDS	Human Immunodeficiency Virus / Acquired Immunodeficiency
HMIS	Health Management Information Systems
HMM	Home Management of Malaria
HTRA	Hard-To-Reach Areas
iCCM	Integrated Community Case Management
IDSR	Integrated Disease Surveillance and Response
IEC	Information, Education and Communication
IMCI	Integrated Management of Childhood Illnesses
IPD	In-Patient Department
IPT	Intermittent Preventive Treatment
IPTp	Intermittent Preventive Treatment for Pregnant Women
IRM	Insecticide Resistance Monitoring
IRS	Indoor Residual Spraying
ITN	Insecticide-Treated Net
KHRC	Kintampo Health Research Centre
KNUST	Kwame Nkrumah University for Science and Technology
LLIN	Long Lasting Insecticidal Net
LMIS	Logistic Management Information System
LPF	Late Parasitological Failure
M&E	Monitoring and Evaluation
MaVCOC	Malaria Vector Control Oversight Committee

MCM	Malaria Case Management
MDGs	Millennium Development Goals
MDRT	Malaria Diagnostic Refresher Training
MICS	Multiple Indicator Cluster Surveys
MIP	Malaria in Pregnancy
MIPc	Malaria in Pregnancy Consortium
MIS	Malaria Indicator Survey
MO	Medical Officer
MOFA	Ministry of Food and Agriculture
MoH	Ministry of Health
MoU	Memorandum of Understanding
MPR	Malaria Programme Review
NAMS	National Archive of Malaria Slides
NGO	Non-Governmental Organization
NHIA	National Health Insurance Authority
NHIS	National Health Insurance Scheme
NIRMOP	National Insecticide Resistance Monitoring Partnership
NMCC	National Malaria Communication sub-Committee
NMCP	National Malaria Control Programme
NMIMR	Noguchi Memorial Institute for Medical Research
OPD	Out-Patients Department

OTCMS	Over-the-counter medicine sellers
OTSS	Outreach Training and Support Supervision
PA	Physician Assistant
PATH	Program for Appropriate Technology in Health
PBC	Produce Buying Company
PBO	Piperonyl Butoxide
Pf	Plasmodium falciparum
Pm	Plasmodium malariae
PM	Pirimiphos methyl
PMD	Point Mass Distribution
PMI	President's Malaria Initiative
PMI	The U.S. President's Malaria Initiative
Po	Plasmodium Ovale
POW	Programme of Work
PPME	Policy Planning Monitoring and Evaluation
PPMED	Policy planning Monitoring and Evaluation Department
PPQ	Piperaquine
PQ	Primaquine
PR	Principal Recipient
PSCM	Private Sector Copayment Mechanism
PSD	Procurement and Supply Division

PSGh	Pharmaceutical Society of Ghana
PSM	Procurement and Supply Management
PT	Proficiency Testing
PU	Procurement Unit
PUDR	Progress Update Disbarment Report
Pv	Plasmodium vivax
PW	Pregnant Woman
Q	Quinine
QA	Quality Assurance
QAACT	Quality Assured Artemisinin-Based Combination Therapy
QC	Quality Control
RBM	Roll Back Malaria
RDTs	Rapid Diagnostic Tests
RHIO	Regional Health Information Officer
RIA	Rapid Impact Assessment
RM	Resource Mobilization
RMFP	Regional Malaria Focal Person
RMS	Regional Medical Store
RSM&E	Research Surveillance Monitoring and Evaluation
S4H	System for Health
SBCC	Social Behaviour Change Communication

SCMP	Supply Chain Master Plan
SDP	Service Delivery Point
SHEPs	School Health Evaluation Programs
SHOPS	Strengthening Health Outcomes through Private Sector
SMC	Seasonal Malaria Chemoprevention
SOP	Standard Operating Protocol
SP	Sulfadoxine-Pyrimethamine
SPMDP	Society for Private Medical and Dental Practitioners Association
SSDM	Supply Stores and Drug Management
T3	Test Treat and Track
TB	Tuberculosis
TF	Treatment Failure
TPR	Test Positivity Rate
UC	Universal Coverage
UG	University of Ghana, Legon
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization
WMR	World Malaria Report

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Executive Summary

The Programme's goal has been to reduce malaria morbidity and mortality by 75% (using 2012 as baseline) by the year 2020; and this goal was persistently pursued in the year under review. To achieve the Programme's target, some areas were identified as priorities for the year under review, these included increase uptake of IPTp, advocacy for adherence to the test, treat and track policy, getting procurement and resource mobilization effectively done and also improve data quality through in-depth research, surveillance, monitoring, and evaluation.

Key Activities Undertaken During the Year 2017

To improve malaria diagnosis and treatment across the country, a number of activities were carried out. Interventions to address observed increase in malaria deaths in the Northern region, meeting with heads of Private health facility and quarterly co-payment task force meetings were held. OTSS Supervision and pre-service malaria seminars were held in School of Public Health/University of Health Allied Science and School of Nursing /University of Ghana. Malaria diagnosis refresher training for laboratory scientists, RDT supportive supervision for Over The Counter Medicine Sellers (OTCMS) were among some of the activities held to improve diagnosis of malaria. NMCP also organized a meeting with the private sector associations and Fio Health Ghana (FHG) on enhancing transmission of data to the national level. To help control the burden of malaria in Pregnancy; in-service training for health workers on IPTp and quality assurance, NGOs training in follow-up of pregnant women and impact assessment of IPTp-SP at Kintampo were conducted in the year under review.

As part of the Continuous Distribution of LLINs to households across the country, two health facility based approaches were used. These strategies were; distributing LLINs to pregnant women registering for the first time (registrants) and children aged 18 months who received second dose of Measles and Rubella at the Antenatal Clinic (ANC) and Child Welfare Clinic (CWC) respectively. One LLIN is given to each beneficiary. Out of 469,918 ANC registrants in the year 2017, 343,053(73%) were given LLIN. Also 78.7% (354,506/450240) of children who received second dose of Measles and Rubella vaccination were served with LLINs. In 2017, Two hundred and two (202) LLINs were distributed in special homes. These homes included, Assurance of Hope for the needy, Missionaries of Charity, Chance for the Children, CWC

Children's Home, Kinder Paradise, Heart of the Father Outreach and Heaven Of Hope. LLINs were also distributed in both private and public schools. A total of 1,369,206 LLINs were distributed to pupils in Classes 2 & 6 across the nine regions. With lessons learnt and challenges encountered during the previous mass campaigns, NMCP and its implementing partners decided to adopt the use of an electronic Application (App) on mobile electronic devices for household registration and LLIN distribution.

A pilot of this process was done in two districts each in Volta and Eastern Regions prior to scale up throughout the country. In the Volta Region, the districts selected included South Tongu and Akatsi North whilst New Juaben and Asuogyaman were selected in the Eastern region.

In the year 2016, IRS was being implemented in the whole of the Upper West Region and the Obuasi Municipality by AngloGold Ashanti Malaria Control Program (AGAMal) with funding from the Global Fund. PMI through Africa Indoor Residual Spraying (PMI/AIRS) also implemented IRS in 5 districts, namely Bunkpurugu Yunyoo, East Mamprusi, Mamprugu Moaduri, West Mamprusi and Kumbugu all in the Northern region.

In 2017 AGAMal extended its operations to 3 more districts, namely Builsa South, Builsa North and Kassena Nankana West districts in the Upper East region. PMI/AIRS on the other hand has also added 2 districts, namely Karaga and Gushegu districts in the Northern region bringing to seven the number of operational districts of PMI/AIRS

A number of mass media activities, community sensitization by NGOs and other behavioural change communication related activities were conducted to improve on uptake of the interventions. The procurement and supply chain management activities at the programme level and thus work closely with the key players in the entire health sector system supply chain system. In collaboration with the SSDM/GHS and Procurement and Supply Unit/MOH, malaria commodities to the respective Regional Medical Stores and the Teaching Hospitals were collated and reviewed. Seasonal malaria chemoprophylaxis was done in 2017 with an average coverage of 96.5% in Upper East region and 88.7% in Upper East region. In spite of the challenges that are inherent in the implementation due to the rainy season, some appreciable protection for the target children was achieved. Stakeholders believe that if the volunteers are given the appropriate protective clothing, their performance will be enhanced.

Research, Surveillance, Monitoring and evaluation activities were conducted across all the thematic areas to improve data capturing, transmission, analysis and use. Data quality audit, DHIMS data verification, monitoring of sentinel site activities and a number of researches were conducted or coordinated by the Programme. Research activities conducted include the dissemination of malaria indicator survey 2016, ATM mortality trend analysis, durability and viability studies for LLINs (LifeNets), evaluating Impact of BCC Intervention, Impact assessment of IPTp; Anaemia, Low birth weight et cetera.

Malaria Burden

In 2017, the country recorded approximately 10.2 million suspected malaria cases representing about 34% of OPD cases. About 19.0% and 2.0% of total admission and total death respectively were attributable to malaria (Table 1).

Table 1: Malaria Morbidity and Mortality, Ghana, 2017

	Indicator	Number Reported	Proportion Of Cases Attributable To Malaria
OUT PATIENT DEPARTMENT (OPD)	Total OPD Cases	30,014,359	
	Suspected Malaria Cases	10,211,971	34.0
	Tested Malaria Cases	8,911,490	87.3
	Confirmed Malaria Cases	4,893,959	47.9
	Suspected Malaria in Pregnancy cases	399,736	3.9
	Tested Malaria in Pregnancy cases	385,158	96.4
	Confirmed Malaria in Pregnant cases	133,687	33.4
ADMISSION	Total Admissions (All ages)	1,523,764	
	Malaria admissions (All ages)	289,627	19.0
	Under 5 malaria admissions	161,157	55.6
DEATHS	Total deaths (All ages)	29,517	
	Total malaria deaths (All ages)	599	2.0
	Under 5 malaria deaths	327	54.6
	Under 5 Malaria CFR	0.20	

NB: * Proportion of OPD cases attributable to malaria **Source:** DHIMS April, 2018

CHAPTER ONE

1.0 Background

Though there has been a significant reduction in malaria morbidity and mortality of in Ghana, it still remains endemic and ranks as the leading cause of morbidity and mortality among children under five years of age. Ghana's entire population is at risk but pregnant women, children under five years, and the immuno-compromised are the most at risk groups. In the year 2016 Ghana recorded 10.4 million suspected malaria cases in its Outpatient departments which denotes a 2.5% increase compared to same period in 2015. Conversely there was a reduction in the number of malaria attributed deaths from 2,137 in 2015 to 1264 in 2016 representing a 40.9% reduction. The various interventions implemented by the programme have been supported by government of Ghana and donor agencies across the world.

In the face of dwindling donor funds in the fight against malaria in Ghana, developing strategies for more efficient advocacy for more internal financial support is imperative.

1.1 Programme Objectives

The overall programme's goal is to reduce the malaria morbidity and mortality by 75% (using 2012 as baseline) by the year 2020.

The specific objectives are:

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

1.2 Priority Areas for 2017

In the year under review the programme focused on; universal diagnosis of all suspected malaria cases and adhering to treatment protocol, improving uptake of Sulfadoxine-Pyrimethamine (SP) for prevention of malaria in pregnancy, advocating funds internally to support the fight against malaria, and ensuring access of quality malaria product and expands through effective procurement and logistics management.

Specifically, the programme planned the following activities to help the move towards achieving overall aim of reducing malaria morbidity and mortality by 75% (using 2012 as baseline) by the year 2020. These included the following:

1.2.1 Vector Control

The Programme planned to pilot Point Mass Distribution (PMD) of LLINs using ICT to enhance data management, undertake Continuous Distribution of LLINs as well as distribution of LLINs to Groups with Special needs. To conduct Indoor Residual Spraying (IRS), Insecticide Resistance Monitoring (IRM) and conduct Malaria Vector Control Oversight Committee Meetings (MavCoc).

1.2.2 Malaria Case Management

The Programme planned Implementation of Interventions to address observed increase in malaria deaths, hold Case Management Technical Working Group Meetings, meeting Private Health Facility Heads on reporting, coordinate Private Health Facility Monitoring, conduct Quarterly Co- Payment Task Force Meetings and carry out Private sector co-payment mechanism activities for ACTs.

1.2.3 Malaria in Pregnancy (MIP)

The unit planned to complete impact assessment of IPTp-SP at Kintampo, conduct in-service training for health workers on IPTp and quality assurance activities, train NGOs in follow-up of pregnant women, hold Bi-annual MIP WG meetings and also carry out Monitoring/Supportive visits to Health Facilities.

1.2.4 Malaria Diagnosis

The programme planned to monitor the Malaria Microscopy Refresher Training and embark on malaria RDT training for pharmacy staff. The programme also planned malaria diagnostic training for private, quasi and public sector. To conduct on-site malaria microscopy training at sentinel sites for malaria parasite prevalence studies. The unit planned to work to improve testing and data management in community pharmacies and Over the Counter Medicines Sellers, (OTCMS) through collaboration with Fio Health Ghana, to train microscopists for WHO accreditation for competence.

1.2.5 Administration and Finance

The Administration and Finance unit planned to organize mid-year and end of year review meetings, conduct coordination meetings (MICC, various committees), conduct financial monitoring on public facilities, participate in the end of year review meeting at the national regional level, coordinate the preparation of half year and annual reports. The unit also planned to conduct internal and external audits.

1.2.6 Procurement and Supply Management (PSM)

In 2017, the PSM unit planned to procure LLINs for continuous distribution and mass campaign, procure RDTs, ACTs, SP and Injection Artesunate, and conduct Physical Stock checks at central and regional medical stores.

1.2.7 Research, Surveillance, Monitoring and Evaluation

The programme planned to conduct surveillance, monitoring and evaluation technical working group meetings (quarterly), produce periodic reports, report on the PUDR for the Global Fund (GF), dashboard for the Country Coordinating Mechanism (CCM), Roll Back Malaria (RBM) Roadmap updates and World Malaria Report (WMR) for the World Health Organization (WHO). The unit also planned to produce malaria Bulletins and conduct On-site Training and Supportive Supervision (OTSS). Others activities includes supervisory visits to public and private health facilities, support Ghana Statistical Service (GSS) in disseminating the year 2016 Malaria Indicator Survey (MIS) results, conduct routine data quality audit, conduct periodic data review in all the 10 Regions in Ghana.

Other activities planned under RSM&E for 2017 were to finalise research on HIV/AIDS, Tuberculosis and Malaria (ATM) Mortality trends in Ghana, Impact of IPTp, to continue

Durability studies on LifeNets LLINs, Evaluating Impact of BCC Interventions, Health Facility Survey and Case Management Quality Assessment and End user verification of pilot PMD in the Volta Region.

1.2.8 Social And Behaviour Change Communication (SBCC)

The programme planned to conduct malaria day advocacy including commemoration of world malaria day. Also planned to conduct quarterly communication sub-committee meetings, produce and air both television and radio adverts on LLINs and Artemisinin-Based Combination Therapy (ACTs), liaise with health promotion to undertake intensive BCC to promote test, treat and track, develop and print material for education on Seasonal Malaria Chemoprevention (SMC).

Other planned activities were to support NGOs advocacy and sensitize community on IPT for the coalition of NGOs in malaria and to design and print 2017 NMCP calendar.

1.3 Targets for January to December 2017

All the above activities by the various units is channeled towards achieving set targets by the end of December 2017 (2). This is shown in table 2 below:

Table 2: Targets for NMCP from January to December 2017

Goal/Objectives	Indicator Description	Intended Target 2017
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)	*No target was set
	Under five Case fatality rate	0.48
	Confirmed malaria cases (microscopy and RDT) per 1000 population per year	106
	Inpatient malaria deaths per 100,000 persons per year	5

Objective 1: To protect at least 80% of the population with effective malaria prevention interventions by 2020	Percentage of pregnant women who received at least 3 dose of Intermittent preventive treatment for malaria during ANC visits during their last pregnancy	65.5%
	Percentage of Households with at least one insecticide treated nets (LLINs).	*No target for this indicator
	Percentage of children under 5 years old who slept under an insecticide-treated net the previous night	*No target for this indicator
	Percentage of pregnant women who slept under an insecticide-treated net the previous night	*No target for this indicator
	Proportion of households in targeted areas that received Indoor Residual Spraying during the reporting period	85% (9252679/10885505)
	Percentage of population in target area protected by Indoor Residual Spraying within the last 12 months	93%
	Objective 2: To provide parasitological diagnosis to all suspected malaria cases and provide prompt and effective treatment	Percentage of reported suspected malaria cases that received a parasitological test (RDTs or microscopy)
	Number and percentage of uncomplicated malaria cases (tested positive) treated with ACT at health facilities.	3716560 (100%)

<p>to 100% of confirmed malaria cases by 2020</p>		
<p>Objective 3: To strengthen and maintain the capacity for programmer management, partnership and coordination to achieve malaria programmatic objectives at all levels of the health care system by 2020</p>	<p>Number of meetings held by MICC and its subcommittee/working groups</p>	<p>21</p>
<p>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</p>	<p>Number of Districts with functional M&E unit with data quality improvement teams.</p> <p>Percentage (%) of health facilities submitting timely and complete reports (on malaria) to regional level</p> <p>Promotion of research that informs the programmer in terms of policy and operational issues</p>	<p>216</p> <p>88.1%</p> <p>6</p>

levels by 2020	Number of sentinel sites established and functioning for epidemiological and insecticide monitoring	26
Objective 5: To increase awareness and knowledge of the entire population on malaria prevention and control so as to improve uptake and correct use of all interventions by 2020	Quantities of SBCC materials (Manuals, posters, radio/TV spots, etc.) produced	12,500
	Percentage of people who know the cause of, symptoms of, treatment for or preventive measures	*No target for this indicator
	Number of mass media spots promoting key messages on malaria case management	3,000

*These indicators are measured through survey and there were no planned surveys for the period under review.

CHAPTER TWO

2.0 Activities planned and carried out

In the year 2017, the various units planned and carried out activities with the aim of achieving the set objectives.

2.1 Case Management

Malaria Case Management

The primary objective of the Malaria Control Programme is to reduce disease and death due to malaria, especially in children under five years and pregnant women. One of the main interventions to achieve this objective is effective case management. Accurate and prompt malaria case management requires that all who provide health care should be able to:

Planned Activities for 2017

1. Implementation of Interventions to address observed increase in malaria deaths
2. Hold Case Management Technical Working Group Meetings
3. Meeting Heads of Private Health Facility on reporting
4. Coordinate Private Health Facility Monitoring
5. Conduct Quarterly Co- Payment Task Force Meetings
6. Conduct activities for private sector co-payment mechanism for ACTs
7. OTSS Supervision
8. OTSS Review Meeting
9. Pre –Service Malaria Seminars- UHAS
10. Lecture on Malaria Case Management at School of Nursing /Legon
11. Quarterly Monitoring to Northern Region Malaria Intervention
12. FLBs Meeting

Activities carried out, 2017

Quarterly Monitoring of activities to reduce malaria case fatality in Northern Region

District Health Information Management System for Ghana (DHIMS) revealed that Northern Region for two consecutive years recorded the highest case fatality rate for 2013 & 2014 (1.11 & 1.07 respectively). Though the region recorded a decrease in the case fatality in 2015 (1.07 in 2014) it was still the highest in Ghana (NMCP Annual report, 2015)

Objectives of First Quarter Monitoring Visit to Northern Region

The overall aim was to help reduce under-five malaria case fatality rate and consequently overall malaria case fatality rate in the Northern Region focusing on the inadequacies of the referral system and emergency units in the facilities.

Two teams of four officials from NMCP were tasked to visit the northern region on 10th April, 2017 to monitor the above activities undertaken in the Northern region for the first quarter with the following objectives:

- i. Assess the first quarter activities implemented,
- ii. Review the performance indicator summary
- iii. Make recommendations for subsequent quarterly activities

Key among other findings was the increase odds of malaria mortality with a duration of stay less than 24 hours. Factors leading to this in the context of the area included late referral, poor and inaccessible transport system in the region, inadequate resource to manage severe malaria cases. Chances of having a drastic decrease in malaria mortality will increase if issues with late reporting by client and adequate resource to manage severe malaria cases are effectively addressed.

Challenges and Recommendations

Regional level

There were some challenges at regional level this included delay in the procurement of accident and emergency logistics and tricycle ambulance for the communities. These delays were due to procurement processes and late disbursement of funds from the national malaria control program.

Below are the challenges and respective recommendations made. Referral from the lower level to the Tamale Teaching Hospital still remains a challenge. This is because some facilities refer to the teaching hospital directly even though those cases could have been managed at district hospitals. The reaction of the physicians at the teaching hospital to such referrals has prevented smooth referrals of cases to the teaching hospital.

Challenges	Recommendations
Delay in the procurement of tricycle ambulance, accident and emergency logistics.	The region was asked to speed up with the procurement processes to acquire the logistics. The regional team was advised to submit the request for funds as early as possible to avoid any delays from national level.
Referral from the districts to the Tamale Teaching Hospital still remains a challenge	Regional team were asked to consolidate the suggestion made at the exit meeting during their monthly managers meeting to help address the issue completely.

District level

Challenges	Recommendations
Delays in forming community emergency transport committee in some districts	The national team tasked the districts to form the committees
Lack of basic accident and emergency logistics in some hospitals	The regional team was tasked to speed up with the procurement processes to acquire the logistics.

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Way Forward

Regional team

1. Strengthen the monthly data validation meetings at the district level and ensure that each district must submit a monthly data validation report.
2. Address the issues of referrals in the region.
3. Finalize procurement issues and inform the program accordingly.
4. Ensure that all the community emergency transport committees are established and functional as soon as possible.
5. Malaria focal person to compile a monthly report on all the malaria mortalities audited.

Case Management Working Group Meeting

The Case Management Working Group (CMWG) is the mechanism through which Roll Back Malaria (RBM) fulfils its task for aspects related to malaria case management.

The CMWG brings together a group of partners and experts who work on use of diagnostics methods, improving drug provision, ensuring access to affordable quality drugs and quality treatment advice in both public and private sectors, improving provider and patient use of malaria drugs, mitigating the risks of antimalarial drug resistance and measuring the impact of implementation scale up on morbidity.

Rationale

One of the four essential elements of the RBM strategy is access to prompt and effective treatment of malaria. Increasing drug resistance, warranting the use of new treatments, combined with weak health systems has made it difficult to ensure that prompt, effective treatment is available and affordable to those who need it. Scaling up access to effective treatment of malaria cases will be contingent on well-coordinated, multi-disciplinary action towards defined objectives, systems, services and products.

A meeting was held on 26th May, 2017 at Kempinski Hotel, Accra.

Objectives of the Meeting were as follows:

1. To update on 1st Half Year 2017 Case Management Activities/Next Steps
2. Web Symposium on Artemisinin Resistance and Multiple First Line Treatments
3. To review and address any outstanding issues

Members were updated on 1st Half Year 2017 Case Management Activities by NMCP and were also provided with the most current information on Artemisinin Resistance and Multiple First Line Treatments by two professors from China.

In-service training of health workers on Case Management including IPTp and Diagnosis

A live-in Training of Trainers Workshop was organised from 4th June to 9th June, 2017 at Miklin hotel, Kumasi. A total of 61 Regional Trainers were trained and participants were Medical Doctors, Midwives/Nurses, Pharmacists, Bio-medical Scientists, Health Information Officers and Regional Malaria Focal Persons from all ten regions. These will in-turn roll out trainings in their various regions from July to September, 2017. It is expected that at most 7 essential health workers per district in all ten regions of Ghana, would have received in-service training on case management including IPTp and diagnostics by the end of September 2017.

Table 3: Cadre of Regional Trainers Trained in Case Management, Ghana, 2017

CADRE OF HEALTH STAFF	No. PARTICIPATED
Midwife	9
Medical officer	10
Pharmacist	10
HIO	10
Malaria Focal Person	7 (3 were reps)
Biomedical Scientist	11
TOTAL	61

Private Sector Co-payment Mechanism

The Private Sector Co-payment Mechanism (“Co-payment Mechanism”) is a financing model used by the Global Fund, to expand access to artemisinin-based combination therapies (ACTs), in the private sector. The mechanism is suitable for countries where the private retail sector is a major provider of health technologies for malaria case management. The Private Sector Co-payment Mechanism is based on the results of the Independent Evaluation of the Affordable Medicines Facility-malaria (AMFm) Phase 1, which showed that: i) a combination of price negotiations; ii) a subsidy provided directly to manufacturers; and iii) large-scale mass communications; led to rapid and large, changes in price, availability, and market share of quality-assured ACTs.

Core Components

The Co-payment Mechanism is comprised of three key components:

- Price negotiations: These are global-level negotiations led by the Global Fund Sourcing Department with pre-qualified manufacturers, to establish maximum allowable ex-factory prices of quality-assured ACTs procured using Global Fund grant resources.
- Subsidy provided directly to Manufacturers: This is a partial payment made by the Global Fund directly to pre-qualified manufacturers on behalf of eligible First-Line Buyers (FLBs), to cover a proportion of the ex-factory price of quality-assured ACTs plus freight and insurance.
- Supporting Interventions: These are country-level activities funded by Global Fund grants or the national government to facilitate the safe and effective scale-up of access to ACTs in the private sector.

Key Actors

Key actors that work together to enable the Private Sector Co-payment Mechanism to achieve its objectives include:

- The National Government
- The Country Coordinating Mechanism (CCM) includes the Co-payment Mechanism in a Concept Note
- The Co-payment Task Force

- The Principal Recipient (PR)
- First-line buyers for the Co-payment Mechanism
- Manufacturers of ACTs
- Local Fund Agent (LFA)
- The Global Fund Secretariat

The Co-payment Task Force advises and provides guidance to the Principal Recipient (PR) on the implementation of the Co-payment Mechanism. It also establishes and reviews first-line buyer conditions of participation and demand-shaping levers, together with the PR.

There was a multiple round of approvals of co-payment mechanism for each country. Due to the time consuming nature of the multiple- round system, the Global Fund proposes holding one round approval in 2016. Therefore, there is an urgent need for a Co-payment task force meeting.

Two meetings have been held so far.

- 1st Meeting was held on 4th April, 2017 and the objectives were to update members on co-payment activities for 2016 and also confirmation parameters for new orders of co-paid ACTs/2017. The parameters that were confirmed were the financial envelop, subsidy levels, demand shaping levers and list of eligible First Line Buyers. Confirmation was done using 2016 as reference.
- 2nd meeting was held on 14th June, 2017 and the objectives were approve proposed orders as per original FLBs requests or as per adjusted by Global Fund, take a decision on utilization of full financial envelop and also decide on FLBs to be prioritised for additional orders if full envelop is to be utilised.
- List of FLBs eligible for 2017 included
 1. Dove Pharmamcy Ltd
 2. East Cantonments Pharmacy Ltd
 3. Ernest Chemist Ltd
 4. GB Pharma Ltd
 5. Gokals Ltd
 6. Kobi Memorial Pharmacy Ltd

7. Kofikrom Pharmacy Ltd
8. M&G Pharmacy Ltd
9. Mikaddo Pharmacy Ltd
10. Neo Pharma Centre Ltd
11. Pharmatrust Ltd
12. Spintex Chemist Ltd
13. Supra Pharma Ltd
14. Vicdoris Pharmaceutical Ltd

Challenges

1. Delay in procuring Northern region logistics
2. Late submission of FLBs quarterly reports
3. Number of days of training short

Way Forward

1. Regional roll out of case management training
2. Quarterly monitoring of interventions in Northern region
3. OTSS in collaboration with M&E
4. Hold Co-payment task force meeting
5. Hold case management working meeting

Second and Third Quarter Monitoring to Northern Region

The objectives of the monitoring were as follows:

- Assess the second quarter activities implemented
- Inspect the 26 motor-king ambulances procured for the region
- Review the performance indicator summary
- Make recommendations for subsequent quarterly activities

Districts Visited included Zabzugu, Tatale/Sanguli, Tolon, Bole, Sawla-Tuna-Kalba, North Gonja, Tamale Metro and Tamale Teaching Hospital

Procurement of 26 motor-tricycle ambulance and emergency equipment as ambu-bags and glucometers was done by the region



Motor-king ambulances procured for the Northern Region, 2017

FIRST LINE BUYERS' MEETING

First line buyers' meeting was held on 7th September, the following were discussed:

- challenges and changes in the process of waiver acquisition
- funding for subsequent years for co-payment
- FLBs support in distribution of short dated ACTs

Challenges

- Non –adherence to negative test result
- Shortage of gloves for RDT testing
- Near Expiry of commodities: ACTs (Western region) RDT (Central Region)

Product Champion Advocacy to improve testing, Adherence and IPTp uptake

- Among all developmental strides in malaria control from universal parasitological testing to targeted effective treatment with ACT is the appointment of focal persons to promote malarial activities at regional and district levels of the healthcare system. Over the years, these focal persons who are staff of the health service, have supported malaria control activities, by ensuring supply of malaria commodities to facilities as well. Trainings, seminars as well as behavior change communication activities, have been put in place, to ensure the promotion of testing before treatment. At all levels, scheduled, regular supervision and monitoring takes place to ensure interventions proceed as planned.
- Although these efforts have improved testing of malaria control interventions to a point, this achievement is still below the desired target. Therefore, the National Malaria Control Program set out to use malaria intervention product champions as an additional strategy that would supplement other efforts to improve testing to the desired target.
- A variable number of districts were selected across the ten regions of Ghana by their geographical spread in the respective regions. Health care centres including forty (40) OTCMS, twenty (20) Pharmacy retail medicine outlets and another twenty (20) health facilities were selected from each region. The staff encountered at the time of visit were sensitized and educated on the need to test before treatment, adherence to test results and promotion of uptake of IPTp at their facilities.
- A total of 967 healthcare attendants from retail medicine outlets OTCMS (553) and Pharmacy (225) as well as health professionals of different cadre from various levels of health facilities (189) were educated and sensitized on the need to test before treating malaria, adherence to test results and uptake of IPTp in a product champion advocacy activity across the country.

Diagnosis

Malaria diagnosis have become a bed rock with which current management of malaria cases revolve. This became necessary after various researches proved that the presumptive diagnosis was not effective enough for malaria case detection and management. As such in 2010, the policy of presumptive diagnosis upon recommendation was revised for health facilities including private retail medicine outlets to testing before treatment. This led to the introduction of Rapid Diagnostic Test Kits (RDTs) in health facilities and private medicine outlets to facilitate testing alongside training of several cadres of health and non health professionals alike on RDT testing. The limitations of RDT kits are overcome with microscopy which is the ‘gold standard’ used to detect malaria parasites, identify parasite species and determine the parasite density. Since microscopy requires skilled personnel, laboratory Scientists are also being trained and given supportive supervision together with proficiency testing to ensure accurate results for effective case management.

The objectives for malaria diagnosis unit is to implement measures that would:

1. Help increase access to malaria diagnostics for testing,
2. Improve upon the quality of malaria testing for accurate and reliable results

Activities Carried Out In 2017

Malaria Diagnosis Refresher Training for Laboratory Scientists

In the light of universal parasitological testing, laboratory Scientists across the country were given malaria diagnostic refresher training to improve their competency and capacity to provide quality testing for all suspected cases of malaria. At the end of June 2017, the trainings have been completed in seven regions (Upper West, Upper East, Northern, Brong Ahafo, Ashanti, Eastern and Volta) remaining the other regions of the country.

All participants examined a total of sixty (60) slides for either parasite detection, species identification or parasite quantification over a four day training with fifteen slides per session. Each slide was examined for a maximum of 10 minutes under examination conditions amidst theoretical presentations.

A total of 244 participants have been trained across the ten regions of Ghana; Upper West (22), Upper East (22), Northern (27), Brong Ahafo (27), Ashanti (26), Eastern (26), Volta (25), Western (19), Central (24) and Greater Accra (26) from various health facilities.

For **species identification**, the participants as a group had a

- 53% improvement from 33% at pre-test to 86% at post test three in Upper West
- 55% improvement from 14% at pre-test to 69% at post test three in Upper East
- 50% improvement from 17% at pre-test to 67% at post test three in the North
- 50% improvement from 17% at pre-test to 67% at post test three in Brong Ahafo
- 83% improvement from 0% at pre-test to 83% at post test three in Ashanti
- 54% improvement from 17% at pre-test to 71% at post test three in Eastern
- 54% improvement from 17% at pre-test to 71% at post test three in Volta
- 83% improvement from 0% at pre-test to 83% at post test three in Western
- 36% improvement from 31% at pre-test to 67% at post test three in Central
- 52% improvement from 17% at pre-test to 69% at post test three in Greater Accra

For **parasite quantification (density)**, the participants as a group had a

- 37.5% improvement from 12.5% at pre-test to 50% at post test three in Upper West
- 62.5% improvement from 0% at pre-test to 62.5% at post test three in Upper East
- 75% improvement from 0% at pre-test to 75% at post test three in the North
- 50% improvement from 0% at pre-test to 50% at post test three in Brong Ahafo
- 50% improvement from 25% at pre-test to 75% at post test three in Ashanti
- 25% improvement from 25% at pre-test to 50% at post test three in Eastern
- 25% improvement from 0% at pre-test to 25% at post test three in Volta
- 25% improvement from 25% at pre-test to 50% at post test three in Western
- 25% Improvement from 25% at pre-test to 50% at post test three in Central
- 75% improvement from 0% at pre-test to 75% at post test three in Greater Accra

The overall average scores for 244 participants trained in all seven regions are shown in Fig1.

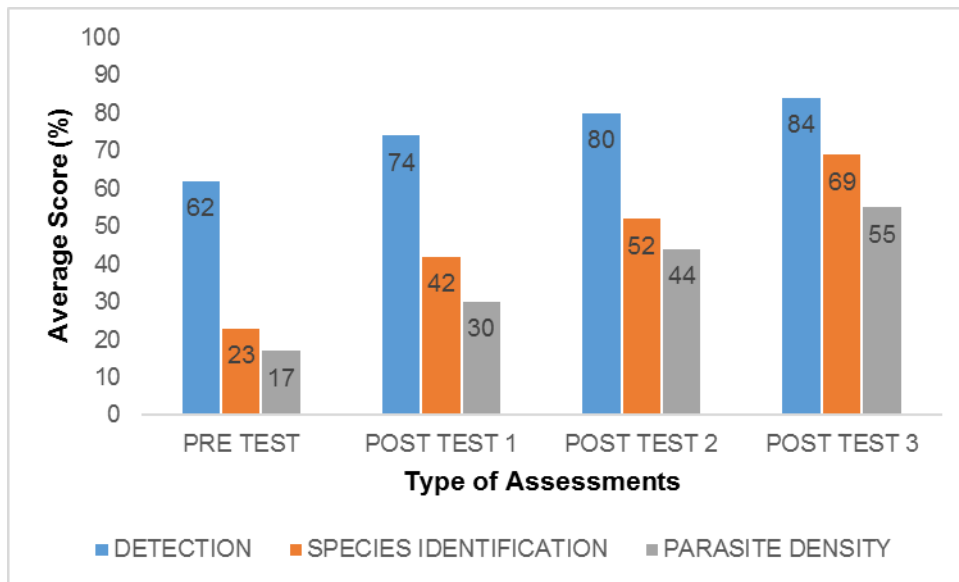


Figure 1: Participants' Microscopy Assessment Scores, Ghana, 2017

The group median scores for participants trained in the various regions Upper West, Upper East, Northern, Brong Ahafo, Ashanti, Eastern, Volta, Western, Central and Greater Accra Regions are shown in Figures below.

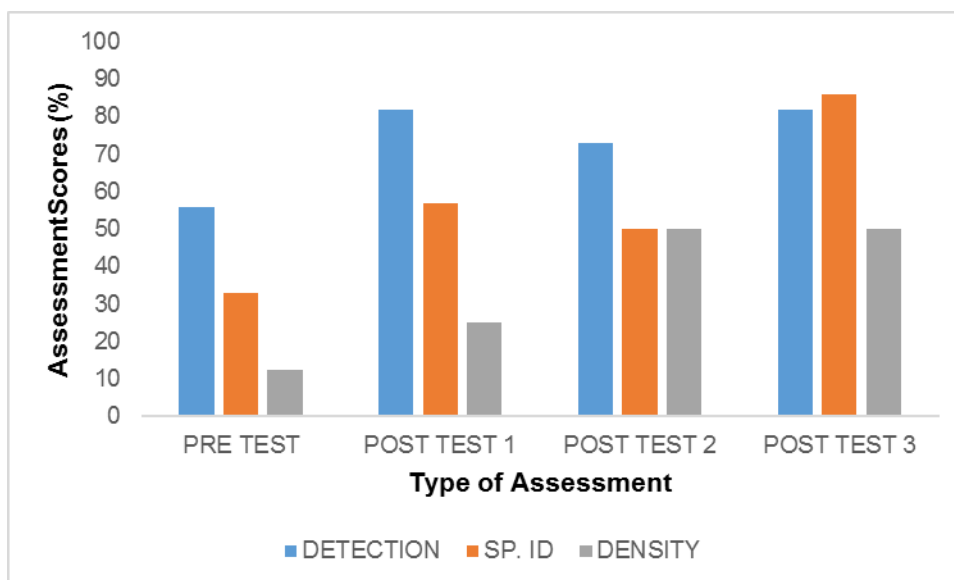


Figure 2: Participants' Microscopy Assessment Scores, Upper West Region, 2017

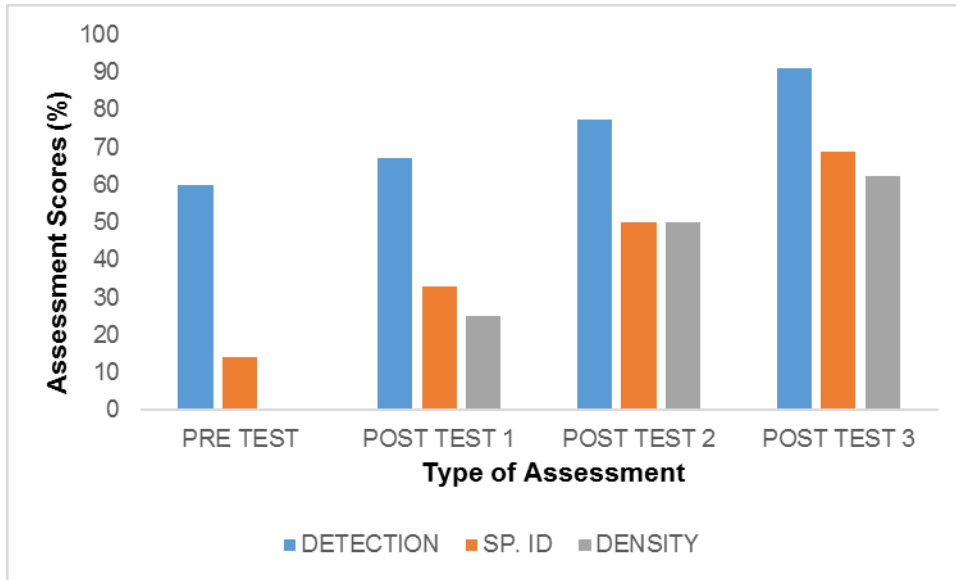


Figure 3: Participants' Microscopy Assessment Scores, Upper East Region , 2017

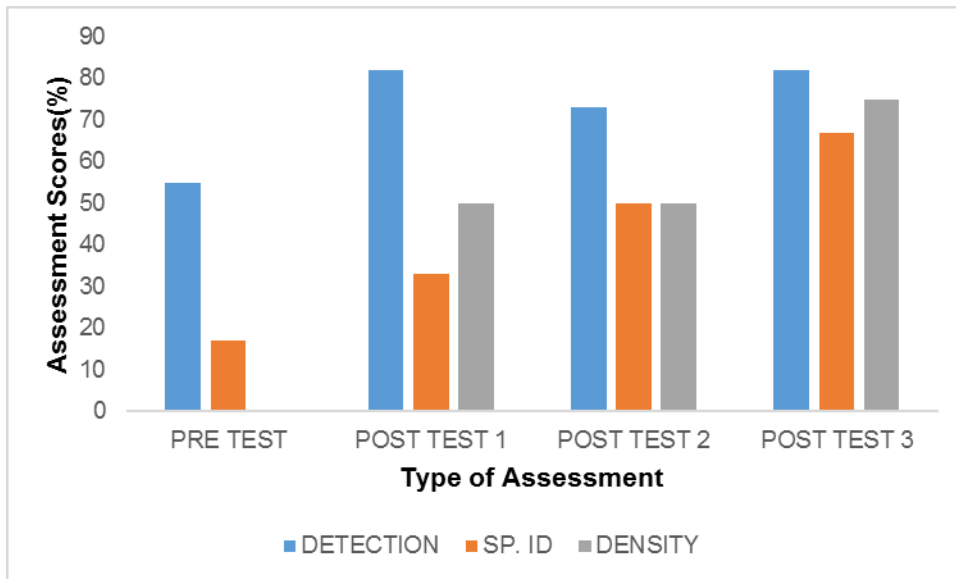


Figure 4: Participants' Microscopy Assessment Scores, Northern Region, 2017

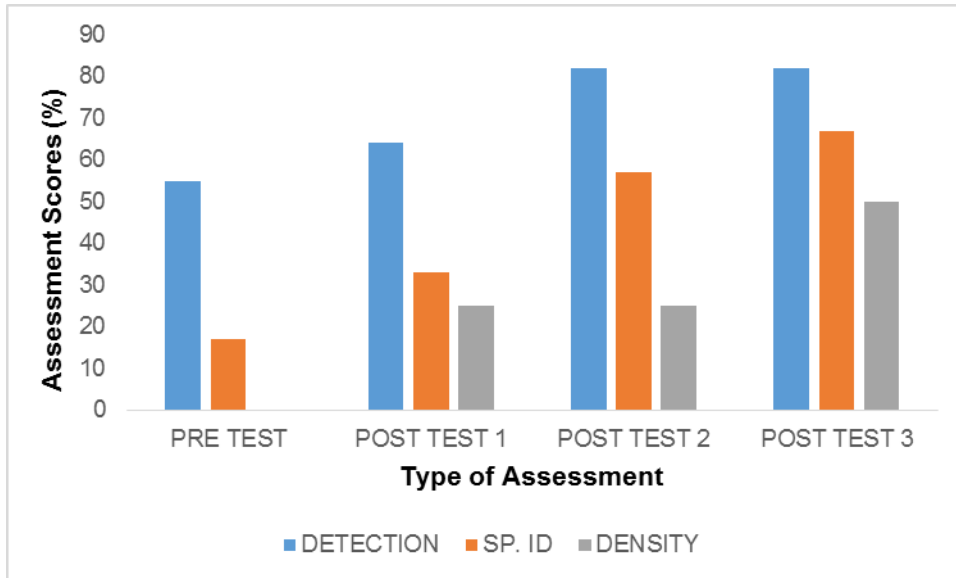


Figure 5: Participants' Microscopy Assessment Scores, Northern Region, 2017

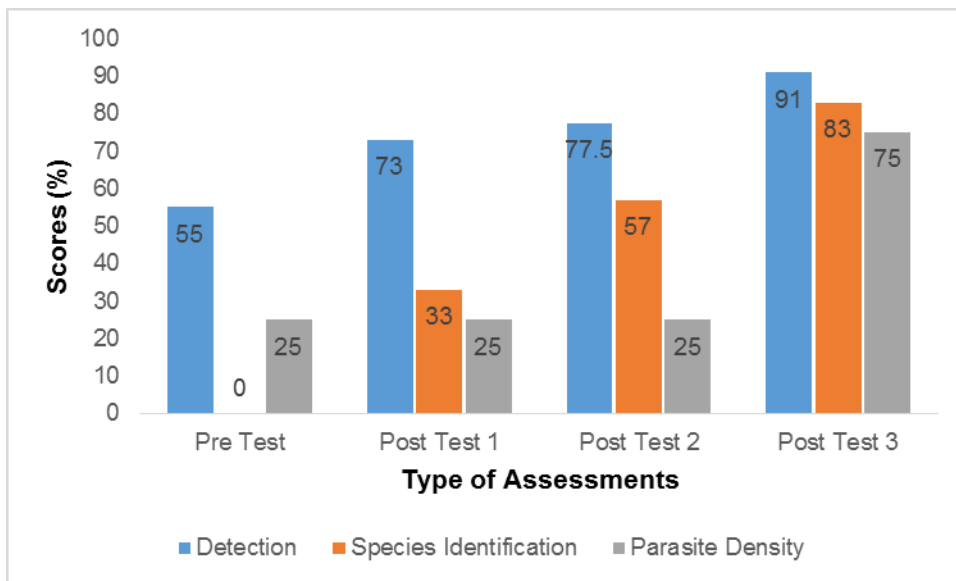


Figure 6: Participants' Microscopy Assessment Scores, Ashanti Region, 2017

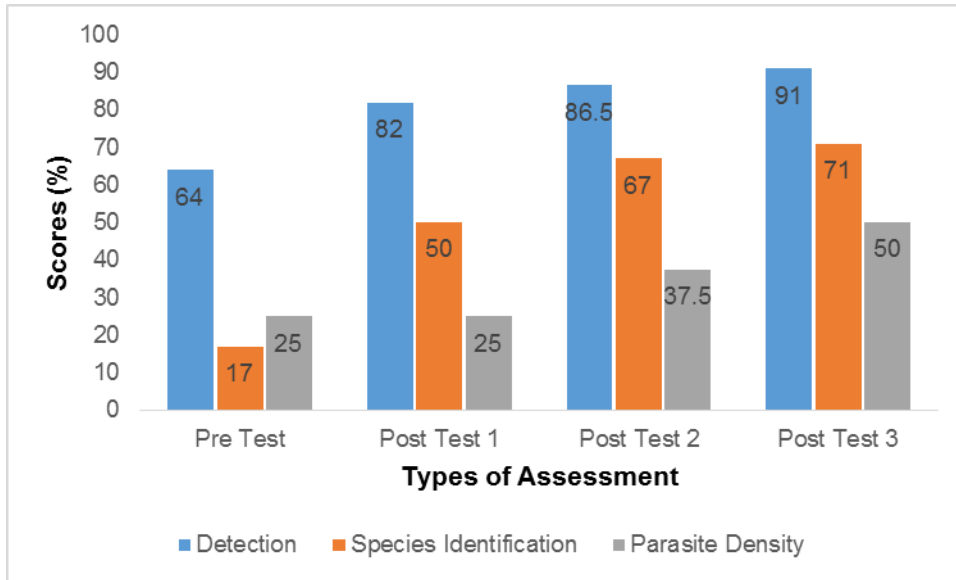


Figure 7: Participants' Microscopy Assessment Scores, Eastern Region, 2017

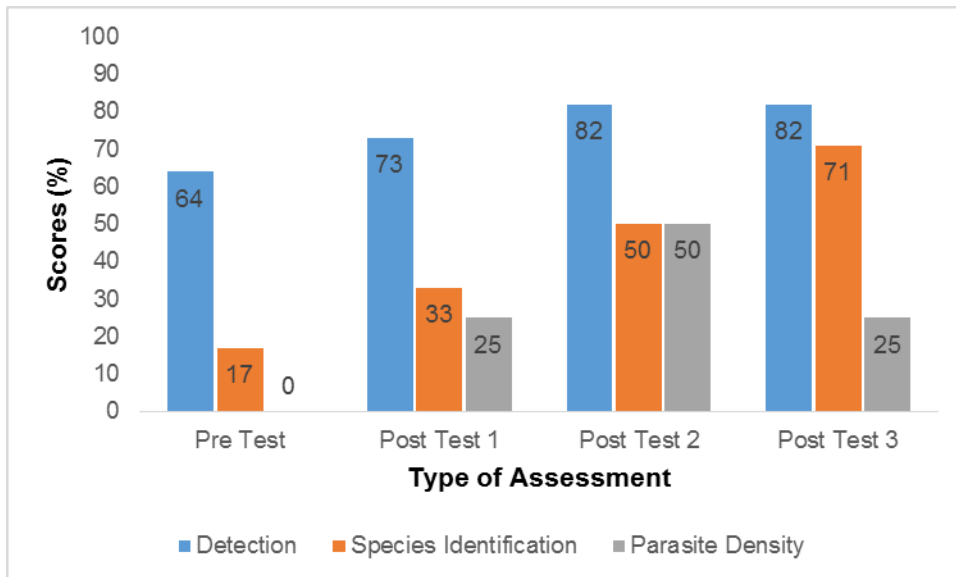


Figure 8: Participants' Microscopy Assessment Scores, Volta Region, 2017

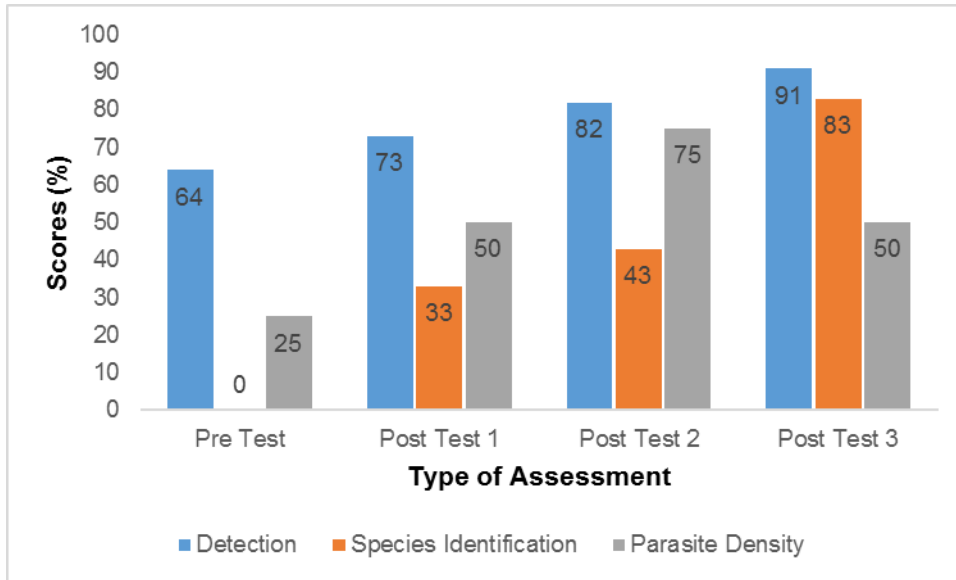


Figure 9: Participants' Microscopy Assessment Scores, Western Region, 2017

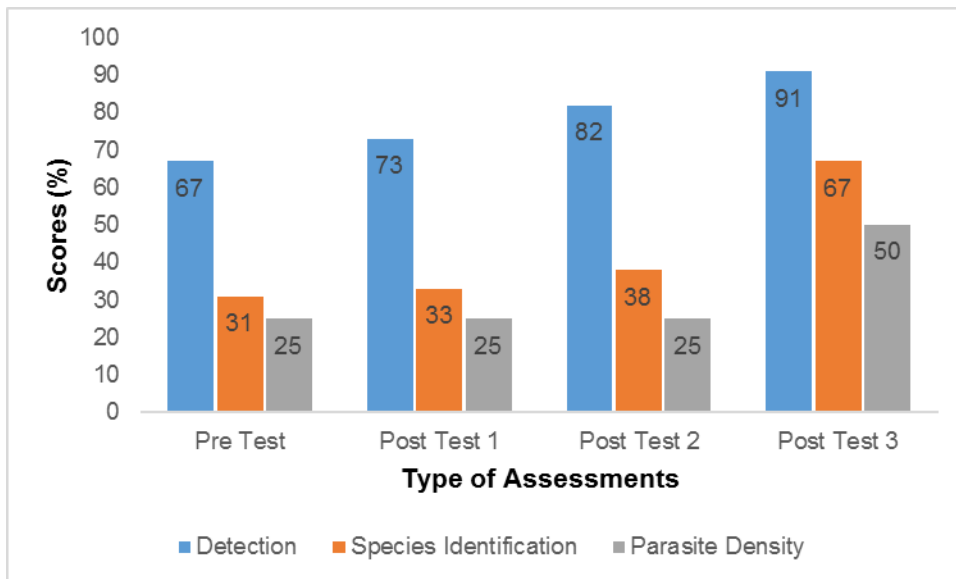


Figure 10: Participants' Microscopy Assessment Scores, Central Region, 2017

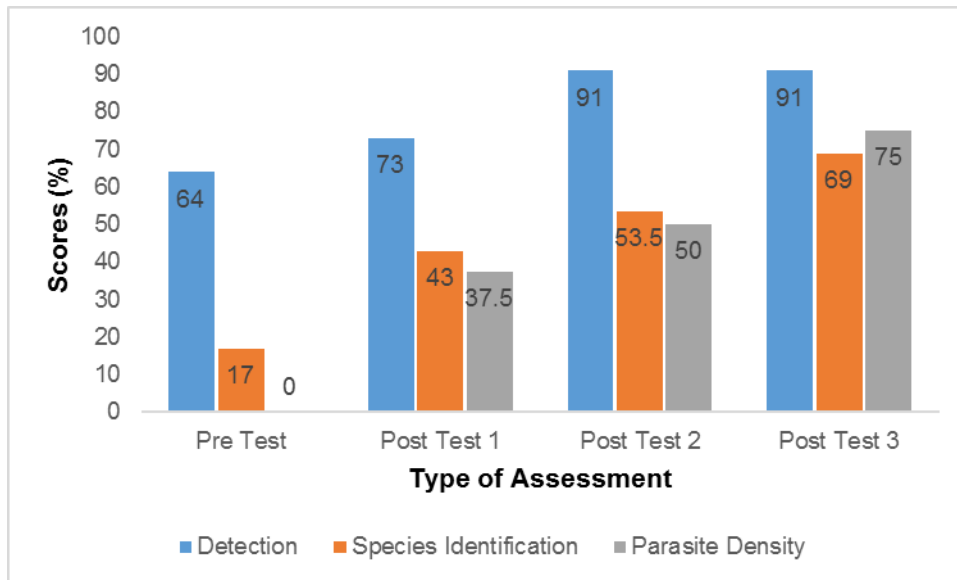


Figure 11: Participants’ Microscopy Assessment Scores, Greater Accra, 2017

In conclusion, the malaria diagnostic refresher training has been successful as participants progressively improved from pre test to post test 3 in all parameters of malaria microscopy examinations.

RDT Supportive supervision for Over The Counter Medicine Sellers (OTCMS)

SHOPS USAID in collaboration with the National malaria control program conducted RDT Supportive Supervision for Over The Counter Medicine Sellers (OTCMS) who purchased malaria RDTs from SHOPS at Upper West (18), Upper East (68), Northern (101), Brong Ahafo (120), Ashanti (1) and Western (269) Regions of Ghana. A total of 720 OTCMS outlets were visited and personnel available were assessed in practical RDT testing and further trained in RDT principles and testing.

Orientation of Malaria Lab OTSS Supervisors on Proficiency Testing Scheme

About 30 Regional Malaria Lab OTSS Supervisors were given orientation on Proficiency Testing Scheme as a quality assurance measure in malaria microscopy by Clinical Lab Unit,

ICD-GHS and supported by PATH MalariaCare/USAID. Proficiency testing of medical laboratory scientists was conducted for about 40 facilities nationwide whereas over 150 health facility labs participated in a laboratory OTSS conducted by CLU-ICD-GHS.

Challenges

1. After the initial plans progressed, the Malaria Diagnostic Refresher Training (MDRT) activity had to undergo re-programming to access fund for it. This caused
 - a change in initial dates for MDRT and
 - further caused a delay in obtaining hotel Invoices for revised MDRT dates for proposal processing
2. Lack of UPS devices to maintain power for microscopy and presentations during power outages.

Malaria Diagnostic Refresher Training (MDRT)

In the second quarter of 2016, a three-day Malaria Diagnostic Refresher Training (MDRT) was conducted for laboratory Scientists from private, public and quasi facilities in five sessions in Sunyani, Kumasi, Volta, and two in Central Regions of Ghana. The main objective of the training was to refresh and assess the skills of the laboratory professionals in malaria microscopy and RDT testing as a way to improve their competences and quality of testing.

A total of 115 laboratory professionals participated in this training with 62% (71/115) from private facilities, 13% (15/115) from public and 25% (29/115) from quasi facilities. The median age of the participants was 30 years and females formed about 17% (19/115) in minority.

The median scores for the theory pre- and post-test assessments 14.3% and 78.6% respectively with the least and highest scores shown in Figure 1 (some recorded negatives because a wrong answer attracted a negative mark).

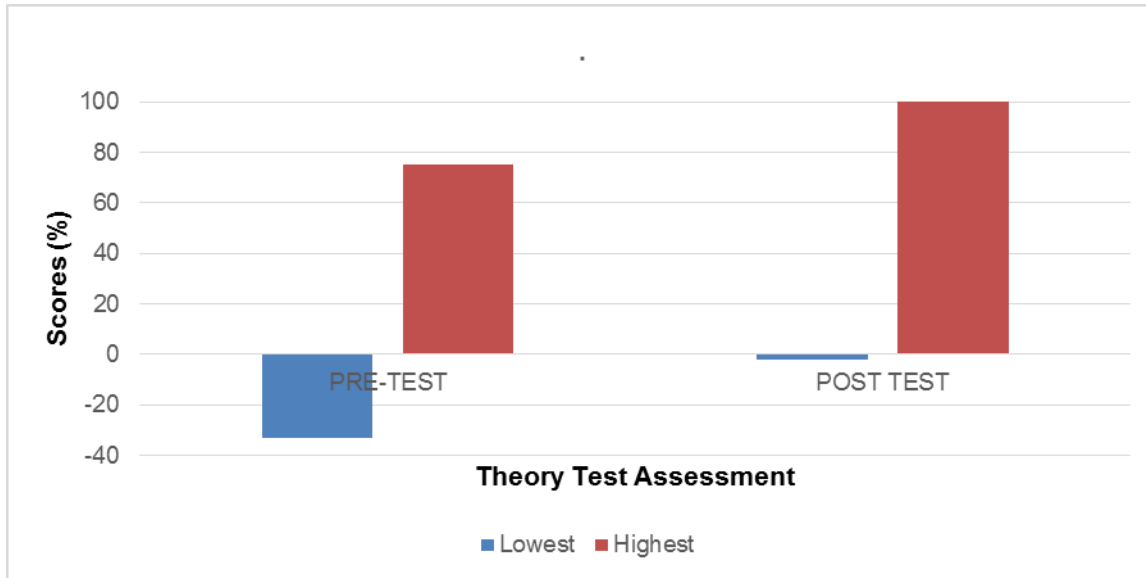


Figure 12: Least and Highest Theory Assessment scores of participants, 2017

The participants improved in their malaria microscopy competency skills from 58% to 91% in parasite detection, 13% to 71% in parasite species identification (Species ID) and 0% to 50% in parasite density determinations during the training. The median scores and improvement of the participants in their microscopy competency skills are shown in Figure 2 below:

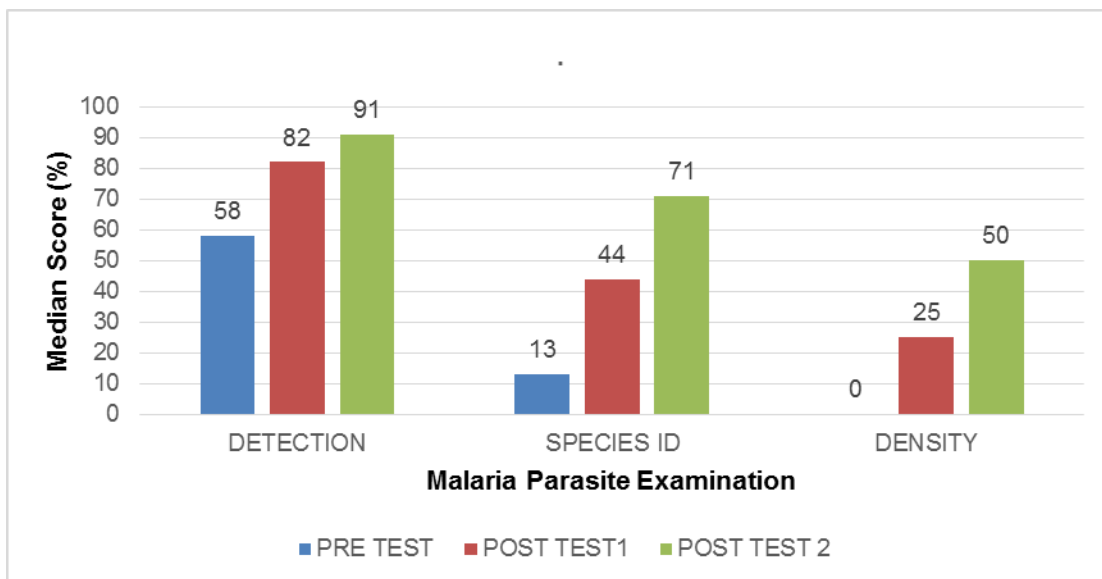


Figure 13: Median Scores and Improvements of participants in their practical malaria microscopy skills during the training, 2017

As per WHO's expert certification, parasite detection, species identification and parasite density skills should be $\geq 90\%$, $\geq 90\%$ & $\geq 50\%$ respectively for level 1 while level 2 is $\geq 80\%$, $\geq 80\%$ and $\geq 40\%$, for parasite detection, species identification and parasite density skills respectively. The participants as a group therefore attained WHO Level 1 for parasite detection (91%) and density skills (50%) after the training but Level 3 for species identification (71) which is very remarkable.

In a similar microscopy training, a total of 295 lab professionals were trained at Kintampo Health Research Centre through the first quarter of 2016. In the third quarter, an on-site microscopy training was also held for 85 laboratory professionals at their various work stations across 26 sentinel sites for malaria parasite prevalence studies in Ghana. Below is a picture of such training at the Upper West Regional Hospital, Wa.



Figure 14: On-site Malaria microscopy training at the Upper West Regional Hospital Laboratory, Wa, 2017

Finally, in the last quarter of 2016, PATH, Malaria care also conducted a four day MDRT in six sessions for 164 laboratory Scientists with 11 of the participants being Lecturers pooled from KNUST, UG and KHTC. The results of the training session involving laboratory professionals from Brong Ahafo and Ashanti Regions showed that the group attained WHO Level one (Expert) grading with $\geq 90\%$ for parasite detection and species identification and $\geq 50\%$ for parasite density / quantitation at the end of posttest: day 3 as shown in figure 17.

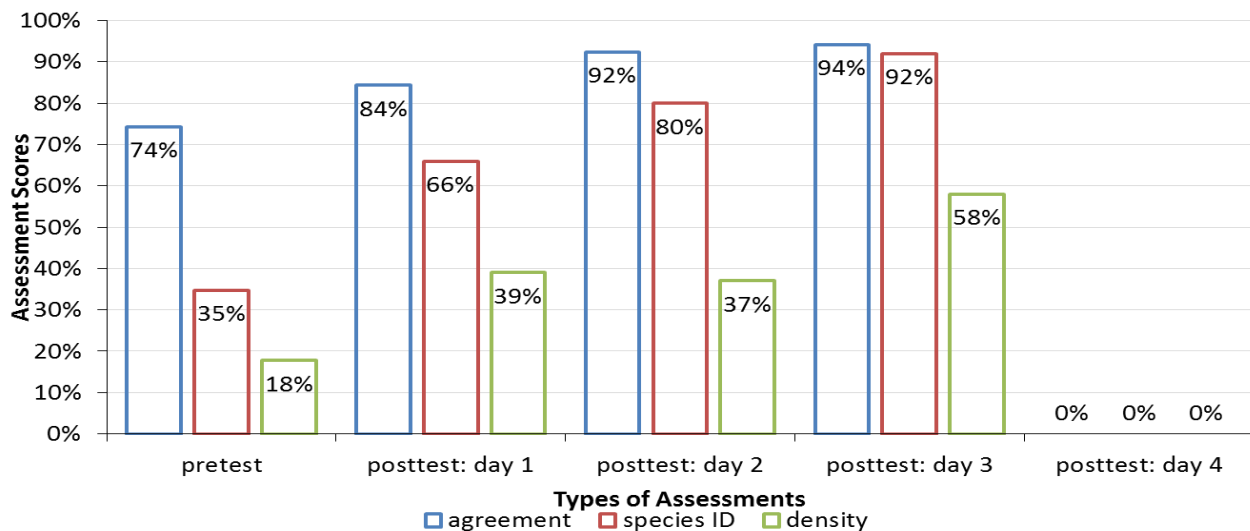


Figure 15: Performance of the group in malaria microscopy competency over time, 2017

Malaria Care further sponsored a one-day training session on the Proficiency testing (PT) scheme for all Regional and national-level laboratory OTSS supervisors. The Proficiency testing (PT) scheme was piloted in 27/28 health facilities in Ashanti Region during OTSS round 12.

The Proficiency Test results indicated that 41% of facilities reached the target of $\geq 80\%$ for parasite detection, 15% reached the target of $\geq 80\%$ for species identification and 40.7% of facilities met the target of $\geq 40\%$ percent for parasite quantitation or density as per the WHO certified competency ratings.

Two Laboratory OTSS rounds 11 and 12 were also conducted in 2016 under the sponsorship of Malaria Care. A total of 379 health facilities were visited for the two rounds 11(180) and 12 (199).

Of about 307 health facilities assessed for malaria microscopy parameters, 53% (164/307) scored at or above the target of 90% whereas 65% (171/264) of health facilities scored at or above the target of 90% upon assessment of malaria RDT parameters as shown in Table 4.

Table 3: Average overall performance scores for facilities visited for laboratory OTSS 11 &12, 2017

Competency area	Overall average health facility (HF) score (most recent visit)	Total No. of HF (Rounds 11 and 12)	Target	% of HF scoring or above target	No of HF at or above target
Microscopy*	90%	307	90%	53%	164
Rapid diagnostic test (RDT)*	92%	264	90%	65%	171
Adherence to negative test results	84%	348	85%	59%	207

Monitoring of RDT Usage by the private sector

Private facilities supplied with malaria RDTs by NMCP in 2014 and 2015 were visited in Greater Accra, Central, and Eastern Regions of Ghana to obtain information and collect data on RDTs received.

Facility attendants encountered were interviewed on the following

- a. Date RDT was received

- b. Quantity of RDT received
- c. Unit Cost price paid for RDT
- d. Unit Selling price of RDT
- e. Brand of RDT received
- f. Expiry date of RDT
- g. Number of RDTs used
- h. Number of RDTs remaining
- i. Number of Persons Tested
- j. Number of positive test
- k. Action Taken on negative results
- l. Feedback comments from facility attendants

A total of 106 facilities were visited with about 57% in Greater Accra. About 54% of attendants encountered were males. Although facilities from SPMDP received RDTs for free, some charged as high as GHC 15.00 for testing as shown in Table 5.

Table 4: Pricing of RDTs across the Selected Regions among the Beneficiaries of RDTs from NMCP, 2017

GROUP	NO. OF FACILITIES	REGION (%)			GENDER		UNIT COST PRICE	UNIT SELLING PRICE	
		GAR	CR	ER	F	M		RANGE FROM	TO
SPMDP	25	15.1	0.85	0.057	9	18	FREE	0	15
PSGH	19	17.9	-	-	10	9	1.2	2	8
OTCMS	57	23.6	30.2	-	29	28	57	23.6	30.2
CPPA	5	0.05	-	-	3	2	DK	5	10
TOTAL	106	56.65	31.05	0.057	51	57	(AVG)1.35	AVG(1.75)	(AVG)9.5

The various private facilities received RDTs from 11/02/2015 to 10/12/2015: Quantity of RDT received; (40 to 2250 pcs), with most of the RDT received being either SD-BIOLINE or FIRST RESPONSE/CARESTART and expiry date from May-2015 to 09/01/2017) as shown in Table 6.

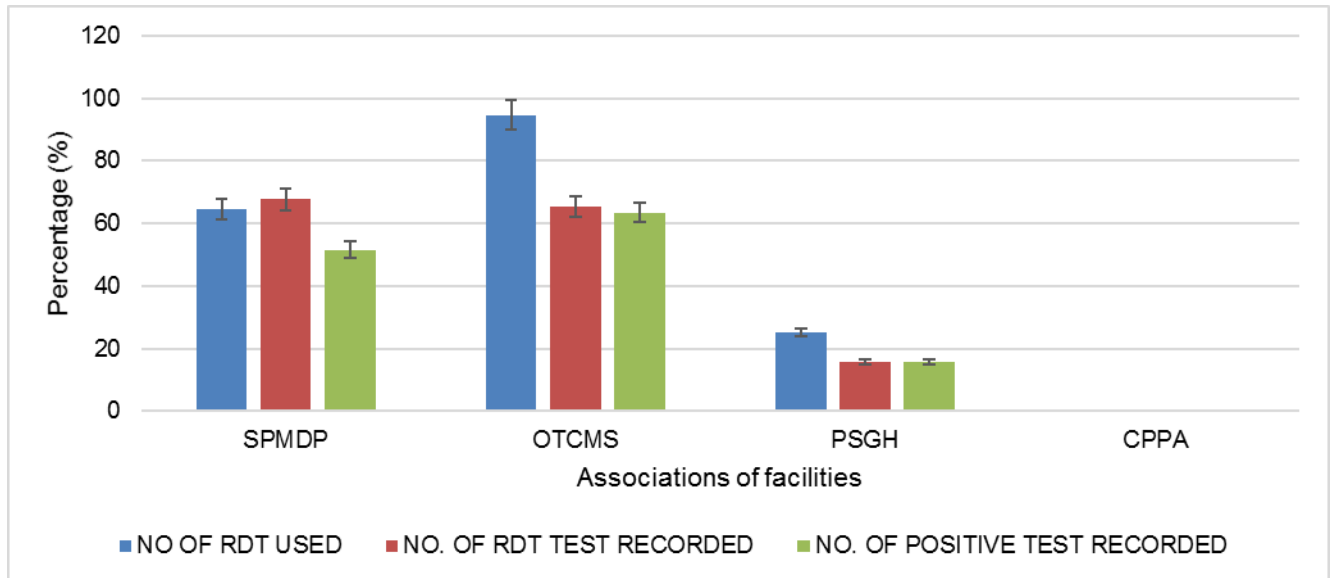


Figure 16: Level of Compliance with Documentation at the Various Private Societies

General Observations

Also, it was generally discovered that most of the facilities did not have records available because they had to submit returns to their groups for new consignments. They however did not make copies for records keeping at their facilities. Meanwhile some facilities also did not document the testing activity at all. It was also noted that some facilities read RDT test results of First Response RDT kits after five minutes instead of 20 minutes.

Some facilities denied receiving RDTs from their groups although they were in the distribution list. (New Life Hospital and Frida’s Memorial clinic) members of the SPMDP.

Feedback Comments from Facility Attendants

Some of the feedback comments were that

1. Some facility attendants admitted that the use of RDTs was useful (23.1%)
2. Some facility attendants of Pharmacy shops testified that clients request for malaria RDT testing has increased possibly due to the advertisement made.
3. Facility attendants also complained about too many negative test results. After they were educated, some requested for training.
4. Some also complained of shortage of RDTs or inconsistent supply of RDTs

GHS/NMCP collaboration with FHG, CPPA and OTCMS

As part of efforts to address the documentation, records and data generation gap with the private facilities as demonstrated by the monitoring in the above session, NMCP organized a meeting - with the leaders of the private sector associations and a team from Fio Health Ghana (FHG). In this meeting, the various group realized and acknowledged the difficulty involved in getting data from their member facilities after they have received RDTs from NMCP. FHG then gave a presentation on how Deki readers could be used to provide real time data from the facilities with a quality assurance measure for RDT testing to overcome the data issue. This was appreciated by the various groups and moved for the adoption of FHG to support us all to get the data with terms and conditions stated in the minutes.

A further MoU between GHS and FHG as well as GHS and Associations was developed based on the terms agreed at the meeting for commencement. Supply of RDTs was therefore halted pending the signing of the MoU which finally occurred in July 2016. Meanwhile leaders of SPMDP declined to sign the MoU against initial agreement.

Those who signed received RDTs in September for the implementation of the agreement with FHG. The commencement of this data transmission saw various turns and twists from the initial understanding and therefore agreement which was handled by management of NMCP.

The MoU was developed with the GHS Lawyer and signed appropriately with FHG - Regarding malaria RDT Diagnoses, surveillance and Quality Assurance and with CPPA and OTCMS - Regarding RDT Distribution and Reporting.

Monitoring on FIONET FHG progress

The NMCP in conjunction with the CPPA and FIONET Ghana in improving data quality and documentation on RDT usage in the country have begun the first phase with the usage of Fionet Mobile-app device as against Deki readers in 30 health facilities. This session captures findings on the progress in data collection and management using the Fionet mobile-app device which was conducted in 2016 with the following objectives

1. To assess progress on Fionet data management and collection using the mobile-app device;
2. To verify reported malaria case management as well as improve documentation
3. To address any difficulties which may arise during the first phase of the project.

A total of 12 (40%) out of 30 enrolled health facilities on Fionet mobile-app device from the CPPA list were visited by NMCP team in the Greater Accra region. The average number of attendants per facility was 5 with 2 and 20 as the lowest and maximum respectively.

Concerning the device, all facilities visited had a Fionet Mobile app device and its operation for data entry was done with ease for most attendants. With a total of 65 attendants, about 90% (59) had been trained to use the mobile app but 5% (3/59) could not operate the mobile app.

Meanwhile, 75% (9/12) of respondents complained about the phone battery being too weak. About 17% (2/12) mentioned that the app could not transmit their data and were therefore scheduled for a replacement. These facilities then stopped entering data while awaiting the replacements although testing continued. Only one password was given per facility as against one password to attendant to track errors easily. Clients name could not be traced in archives making references difficult while some records pre-dated start of project. Some mobile apps also displayed positive results as positive for P.v and Pf in archives of some facilities instead of just positive for P.f only. Furthermore, 17% (2/12) of facilities recommended for Deki Readers instead to help in test interpretation and picture taking.

For supply and pricing of RDTs, all 12 facilities visited obtained RDTs at GHc 1.8 as per the agreed MOU. About 42 % (5/12) of facilities tested at a higher charge average cost of GHc 3.71 (3.0 -8.0) than GHc 2.50 as stipulated in the MOU. About 60% (6/12) of respondents believed the waiting time of about 30 minutes (for negative tests at 15 minutes) is too long thereby hampering process. Other facilities rather perform test only upon patient request including clients purchasing antimalarial medicines. Some facility members recommended reconsideration of

RDT testing price of GH¢2.50 and requested that public education via Adverts on the need to test before treatment of malaria be intensified to increase patronage.

Also to whip up interest of other facilities to sign onto the RDT testing and Fionet Data service, the team contacted some facility owners. However, all these facilities declined the offer after getting to know about the charge limit of GHc 2.5 for testing after purchasing at GHc 1.8.

A stakeholders meeting was finally held to deliberate on these findings and the way forward discussed.

Malaria in Pregnancy

Malaria infection during pregnancy causes maternal anaemia and placental parasitaemia both of which are responsible for miscarriages and low birth weight babies among pregnant women.

Malaria in pregnancy is a priority area in the control of malaria and Ghana has over the past years deployed a number of strategies to address the problem of malaria in pregnancy. In 2003, Ghana adopted the Intermittent Preventive Treatment during Pregnancy (IPTp) strategy using Sulphadoxine and Pyrimethamine (SP), together with the use of insecticides treated nets, for the prevention of malaria in pregnancy.

Currently these preventive interventions have been integrated in Anti-Natal Services (ANC), where IPTp-SP, 3 tablets, is given to the pregnant women from 16th week of pregnancy or after quickening, once every month, till delivery, as Directly Observed Therapy (DOT), and Long Lasting Insecticides Treated Nets, are given to every ANC registrants. All these are provided free of charge to the pregnant women.

Planned activities for 2017

- Complete impact assessment of IPTp-SP at Kintampo
- Conduct in-service training for health workers on IPTp and quality assurance activities
- Train NGOs in follow-up of pregnant women

- Bi-annual MIP WG meetings

Monitoring/Supportive visits to Health Facilities

Activities carried out in 2017

Malaria Operational Plan for Fisical Year (MOP FY) 2018 field visit: Malaria in Pregnancy unit took part in MOP FY2018 that was organised by PMI in March 2017. The regions visited were Volta, Central and Western. Three (3) districts each from these regions were selected, and one each of regional hospitals, district Hospitals, health centres, and CHPS were visited in each of the 3 regions.

The following were the findings on Intermittent Preventive Treatment in pregnancy during the regional visits:

- Implementation of IPTp using DOTs at all levels of care, however women were made to chew SP
- Verbal screening done for clients to determine SP allergy
- Staff not aware of new policy of IPTp(SP until delivery) in some of the Municipal Hospitals and Health Centres
- About 75% of the facilities visited were aware that 5mg folic acid should not be given together with SP due to reduction of efficacy.
- A circular sent from the national level in October 2016 on malaria prevention and micronutrient deficiencies in pregnancy to all regions for communicating to lower levels was not available in any of the facilities visited
- Concurrent use of Iron III polymatose complex and Folic acid (5mg)
- Water was given in all facilities for pregnant women to take SP by DOT
- Midwives are routinely testing every pregnant woman for malaria.

The following recommendations were made:

- Training on New Malaria Policy should be organised for all new staff.
- Transport should be provided for the lower level facilities to ensure regular pull of commodities from Districts

- RHMT should make copies of the circular on malaria prevention and micronutrient deficiencies in pregnancy available to all health facilities in their jurisdiction and distribute MIP Guidelines to all facilities
- DHMT should ensure that all the benefits of SP is included in the health talk at facilities and during outreaches
- Need for on-the job training to inform on appropriate administration of FA and Fe (III) polymatose
- Family Health Department (FHD) to write to all health facilities that routine screening of pregnant women for malaria is not recommended by WHO and NMCP, as this is a drain on resources.

In-service training of health workers in Malaria Case Management including Malaria in Pregnancy

Reprogrammed funds were made available for in-service training of health workers in Malaria Case Management including Malaria in Pregnancy. Live-in Training of Trainers Workshop was organised at Miklin Hotel, Kumasi, from 4th June to 9th June, 2017. A total of 61 Regional Trainers were trained in Malaria Case Management (uncomplicated and Severe Malaria), Malaria in Pregnancy, Diagnosis (RDTs and Microscopy), Data Management, Procurement and Supply Chain Management, at the workshop. The trainers included Medical Doctors, Midwives/Nurses, Pharmacists, Bio-medical Scientists, Health Information Officers and Regional Malaria Focal Persons. These in-turn rolled out trainings in their various regions from July to August, 2017. Table 1 highlights the Regional Roll out of the in-service trainings.

Table 5: Regional Malaria Case Management In-service Trainings, Ghana, 2017

Region	No	of	No of Health	No	of	No of Health	Achievement
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	Districts	Workers Targeted to Be Trained	Batches	Workers Trained	%
Volta	25	180	4	180	100.0
Western	23	160	4	161	100.6
Greater Accra	30	200	4	193	96.5
Eastern	26	180	4	180	100.0
Central	20	150	3	150	100.0
Brong Ahafo	27	180	4	177	98.3
Ashanti	30	200	4	200	100.0
Northern	26	180	4	159	88.3
Upper West	11	120	3	120	100.0
Upper East	13	120	3	110	91.7
Grand Total	231	1,670	37	1,630	97.6

Challenges

- Stock outs of commodities at facilities when districts and regional stores are having stock.
- Refusal of some health providers to implement IPTp-SP.
- Inadequate ANC registers and lack of Form A at the health facilities.
- Yet to receive approval for the printing of IPTp daily tally sheets that was designed in 2016.

Recommendations

- DHMTS should ensure regular supply of malaria commodities to all their reporting facilities.

- Renewal of health service licensure should be tied with submission of quarterly reports.
- PPMED should liaise with MOH to ensure availability of all registers
- Procurement unit should grant the needed approval for the printing of IPTP tally sheet

2.2 Vector Control

The Vector Control Unit of the National Malaria Control Programme as part of its IMVM policy implements an integrated vector control approach. In the year under review, the following activities were planned and undertaken:

- Continuous Distribution (CD) of LLINs
- Pilot of LLIN Point Mass Distribution (PMD)
- Indoor Residual Spraying (IRS)
- Malaria Vector Control Oversight Committee (MaVCOC) and ITN Subcommittee Meeting
- Insecticide Resistance Monitoring

Continuous Distribution of LLINs

Ghana's Continuous Distribution Strategy is used to 'push' nets into households periodically through the following channels:

- Health facility based distribution
 - During Antenatal (ANC) visits (targeting pregnant women at their first ANC visit)
 - During Immunizations (EPI) (targeting 18 month old children receiving their 2nd dose of Measles and Rubella vaccination)
- School Distribution
 - Primary Schools (targeting children in primary 2 and 6)

Health Facility-Based Continuous Distribution

As part of the Continuous Distribution of LLINs to households across the country, two health facility based approaches were used. These strategies were; distributing LLINs to pregnant women registering for the first time (First registrants) and children aged 18 months who received second dose of Measles and Rubella at the Antenatal Clinic (ANC) and Child Welfare Clinic (CWC) respectively. One LLIN is given to each beneficiary.

Out of 942,755 ANC registrants in the year 2017, 728,498 were given LLIN representing 77.3%. Also 81.5% (757,634/929,135) of children who received second dose of Measles and Rubella vaccination were served with LLINs.

Table 6: Health Facility Based LLINs Distribution By Regions, 2017

Region	LLIN Distributed To Children	Children Who Received Measles 2	Proportion of children given LLIN	LLIN Distributed To ANC Registrants	ANC Registrants	Proportion of ANC Registrant given LLIN
Ashanti	113,501	178,741	63.5	89,959	161,193	55.8
Brong Ahafo	94,309	96,291	97.9	83,946	87,099	96.4
Central	50,364	79,656	63.2	54,151	87,893	61.6
Eastern	95,317	99,353	95.9	78,878	84,851	93.0
Greater Accra	128,427	152,065	84.5	116,734	154,969	75.3
Northern	76,417	107,155	71.3	96,641	134,638	71.8
Upper East	25,165	31,335	80.3	29,281	37,501	78.1
Upper West	21,601	22,698	95.2	23,348	27,015	86.4
Volta	73,213	77,253	94.8	63,547	68,700	92.5
Western	79,320	84,588	93.8	92,013	98,896	93.0
Grand Total	757,634	929,135	81.5	728,498	942,755	77.3



Health Facility-Based LLIN Distribution Section, Ghana, 2017

Review Meetings on Continuous Distribution

The NMCP in collaboration with USAID VectorWorks carried out review meetings in the regions to document and take action on issues affecting continuous distribution in general. The following were observed and key action taken where necessary:

- Health workers adherence to the guidelines on health facility distribution of LLINs is key to the success of this intervention
- On-The-Job training for service providers at ANCs and CWCs in health facilities visited.

Monitoring and Supportive Supervision on Continuous Distribution

NMCP, USAID VectorWorks and Regional and District Health Management teams carried out monitoring and supportive supervision to the districts and health facilities.

Challenges

- Logistic Supply Chain related:
 - Artificial stock out in some health facilities due to non-adherence to maximum and minimum stock levels and re-order protocols stock and re-order protocols
 - Inadequate/lack of tools for documentation such as bin cards
 - Inadequate Storage space in some districts.

- Education on ITN use and care
 - Inadequate job aids at facilities for education on ITN use and care.

- Maternal health and child health record books:
 - LLIN given and recorded with a tick instead of date given. The challenge is that health facility staff are unable to indicate the date of receipt of an ITN by a client.
 - Some facilities do not indicate the nets given in ANC register even though columns are provided.

- Monthly reporting
 - Some facilities lacked monthly midwives returns (Form A) and resorted to the use of older forms which do not have columns for ITNs distributed. This affects coverage of LLINs distributed through the ANC channel.

Corrective Measures

- The NMCP and partners currently supplies stocks to last a year instead of six (6) months. This is to avoid delays in supply after the 6 months have elapsed.
- Districts have strengthened the sub-district capacity to store and distribute ITNs to facilities to ensure stock outs do not arise
- When there is shortage of bin cards, photocopied versions should be used
- Timely entry of data into DHIMS to avoid data from preceding months packed onto a single month due to DHIMS periodic closure of entry.

- Institution of monthly data audit at every facility to validate data to be entered in DHIMS.
- Continuous education of health facility staff to improve knowledge of health facility-based continuous distribution by supervisors.
- Entries of LLINs received and issued should be correctly recorded in inventory control/bin cards.

On-the-Job Training of key staff following the monitoring and supervision Exercise

These visits resulted in on-the-job training of key personnel. The areas where gaps were identified and training provided includes:

- Documentation
- Stock out status
- Order and reorder protocols

Number of health facilities visited and persons supervised

The table below shows the number of health facilities visited and persons supervised. In all 10 regions, 4,749 health facilities were visited and 15,303 health facility staff were supervised by district teams. Additionally, national and regional monitoring teams after review of performance data from DHIMS visited 984 health facilities and coached 1,497 health facility staff.

Table 7: On-Job Training on Continuous LLIN Distribution, Ghana, 2017

Region	No. Health facilities visited	No. of ANC/CWC/stores Trained		
		Male	Female	Total
Greater Accra	373	107	1633	1740
Ashanti	646	574	1820	2394
Eastern	696	296	1522	1818
Western	515	327	986	1313
Brong Ahafo	757	411	1267	1678
Volta	474	491	1492	1983
Central	337	218	1279	1497
Northern	371	533	610	1143
Upper East	285	260	490	750
Upper West	295	378	609	987
Total	4749	3595	11708	15303

School-Based Distribution

LLINs were distributed in both private and public schools; and pupils in primary two (2) and six (6) were the beneficiaries. The Schools' Health Education Programs (SHEP) and the Health Management Teams in both the regions and the districts coordinated the activities.

The 2017 school distribution of LLIN was carried out in nine (9) out of the ten (10) regions (Upper West Region was the only exception). Activities towards the school distribution focused on Training, Social Behaviour Change Communication (SBCC) activities, Validation and

Distribution of LLIN. A total of 1,369,206 LLINs were distributed to pupils in Classes 2 & 6 across the nine regions. A one-week mop up of the distribution exercise was undertaken due to delays encountered in reaching some schools coupled with conflicting activities such as the 2017 BECE which engaged most teachers as examination invigilators.

In all, a total of 1,369,206 pupils in both public and private schools received nets as against 1,382,116 pupils targeted for the campaign, representing 99.1% coverage.

Below is a summary of school class enrolment, net allocation and nets distributed to pupils per region.

Table 8: LLINs Distributed under the School Distribution Exercise, Ghana, 2017

REGION S	Class Enrollment			ITNs Supplied/R eceived by District (Form C)	ITNs Distributed			% Covera ge	Excess ITNs
	P2	P6	Total		P2	P6	Total		
Western	84,338	71,304	155,642	163,495	82,899	69,543	152,442	97.9	11,053
Eastern	73,646	61,511	135,157	142,631	73,585	61,237	134,822	99.8	7,809
Greater Accra	94350	89780	184130	195176	94350	89780	184,130	100	11,046
Upper East	38738	33491	72229	75831	38783	33697	72,480	100.3	3,351
Northern	93403	69329	162732	161251	93213	67138	155,413	95.5	5,838
Brong Ahafo	74479	62112	136591	142805	76788	62192	138,980	101.7	3,825
Ashanti	143731	125508	269239	277950	140613	124881	265,494	98.6	12,456
Volta	64635	51103	115738	117669	63857	51003	114,860	99.2	2,809
Central	81739	68919	150658	158989	80634	69951	150,585	100	8,404
Total	749,059	633057	1,382,116	1,435,797	744,722	629,422	1,369,206	99.1	66,591



Class Six Pupil displaying received nets, 2017



Class Two Pupil showing excitement after receiving LLINs, 2017

Distribution to Special groups

In December 2016, a number of orphanages in the Greater Accra Region benefitted from the distribution of LLINs. In February 2017, a mop up of this activity was undertaken in seven additional orphanage homes. Two hundred and two (202) LLINs were distributed in these seven homes. These homes included, Assurance of Hope For The Needy, Missionaries of Charity, Chance for the Children, CWC Children's Home, Kinder Paradise, Heart of the Father Outreach and Heaven Of Hope.

Follow-up Visit on Net Use at Orphanages

In order to verify whether nets distributed to orphanages towards the end of 2016 were being used, a team from the NMCP paid visits to the orphanages concern in February, 2017.

Findings from the follow up visits included;

- **Christ Faith Foster Home (Frafraha):** net use not encouraging as only few nets were seen hanged on beds. However caretakers explained that some children removed the nets during day time to allow space in the rooms.
- **Beacon House at Mensah (Dodowa):** nets were yet to be hanged. The Caretaker explained that a carpenter was expected to mount poles on the beds before the nets could be hanged.
- **Mawuvio (Ayikuma near Dodowa):** net use was very impressive as nets were seen hanged on all beds due to caretaker's insistence that all children sleep in the net.
- **Echoing Hills (Madin):** no verification could be made as the caretaker reported the home was on Xmas break and there was fumigation on-going in the dormitories at the time of visit.
- **Handy Evangelism Orphanage (Agbogba):** this home was also on Xmas break at the time of the visit.

LLIN distribution to the military at Bondase Military Training Camp

On 25th January, 2017, based on a request by the military command at the Bondase Military Training Camp for nets to be distributed to troops undergoing training prior to departure to

peace-keeping mission in Sudan, a team from the NMCP distributed 900nets to the soldiers at the camp. The distribution was preceded by health talk on causes and prevention of malaria, net use, care and maintenance.

LLINs were seen hanging in almost all sleeping places at the camp. This was an assurance that the soldiers will put the LLINs to good use.

Pilot of LLIN Point Mass Distribution (PMD)

Ghana has implemented two rounds of mass LLIN distribution campaigns since 2010. The last round was completed in the year 2016. With lessons learnt and challenges encountered, especially with household registration, distribution and documentation, the NMCP and its implementing partners decided to adopt the use of an electronic Application (App) on mobile electronic devices for household registration and LLIN distribution.

In order to learn lessons from the initial implementation of the App/electronic device for household register and distribution, two districts each in Volta and Eastern Regions were selected for a pilot prior to scale up throughout the country. In the Volta Region, the districts selected included South Tongu and Akatsi North whilst New Juaben and Asuogyaman were selected in the Eastern region.

Series of activities including trainings of registration assistants (RAs) on the use of the Apps (phones) were carried out in the four pilot districts in the two regions (Volta and Eastern).



Training of Registration Assitants on The Use of Apps, 2017

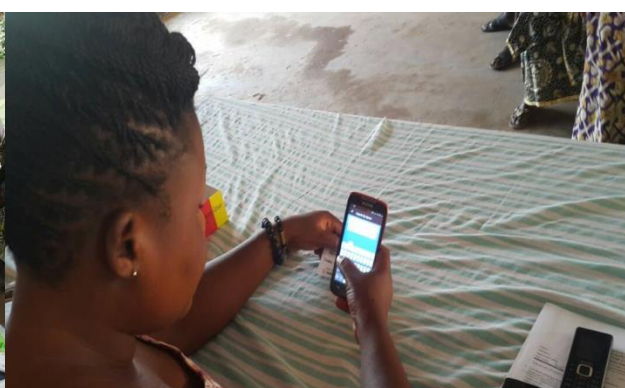
Registration using the Apps was conducted in October and November, 2017 in the pilot districts of the Volta and Eastern regions while the LIIN distribution was carried out in November and December, 2017 in Volta and Eastern regions respectively. The pilot distribution in the Volta Region took place from 21st to 27th November, 2017 and that of Eastern region was from 6th to 12th December, 2017.

In all, a total of 78,384 LLINs were distributed in the Volta region as against 88,053 LLINs allocated as per registration data, representing 89.0%. In the Eastern region out of 164,240 LLINs allocated, 124,341 were d

istributed, indicating a percentage coverage of 75.7%.

Table 9: Coverage of PMD Pilot, Eastern and Volta Regions, Ghana, 2017

PILOT PMD COVERAGE BY DISTRICT			
DISTRICT	LLIN ALLOCATED (pcs)	DISTRIBUTED (pcs)	COVERAGE (%)
Akatsi North	20,779	18,736	90%
South Tongu	67,274	59,648	89%
TOTAL (VOLTA REGION)	88,053	78,384	89%
Asuogyaman	59,862	54,662	91%
New Juaben	104,378	69,679	67%
TOTAL (EASTERN REGION)	164,240	124,341	76%



LLIN Distribution Using App Device, 2017

Indoor Residual Spraying (IRS)

IRS is one of the most effective but cost intensive Malaria Control interventions being implemented in some selected regions in Ghana.

In the year 2016, IRS was being implemented in the whole of the Upper West Region and the Obuasi Municipality by AngloGold Ashanti Malaria Control Program (AGAMal) with funding from the Global Fund. PMI through Africa Indoor Residual Spraying (PMI/AIRS) also implemented IRS in 5 districts, namely Bunkpurugu Yunyoo, East Mamprusi, Mamprugu Moaduri, West Mamprusi and Kumbugu all in the Northern region.

In 2017 AGAMal extended its operations to 3 more districts, namely Builsa South, Builsa North and Kassena Nankana West districts in the Upper East region. PMI/AIRS on the other hand has also added 2 districts, namely Karaga and Gushegu districts in the Northern region bringing to seven the number of operational districts of PMI/AIRS. These geographical expansions of IRS by the two IRS implementing agencies was made possible due to the inception of Next Generation IRS (NgenIRS), an initiative by UNITAID to subsidize the cost of insecticides for IRS. The initiative was also aimed at mitigating the seemingly growing issue of insecticide resistance.

During the year 2017, PMI/AIRS sprayed 304,684 (94.0%) structures out of a total of 316,587 structures targeted, while AGAMal sprayed 94,486 structures, representing 67.71% of a total of 108,969 structures targeted for the year.

AGAMal's operation in Obuasi was faced with insecticide resistance compelling AGAMal) to resort to larviciding from August to December, 2017 as a supplementary measure using VectoBac G (*Bacillus thuringiensis israelensis*). This involved the treatment of identified breeding sites by 10 applicators, pre- and post-treatment larval density assessment by taking 10 purposive dips per sentinel breeding site. A questionnaire was deployed to measure community acceptance and perceived effectiveness of the activity.

Entomological monitoring activities carried out by AGAMal included:

- Adult mosquito collection in 4 sentinel districts using Human Landing Catches (HLC), Pyrethrum Spray Collections (PSC) and Exit Trap Collections (ETC)
- Residual efficacy monitoring of IRS using indoor density assessment, insecticide susceptibility tests where four (4) insecticide classes were deployed.
- Larval density assessment.

Insecticide Resistance Monitoring (IRM)

IRM is an initiative by the National Insecticide Resistance Monitoring Partnership (NIRMOP) to monitor reported resistance of malaria vectors to pyrethroid insecticides in the country. The initiative sought to generate sustainable countrywide data of insecticide susceptibility levels among the malaria vector population in Ghana.

The IRM was carried out in all the 20 sentinel sites (see table 2 below) and molecular analysis in the laboratory on all mosquito samples from the field work was done. The activities for the 20 sites in the 10 regions were divided into two: the southern sector and the northern sector activities. Activities for the southern sector started from 13th June, 2017 and lasted for over one month while that of the Northern sector started from September and ended in December, 2017.

Activities carried out included capacity building, larval surveys and rearing of larvae, WHO insecticide susceptibility bioassays, synergist assays and monitoring of field activities.

Results of the 2017 IRM were as follow:

- All teams completed the minimum of 9 insecticides recommended for testing (100% completion rate).

- We detected pyrethroid resistance in ALL sites surveyed.
- High frequency of *kdr-w* resistance allele at all sites
- Enhancement of susceptibility was observed with the use of PBO synergist for Deltamethrin and Permethrin in most cases
- The use of synergist papers gave some indication of metabolic mechanism (oxidase enzymes) being involved in the development of resistance to some pyrethroids in ALL sites.
- High carbamate and DDT resistance observed.
- Pirimiphos methyl was effective in 70% (14 of 20) of sites.

Table 13: 20 Insecticide Resistance Monitoring Sentinel Sites

REGION	DISTRICT	SENTINEL SITES
SOUTHERN SECTOR		
Ashanti	Ejura Sekyeredumase Asante Akim North	1. Ejura, 2. Konongo
Western	Sefwi-Wiawso Prestea/Huni	1. Wiawso 2. Bogoso
Central	Atti-Mokwa district Gomoa East	1. Twifo Praso, 2. Okyereko
Eastern	Kwaebibirem Lower Manya Krobo	1. Kade, 2. Akuse
Greater Accra	Dangme East Ga South	1. Ada-Foh 2. Weija
Volta	Nkwanta South Ketu North	1. Nkwanta 2. Afife
NORTHERN SECTOR		
Brong Ahafo	Asutifi Sene	1. Kenyase, 2. Kwame Danso

Northern	Sawla-Tuna-Kalba Nanumba-South	1. Sawla 2. Wulensi
Upper East	Bawku West Builsa South	1. Bawku 2. Fumbisi
Upper West	Wa West Sissala East	1. Wecheia 2. Tumu



Table 10: Map of Ghana Showing IRM Sentinel Sites



Collection of mosquito larvae, Sefwi Wiawso, 2017

Malaria Vector Control Oversight Committee (MaVCOC)

MaVCOC is a committee comprising of organizations with an oversight responsibility on all malaria vector control activities of Ghana's National Malaria Control Program. The committee meets quarterly to deliberate on issues related to vector control activities in the country. The committee met thrice in the year under review . The committee dealt with the following activities:

- Review of all vector control activities
- Shea contamination issues
- Inesfly paint issues
- Development and review of National Insecticide Resistance Monitoring Management and Monitoring Plan
- Discussion on new generation insecticides – review and implementation in Ghana

Challenges and Way Forward

Challenges	Way Forward
Point Mass Distribution (PMD) <ul style="list-style-type: none">• Limitations based on the specification of phone• Apathy at urban areas• Net Texture and type• Code not written out properly	<ul style="list-style-type: none">• New Phones with better specifications• Strategize for urban area distribution• Procurement? (specify particular texture during procurement)• Review meeting
Continous Distribution (CD) <ul style="list-style-type: none">• Poor documentation on logistics flow• Recording of LLINs to pregnant women	<ul style="list-style-type: none">• Enforce adherence to logistics management SOP's

<ul style="list-style-type: none"> • Movement of nets for Health –Facility Based Distribution (pull system) • Districts complaint about funds for movement of nets from districts to facilities 	<ul style="list-style-type: none"> • Regular supervision at all levels. • M&E activities to sensitize facilities <p style="text-align: center;">NMCP – add to all training sessions</p> <p style="text-align: center;">DHMTs – Sensitize and ensure this is done</p>
<p>Insecticide Resistance Monitoring (IRM)</p> <ul style="list-style-type: none"> • Lack of rearing space in some sites • High usage of herbicides and pesticides 	<ul style="list-style-type: none"> • Collaboration with DHMTs • Conduct an Insecticide Usage Survey

2.3 Procurement and Supply Management

The PSM Unit coordinates the procurement and supply chain management activities at the programme level and thus work closely with the key players in the entire health sector system supply chain system including partners.

The Unit also handles the office store and the supply of office consumables and printed materials including policy and guideline documents.

The Unit in addition, collaborates with the SSDM/GHS and Procurement and Supply Unit/MOH to collate and review requisitions for the supply of malaria commodities to the respective Regional Medical Stores and the Teaching Hospitals.

Planned Activities for 2017

Activities planned to be carried out in the year include processes that will result in the procurement of LLINs and other malaria commodities.

Procurement of Commodities

The procurement of malaria commodities are done by the Ministry of Health, USAID/PMI and the Global Fund. The USAID/PMI uses procures commodities through the Global Health Supply Chain-Procurement and Supply Chain Management (GHSC-PSM) project while the Ministry of Health handles government financed procurement. The Unit worked closely with the MOH

Procurement unit to ensure the replacement of a government order of SP that had earlier had quality issues.

In the period under review, the PSM unit worked with the USAID team to determine the commodity needs which were factored into the PMI MOP FY 2018. The supply plan was updated with fresh information on the status of the global Fund Procurement. The Unit also communicated the programme's need for SP tablets to the Ministry and has since been following up.

The procurement of Global Funded commodities which is mainly done through the Pooled Procurement Mechanism by the Partnership for Supply Chain Management (PfSCM) for pharmaceuticals and IDA for LLINs, was migrated from manual to a web based requisition platform called wambo and throughout the year under review, the PSM unit worked closely with the Procurement and Supply Unit, MOH (PSU/MOH) to successfully place all the orders for 2017 commodities through wambo.

The Unit addressed issues arising out of the orders placed and monitored the process till the delivery of the commodities.

PSM unit worked with PSU/MOH to ensure the obtain of a Letter of Exemption from the Ministry of Finance allowing the MOH to clear malaria commodities free of custom duties. Though there was an initial delay from the Ministry of Finance, attributed to the change in government, the letter was eventually secured for commodities that had arrived at the ports to be cleared. This delay caused some demurrage to be incurred on some commodities. Even though the orders for the Global Fund supported procurement was placed at the right time, the follow up and approval processes caused some delays and not all the commodities were delivered on the initially desired and agreed time.

This situation affected particularly the time bound implementation of SMC. The Programme therefore pleaded with the Ministry of Health to step in by procuring the medicines from a local manufacturer to fill the gap. The ministry managed to procure a million doses for the 2017 implementation of the SMC.

Table 11: Orders for 2017 commodities from the Global Fund

Item Description	Quantity	Qty Delivered	Variance	Comments
LLIN for Mass Campaign	4,247,300	3194300	1,053,000	Delivery delayed
LLINs for ANC	399,388	399,388	0	
LLIN for Child Welfare Clinics	318,024	318,024	0	
LLIN for School distribution	678,134	678,134	0	
Injection Artesunate 30 mg	150,000	150,000	0	
Injection Artesunate 120mg	200,000	0	200,000	Delivery delayed
Artemether lumefantrine 12's	214,578	214,578	0	
Artemether lumefantrine 18's	71,526	71,526	0	
Artemether lumefantrine 24's	500,640	500,640	0	
Amodiaquine+Sulfadoxine/Pyrimethamine 153mg+500/25mg, dispersible tablets, co- Blister 50 x 3+1 Tabs	24,644	24,644	0	
Amodiaquine+Sulfadoxine/Pyrimethamine 76,5mg+250/12,5mg, dispersible tablets, co-Blister 50 x 3+1 Tabs	4,928	4,928	0	
Malaria RDTs	11,143,857	5,500,000	5,643,857	Delivery delayed

USAID Procurement of malaria commodities

The USAID procures some malaria commodities planned for and budgeted under the PMI assistance to Ghana through the GHSC-PSM which undertakes supply chain activities for the USAID. During the year under review, GHSC-PSM brought in 2,500,000 rapid diagnostic test kits and 14,022 pieces of 100mg rectal artesunate.

Ministry of Health's procurement of malaria commodities

The ministry was approached to procure for use in 2017 the medicines needed for SMC. This became necessary when it became obvious that the Global Fund orders were not going to be delivered in time to be used. The Ghana Health Service appealed to the Minister to intervene so he did and the medicines were procured locally for SMC. In the year under review the Ministry initiated procurement process for the supply of Sulphadoxine pyrimethamine tablets for IPTp.

Distribution of malaria commodities

In the year there was an emergency distribution of 800,000 treatments of artemether lumefantrine 20/120 mg packs of 24 tablets due to the closeness of the expiry date July 2017. Again in August there was an emergency distribution of about 780,000 treatments of artemether lumefantrine adult packs through the first line buyers when it emerged that the expiry date was close and the public sector was not going to be able to consume all. Permission was sought for from the USAID to dispose of this stock through the private sector to avoid expiry when others needed it.

Besides these two emergency distributions, there were scheduled distributions in January/February, April/May, August/September and November/December from the central level to the ten Regional Medical Stores and four Teaching Hospitals. The programme also supplied upon request some artemether lumefantrine pediatric formulations to the society of Private Medical and Dental Practitioners as a measure to mitigate the risk of expiry.

The stock balances as at December 31st 2017 is summarized in table 16.

Table 12: Summary of commodities received and issued from central level

DESCRIPTION	QUANTITY RECEIVED(Treatment Or Pcs)	SOURCE OF FUNDS	QUANTITY DISTRIBUTED(Treatments or Vials or PCs)
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DESCRIPTION	QUANTITY RECEIVED(Treatment Or Pcs)	SOURCE OF FUNDS	QUANTITY DISTRIBUTED(Treatments or Vials or PCs)
Artemether Lumefantrine 6's	581,760	GF	518,880
Artemether Lumefantrine 12's	650,910	GF	415,410
Artemether Lumefantrine 18's	216,960	GF	216,270
Artemether Lumefantrine 24's	506,400	GF	1,869,900
Artesunate Amodiaquine 25/67.5 3's	436,325	GF	290,050
Artesunate Amodiaquine 50/135 mg 3's	1,018,075	GF	1,869,900
Artesunate Amodiaquine 100/270 mg 3's	290,900	GF	574,200
Artesunate Amodiaquine 100/270 mg 's			929,125
Tab Quinine Sulphate	-	USAID	96,000

DESCRIPTION	QUANTITY RECEIVED(Treatment Or Pcs)	SOURCE OF FUNDS	QUANTITY DISTRIBUTED(Treatments or Vials or PCs)
Injection Artesunate 30mg	150,000	GF	-
Injection Artesunate 60 mg	432,796	GF	408,800
Injection Artesunate 120 mg	200,000		-
SP+AQ 250/12.5 +73.5 mg (1+3)	313,850	GF	148,850
SP+AQ 250/12.5 +73.5 mg (1+3)	500,000	GOG	500,000
SP+AQ 500/25 +150MG (1 +3)	1,981,875	GF	749,675
SP+AQ 500/25 +150MG (1 +3)	500,000	GOG	500,000
Sulphurdoxine pyrimethamine 500/25 mg	976,550	GOG	976,550
Sulphurdoxine pyrimethamine 500/25 mg	1,123,450	USAID	1,050,000

DESCRIPTION	QUANTITY RECEIVED(Treatment Or Pcs)	SOURCE OF FUNDS	QUANTITY DISTRIBUTED(Treatments or Vials or PCs)
Rectal Artesunate 100mg	14,022	USAID	-
Malaria RDT	9,500,000	GF	9,543,900
	2,500,000	USAID	1,481,650
LLINs	1,395,552	GF	1,395,552

Table 13: Central Level Stock Status as at December 31, 2017

Item Description	Balance Dec 31st
Artemether+Lumefantrine 20/120mg 6's	2,095
Artemether+Lumefantrine 20/120mg 12's	7,847

Artemether+Lumefantrine 20/120mg 18's	23
Artemether+Lumefantrine 20/120mg 24's	17,484
Artesunate + Amodiaquine 25/67.5	5,849
Artesunate + Amodiaquine 50/135	7,407
Artesunate + Amodiaquine 100/270 (6-13yr)	268
Artesunate+ Amodiaquine 100/270 (14yrs+)	18,748
Artesunate Injection. 60mg	559,615
Artesunate Supp. 50mg	0
Artesunate Supp. 100mg x6s	2,337
Dihydroartemisinin+Piperaquine tab(40+320mg)	0
Quinine injection, 300mg	0
Quinine tablet, 300mg x1000s	1,252
Sulfadoxine+Pyrimethamine 500mg	477,750
Malaria RDTs X 25s	338,366
Examination gloves x 100s	139,299
Sulfadoxine/Pyrimethamine/Amodiaquine 250/12.5mg/76.5mg	3,300
Sulfa/Pyri/Amod 500/25mg/153mg	24,644
Mosquito Nets	3,194,287

Quantification of malaria commodities

During the year the PSM team led the national Quantification team to undertake a quantification of malaria commodities exercise. The output has been used to prepare the 2018 supply plan.

Other activities involving PSM Unit (Transport)

Two vehicles that got flooded at the Ghamot workshop were eventually released to the programme after a prolonged negotiation for refurbishment. The Programme's transport officer coordinated the process the release of the vehicles and the related documentation.

During the period the transport officer arranged for vehicles to undertake several field work involving NMCP technical staff.

2.4 Social and Behavioral Change Communication

Planned Activities

Mass Media Activities

Community Sensitization by NGOs

Community Sensitization by NCCE

Monitoring NGOs Activities

Conduct SBCC Sub Committee Meeting

Conduct training for Journalist Nationwide

Activities Carried Out

The collaborative project between the National Commission for Civic Education (NCCE) and the National Malaria Control Programme (NMCP) aimed at creating behavioural change among communities by enhancing individual's motivation and adherence to good environmental management practices, use of insecticide treated nets, and the use of Intermittent Prevention Treatment (IPT) as a way of preventing malaria among pregnant women. The activities for the

project included cinema shows and public broadcasts used as visibility creating mechanisms to sensitise people living in the remotest parts of the country. The project covered forty-three (43) districts in the ten regions of the country. The messages in the docudrama and the audio recordings emphasised the use of the Intermittent Prevention Treatment (IPT) using Sulphadoxine Pyrimethamine (SP) targeting pregnant women, Long Lasting Insecticide Treated Nets (LLITNs), and Rapid Diagnostic Test (RDT) for malaria.

Although the project was originally planned for mainly deprived and hard to reach communities, the NCCE team extended the activities to students in basic and second cycle schools. This innovation expanded the audience for the cinema shows and included the youth who are the crucial population of the country. It was expected that the involvement of school going youth will have a spill-over effected on the adult population.

OBJECTIVES OF THE PROJECT

Broadly, the project had the objective of creating public awareness and enhance behavioural change among all spectra of the Ghanaian population. Specifically, the objectives were:

To encourage Intermittent Prevention Treatment (IPT) through the use of SP among pregnant women, and the use of LLINTs for prevention among all spectra of the country's population.

To encourage people to visit a health facility and take the Rapid Diagnostic Test (RDT) before treatment as a way to reduce the abuse of the ACTs.

To enhance family support for pregnant women and children who are the most vulnerable sections of the population.

Assigned Roles, Responsibilities and Logistics for the Project

Personnel from the Programmes Department of the NCCE were assigned the responsibility to facilitate the organization of the cinema shows and the broadcasts. The district offices of the NCCE helped to select communities and schools where the cinema shows were held. More so, health staff such as Community Health Nurses and Midwives, as well as some officers of the District Health Directorates gave support to the NCCE officers, especially through answering technical questions on the use of SP and the LLINTs. Other tangible materials used in the implementation process were:

Two mobile cinema vans.

NCCE District offices pick-up vehicles used for the dawn-to-dusk broadcasts.

Videos on documentaries and docudrama on SP, LLINTs, and RDTs, jingles and radio sketches in various Ghanaian languages.

Posters.

Demography of Audience

The cinema shows in all ten regions attracted a large number of audiences. Chiefs, Assembly members, and occasionally the clergy played important roles in ensuring the successful implementation of the project. Also the main occupational distributions of the audiences in the regions are farming, trading, fishing, artisanship, food processing, and charcoal burning.

Additionally, this time cinema was screened in at least four (2) schools, mostly Junior and Senior High, in each district; this expanded the number of audience directly, and indirectly as things learnt in schools are easily transmitted to adult population.

Achievements

The project implementation processes came with some modest achievements, significant among them are as follows:

The project team was able to reach an estimated sixty thousand two hundred (60, 200) audience in one hundred and seventy-two (172) remote communities, and ninety (90) schools from forty-three (43) districts selected from all the ten (10) regions of the country.

The project created an opportunity for major stakeholders in the health sector which included community health professionals, district health officials, Assembly members, and traditional authorities, the clergy, and teachers to use single platform to address behavioural change against the menace of malaria.

The implementation team was able to secure commitment from some District Assemblies which promised to liaise with NCCE district offices to carry out further community visits in the future, e.g. Shama District in the Western region.

Community radio stations some of which have listening audience beyond the selected districts were used for mass education in local languages. This helped the team to reach audience who could not come to see the cinema shows.

Challenges

The implementation team faced some challenges on the field some are presented below:

The videos for the docudrama were in only two languages (English and Twi) and were in short episodes which made it difficult for the audience to follow the story line.

Unlike previous NCCE/NMCP collaborations, this project did not have budget for community entry. This made it difficult for the project team to meet some traditional protocols such as buying of schnapps and Kola for chiefs.

NCCE used portion of the budget for fuel as night allowances and T&T for the community health workers who accompanied the team.

Part of the activities started during the raining season so storms disrupted some cinema shows midway, and also prevented NCCE from reaching some remote communities where attendance had been very encouraging during previous engagements.

The cinema shows competed for audience with telenovelas-Kumkumbagia- and the European soccer league. This affected attendance in some communities.

Recommendations

In the face of the above challenges, the NCCE recommends as follows:

Time table for future activities should coincide with the Dry Season which is the off farming period for a lot of rural communities.

There should be follow-up activities in both beneficiary communities and new ones because behavioural change cannot be fully achieved by one-off activity.

Subsequent projects should budget for community entry protocols such as schnapps, kola, and payments to community gon-gon beater and radio stations.

NCCE should be given some LLINTs for distribution during future engagements.

Way forward

NCCE is ready to carry out this behavioural change project to the remaining districts of the country.

NCCE will like to collabortate with NMCP to reach other identifiable groups such as women fellowship in churches, transport operators e.g. GPRTU, PROTOA; market women, tailors and beautician associations through community engagement strategies such as durbars, stakeholder meetings, and public forums.

Commemoration of World Malaria Day

World Malaria Day sprung out of the efforts taking place across the African continent to commemorate Africa Malaria Day. The World Health Assembly instituted World Malaria Day in May 2007 to give countries in affected regions the chance to learn from each other's experiences and support one another's efforts. Since 2008, countries have been commemorating this day under various themes, assigned by the Roll Back Malaria Partnership (RBM) & World Health Organization (WHO) based on global efforts and challenges. World Malaria Day also enables new donors to join in a global partnership against malaria, and for research and academic institutions to reveal scientific advances to the public. The day also gives international partners, companies and foundations a chance to showcase their efforts and reflect on how to scale up what has worked. World Malaria Day (WMD) is commemorated every year on 25 April and recognizes global efforts to control malaria.

This year's theme for this year's commemoration was; "END MALARIA FOR GOOD". This theme reflects the vision of a malaria free world set out in the Global Technical strategy for malaria 2016-2030. As adopted in May 2015 by the World Health Assembly, the strategy aims to drastically lower global malaria burden over the next fifteen years. The objectives and goals of this strategy follows the great progress made under the Millennium Development Goals, it is however important to build on this success and 'end malaria for good' under the Sustainable Development Goals;

reducing the rate of new malaria cases by at least 90%

reducing malaria death rates by at least 90%

eliminating malaria in at least 35 countries

preventing a resurgence of malaria in all countries that are malaria-free

The objectives for the commemoration were:

- to update the world progress of malaria control, highlights successes and challenges
- to remind partners, stakeholders and the community at large that the countdown to malaria prevention and control has started
- to call for all and sundry to join in the fight towards the control and possible elimination of malaria in Ghana and to
- inaugurate the Ghana Malaria Foundation.

Commemorating Activities

Preparatory /Planning

A Planning Committee was set up to plan the event and was comprised of officers from the National Malaria Control Programme (NMCP), Public Relations Office and Health Promotion Department of the MOH/Ghana Health Service, Health partners; VectorWorks, PSMP, Systems for Health, NGOs, Media personnel among others. The committee came out with plans and budgets for specific activities for the event. Specific sub committees were instituted to plan in detailed, brainstormed ideas during the main committee. There were subcommittees for Media Activities, Health Walk, Symposium and Administration and logistics. Four (4) planning meetings were held. However the various subcommittees held a number of meeting in planning their assigned activities. Institutions and individuals were assigned specific roles to ensure the success of all planned events.

Pre- Activities- Health Walk

A Health Walk through some principal streets and communities was held on 22nd April, 2017 as part of awareness creation of the day. This event brought together health/implementing partners, NGOs/CSOs, corporate institutions (banks, insurance companies, etc.), students from health institutions, the media, implementing partners, keep fit clubs, etc. The work was planned in close collaboration with the National Sports Council, the Nima Divisional Police and the

Information Services departments. Participant converged at the forecourt of the Trade Union Congress through the Kanda Highway and through the streets of Nima. Final converging point was at the Kawukudi Park where the participants were taking through and aerobics. The Programme Manager also gave a briefing on activities of the year commemoration. The walk was accompanied by sensitization on malaria intervention using placards and broadcast with the information van. The Deputy Director General of Ghana Health Service, Director of Finance, Ministry of Health, Programme Manager and Deputy gracefully participated in this event.

There were a radio and television interviews and discussion programme to kick start the commemoration.

Official Launch & Commemoration

This year's commemoration was officially launched on 24th April, 2017 at the the Accra International Conference Centre and focused on domestic resource mobilization, advocating cooperate and individual support to malaria control in the country. The event was chaired by the La Mantse, Nii Kpobi Tettey Tsuru III and launched by the Her Excellency, the First Lady of the Republic, Mrs. Rebeca Akufo Addo. The Deputy Minister of Health and Deputy Director General graced the event and gave the keynote and welcome addresses respectfully.

The Deputy Minister of Health officially announced the pilot implementation of the in Ghana. He indicated the vaccine, RTSS, has gone through more than 20 years of testing and Ghana has played a major role in its development.

The Commemoration also saw the inauguration of the Ghana Malaria Foundation by the First Lady. The foundation is group made up of Ghanaian businessmen and women who have come together to raise and mobilize domestic funds to support malaria control in Ghana. The Chairman, Mr. Prince Kofi Amoabeng and other fourteen board members were charged advocate for financial support using the personal and corporate influence to engage the private sector in-country and out of the shores of the country as well. Their effort is very critical to the malaria control in Ghana to complement the donor funding.

Community sensitization programme

The Infanta Malaria Prevention Foundation, a Non-Governmental Organization chaired by First Lady Rebecca Akufo-Addo organized community outreach screening programme in Tema Station, Accra. The day was used to screen vulnerable target group (Head porters and market women).The event was used to distribute LLINs to them.

Post launch activities

The official launch/ commemorations on April 24th 2017 did not end the activities for the year. The following were activities carried out to sustain the campaign on calling for domestic resources mobilization as well intensifying education on the progress and challenges of the NMCP.

Media Activities

Radio and TV discussion programmes were planned with selected media houses. This was aimed at increasing the knowledge and awareness of the achievements, challenges, ongoing or planned activities to combat the disease in the country. Resources persons were assigned the various media house and programme. Interviews on both TV and radio were undertaken by key GHS/NMCP personnel to disseminate information on malaria.

Non-Governmental Organizations(NGOs) Activities for 2017

NGOs are civil society organizations that provide support to communities in every aspect to livelihood to complement government efforts. The NMCP recognizes the efforts in implementing malaria control activities at the grass root level thus over the years, continued to strengthen partnership with reputable organizations to undertake Community sensitization activities, which is one of the key components of Social Behaviour Change Communication (SBCC) activities in Ghana.

Key amongst their activities has been community sensitization through existing and effective communication channels within their respect communities and identifying and following up on pregnant women to ensure improved uptake of IPTp.

In 2017 the programme continue engagement with thirty-three (33) NGOs who successfully passed the performance assessment. These organizations were funded with an amount of Twelve thousand Ghana cedes (GHC12,000) for first half of the year and Twenty-three thousand Ghana Cedis (GHC 23,000) for the second half of the year to work in 33 districts in 9 regions of the country except in Ashanti. Activities included house to house/mosque/church/market education, training of community volunteers/opinion and organized group leaders, identification and follow up on pregnant women. Specific activities implemented by the Programme were:

Capacity building, Supportive Supervision and Monitoring

Monitoring and supportive supervision and onsite capacity building was conducted in November in all thirty-three districts within the 9 regions NGOs are implementing. The exercise sought to

Provide onsite training on report writing and data collection and reporting

Verify the legitimacy of the registered certificates of these NGOs

Review and verify the IE&C activities undertaken by the NGO in the quarter under review

Assess the existing collaboration between the NGO and the District Health Directorate

Assess implementation of activities as outlined in their contract

Verify the logistics procured by the NGO

Assess Financial Management and Internal Controls practiced by the NGO

Performance review and Assessment

In April all 33 NGOs submitted both activity technical and financial reports for review and assessment. A team of evaluators comprising Ghana Health Service SSDM, Health Promotion, Public Relations and NMCP met to assess the report using an agreed criteria. At the end of the exercise, all 33 NGOs passed the 50 percent pass mark. All 33 organizations were reengaged for the period August to December, 2017. Final assessment of the year was held in January 2018, where 208 organizations made a passed mark of 40 %.

Successes

There has great improvement in report writing as compared to previous engagements.

Evidence of community sensitization when followed up community members especially with the Pregnant women identification and follow up

Very dedicated and committed volunteers

Very good collaboration with the District Health Management Teams

Most NGOs have support of Opinion leaders(chiefs, assembly members, religious leaders, etc) gladly supports malaria activities undertaken by volunteers

Some communities also support volunteers with food stuff to encourage them continue work especially with visit to pregnant women.

Some community health workers are providing great support to the volunteers. They follow up on pregnant women identified but are unwilling to go the facility upon several follow up visits.

Challenges

Some NGOs still have issues with report writing

Some also do not follow the reporting format

Some facilities do not document administration of SP in the maternal record book of pregnant women so it becomes difficult for volunteers to track uptake, especially in cases when the pregnant women doesn't also remember

Most pregnant teenagers do not report early to health facilities because of stigma and some cases attitudes of health workers

2.5 Seasonal Malaria Chemoprevention

Seasonal Malaria Chemoprevention is an intervention to offer protection for children aged between 3 and 59 months. The WHO Policy recommendation on this intervention was published in March 2012. This intervention was subsequently incorporated in the National Strategic Plan for Malaria Control (2014-2020). In this intervention, the children in this age group living in the target region are given monthly full treatment doses of SP plus amodiaquine with the objective of maintaining adequate blood levels of the anti-malarials during the period of highest risk which is the rainy season. Even though Ghana is not a Sahelian country, the decision to implement SMC in the northern part was taken for two reasons; 1. that part of the country has similar conditions to those in the Sahel region and 2. the high parasitaemia levels in children living in the area as evidenced in the MICS 2011 findings.

Background

Preparatory activities for SMC implementation including awareness creation and community sensitization, began in 2014 but due to the inability of the supplier of the WHO-prequalified medicines to deliver in good time, actual implementation took place in 2015 when the DFID promised to support implementation by procuring the medicines from Kinapharma, a local manufacturer who managed to produce and deliver on the right time.

The intervention was proved to be feasible and effective in Ghana. It was therefore extended to the Upper East region in 2016 with DFID supporting with part of the medicines needed while the Global Fund also placed orders for the remaining part.

Once again the Global Fund orders for 2016 also could not be delivered on time so the Programme relied only on the DFID orders hoping for a second order by DFID to make up for the deficit.

In course of the execution of the DFID contract, the DFID changed the Procurement Agent this eventually resulted in a misunderstanding between the supplier and the Procurement Agent regarding the quality tests on the product. The DFID refused to pay for the products even though it had been delivered to the Ministry of Health's warehouse, the NMCP could not use the product to achieve the four rounds needed.

In 2017 when it became known that the Global Fund orders would not be delivered on time for implementation, the Programme appealed to the Minister of Health through the Director General, Ghana Health Services, to procure the needed quantities to enable the two regions undertake four rounds of implementation. The request was granted and additional stock was procured. This enabled the two regions to cover the target population with four rounds of doses for SMC.

Preparatory activities

Joint planning meeting with the two regions

The NMCP convened a joint planning meeting with the two Regional Health Directorates in the Upper East regional capital Bolgatanga to develop a detail implementation plan. Each region was given their respective funds after their budgets were studied and accepted. The regions were fully supported by technical persons from the NMCP to help with the training of the health workers and volunteers who were recruited to undertake the exercise at the community level.

Social Mobilization activities

The regions undertook a comprehensive Social mobilization activities to sensitize the communities on the SMC and educated the population on the benefits as well as their roles and responsibilities to make the exercise successful for the full benefits to be achieved. Some of the

social mobilization activities were radio discussions in both English and local languages. NMCP technical staff beefed up their regional counterparts to reinforce the importance of the exercise and the need for cooperation from the entire population.

Training of Health Workers and Volunteers

All cadres of health workers in the two regions were trained or given orientation on SMC and what their roles should be and what will be expected of them.

There were four main thematic areas of focus for the training;

- Technical
- M&E
- Supply Chain
- Social Mobilization and SBCC

The trained health workers in turn trained volunteers in their respective districts and sub districts and also constituted technical and supervisory teams to coordinate, supervise and monitor activities in the specific thematic area.

Dosing of the eligible children

The 2017 SMC was implemented simultaneously in the Upper East and Upper West regions from July to October. The table 1 shows the exact dosing periods for both regions.

Table 14:2017 SMC dosing schedule for UWR &UER

Round	Date of dosing
1	24 th to 29 th July, 2017
2	21 st to 26 th August, 2017
3	25 th to 30 th September, 2017
4	23 rd to 28 th October, 2017

During the week of dosing, technical personnel, additional vehicles and drivers were mobilized from NMCP and other departments from MOH/GHS headquarters and other agencies to support the regional staff to undertake supervision and monitoring to ensure that challenges and problems that emerge were addressed.

A technical team under the leadership of the Regional FDA Officers undertook an active pharmacovigilance as an integral part of the SMC dosing exercise. This team followed the volunteers from community to community and house to house as they administered the doses. The team was responsible for documenting and reporting adverse drug reactions and also making sure that the completed ADR forms were forwarded to the FDA headquarters through the regional FDA representative.

Target population

Tables 2 and 3 show the estimated number of children targeted for 4 rounds of dosing in the two regions by district

Table 15 Projected population of eligible children targeted for 4 rounds of dosing per district in UWR

Upper District	West	Projected Population 2017 (1.9%)	Population 0-11 Months (4%)	Population 3-59 Months (19.2%)	Population 3-11 mths	Population 12-59 Months (16%)
DBI		37,172	1,487	7,137	1,190	5,948
Jirapa		100,851	4,034	19,363	3,227	16,136
Lambussie		58,928	2,357	11,314	1,886	9,428
Lawra		63,468	2,539	12,186	2,031	10,155
Nadowli Kaleo		70,508	2,820	13,538	2,256	11,281
Nandom		51,675	2,067	9,922	1,654	8,268

Sissala East	64,488	2,580	12,382	2,064	10,318
Sissala West	56,554	2,262	10,858	1,810	9,049
Wa East	82,224	3,289	15,787	2,631	13,156
Wa Municipal	122,313	4,893	23,484	3,914	19,570
Wa West	92,804	3,712	17,818	2,970	14,849
Total	800,984	32,039	153,789	25,632	128,158

Table 16 Projected population of eligible children targeted for 4 rounds of dosing per district

Upper East District	2017 Population (Rate: 1.2%)	Population of Under- fives (20%)	Population below 1yr (4%)	Population of 3-11 months (3.2%)	Population 12-59 months (16%)	Population of 3-59 months (19.2%)
Bawku Mun	107,119	21,424	4,285	3,428	17,139	20,567
Bawku West	102,223	20,445	4,089	3,271	16,356	19,627
Binduri	66,938	13,388	2,678	2,142	10,710	12,852
Bolga Mun	143,006	28,601	5,720	4,576	22,881	27,457
Bongo	91,908	18,382	3,676	2,941	14,705	17,646
Builsa North	61,395	12,279	2,456	1,965	9,823	11,788

in UER

Builsa South	39,694	7,939	1,588	1,270	6,351	7,621
Garu Tempani	141,325	28,265	5,653	4,522	22,612	27,134
Kass Nan Mun	119,519	23,904	4,781	3,825	19,123	22,948
Kass Nan West	76,822	15,364	3,073	2,458	12,291	14,750
Nabdam	36,772	7,354	1,471	1,177	5,884	7,060
Pusiga	62,700	12,540	2,508	2,006	10,032	12,038
Talensi	88,265	17,653	3,531	2,824	14,122	16,947
Total	1,137,686	227,537	45,507	36,406	182,030	218,430

Coverage

The average coverage in Upper West region for the 2017 SMC implementation was 96.5% while Upper East achieved an average of 88.7%.

Table 4 summarizes the respective coverage of each region per each round.

Table 17 Summary of coverages in the two regions for each round

Dosing Round	Coverage	
	UWR	UER
Round 1	98.2	82.2
Round 2	96.4	90.8
Round 3	95.8	91.3
Round 4	95.5	90.5
Average	96.5	88.7

Lessons learned

A number of lessons were learned from the 2017 SMC implementation.

- Notifying the Minister of Health of the initial problem with the medicine procurement resulted in a timely intervention by the Government of Ghana to fill the gap. This enabled the two target regions to undertake the required four rounds of dosing.

- The involvement of traditional and opinion leaders facilitated community mobilization and eventually resulted in community acceptance and high coverage of over 80%.
- Effective social mobilization yielded good results

Challenges

The volunteers did not have the appropriate protective gear (rain coats and wellington boots) to enable them move through the rains and hence spent more time in covering certain communities.

Delays in sending completed ADR forms from various communities to the FDA results in delays in assigning causality for the adverse events.

The NMCP do not have the full complement of vehicles required to carry out the supportive supervision during the week of dosing and this results excessive pressure on the few that are available

Conclusion and Way forward

The 2017 SMC implementation best results ever in terms of coverage due to the availability of the medicines. In spite of the challenges that are inherent in the implementation due to the rainy season, some appreciable protection for the target children was achieved. Stakeholders believe that if the volunteers are given the appropriate protective clothing, their performance will be enhanced. The intervention needs to be repeated in 2018 to provide protection for the children in those regions.

2.5 Research, Surveillance, Monitoring and Evaluation (RSM&E)

Activities conducted under research, surveillance, monitoring and evaluation include, monthly data verification and validation, malaria data quality audits, Surveillance Monitoring and Evaluation Technical Working Group (SM&ETWG) meetings, public and private facility supervisory visits, epidemiological sentinel sites monitoring and review meetings, dissemination of quarterly bulletins and submission of periodic reports to GHS, The Global Fund, Country Coordinating Mechanism (CCM) and WHO. The RSM&E unit also provided technical support to various units as required. The unit was part of the core team for the

successful 2018-2020 Global Fund Grant application.

DHIMS Data Verification

To ensure timely, quality, consistent and relevant malaria data at all levels, the SM&E unit conducted monthly DHIMS data verification in all regions. Health facility level data on malaria indicators reported through DHIMS were downloaded from DHIMS2 and verified for consistency. District and facilities with data quality issues were followed up on through onsite visits and other channels to rectify the issues. The table below shows summary of facilities identified with data quality issues and number visited within the year, 2017.

Table 18: Number of facilities visited in 2017

Region	No. of Districts	No. of District Visited	No. of Facilities	No. of Facilities Identify with Data Inconsistencies	No. of Facilities Visited	No. of facilities reached via phone call and email only
Greater Accra	16	12	689	326	284	42
Central Region	20	10	430	283	213	70

Volta Region	25	15	581	269	197	72
Western Region	22	14	739	222	182	40
Ashanti Region	30	30	1,505	975	423	552
Brong Ahafo Region	27	16	728	512	312	200
Eastern Region	26	12	891	332	186	146
Northern Region	26	24	644	425	220	205
Upper East Region	13	11	369	300	185	115
Upper West Region	11	8	355	180	105	75
Total	216	150	6,931	3,824	2307	1517

Data Quality Audit

In the year under review, the NMCP in collaboration with Policy Planning Monitoring and Evaluation Department (PPMED) conducted two rounds of data quality audit in selected health facilities nationwide.

The purpose of the Data Quality Audit (DQA) was to verify the accuracy of reported data and assess the quality of the data recorded in source document and reporting system, in relation to the Standard Operating Procedures (SOPs) of the Health Information Management System (HMIS). Only one (1) round of DQA was conducted in 2017. Eight (8) health facilities/ service delivery sites were randomly selected from four (4) randomly selected districts in each region. The exercise was conducted in the month of June/July. The process included a three day orientation for the assessment teams and a two-week field work. The team comprised 10 district health information officers, 10 district malaria focal persons and 10 national officers drawn from NMCP and PPME/CHIM. A team of 3 persons (an HIO, a MFP and a national officer) was responsible for assessing one region. The regional health information officers and regional malaria focal persons were responsible for supervising the

assessment teams in their respective regions.

Two protocols were used for assessment;

Protocol 1 – M&E System Assessment; assessing data management capacities of the management unit; and data reporting systems selected (reporting performance quantitatively in terms of accuracy, timelines, completeness and availability of source documents and reporting forms

Protocol 2 – Data Verifications; for the quantitative evaluation of the source documents were identified and the indicator values recalculated for the reporting period. These data were compared to the reported values from the DHIMS and a verification factor calculated for each site and aggregation level and a composite national score.

Indicators, Reporting Period – Rationale for selection

The indicators for verification are the ones that are reported by service delivery levels to the NMCP at the national level through District Health Management Information Management System (DHIMS). They were chosen based on their priorities to the programme and their effectiveness in assessing quality of service delivery and documentation of practices/ services. In addition, the indicators were chosen for their strategic importance for disease monitoring (treatment and prevention) as well as their significance with regard to financial investment. The seven (7) indicators chosen for this exercise comprise three OPD indicators, two ANC indicators, one inpatient indicator and one CWC indicator. The period selected for review is **March 1st, 2017 to May 31st, 2017**.

The seven indicators chosen for this exercise were:

- Number of suspected malaria cases among pregnant women
- Number of suspected malaria cases tested among pregnant women (Microscopy or RDT),
- Number of OPD malaria cases put on ACTs
- Number of pregnant women receiving IPT 3
- Number of inpatient malaria deaths
- Number of LLINs given to ANC registrants
- Number of LLINs given to Children 18 months and above given measles 2 doses

Key Findings for the M&E system Assessment - All Levels

Regional Level

- The goals and objectives of the Regional Health Administration are in line with the National level.
- All the Regions had an organogram for the Health Information Unit.
- There wasn't a clear budget allocated for data management activities.
- Inadequate use of SOPs and implementation guidelines.

District Level

- Record keeping at both district aggregation points visited was orderly. All records were easily retrievable and referenced.
- HIOs are at post and appropriate equipment available to them for data servicing. However, the culture of off-site back up system is still a big challenge.
- Non-functional data validation teams

Facility Level

- All facilities visited had standardized registers and reporting forms to capture malaria data which conforms to the national guidelines, however these registers and reporting forms were insufficient.
- The Electronic Medical Records (EMRs) such as HAMS, KPAL & Associate software and PHIS used by the hospitals (Nandom Hospital, Bawku Presby Hospital, War Memorial Hospital, Akwatia St. Dominic Hospital, Ashiaman Community Hospital, Shai Osu Doku Hospital) are not compatible with the approved GHS standard reports. This causes massive data lost.
- Inadequate staff for data management
- Incomplete entries in the Consulting Room Register making it difficult for Health Information Officers to collate data at the end of the month.
- Lack of standardized register for collecting ACTs data; Dispensary Register
- Lower level facilities such as the CHPs; don't have any form of M&E and action plans as well as organizational structure for the facilities.

Key findings for the data verification protocol at all levels

Findings across all district and service delivery sites.

District level

1. Poor filing system in some districts. Reports from sub-districts and facilities could not be traced though entries had been done in the DHIMs
2. Some districts do not verify or validate data from source document before entering into the DHIMs

Hospital level

1. All the hospitals enter their own service data in the DHIMS
2. Some hospitals don't send copies of data entered into the DHIMS to the district after entries are done
3. Data on ACTs are not well kept or no data at all in some facilities.
4. Data often not verified before entered in the DHIMs.
5. Poor filing system across all facilities. Reports and registers not well kept/some missing source
6. Consulting room register not completely filled.

Health Centre/ CHPS level

1. Reports at this level well-kept and easily retrieved
2. Less supervision from district and regional levels

Sentinel Site Monitoring and Supportive Supervision

Malaria diagnosis has largely been presumptive over the years leading to poor data on prevalence of malaria in the country. This with associated limitations with malaria prevalence from District Health Information Management System (DHIMS 2) which includes incomplete data, inaccurate data and low private sector reporting makes it difficult to use DHIMS 2 alone for programme decisions for some indicators. Due to this, the National Malaria Control Programme (NMCP) in collaboration with the Noguchi Memorial Institute for Medical Research (NMIMR) is using established sentinel sites for the Monitoring of malaria parasite positivity rates across the country which will also help assess the progress of interventions towards reduction in disease prevalence and species differentiation.

Planned Activities for Sentinel sites

To ensure sites adherence to the T3 policy, data management guidelines and techniques in malaria testing as taught during the training sections, a quarterly monitoring and supportive supervision exercise with NMCP/NMIMR were planned. The dates below were selected for monitoring:

Table 19: Scheduled monitoring activities for 2017

Monitoring	Date
1 st	23 rd January – 9 th February 2017
2 nd	17 th April – 4 th May, 2017
3 rd	24 th July – 10 th August, 2017
4 th	13 th November - 30 th November 2017

Pre and post monitoring meetings were held with NMIMR to plan and assess the exercise carried out by the teams. Review meeting were planned to be held with implementers and managers

Table 20: Planned First review meeting for 2017

Zone	Date	People to be invited	
		<ul style="list-style-type: none"> ➤ District Director of Health Service ➤ Head of Facility ➤ Regional and district focal persons 	<ul style="list-style-type: none"> ➤ Managers meeting will be held on the Thursday of the week
Northern	29 th February – 4 th March	<ul style="list-style-type: none"> ➤ Prescriber ➤ OPD nurse 	<ul style="list-style-type: none"> ➤ Implementers meeting will be held on the
Middle	7 th – 11 th March	<ul style="list-style-type: none"> ➤ Laboratory rep. 	

Southern	14 th – 18 th March	➤ Health information person in the facility	Monday and Tuesday of the week
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Table 21:Planned second review meeting for 2017

Zone	Date	People to be invited	
		<ul style="list-style-type: none"> ➤ District Director of Health Service ➤ Head of Facility ➤ Regional and district focal persons 	➤ Managers meeting will be held on the Thursday of the week
Northern	6 th September – 10 th September	<ul style="list-style-type: none"> ➤ Prescriber ➤ OPD nurse ➤ Laboratory rep. ➤ Health information person in the facility 	➤ Implementers meeting will be held on the Monday and Tuesday of the week
Middle	12 th September – 16 th September		
Southern	19 th September – 23 th September		

Approach for sentinel sites Activities

The sentinel sites were visited, a checklist was designed for use by the teams. This was used in assessing how the system picks up suspected cases and treats them. Checklist was also used to assess personnel, availability of logistics, documentations and testing rate of the sentinel sites. NMIMR also uses the opportunity to pick up slides and used Rapid Diagnostic Test (RDT) from the sites for testing, while supplying sites with requested/needed logistics.

Activities Carried Out under Sentinel sites

Only one round of review meeting was carried out in Tamale, Kumasi and Elmina. Managers and Implementers review meetings were held on 8th to 12th May, 15th to 19th May and 22nd to 26th May for northern, middle and southern zone respectively. The second review meeting

was not held due to financial reprogramming. Staff trained included Prescribers, Laboratory staff and malaria focal persons from all sentinel site. Approximately three months after the training, monitoring exercises were carried out in all the thirty sentinel sites with teams of four each (NMCP+NMIMR) 24th January to 10th February, 2017 and 23rd April to 6th May, 2017. Quarterly monitoring were carried out per the planned timelines.

General Findings of the last monitoring for 2017

- Testing rate has improved
- Adherence to the T3 policy improving
- More facilities have started using the Counting system
- Improvement in DHIMS reporting rate

Human Resource at the Laboratory

With the exception of Jirapa Urban Health Centre, Tinga Health Centre and Prang Health Center all other sentinel sites had at least one trained laboratory staff. However, all these sites has trained other personnel on the job to perform some basic tasks.

Parasite Detection

With the exception of Buipe Health Center, Prang Health Center, Jirapa Urban Health Center, Adwumakasekese centre, Pakro Health centre and Tinga Health Center all the sentinel sites uses both Parasite count and species identification techniques to detect malaria parasite.

Availability of Logistics

There has been some improvement in logistics availability, however some laboratories still have some challenges ranging from malfunctioning microscope and (or) inadequate logistics ranging from, 0-10µl micropipette, microscopes, buffer tablets, tally counters, pH meter and distilled water for slide washing.

Adherence To Treatment Protocol

Adherence to treatment protocols has improved, 30% (9/30) of the sites visited partly adhere to the T3 policy. They either treated clients presumptively or administered ACTs to clients

that tested negative using RDTs or Microscopy. Others still had issues with data collection, record keeping and data quality. On-job training was provided where necessary.

Microscopic Slide Examination

Only 16.7% (5/30) of the sentinel sites met the target of $\geq 85.5\%$. With Bekwai Government Hospital having the highest score of 94.4% (75.5/80) and Shai Osudoku Hospital having the least average score of 12% (9.5/80).

Mortality Review

Eight (8) out of the 30 sentinel sites recorded 15 malaria deaths with in the period under review. The team and clinicians in the respective facilities conducted a mortality folder review to determine the underlining cause of death. At the end of the review, the team concluded that only 13 out of the 15 deaths was actually caused by malaria. The other two (2) was as a result of data entry error. Measures were taken to make corrections in DHIMs but unfortunately only one of them could be changed. The other death was wrongly entered in July, for which DHIMS data entry access was blocked.

Challenges

The challenges that hindered work in some selected facilities are listed below.

- Non function data validation teams
- Inadequate Laboratory Supplies
- Poor filling and folder retrieval system
- Poor slide coding and/or filing system

Table 22: Summary of results from assessment of adherence to T3 and verification of reported OPD malaria cases, July- September, 2017

Region	Sentinel Site	Documentation/ Adherence to T3 (%)				Data Verification (%)
		July 2017	August 2017	September 2017	Total Score	DHIMS versus Reporting Form
Ashanti	Adumakasekese Health Center	90	100	100	96.7	100
	Bekwai District Hospital	100	100	100	100	100
	St. Martins (Agroyesum) Hospital	100	100	100	100	96.7
Brong Ahafo	Sunyani Municipal Hospital	100	100	100	100	96.7
	Prang Health Centre	100	100	100	100	96.7
Central	Ewin Polyclinic	100	100	100	100	100
	Diaso Health Center	100	100	100	100	100
Eastern Region	Begoro Government Hospital	100	100	100	100.0	96.7
	Pakro Health Centre	100	100	100	100.0	100
Greater Accra	Shai Osudoku District Hospital	100	100	100	100	100
	Obom Health Centre	100	100	100	100	100
	Danfa Health Centre	100	100	100	100	100

	Lekma Hospital	100	100	100	100	100
Northern	Buipe Health Centre	100	90	100	96.7	93
	Kings Medical Centre	100	100	100	100	93
	Tinga Health Centre	100	100	100	100	80
	Yendi District Hospital	100	90	100	96.7	
Upper East	Garu Health Centre	100	100	100	100	100
	Talensi District Hospital	90	100	100	96.7	90
	War Memorial Hospital	100	100	100	100	75
Upper West	Upper West Regional Hospital	60	90	40	63.33	0
	Wa West District Hospital	100	100	100	100	95
	Jirapa Health Centre	90	100	100	96.7	80
	Lawra Health Centre	100	100	100	100	100
	Nandom District Hospital	100	90	100	93.3	75
	Tumu Health Centre	90	100	90	93.3	75
Volta	Dambai Health Center	100	100	100	100	100
	Hohoe District Hospital	100	100	90	96.7	53
Western	Akontombra Health Centre	90	100	100	96.7	97
	Tarkwa Old Government Hospital	90	100	90	93.3	93

Table 23: Summary of results from slide examination, July - September, 2017

Slide Examination		
Region	Sentinel Site	Average Score (%)
Ashanti	Adumakasekese Health Center	40.6
	Bekwai District Hospital	94.4
	St. Martins (Agroyesum) Hospital	75.6
Brong Ahafo	Sunyani Municipal Hospital	69.4
	Prang Health Centre	83.8
Central	Ewin Polyclinic	54
	Diaso Health Center	74
Eastern Region	Begoro Government Hospital	66.9
	Pakro Health Centre	85.6
Greater Accra	Shai Osudoku District Hospital	12
	Obom Health Centre	13
	Danfa Health Centre	91
	Lekma Hospital	62
Northern	Buipe Health Centre	67.5
	Kings Medical Centre	70
	Tinga Health Centre	60
	Yendi District Hospital	60
Upper East	Garu Health Centre	38.8

	Talensi District Hospital	46.3
	War Memorial Hospital	51.3
Upper West	Upper West Regional Hospital	62.5
	Wa West District Hospital	75
	Jirapa Health Centre	77.5
	Lawra Health Centre	67.5
	Nandom District Hospital	43.8
	Tumu Health Centre	61.3
Volta	Dambai Health Center	32
	Hohoe District Hospital	57
Western	Akontombra Health Centre	42
	Tarkwa (Apinto) Old Government Hospital	89

Lesson Learnt

There was still the need for improvements in the quality of malaria slides at sentinel sites.

Researches in 2017

A number of researches were conducted or coordinated by the programme. This included the following:

- ATM Mortality trend analysis
- Durability and viability studies for LLINs (LifeNets)
- Malaria indicator Survey 2016
- Evaluating Impact of BCC Interventions
- Impact assessment of IPTp; Anaemia, Low birth weight
- Health Facility Survey and Case Management Quality Assessment
- Economic Assessment Of Malaria Control Interventions In Ghana
- Malaria Impact Evaluation
- Factors contributing to increasing malaria prevalence in Volta and Eastern regions
- Assessment of the availability and pricing of Co-paid Antimalarials across Retail medicine outlets in Ghana
- End user survey of Pilot PMD
- Assessment of Retail Pharmacy outlets on RDT testing prices and Fionet mobile data transmission, Central and Greater Accra Region

Some of the planned activities have been completed and report submitted while others are in various stages of implementation. Completed research activities in 2017 included the following:

a. Evaluating the impact of BCC intervention

In order to assess the effectiveness of the malaria Behaviour Change Communication (BCC) messages deployed to help control malaria in Ghana, Strategic Communications Africa Ltd. (Stratcomm Africa) was engaged by National Malaria Control Programme (NMCP) /Ghana Health Service (GHS) to undertake a national survey. The aim was to determine the extent to which the malaria BCC messages had impacted the behaviours of target audience. Stratcomm Africa carried out the task through an investigation of the existing level of knowledge, attitudes, perceptions and behaviours in relation to messages contained in the Behaviour Change Communication effort.

Specifically, the study measured awareness of the messages, how they were heard, whether they were heard, if they were understood, the manner they were meant to be understood, and whether the messages have succeeded in positively influencing practices and behaviours. The study also ascertained the media consumption habits of respondents Findings from this study will serve as baseline for measuring the impact of malaria BCC messages over time. The findings will again will be measured inform future malaria control related BCC strategies including the content and media through which the messages are translated.

Data Collection and Analysis

Secondary and primary data was used for the research. To obtain secondary information, Stratcomm undertook a documentary analysis of reports provided by GHS and NMCP on malaria activities in Ghana. A mixed method was used in obtaining primary data. Through thought provoking key informant interviews and focus group discussions qualitative details about malaria control activities from the staff of the GHS and the NMCP was obtained. An individual questionnaire survey was used to obtain information on the effectiveness of the malaria control messages and further communication gaps in the dissemination of these messages was unearthed. The results of the study exhibits some differences in rural and urban response to the malaria BCC messages.

Malaria Prevention and Treatment

Overall, though the study finds high positive behaviour towards ownership of ITNs, the same cannot be said about its usage. Respondents aged between 30 to 39 years sleep under ITNs

whereas those between ages 40 to 49 have a lower positive behavior towards the use of ITNs. There are also several general conclusions that can be reached based on the information gathered from respondents and these are:

- There is the need for segmentation in the dissemination of messages since the Ghanaian population is different in certain characteristics such as location, socio economic class (SEC) and age
- There are still a reasonable number of Ghanaians who believe in the use of traditional methods of treating malaria.
- Most respondents do not go to a health facility to confirm whether or not they have malaria. They conclude that they are suffering from malaria based symptoms that they have over a period of time come to associate with malaria.
- Even though the Behaviour Change Communications messages are widespread, some Ghanaians still practice self-medication.
- According to respondents, the increased number of health facilities outweighs the availability of drugs at these facilities. Often, the health facilities run out of drugs resulting in patients purchasing drugs from chemical shops or pharmacies which is more expensive.
- Poor road network is still a huge barrier to accessing quality healthcare.
- The television and radio serve as the most effective and reliable sources of information for respondents. Some people also mention internet and text/voice messages from telecommunication companies to subscribers.
- Communication with voice in local languages has the more impact as locals identify quickly with it. This results in a high acceptability and hence a higher likelihood that it stimulates the desired behaviour change.
- ‘Nets up’ advert received low commendation especially from older participants. Additionally, adverts in animation were not that appealing to respondents and digital media are appealing to respondents.

The study also has specific findings which are related to gender and spatial characteristics of respondents. There are slight gendered differences in the behaviours communicated through the BCC messages. Female are more likely (than males) to accept and practice the behaviours

communicated through the various BCC messages. This implies that the malaria prevention and treatment related BCC messages have more influence on females. Specifically, in the ownership of nets, sleeping under nets, testing before treatment and the use of ACTs for treatment, females showed a higher likelihood when compared to males.

Differences exist between urban and rural response to the BCC messages. Though the ownership of ITNs is higher among urban than rural dwellers, usage of what is owned is higher in rural dwellings. Again the adherence to the BCC messages if heard is higher in the “somewhat” impoverished regions of the country, such as Northern, Upper East, Upper West, Volta and Central Regions. The study hence indicates that rural dwellers practice and are more likely to continue practicing the behaviours communicated through the Malaria related BCC messages than urban dwellers. Several reasons may account for the differences urban and rural

Rural areas

In rural areas the preferred medium is the radio. It is perceived as a more reliable source of information because, unlike television, one does not have to be in a specific place to listen. The radio is used as a companion throughout the day, providing news and entertainment to its listeners. The television is said to be a source of entertainment especially amongst female listeners. Additionally, inadequate infrastructure implies that the tech-savvy in rural areas will have no proper access to internet. This implies fewer options in the television stations for viewers as compared to the wider variety accessible by the listeners of the radio. In areas that had never heard the malaria control messages due to poor TV & Radio network coverage, they rely more on sensitization and education from health workers who occasionally visit their communities and CHPS compounds

Urban areas

On the other hand in urban areas, people rely heavily on the television as a preferred choice of medium for information and entertainment. Some respondents indicate that the television is a chance for the family to be together. Families rely on television especially for entertainment purposes. In addition the news and newspaper reviews, segments on radio and TV are regularly patronised by most people in urban settings. Behaviour change is nevertheless minimal in the

urban areas despite the numerous media available to respondents. They explained their reluctance to sleep under their treated bed nets. The reasons for this include:

- Hot air is trapped in the treated net and hence sleep becomes uncomfortable
- The chemical used in treating the net causes their eyes to swell

There are challenges that limit the effectiveness and spread of the BCC messages. The study finds that key amongst these are the following:

- Use of herbal medicine. People tend to patronise local/herbal medicine for the treatment of malaria as it is less expensive.
- Superstition about modern medicine for the treatment of malaria.
- Perceived ineffective and inefficient operation of the NHIS.
- There is some form of ignorance and reluctance of society in changing attitudes as well as behaviours towards malaria control.
- Inadequate and inexperienced health personnel
- Prevalence of quack health practitioners.
- Inadequate funds and logistics
- Inadequate knowledge with regard to usage and validity of Insecticide Treated Nets (ITNs).

A lot can still be done to raise more awareness and build commitment to malaria interventions, especially by building on already existing mechanisms identified in the study as very important. The recommendations of this study are that such opportunities are further strengthened. They include the following:

- The National Malaria Control Programme (NMCP) which helps in diverse ways to fight malaria be strengthened to solicit more resources within and outside Ghana to help fight malaria.
- The introduction and operations of the National Health Insurance Scheme (NHIS) be again oriented toward malaria control and prevention
- That a deeper awareness is created using the various social media which have now evolved into a huge platform should also be leveraged to inform the public about malaria with ease and speed.

- There should be specifically targeted programmes which entail visits to corporate organizations to educate them on the prevention and treatment of malaria.
- That the opportunity to incorporate malaria control into the curricula of schools at all levels is continued.

b. Malaria Indicator Survey 2016

Malaria Indicator Survey 2016 (3) was completed and disseminated in 2017. Ghana Statistical Service/ICF Macro were contracted by NMCP to conduct this study with the following objectives:

1. To measure the extent of ownership and use of mosquito bednets
2. To assess coverage of intermittent preventive treatment to protect pregnant women
3. To identify practices and specific medications used for treating malaria among children under age
4. To measure indicators of behaviour change communication messages, knowledge, and practices about malaria
5. To measure the prevalence of malaria and anaemia among children age 6-59 months

The sample for the 2016 MIS was designed to provide estimates of key malaria indicators for the country as a whole, for urban and rural areas separately, and for each of the 10 administrative regions in Ghana (Western, Central, Greater Accra, Volta, Eastern, Ashanti, Brong Ahafo, Northern, Upper East, and Upper West).

The following key findings were made from the study:

Ownership of long-lasting insecticidal nets (LLINs):

Seventy-three percent of households in Ghana own at least one LLIN with Fifty-one percent of households have one LLIN for every two people who stayed in the household the night before the survey.

Access to an LLIN:

Two-thirds (66%) of the household population in Ghana have access to an LLIN. The percentage of the population with access to an LLIN decreases with increasing level of household wealth from 76% in the lowest wealth quintile to 57% in the highest wealth quintile.

Use of LLINs:

Forty-two percent of the household population slept under an LLIN the night before the survey. About half of children under age 5 and women age 15-49 slept under an LLIN the night before the survey.

Intermittent Preventive Therapy (IPTp):

Six in ten women received three or more doses of SP/Fansider for the prevention of malaria in pregnancy.

Fever prevalence: One in three children (30%) under age 5 had fever in the 2 weeks before the survey.

Care-seeking for fever: Advice or treatment was sought for 72% of children with fever in the 2 weeks before the survey.

Source of advice or treatment: Among children with recent fever for whom care was sought, 51% received advice or treatment from the private health sector, 48% from the public health sector, and 2% elsewhere.

Testing: Thirty percent of children with a recent fever received a finger or heel prick for testing.

Type of antimalarial drug used: Among children under age 5 with a recent fever who received an antimalarial, 59% received artemisinin combination therapy.

Malaria: Two in ten children age 6-59 months tested positive for malaria via microscopy.

c. Assessment of Retail Pharmacy outlets on RDT testing prices and Fionet mobile data transmission, Central and Greater Accra Region, March 2017

The National Malaria Control Programme (NMCP) of the Ghana Health Service has extended its promotion of test, treat and track policy to retail Pharmacy and Over the Counter medicine outlets to promote testing before treatment of malaria as a component of their services. For this reason NMCP in collaboration with Community Pharmacist Practice Association (CPPA) and Over the Counter Medicine Sellers Associations (OTCMS) as well as Fio Health Ghana in an MoU supplied malaria RDTs to retail pharmacy and OTCMS outlets at GHc 1.8 (GHc 0.50p for RDT kits, for quality monitoring, GHc 0.30p for distribution and GHc 1.00 for quality assurance and real time data transmission) to test clients at a fee not more than GHc 2.5 at the various drug outlets. This cost is intended to make testing affordable so that clients would be encouraged to test before treatment.

In march 2017, NMCP set out to conduct a rapid assessment on malaria RDTs at retail pharmacy and OTCM in the Greater Accra and Central Region who received these Malaria RDTs to ascertain their compliance with testing price and progress of the data transmission activities of Fio Health Ghana. The facilities were contacted through a phone call for directions to their shops; and the facility attendants encountered were interviewed on several variables concerning RDT supply, availability, pricing and performance of the Fionet mobile app device.

Outcome

All the 40 retail medicine outlets supplied with these RDTs and fionet devices were visited; out of these 37.5% (15/40) were located in the Central Region and 62.5% (25/40) in the Greater Accra Region. The facilities encountered were more of Retail Pharmacy shops 67.5% (27/40). There were more female respondents 60% (24/40) and the respondents with highest frequency were Pharmacists 35% (14/40) as shown in Table 1. The median number of attendants per facility was 4 with a modal number of 2 attendants per facility.

Table 24: Medicine outlet by region, gender and cadre of respondent.

		OTCMS (n)	PHARMACY (n)	TOTAL (n)
Region of Outlet	Greater Accra	0	25	25
	Central	13	2	15
Gender of Respondent	Male	8	8	16
	Female	5	19	24
Cadre of Respondents	Pharmacist	0	14	14
	Pharmacy Technician	2	1	3
	Licensed OTCMS	6	0	6
	Medicine Counter Assistant	1	11	12

	OTCMS attendant	4	0	4
	Other	0	1	1
	TOTAL	13	27	40

Compliance of Pharmacy and OTCMS outlets on RDT testing prices

Eighty two percent (33/40) of the Pharmacy and OTCMS outlets together received malaria RDT supply through their respective associations. But as at the time of visit, 75% (30/40) of the facilities had malaria RDTs available. About 84% (11/13) of the facilities which purchased the RDTs above the agreed amount of GHc 1.8 per test kit obtained their supplies from CPPA with a median price of GHc 2.0. Most of the facilities 62.5% (25/40) also performed the malaria test with the RDTs above the agreed price of GHc 2.5 of which majority were retail pharmacy outlets 66.6% (18/27). Meanwhile, majority 72.5% (29/40) confirmed they were aware of the agreed testing price of Ghc 2.5 with Pharmacy outlets forming the most 85% (23/27).

Progress of the data transmission services of Fio Health Ghana

All the respondents with the mobile app had received training on its operation with a median number of three attendants trained per facility and can access the mobile app. Each facility with the phone had only one password although a median number of three attendants can access the phone per facility as against agreements reached. About 30% (13/40) of the facilities had access to a portal that helps them to access the full records of the patients tested in terms of reference. Meanwhile, as at the time of visit almost 80 % (25/32) of facilities whose mobile phones were accessible were found to be off.

Challenges

About 60% of the challenges faced by the facilities are related to the issues of the mobile phone battery discharging quickly while 15% of complains are about the testing time. Too many negative test outcomes have also become a worry to facility attendants whilst others are not comfortable with the quality of gloves.

Recommendations from Respondents

Majority of the respondents did not give any recommendation. The few ones also requested for the review of the testing price and the type of RDT kits supplied to detect all species among others.

Conclusion

Most of the retail medicine outlets are not complying with the testing price for malaria agreed. The high proportion of facilities which had their internet mobile phones off coupled with challenges with the mobile phone battery may have implications on the testing and data transmission required from the private retail medicine outlets and may not be sustainable.

We therefore recommend that the whole programme with the private facilities concerning malaria RDT testing, pricing, quality assurance and data transmission should be reviewed towards a more sustainable activity.

d. Assessment of the availability and pricing of Co-paid Antimalarials across Retail medicine outlets in Ghana

Background

Ghana benefitted from Affordable Medicines Facility-malaria (AMFm) initiative which was a financing mechanism that seek to increase access to Artemisinin-based Combination Therapies (ACTs) to the end-user nationwide using public, private and non-profit sector health care and service providers. After the phase 1 of its implementation in 2012, the Ministry of Health through the National Malaria Control Programme with the support of Global Fund has sustained the co-payment financing mechanism of ACTs as a pro-poor initiative to make quality assured ACTs available, accessible and affordable to the general population in the country. Four years following the support and sustenance, a nationwide assessment of the co-payment initiative has not yet been conducted to establish a solid bases for its continuity as a country. Therefore, the National Malaria Control Programme conducted a survey to assess the availability and pricing of the co-paid ACTs across the country as a measure to ascertain the progress and sustenance of the co-payment initiative in Ghana.

Method

A cross sectional study was conducted from March 8 – 24, 2017. A number of districts were selected across the ten regions of Ghana by their geographical spread in the respective regions. Both OTCMS and Pharmacy retail medicine outlets were selected from each district and assessed for the availability and pricing of the co-paid ACTs. In-charges of the retail outlets were interviewed using a structured questionnaire. Data was analysed with Epi Info version 7 and Microsoft Excel.

Results

A total of 778 retail medicine outlets were surveyed across the country. About 99% (775/778) had antimalarial medicine available of which 93% (720) were of Artemether Lumefantrine generic. Ninety eight percent (98%) of outlets with antimalarial medicines had green leaf / co-paid ACTs available. The brand of green leaf or co-paid ACT available at the outlets at higher proportions was Combiart 28.6% (407/1421). It formed 73% and 35% of green leaf ACTs available at OTCMS and rural outlets respectively whereas Coartem formed 52% of green leaf

ACTs available at Pharmacy and urban outlets. The average retail price of the green leaf ACT was found to be GHc 4.63 but GHc 4.4 in outlets located in rural settlements. The brand of green leaf ACT with the highest average retail price of GHc 6.3 was Coartem. The odds of obtaining a green leaf ACT at a retail price less than GHc 4.23 (USD \$1.0) was 25 times more likely than non green leaf counterparts OR(CI) = 25.2(18.5 – 34.3) but about two times more likely to occur in outlets at rural settlements OR(CI) = 2.1(1.6 – 2.7) than urban ones.

Conclusion

Green leaf or Co-paid ACTs were highly available at retail medicine outlets across the country with the dominance of AL over AA. The average retail price of green leaf ACT was GHc 4.63 and it was lower at OTCMS outlets and at rural settlements than Pharmacy and peri-urban as well as urban settlements.

e. Mid Term Review(MTR) for National strategic plan 2014-2020

Goal and Objectives Of MTR

Reviewing the progress made with respect to the strategic plan was key to achieving the ultimate goal of the programme.

Goal of the MTR

The goal of the midterm review of the 2014-2020 strategy was 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 in malaria control from 2014- 2016.

Objectives of the MTR

The objectives of the midterm review were:

- 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.

Methods For The Mid Term Review

Phase Of MTR

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 AFRO.

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 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 while other teams undertook regional, district and community field visits to malaria service delivery points (Persons interviewed annexed). 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 officially started from 3rd May 2017 and involved 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 of the programme where necessary.

Members of the local, desk review and field teams are annexed. Timelines and persons responsible was drawn for every phase of the Review (annexed).

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. The following were part of the 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

Phase III: External Validation

A team was put together to validate the data gathered from the desk review. Number of institutions and facilities were visited across the country to validate the data. Institution and persons interviewed are annexed.

Key findings were made in all thematic areas after which the following recommendations were made

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 advocacy profile

- 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
- 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
- WHO and partners should explore new insecticides to support program implement insecticides resistance management plan
- Standard treatment guidelines should be revised in line with the Malaria Case management guidelines

NMCP

- Need to leverage resources and facilitate activities of the Malaria Foundation
- To strength integration of ICCM into CHPS program
- 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
- 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
- Implement a resistance management plan
- 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.
- NMCP should have district based malaria epidemiology maps to help targeted efforts as Ghana moves towards Malaria Elimination.
- NMCP should ensure revised Malaria Case management guidelines are incorporated in the Standard treatment guidelines

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.
- RHMT and DHMT should strengthen data use at all levels
- 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

CHAPTER THREE

3.0 Progress and Achievements

The number of health facilities reporting in the DHIMS increased from 7,060 in 2016 to 7,570 in 2017. This increase might have resulted from recent enrollment of several CHPS compounds and private facilities in DHIMS. In 2017, proportion of OPD malaria tested stood at 87.3% as compared with 77.3% in 2016. Proportion of confirmed malaria cases to total OPD cases decreased from 16.8% in 2016 to 16.3% in 2017. The country also saw a drastic reduction in proportion of death attributable to malaria from 4.2 in 2016 to 2.0 in 2017.

Outpatient Malaria Cases

The proportion of OPD cases attributable to malaria ranged from 30.9% to 43.7% over the years. It decreased steeply from 43.7% in 2013 to 30.9% in 2014 and increased steadily to 38.7% in 2016 and further drop to 34.0% in 2017.

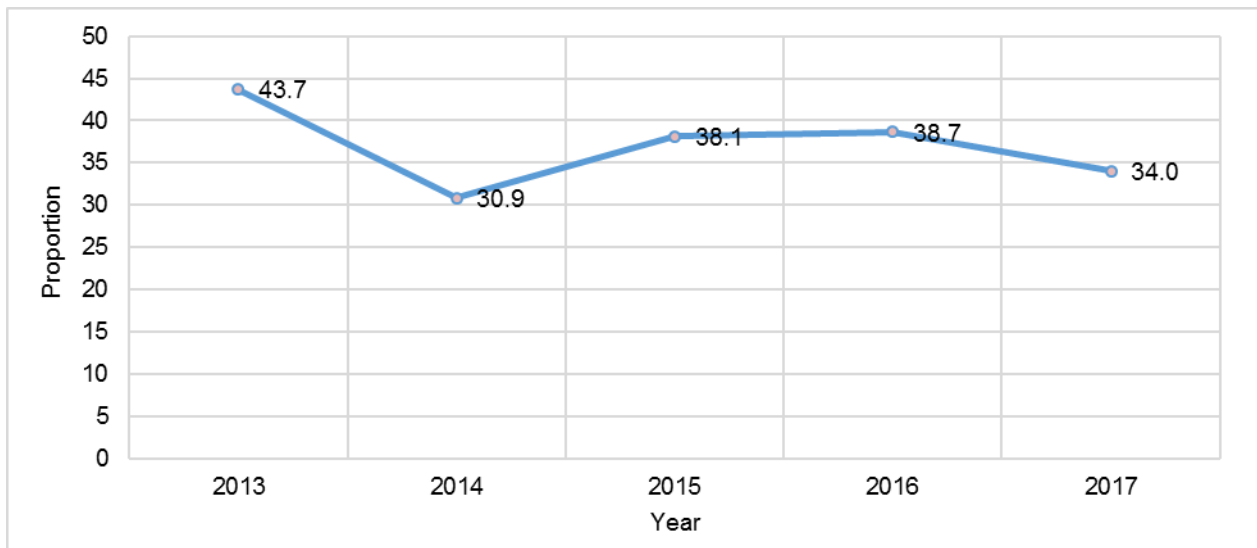


Figure 17: The Proportion of OPD Cases Attributable to Malaria, Ghana, 2013 - 2017

Eastern Region recorded the lowest proportion (27.8%) of OPD cases attributable to malaria while Upper East region recorded the highest(44.7%).

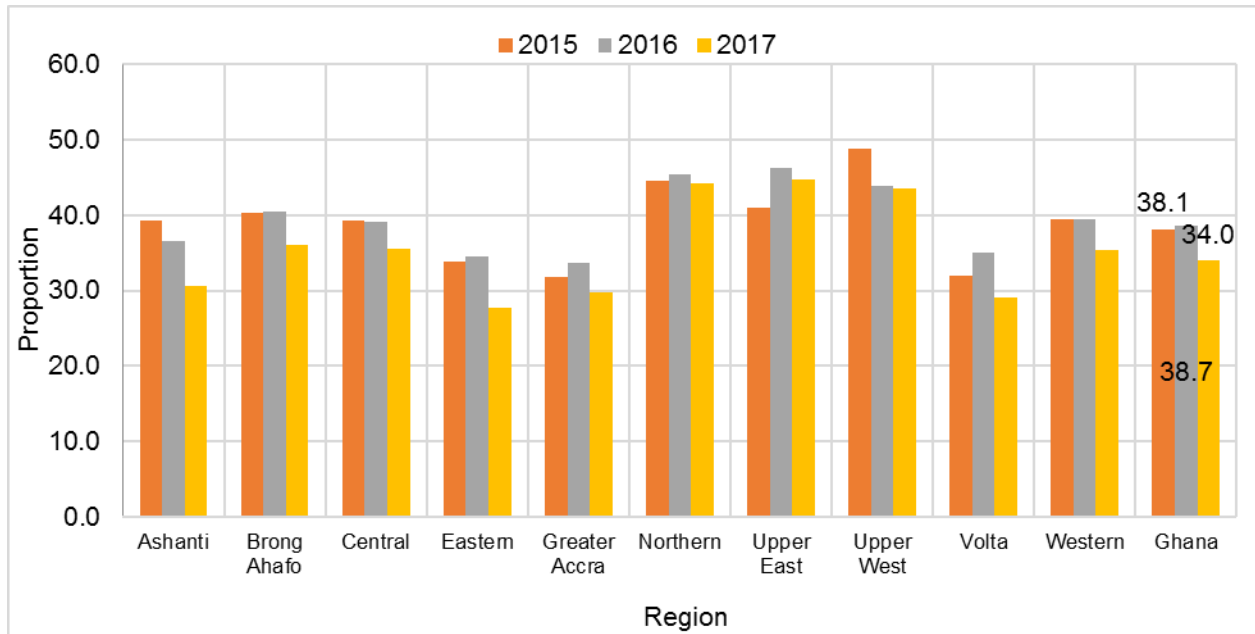


Figure 180: Proportion of OPD Cases Attributable to Malaria by Region, 2015 - 2017

Since 2013, there has been an upward trend in proportion of OPD malaria cases tested (microscopy or RDT). The proportion of OPD malaria cases tested as at 2017 is 87.3% (figure21).

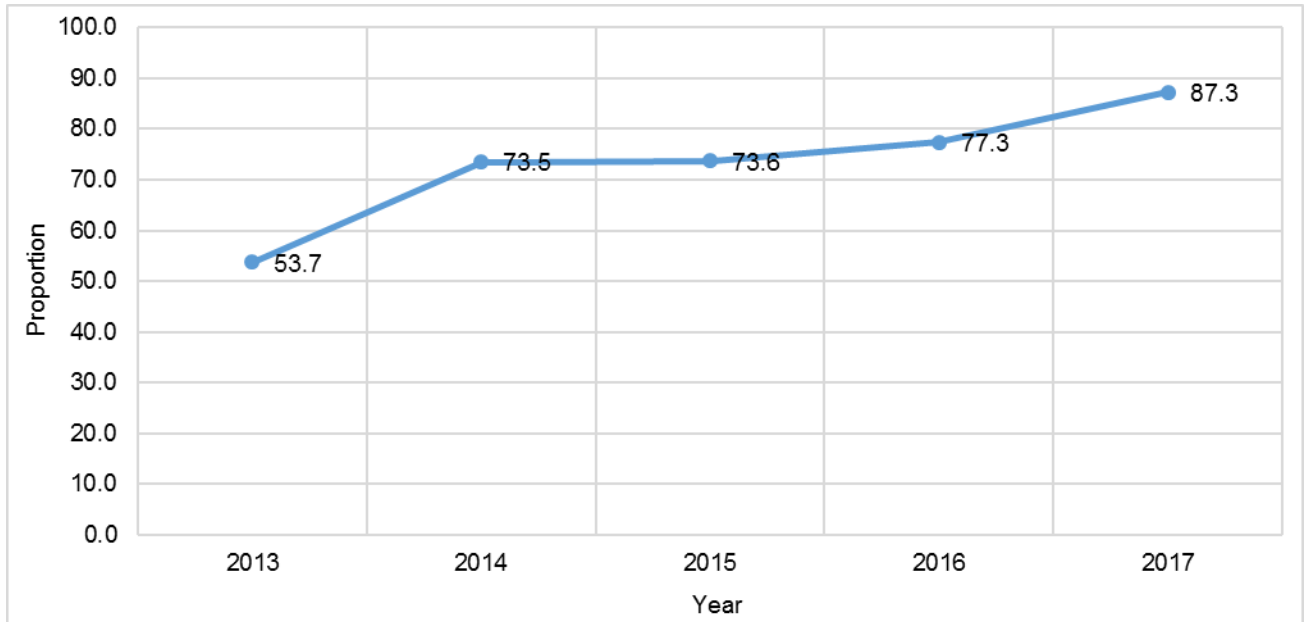


Figure 21: Proportion of OPD Malaria Cases Tested, Ghana, 2013 - 2017

With the exception of Ashanti and Northern Region which recorded a decline in the proportion of malaria cases tested, all other regions achieved above the 80% target (Figure 22).

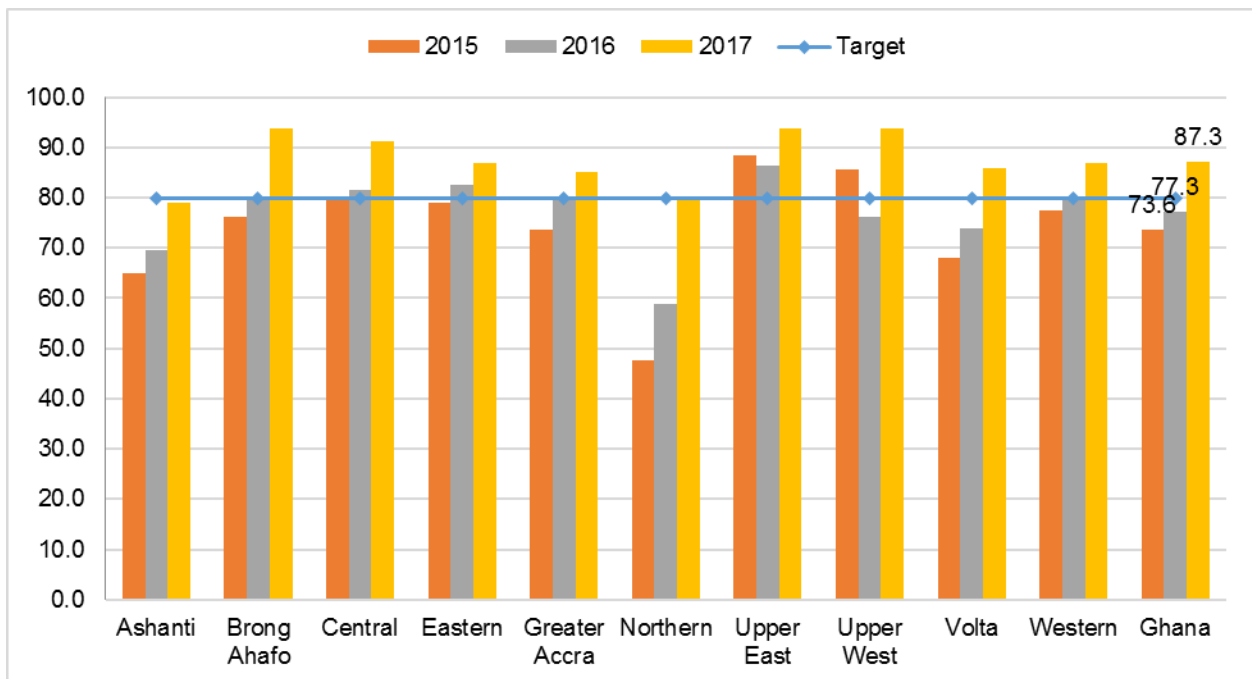


Figure 19: Proportion of OPD Malaria Cases Tested by Region, 2015 – 2017

In 2017, the malaria test and slide positivity rate for both RDTs and microscopy nationwide were 30.1% and 23.4% respectively. Volta region had the lowest slide positivity rate of 11.9 % (Figure 23).

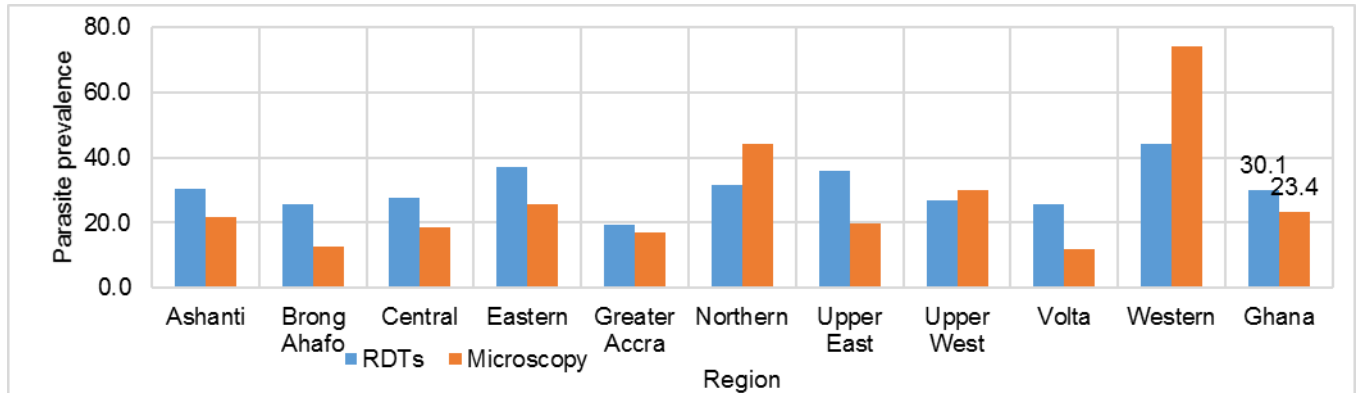


Figure 20: RDT test and slide positivity rates, Ghana, 2017

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 ACTs decreased from approximately 57.4% in 2015 to 51.2% in 2017; this may be due to improved case management practises across the 10 regions (Figure 24).

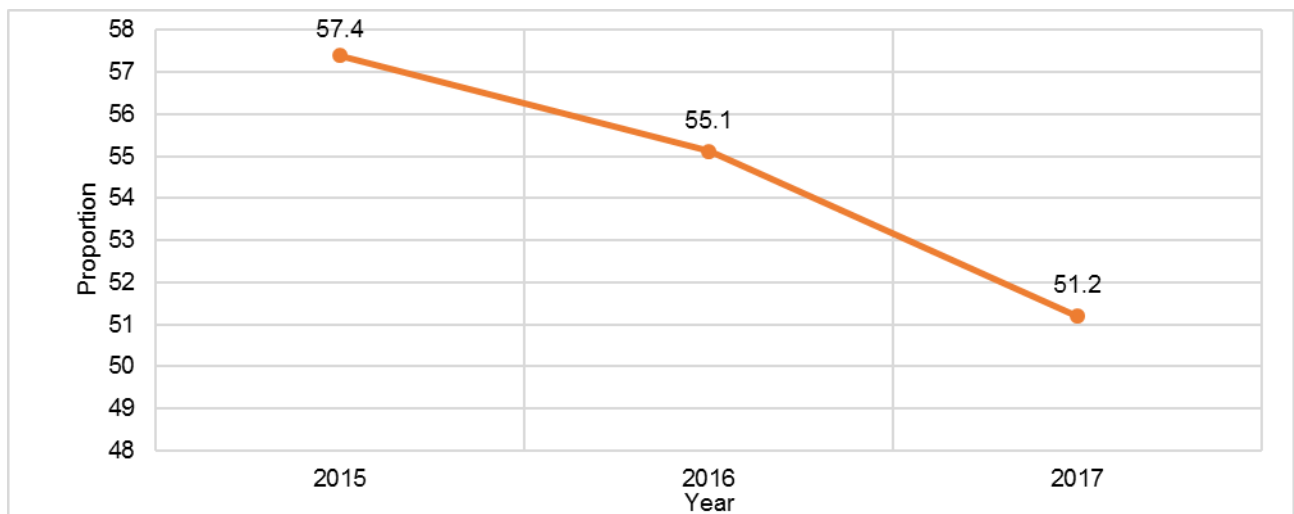


Figure 21: Proportion of OPD Malaria Cases Put on ACTs, Ghana, 2015 – 2017

The Volta and Western region treated the largest proportion (60.2%) of malaria cases with ACTs whilst Greater Accra region had the least (32.9%) in 2017 (Figure 25).

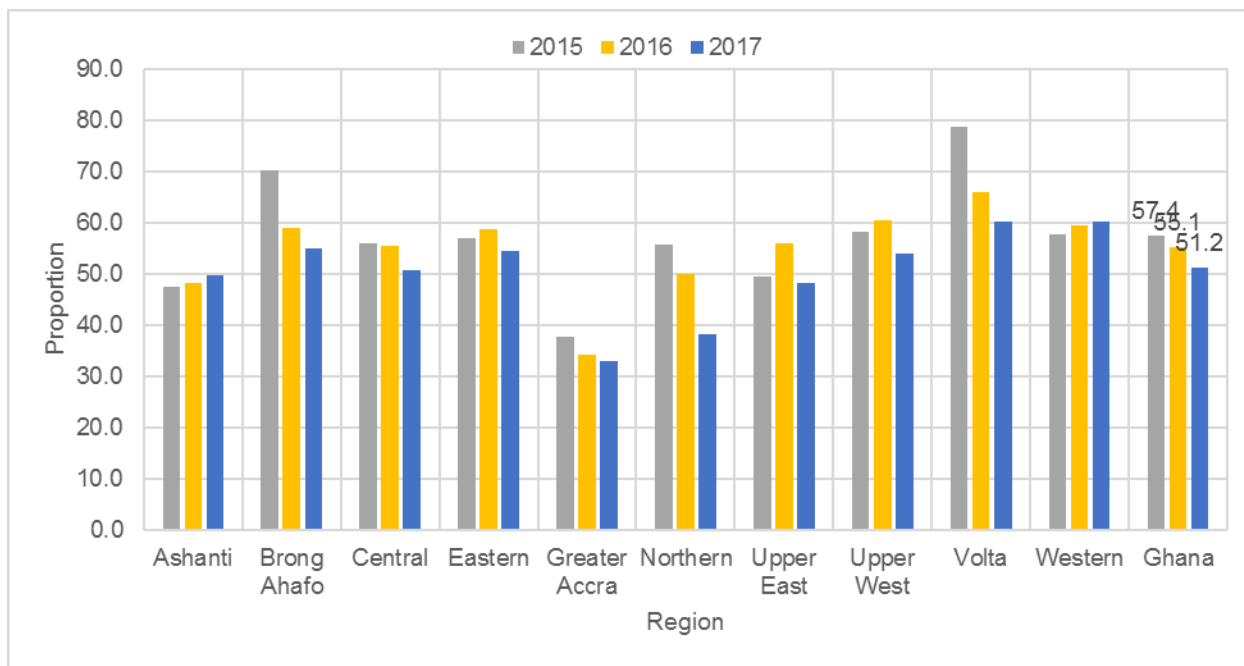


Figure 22: Proportion of OPD malaria cases put on ACTs by Region , 2015 – 2017

3.2 Malaria in Pregnancy

Approximately 399,736 suspected malaria in pregnancy cases were recorded at OPD in 2017 compared to 383,034 cases seen in 2016. The top three regions with the highest number of malaria in pregnancy cases in 2017 were the Western region (62,512 cases), followed closely by the Central Region (55,327 cases) and Ashanti region (52,665 cases). The region with the least number of malaria in pregnancy cases is the Upper West Region (11,730 cases).

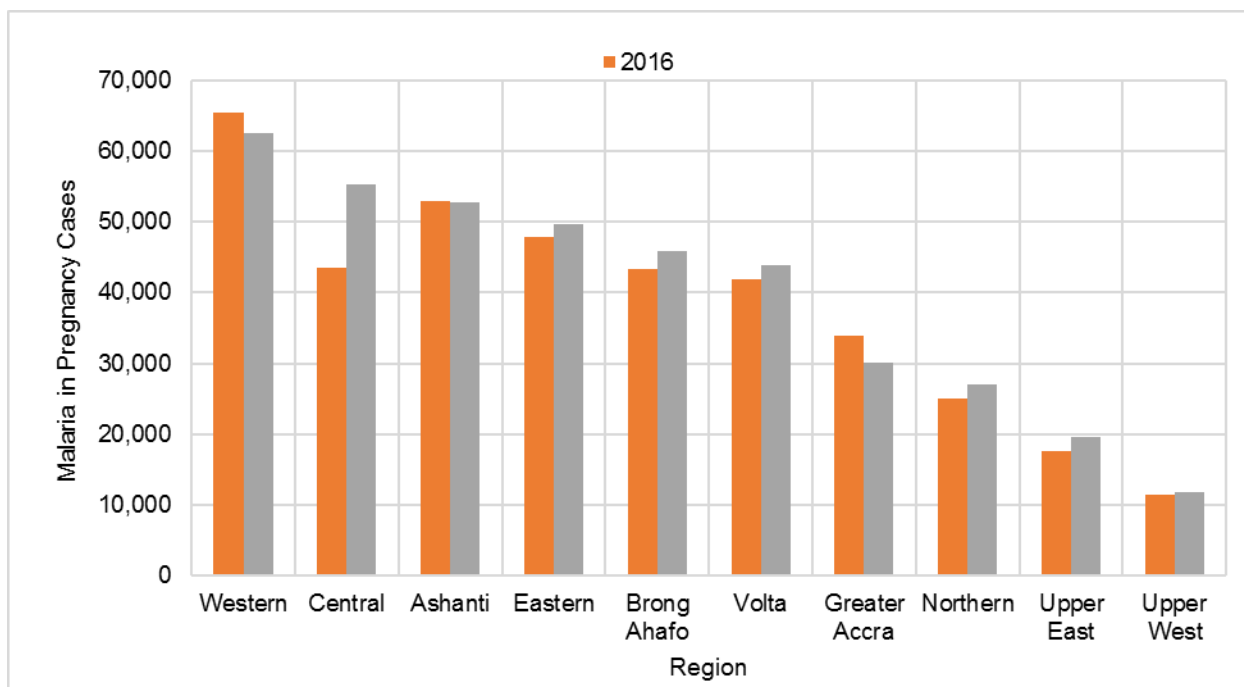


Figure 23: Malaria in Pregnancy by Region, 2016 – 2017

Intermittent Preventive Treatment in Pregnancy (IPTp)

In 2017, a total of 942,755 pregnant women were registered, 643,769 (68.3%) of these pregnant women received the 1st dose of SP, compared to 611,770 (64.0%) in 2016. Approximately 545,378 (57.8) of the registered pregnant women took the 2nd dose of SP compared to 492,291 (51.2%) in 2016, likewise 405,412 (43.0) in 2017 compared to 350,368 (36.7) with IPTp3 uptake. In 2017, 208,046 pregnant women (22.1%) took up IPTp4 and 83,890 (8.9%) took up IPTp5. The trend over the years is as shown in (Figure 27).

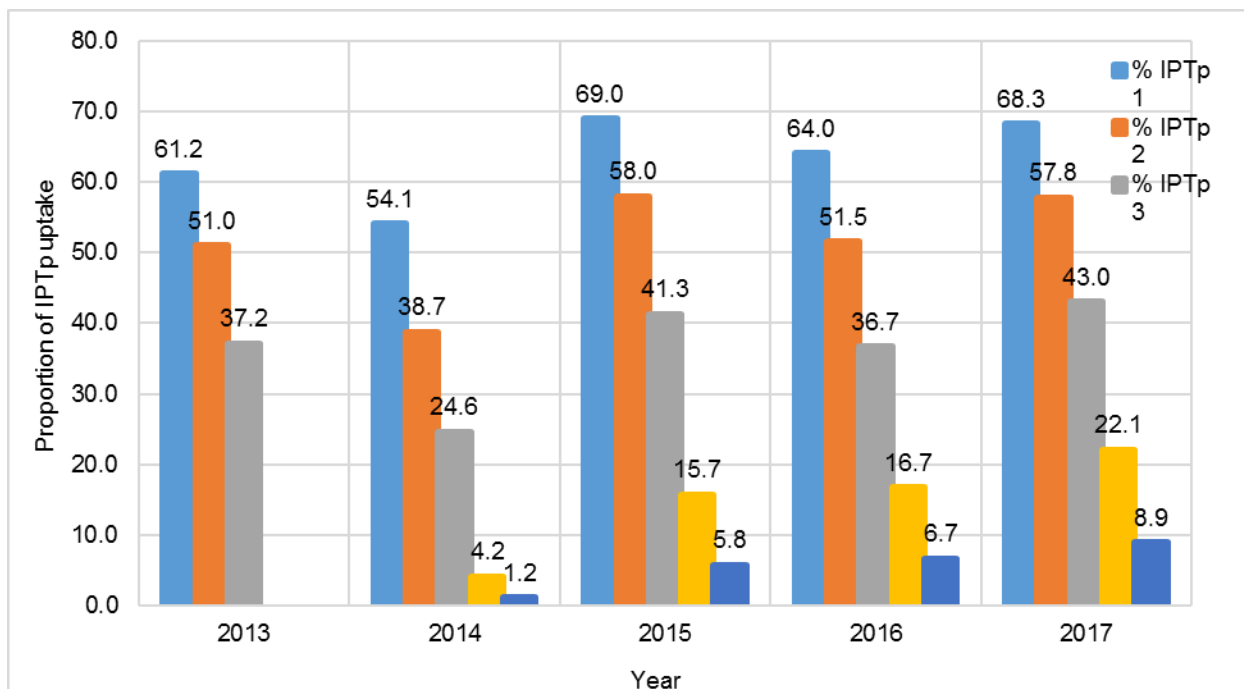


Figure 24: Proportion of Pregnant Women who took up IPTp, Ghana, 2013 - 2017

In 2017, Ghana recorded 43.0% IPTp 3 uptake, which is below the NMCP target of 60.7%. Brong Ahafo Region reported the highest of 56.4% followed by Upper West Region with 51.3% while Northern Region recorded the lowest uptake of 35.9% (Figure 28).

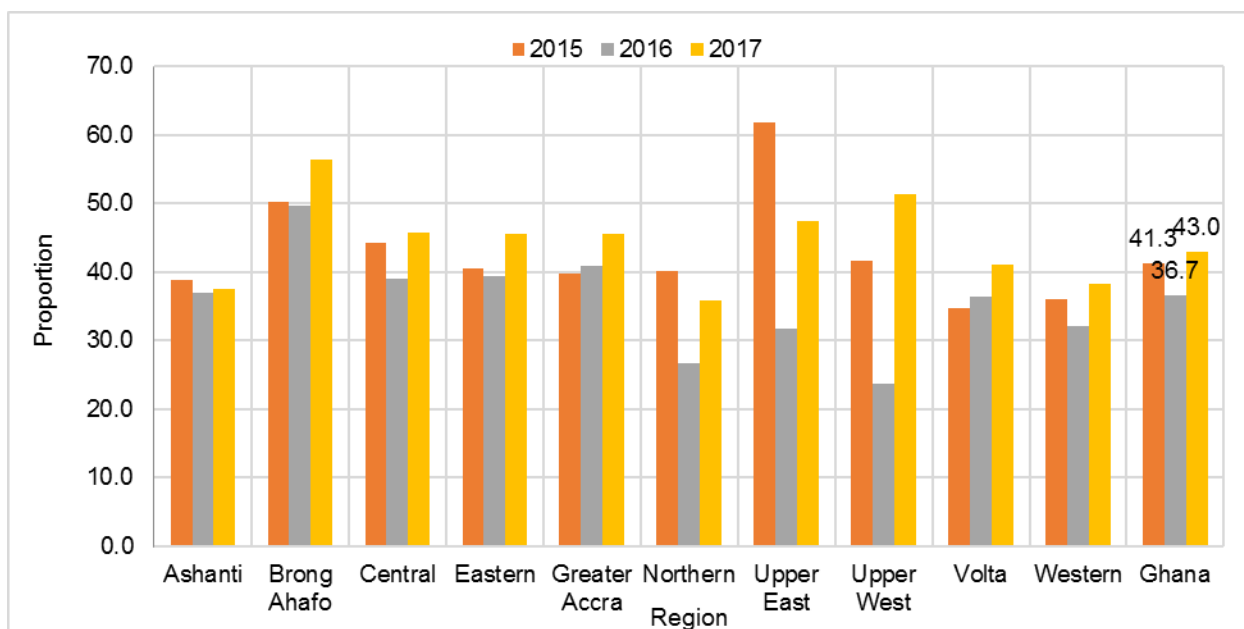


Figure 25: IPTp Uptake by Pregnant Women by regions, 2015 - 2017

3.3 Malaria admission

Proportion of admissions attributable to malaria has decreased over the years from 28.1% in 2014 to 19.0% in 2017 (figure 29).

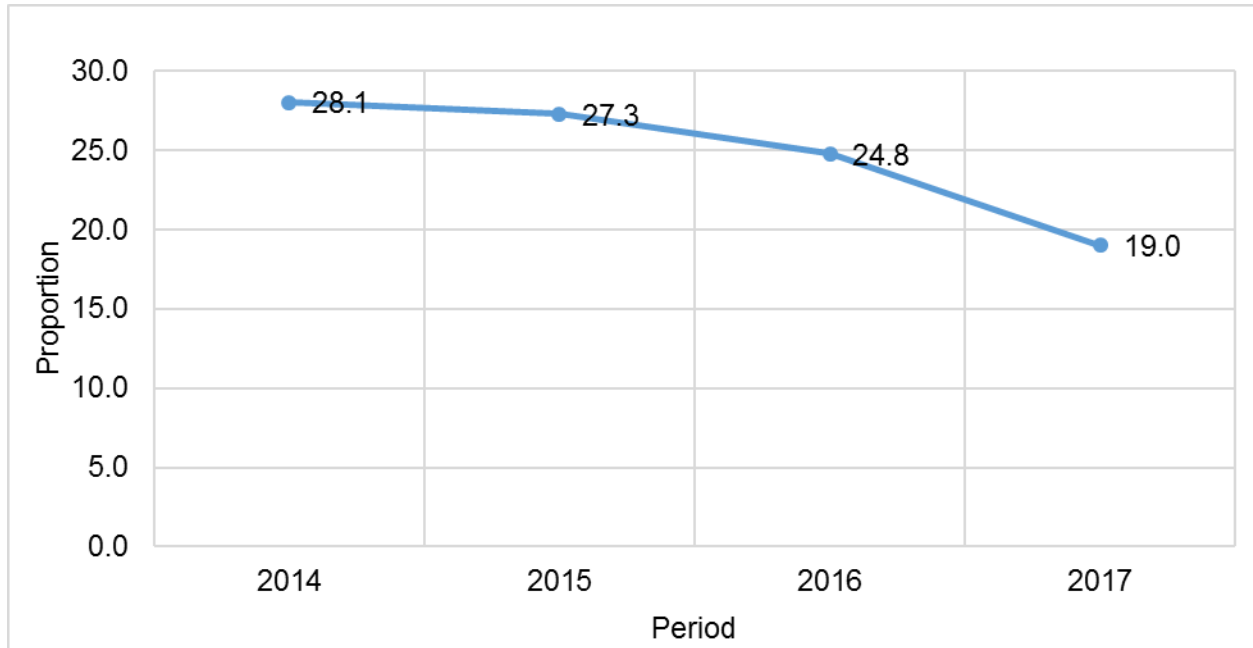


Figure 29: Proportion of admissions attributable to malaria, Ghana, Jan - Dec 2014 – 2017

3.4 Malaria Deaths

The total number of deaths attributable to malaria in 2017 was 599 representing a reduction of about 54.6% over 1,264 malaria deaths recorded in 2016. Out of these malaria deaths, 327 occurred among children under-5-years in 2017 compared to 590 in 2016 (Table 25).

Table 25: In-patients Malaria Deaths, Ghana, 2013-2017

Years	In-patient malaria death	Under 5 malaria deaths	5 years and above malaria deaths
2013	2,985	1,348	1,637
2014	2,200	1,060	1,140
2015	2,133	1,033	1,100
2016	1,264	590	674
2017	599	327	272

It is also worth noting that the country recorded a sharp systematic reduction in the proportion of deaths due to malaria from 7.5 in 2014 to 2.0 in 2017. This reduction can be ascribed to improved malaria case management in the health sector.

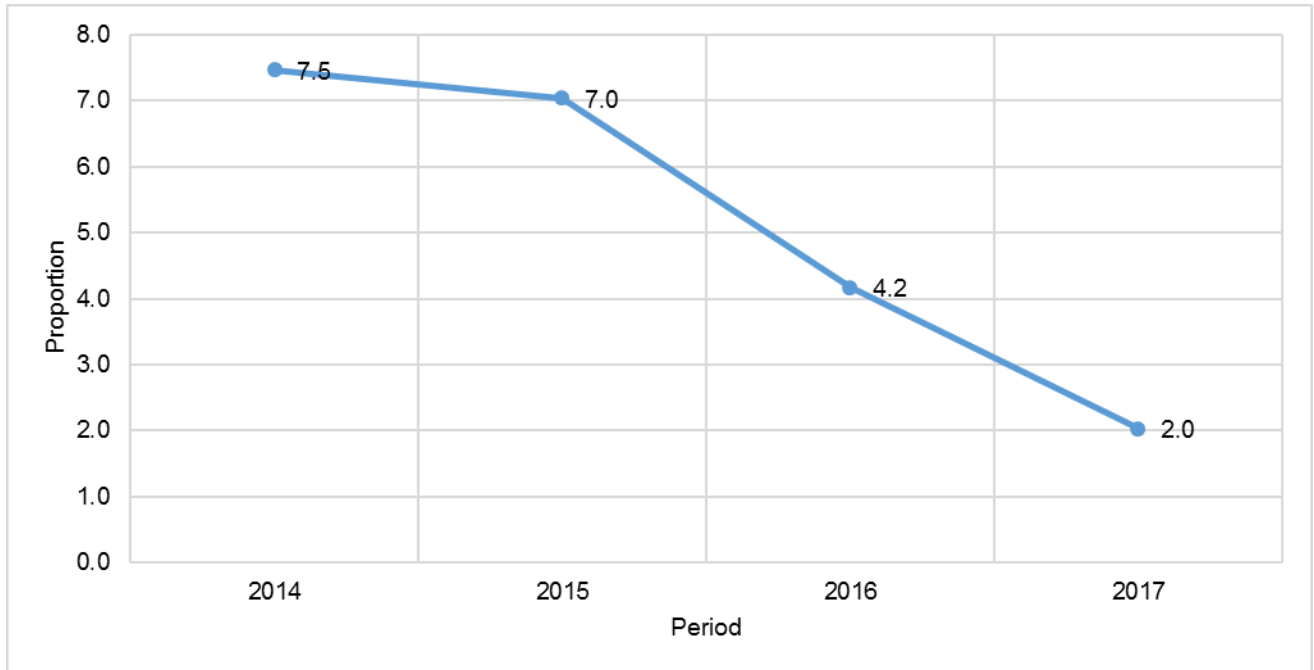


Figure 30: Proportion of In-Patient Malaria Deaths, Ghana, 2014 - 2017

A similar trend is seen when population size is factored in the graph (figure 31).

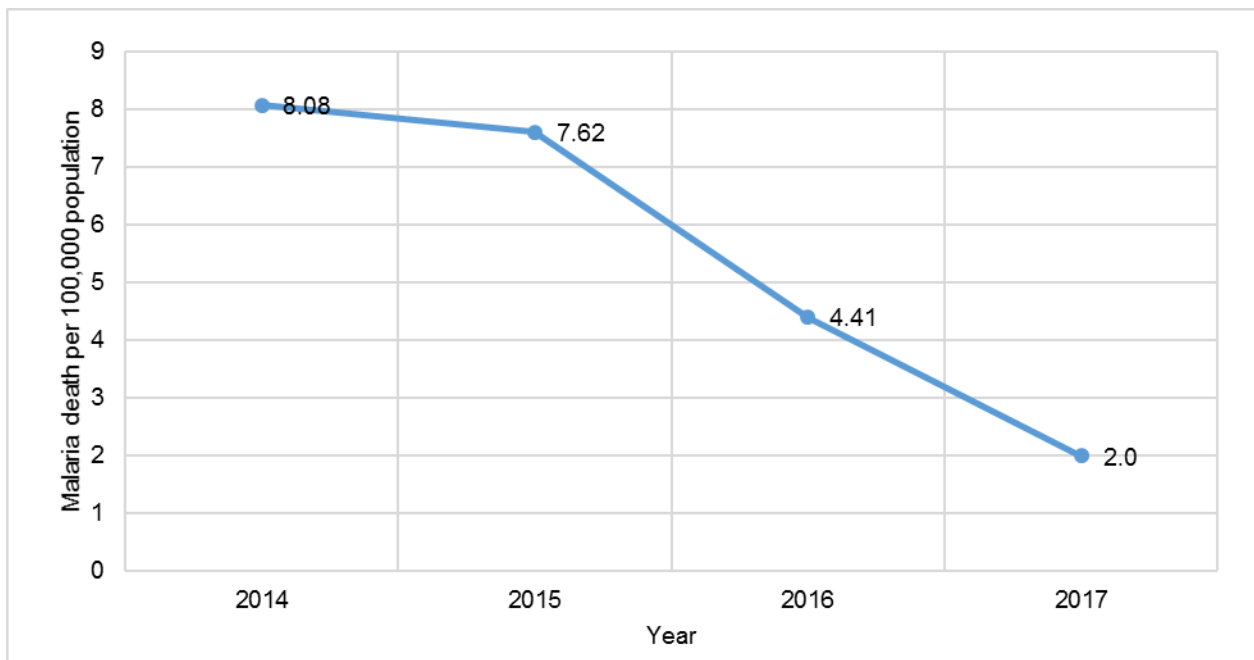


Figure 26: Malaria Deaths per 100,000 Population, Ghana, 2014 – 2017

There was a reduction in the Case Fatality Rate recorded, from approximately 0.51 in 2015 to 0.20 in 2017. In 2017, Northern recorded the highest case fatality rate (0.34) whilst the least was

recorded by Ashanti Region (0.05) (Figure 32).

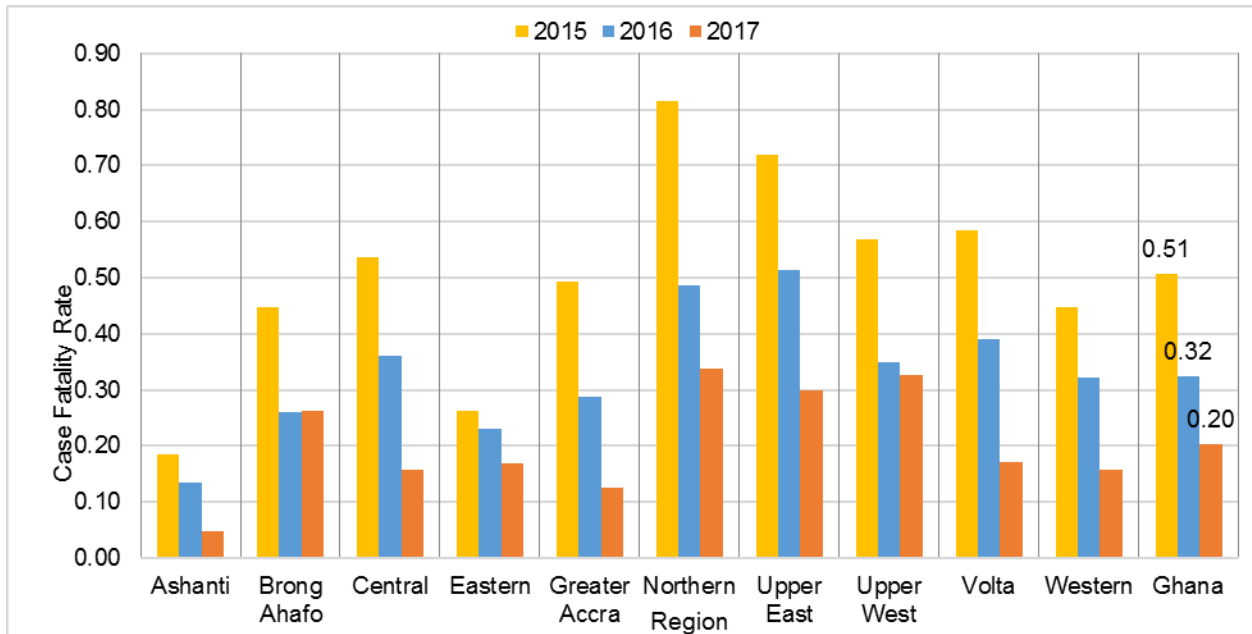


Figure 27: Children under five case fatality rate by region, 2015 – 2017

CHAPTER FOUR

4.0 Conclusion and Way Forward

4.1 Conclusion

The objective of reducing the burden of malaria morbidity and mortality by 75% by 2020 using 2012 as the baseline is on course. Almost all the targets for the year under review were achieved and this is summarized in the table below.

Table 26: Key Performance indicators and results for 2017

Indicator Description	Intended Target	Actual Result	% Achievement
Under five malaria case fatality	0.48	0.20	240
Percentage of reported suspected malaria cases that received a parasitological test (RDTs or microscopy)	80	87.3	109
Proportion of estimated malaria cases (presumed and confirmed) that received first line anti-malarial treatment at health facilities	50	51.2	102
Percentage of pregnant women on Intermittent preventive treatment (at least three doses of SP) according to national policy	66	43.0	65

Proportion of targeted risk groups (pregnant women and children under five years, including school distribution) receiving long-lasting insecticidal-nets through routine distribution	77	79.4	103
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4.2 Way Forward

The following activities will be carried out in 2018 to help the programme achieve its targets for the year:

CASE MANAGEMENT
TREATMENT
Monitoring of compliance of PSCM
Corrective measures to address any abnormal occurrences in case management
Workplace advocacy for adherence to diagnosis and treatment guidelines
Conduct Clinical Onsite Training and Supportive Supervision (OTSS) at district level (including data management)
Sentinel sites studies for Antimalarial drugs efficacy monitoring
Collaborate with training institutions to update curriculum and arrange for pre-service training opportunities in all medical and allied schools for update in MCM
Hold Case Management Technical Working Group Meetings
Coordinate Private Health Facility Monitoring
Meeting Private Health Facility Heads on reporting
Monitoring of compliance of pharmacies and OTCMS
Conduct Quarterly CoPayment Task Force Meetings
Development of framework for Private sector co-payment mechanism for ACTs

Pharmacovilance for AntiMalarials
Update of malaria case management, MiP guidelines, AntiMalaria Drug Policy
Disseminate updated malaria case management, MiP guidelines, AntiMalaria Drug Policy
DIAGNOSIS
Hold in-service training workshop for laboratory assistants on microscopy
Conduct Malaria Diagnostic Training for health facilities (in-service training for laboratory scientist)
Conduct pre-service Malaria Diagnostic training for laboratory scientist
Conduct laboratory OTSS/PTS to ensure quality in malaria diagnosis in health facilities
Lessons learnt workshop from Lab OTSS
Support National Archive for Malaria Slides (NAMS) maintenance
National competency assessment of microscopy supervisors
MALARIA IN PREGNANCY
Train NGOs in follow up of pregnant women
Hold MiP working group meetings
SEASONAL MALARIA CHEMOPREVENTION (SMC)
Review of 2017 SMC implementation
Planning and preparation for 2018 SMC implementation
Transportation of commodities to regions
Training of trainers of SMC
district trainings on SMC
Dosing of children 3-59months
Supportive supervision for SMC service providers
Pharmacovigilance of SMC
IEC/BCC activities (general public and health workers) on SMC

Post dosing Review Meeting(UER and UWR)
VECTOR CONTROL
LONG LASTING INSECTICIDE NETs
Pilot Point Mass Distribution lessons learnt meeting
Distribute LLINs through mass campaigns in Eastern
Distribute LLINs through mass campaigns in Volta
Distribute LLINs through mass campaigns in Northern Region
Distribute LLINs through mass campaigns in Western, Central
Distribute LLINs through mass campaigns in Upper East
Distribute LLINs through mass campaigns in Brong Ahafo
Distribute LLINs through mass campaigns in Ashanti
Distribute LLINs through mass campaigns in Greater Accra Regions
Distribute LLINs through ANC, CWC, for Continuous Distribution; distribution in Upper West region
Monitoring and review meetings on LLINs through ANC, CWC, for Continuous Distribution in all regions
Distribution to special groups
INSECTICIDE RESISTANCE MONITORING
Insecticide Resistance Monitoring - Field tests, lab work, Monitoring and Supervisory Visits
Insecticide Resistance Monitoring report dissemination meeting
Finalisation of Insecticide Resistance Management Plan
INDOOR RESIDUAL SPRAYING
Implement IRS in targeted areas
IRS implementation in Prisons (special population)
Hold quarterly MaVCOC meeting
PROCUREMENT AND SUPPLY MANAGEMENT (PSM)
Quantification for malaria commodities

Development of functional database for NMCP procurement
Re-organization of NMCP stores
Conveyance of nets to districts for mass campaign
Follow-up on availability of malaria documents and reporting tools from national to health facility
Support Integration and Harmonization of LMIS
Physical Stock checks at central and regional medical stores
End-user verification of malaria commodities at health facilities
Support improvement of supply chain from RMS to health facilities
Validation and allocation of malaria commodities to regions and Teaching hospitals
RESOURCE MOBILIZATION
Support Setting up of Corporate Malaria Programs for companies
Signing of MOU between NMCP and GMF
Continue soliciting for resources from corporate organization for malaria control
Assess operations of GMF
Develop GMF policies of operation
Develop a network of donors /contributors
Working Group Meetings
SURVEILLANCE, MONITORING AND EVALUATION
Surveillance, Monitoring and Evaluation Technical Working Group Meetings
PRODUCTION OF PERIODIC REPORTS
PUDR for GF,
Dashboard for CCM
WMR for WHO,
Annual and half year reports

Update malaria score-card
Development and production of bulletin
Develop Malaria Data Repository at NMCP
Conduct Routine Data Quality Audits (RDQA)
Conduct monthly data validation at National & Zonal levels
RESEARCH
Baseline Study on Vulnerable group (kayayei)
Sub regional Parasitemia levels in Greater Accra Region(GAR)
Monitoring Efficacy and Durability of LLINs
IPTp impact studies
Monitoring and supportive supervision of sentinel site for Parasite prevalence tracking
Health Facility Survey and Case Management Quality Assessment
AIDS/TB/MALARIA(ATM) Mortality analysis
Assessment of presence of Pf HRP2 gene deletions in Ghana
Research working group meeting
Economic assessment of malaria control interventions
Impact of malaria control activities over the past decade (2007-2016)
ADVOCACY, COMMUNICATION AND SOCIAL MOBILIZATION (ACSM)
Support community based SBCC by NCCE for LLINs use; to be reviewed
Engagement of NGOs to undertake community level SBCC
Review of performance of existing NGOs
Orientation and meeting of NGOs

Monitoring of NGOs
Engagement of vulnerable groups(kayayei) to reduce malaria
Train and orient journalist and media personnel
Design and Produce TV shows and documentaries on Malaria interventions in 7 languages
Design and Production of advert on IPTp
Airing of TV shows and documentaeries on malaria interventions (LLIN, Case Management, IPTp) in 7 langauges
Airing of radio shows on malaria interventions (LLIN, Case Management, IPTp)
World malaria day commemoration activities
Conduct Quarterly Advocacy and BCC meetings
Using entertainment education and technology based channels to promote malaria interventions mobile phone platform, community drama, community radio)
School-based SBCC (VR, ASH, BA,CR,ER,NR&WR)
LLINs SBCC campaign
Health facility-based SBCC
Designing of manuals, documents and tools
PROGRAMME MANAGEMENT
Hold Refresher training for the drivers in NMCP national office
Meetings with Implementing partners
Coordination meetings for various Technical Working Group Meetings (Case Mgt, MiP, MAVCOC, SM&E, NMCC etc.)
Support commemorative events to increase malaria awareness
Mid year review meetings
Trainings and workshops for capacity building of staff of NMCP
End of year review meetings
Supportive Supervisory visits - National visiting regional
Support annual report publication, peer journals and dissemination
Scientific writing workshop

Conduct internal audit
conduct external audit
Cooperate ICT training for end users (staff)
Ensuring Regular backups
Cooperate website update and maintenance
Maintenance of ICT Infrastructure at NMCP

5.0 Reference

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2. NMCP Strategic Plan. National Malaria Control Programme, Strategic Plan 2014-2020. 2015
3. The DHS Program - Ghana: Malaria Indicator Survey (MIS), 2016 [Internet]. [cited 2018 Mar 13] Available from: <https://dhsprogram.com/what-we-do/survey/survey-display-516.cfm>