# ABBREVIATIONS

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<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>ACT</td>
<td>Artemisinin-Based Combination Therapy</td>
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<td>ACSM</td>
<td>Advocacy Communication and Social Mobilization</td>
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<tr>
<td>ADDRO</td>
<td>Anglican Diocesan Relief Organization</td>
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<td>ADRs</td>
<td>Adverse Drug Reactions</td>
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<tr>
<td>AFRO</td>
<td>WHO Africa Regional Office</td>
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<tr>
<td>AGA</td>
<td>AngloGold Ashanti</td>
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<tr>
<td>AGAMal</td>
<td>AngloGold Ashanti Malaria Control Program Ltd</td>
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<tr>
<td>ANC</td>
<td>Antenatal Clinic</td>
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<tr>
<td>AQ</td>
<td>Amodiaquine</td>
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<tr>
<td>AS</td>
<td>Artesunate</td>
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<tr>
<td>AMDP</td>
<td>Antimalarial Drug Policy</td>
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<tr>
<td>AMFm</td>
<td>Affordable Medicines Facility-Malaria</td>
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<td>AMTs</td>
<td>Artemisin monotherapies</td>
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<tr>
<td>ANC</td>
<td>Antenatal Care</td>
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<tr>
<td>ARI</td>
<td>Acute Respiratory Infection</td>
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<tr>
<td>AS-AQ/AA</td>
<td>Artesunate +Amodiaquine</td>
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<tr>
<td>AL</td>
<td>Artermether-Lumefantrine</td>
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<tr>
<td>CBAs</td>
<td>Community-Based Agents</td>
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<td>CBO</td>
<td>Community-Based Organization</td>
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<tr>
<td>CCM</td>
<td>Country Coordinating Mechanism</td>
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<td>CD</td>
<td>Continuous Distribution</td>
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<td>CFR</td>
<td>Case Fatality Rate</td>
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<tr>
<td>CHAG</td>
<td>Christian Health Association of Ghana</td>
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<tr>
<td>CHIM</td>
<td>Centre for Health Information Management</td>
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<tr>
<td>CHO</td>
<td>Community Health Officer</td>
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<td>CHPS</td>
<td>Community Health Planning Services</td>
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<td>CFR</td>
<td>Case-Fatality Rate</td>
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<td>CHQ</td>
<td>Chloroquine</td>
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<tr>
<td>CMS</td>
<td>Central Medical Store</td>
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<tr>
<td>CPPA</td>
<td>Community Pharmacist Practice Association</td>
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<tr>
<td>DHMT</td>
<td>District Health Management Team</td>
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<tr>
<td>DDT</td>
<td>Dichlorodiphenyltrichloroethane</td>
</tr>
<tr>
<td>DFID</td>
<td>Department for International Development (British)</td>
</tr>
<tr>
<td>DHAP</td>
<td>Dihydroartemisinin Piperaquine</td>
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<tr>
<td>DHS</td>
<td>Demographic and Health Survey</td>
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<td>DHIMS</td>
<td>District Health Information Management System</td>
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<td>DRGs</td>
<td>Diagnosis Related Groups</td>
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<td>DSS</td>
<td>Demographic Surveillance Systems</td>
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<td>EPA</td>
<td>Environmental Protection Agency</td>
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<td>EPI</td>
<td>Expanded Programme on Immunization</td>
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<td>ETF</td>
<td>Early Treatment Failure</td>
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<td>FDA</td>
<td>Food and Drugs Authority</td>
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<td>FDC</td>
<td>Fixed-Dose Combination</td>
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<td>FHD</td>
<td>Family Health Division</td>
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<tr>
<td>FY</td>
<td>Fiscal Year</td>
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<tr>
<td>GFATM</td>
<td>Global Fund to fight AIDS, Tuberculosis and Malaria</td>
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<tr>
<td>GF</td>
<td>Global Fund</td>
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<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>GHS</td>
<td>Ghana Health Services</td>
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<td>GNPD</td>
<td>Ghana National Drugs Programme</td>
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<td>GoG</td>
<td>Government of Ghana</td>
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<tr>
<td>G6PD</td>
<td>Glucose-6-Phosphate Dehydrogenase Deficiency</td>
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<td>GSS</td>
<td>Ghana Statistical Service</td>
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<tr>
<td>HBC</td>
<td>Home-Based Care</td>
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<td>HH</td>
<td>Household</td>
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<tr>
<td>HIO</td>
<td>Health Information Officer</td>
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<tr>
<td>HIS</td>
<td>Health Information Systems</td>
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<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<tr>
<td>HIV/AIDS</td>
<td>Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome</td>
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<tr>
<td>HMIS</td>
<td>Health Management Information Systems</td>
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<td>HMM</td>
<td>Home Management of Malaria</td>
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<tr>
<td>iCCM</td>
<td>Integrated Community Case Management</td>
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<td>IDSR</td>
<td>Integrated Disease Surveillance and Response</td>
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<tr>
<td>IEC</td>
<td>Information, Education and Communication</td>
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<tr>
<td>IMCI</td>
<td>Integrated Management of Childhood Illnesses</td>
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<tr>
<td>IPD</td>
<td>In-Patient Department</td>
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<tr>
<td>IPT</td>
<td>Intermittent Preventive Treatment</td>
</tr>
<tr>
<td>IPTp</td>
<td>Intermittent Preventive Treatment for Pregnant Women</td>
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<tr>
<td>IPTi</td>
<td>Intermittent Preventive Treatment for Infants</td>
</tr>
<tr>
<td>IRS</td>
<td>Indoor Residual Spraying</td>
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<tr>
<td>ITN</td>
<td>Insecticide-Treated Net</td>
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<tr>
<td>LBW</td>
<td>Low Birth Weight</td>
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<tr>
<td>LLIN</td>
<td>Long Lasting Insecticidal Net</td>
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<td>LPF</td>
<td>Late Parasitological Failure</td>
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<tr>
<td>MaVCOC</td>
<td>Malaria Vector Control Oversight Committee</td>
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<tr>
<td>MDGs</td>
<td>Millennium Development Goals</td>
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<td>MDRT</td>
<td>Malaria Diagnostic Refresher Training</td>
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<tr>
<td>M&amp;E</td>
<td>Monitoring and Evaluation</td>
</tr>
<tr>
<td>MICS</td>
<td>Multiple Indicator Cluster Surveys</td>
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<td>MICC</td>
<td>Malaria Interagency Coordinating Committee</td>
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<tr>
<td>MIP</td>
<td>Malaria in Pregnancy</td>
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<tr>
<td>MIS</td>
<td>Malaria Indicator Survey</td>
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<tr>
<td>MOFEP</td>
<td>Ministry of Finance and Economic Planning</td>
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<td>MoH</td>
<td>Ministry of Health</td>
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<tr>
<td>MPR</td>
<td>Malaria Programme Review</td>
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<td>NAMS</td>
<td>National Archive of Malaria Slides</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
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<tr>
<td>NHIA</td>
<td>National Health Insurance Authority</td>
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<tr>
<td>NHIF</td>
<td>National Health Insurance Fund</td>
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<td>NHIS</td>
<td>National Health Insurance Scheme</td>
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<tr>
<td>NMCC</td>
<td>National Malaria Communication sub-Committee</td>
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<td>NMCP</td>
<td>National Malaria Control Programme</td>
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<tr>
<td>NMIMR</td>
<td>Noguchi Memorial Institute for Medical Research</td>
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<tr>
<td>OPD</td>
<td>Out-Patients Department</td>
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<tr>
<td>OIG</td>
<td>Office of the Inspector General</td>
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<tr>
<td>ORS</td>
<td>Oral Rehydration Salt</td>
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OTC               Over-the-counter
OTSS              Outreach Training and Support Supervision
PCR               Polymerase Chain Reaction
POW               Programme of Work
PPME              Policy Planning Monitoring and Evaluation
PR                Principal Recipient
PSD               Procurement and Supply Division
PSG               Pharmaceutical Society of Ghana
PSM               Procurement and Supply Management
Pf                Plasmodium falciparum
Pm                Plasmodium malariae
PMI               The U.S. President's Malaria Initiative
Po                Plasmodium Ovale
PPQ               Piperaquine
PQ                Primaquine
PU                Procurement Unit
P.v               Plasmodium vivax
PW                Pregnant Woman
Q                 Quinine
QA                Quality Assurance
QAACT             Quality Assured Artemisinine-Based Combination Therapy
QC                Quality Control
RBM               Roll Back Malaria
RDTs              Rapid Diagnostic Tests
RMS               Regional Medical Store
SCMP              Supply Chain Master Plan
SDP               Service Delivery Point
SMC               Seasonal Malaria Chemoprevention
SPMDP             Society for Private Medical and Dental Practitioners Association
SP                Sulfadoxine-Pyrimethamine
SWAP              Sector – Wide Approach
OTCMS             Over the Counter Medicine Sellers
T3                Test Treat and Track
TB                Tuberculosis
TF                Total Treatment Failure
UC                Universal Coverage
UNICEF            United Nations Children's Fund
USAID             United States Agency for International Development
WHO               World Health Organization
WHOPES            WHO Pesticide Evaluation Scheme
ACKNOWLEDGEMENT

The National Malaria Control Programme wishes to express its gratitude to the following persons and institutions for their support during the year under review:
Malaria aside its health implication has huge socio-economic burden on the nation and the world at large. It is one of the leading causes of death in sub-Saharan Africa and though preventable, the disease remains a public health menace in Ghana. The overall goal of the National Malaria Control Programme (NMCP); to reduce the malaria morbidity and mortality by 75% (using 2012 as baseline) by the year 2020, continued to be pursued in 2015. To achieve our objective some areas were identified as priorities for the year 2015 this included; universal diagnosis of all suspected malaria cases and adhering to the test result in the treatment, improving uptake of SP for prevention of malaria in pregnancy with respect to the new policy (SP given till delivery), effective implementation of Integrated Community Case Management, iCCM and increasing coverage of expertise in malaria diagnosis among preceptors and health workers. Another key area is raising funds internally to support the fight against malaria. Effective procurement and logistics management to ensure malaria product quality and expands access to planned interventions was also key and finally effective and successful implementation of seasonal malaria chemoprevention was also a priority for the year under review.

**Activities Undertaken In 2015**

The NMCP with support from the Resource Mobilization Sub Committee/Working group developed a Financial Sustainability and Resource Mobilization Plan to guide the generation of domestic funds for malaria control in Ghana. The Working group in November selected and outdoored a malaria Ambassador in the person of Mr. Prince Kofi Amoabeng who in collaboration with the Resource Mobilization Working Group is leading the process for the establishment of the Malaria Foundation. Under Case Management a number of training and meetings were held in Diagnostics, Malaria Case Management, Integrated Community Case Management and Malaria in Pregnancy. A total of 245 laboratory Scientists from 217 health facilities of the various levels were trained in malaria diagnostics. A total of 44 lecturers and laboratory technicians were also trained in two pre-service institutions (University of Development Studies and University of Cape Coast) on malaria case management with emphasis on microscopy. National Malaria Control Programme supported Kintampo Health and Research Centre (KHRC) to characterize and validate National Archive of Malaria Slides (NAMS) by PCR. Two sessions of a Two-day training of trainers of regional representatives; which was carried out concurrently in Koforidua and Kumasi for the whole country. The number of institutions represented were 17 and 44 participants were trained. JHPIEGO and MalariaCare also carried out training of tutors for nursing health institutions and Laboratory Personnel at Medical laboratory schools respectively.

In 2015, the MOH and Jhpiego identified ten midwifery schools for eLearning module; an expansion of that which was started in 2014.

Activities carried out during the year 2015 under Vector Control include: Point Mass Distribution of LLINs/review of point distribution guidelines, Continuous Distribution of LLINs, Peers Run Project, Indoor Residual Spraying (IRS), Insecticide Resistance Monitoring and larviciding. Health commodities play a major role in the delivery of public health service. These are all bulky and/or temperature sensitive commodities requiring huge storage space and optimum storage conditions. The unfortunate fire incident in the Central medical Stores in the beginning of the year 2015 therefore posed serious threat to malaria control in the country. The Global Fund and the USAID’s engagement of Imperial Health Services, a private company specialized in the warehousing and distribution of health commodities, did not only increase the hope for health commodity security but also offered an opportunity to initiate a scheduled delivery from central level to the Regional Medical Stores and those of the four main Teaching Hospitals.
In 2015, Seasonal Malaria Chemoprevention was implemented in four rounds with the main objective of targeting an estimated 150,000 children aged 3-59 months in the year 2015 during the rainy season in the Upper West Region of Ghana. Data verification and validation was also conducted during the period under review as well as a review meeting for the 30 malaria sentinel sites. National Malaria Control Programme also participated in the drafting and dissemination of Demographic and Health Survey (DHS 2014) report, held research working group meeting, conducted research into the economic burden of malaria in Ghana and on factors contributing to high malaria mortality in the Northern region of Ghana. The administrative department coordinated and supported the various sub-committee meetings as well as the MICC meeting and the general administrative duties in the office.

**Progress and Achievements**

In 2015, the country recorded approximately 10 million suspected malaria cases with 31% being children under five.

**Table 1: Malaria Morbidity and Mortality in 2015, Ghana**

<table>
<thead>
<tr>
<th>CATEGORIES</th>
<th>NUMBER REPORTED</th>
<th>PROPORTION ATTRIBUTABLE TO MALARIA</th>
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<tr>
<td><strong>OPD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All OPD Cases</td>
<td>26,689,329</td>
<td>38.1%</td>
</tr>
<tr>
<td>All suspected Malaria Cases</td>
<td>10,169,829</td>
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</tr>
<tr>
<td>Pregnant Women</td>
<td>327,145</td>
<td>3.2%*</td>
</tr>
<tr>
<td>Under 5 years</td>
<td>3,169,512</td>
<td>31.2%*</td>
</tr>
<tr>
<td><strong>ADMISSION</strong></td>
<td></td>
<td></td>
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<tr>
<td>All Admissions</td>
<td>1,500,962</td>
<td>27.3%</td>
</tr>
<tr>
<td>Admissions attributed to malaria.</td>
<td>409446</td>
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<tr>
<td>Under 5 years malaria cases</td>
<td>204,164</td>
<td>49.9%*</td>
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<tr>
<td><strong>DEATHS</strong></td>
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<tr>
<td>Total deaths</td>
<td>30,344</td>
<td>7.0%</td>
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<tr>
<td>All malaria deaths</td>
<td>2,133</td>
<td></td>
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<tr>
<td>Under 5 years malaria deaths</td>
<td>1,033</td>
<td>48.4%*</td>
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<td><strong>UNDER 5 MALARIA CASE FATALITY RATE</strong></td>
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<td>0.51</td>
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**NB:** *proportion of cases to total malaria cases*

Source: DHIMS
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1.2.5 Malaria in Pregnancy

1.2.6 Integrated Community Case Management (iCCM)

1.2.7 Diagnostics

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CHAPTER ONE

1.0 Introduction
Malaria aside its health implication has huge socio-economic burden on the nation and the world at large. It is one of the leading causes of death in sub-Saharan Africa and though preventable, the disease remains a public health menace in Ghana. Data from the District Health Information System (DHIMS) reveals that about thirty percent of all Out-patient Department (OPD) cases were malaria, 73.5% of all OPD malaria cases were tested before treated, 30.6% of all admission cases were malaria and about 7.2% of all deaths on admission were from malaria in the year 2014. Reduction in malaria burden has been aided by financial assistance mainly from international organizations. Looking inwards for financial, material and human resources in the fight against malaria is becoming increasing relevant in these times due to the pattern of financial flow in the fight against malaria. Developing strategies for more efficient advocacy for more internal financial support in the fight against malaria is needed.

1.1 Programme Objectives
The overall programme 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 Planned For 2015
Priorities areas for 2015 included Malaria Case Management with a focus on universal diagnosis of all suspected malaria cases and adhering to the test result in the treatment. Improving uptake of SP for prevention of malaria in pregnancy with respect to the new policy (SP given till delivery). Effective implementation of Home Based Care (now Integrated Community Case Management, iCCM) and increase coverage of expertise in malaria diagnosis among preceptors and health workers are the major areas of focus under case management.

Advocacy, Communication and Social Mobilization is another key area to help us raise funds internally to support the fight against malaria. Effective procurement and logistics management to ensure malaria product quality and expands access to planned interventions was also key and finally effective and successful implementation of seasonal malaria chemoprevention was also a priority.

In 2015 the programme planned the following activities to help achieve target for 2015 with the 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 **Procurement and Supply Management (PSM)**
Under PSM, the Programme planned to procure for continuous distribution and LLINs mass campaign, procure RDTs, pursue private sector co-payment mechanism, support integration and harmonization of Logistic Management information System (LMIS) and conduct Physical Stock checks at central and regional medical stores in 2015.

1.2.2 **National Policy and Regulatory Preparedness**
Under national policy and regulatory preparedness for 2015, the programme planned to conduct cohort event monitoring studies to assess safety and quality of ACTs and work with the task force to prevent leakages of co-paid ACTs.

1.2.3 **Partnership, Planning and Resource Mobilization**
The Programme planned in 2015, to finalize the resource mobilization (RM) plan with RM Sub Committee and other stakeholders, lobbying the presidency to get the president to make a firm commitment to assign domestic funds to malaria control activities, meeting with the parliamentary select committee on health and finance on the need to get cabinet and the presidency to act on getting domestic financing for malaria activities and also for parliamentarians to advocate at various avenues to get funding to support malaria control activities in their constituencies and setting up a malaria fund with the support of professional fundraisers and event organizers to support NMCP and its partners.

1.2.4 **Malaria Case Management**
Under malaria case management, in 2015, the Programme planned to conduct case management trainings for tutors in pre-service health institutions, conduct case management for severe malaria cases at referral points, conduct a meeting with providers in quasi government health facilities, conduct private sector health facility supervisory visits half yearly, conduct on-site training and supportive supervision (OTSS) half yearly in public health facilities, and conduct training for providers in private and quasi government on case management.

Other activities planned for 2015 under malaria case management are developing observation chart to monitor cases of severe malaria at referral points, providing CMEs for physicians, pharmacists and nurses, collaborating with Partners.

To develop job aide for injection artesunate use in health facilities, revising monitoring tools/OTSS to capture emergency response and management of complications due to severe malaria, conducting a 2-day facilitators training on malaria case management/emergency response and organizing meetings with providers from Quasi government facilities. The rest are to Collaborate with training institutions to update curriculum and arrange for pre-service training opportunities in all medical and allied schools for update in Malaria Case Management and coordinate a meeting with NHIA to address concerns raised on issues of diagnosis and treatment of malaria.

1.2.5 **Malaria in Pregnancy**
The Programme planned to conduct OTSS on MIP (as part of Case Management), stakeholders’ meeting on folic acid formulation, quarterly text messaging, phone calls and monitoring data, IPTp assessment study/operation research to identify reasons for drop out of IPTp and outcome of IPTp, quarterly MIP working group meeting, develop job aid for MIP and conduct in-service training for health workers.
1.2.6 Integrated Community Case Management (iCCM)
In 2015, the Programme has planned under iCCM to roll out of CBA OTSS across the country, hold sessions of refresher training for CHO, hold CBAs peer review meetings (half yearly), post quarterly text message/call reminders to disseminate information, Revise the quantification of iCCM products to serve as advocacy tools (for both local and international partners), advocate for funds for printing of HBC manuals and reporting tools and hold Quarterly iCCM coordinating committee meetings.

1.2.7 Diagnostics
Sentinel sites studies for parasite prevalence tracking, conduct Malaria Diagnosis Refresher Training (MDRT) for trainers for regional -level laboratory OTSS supervisors, conduct MDRT in each region for district-level laboratory OTSS supervisors, conduct malaria diagnostic refresher training for facilities, conduct lessons learnt workshop for regional-level laboratory OTSS supervisors, hold in-service training for laboratory assistants and development of GHS quality assurance plan and standard protocol for RDTs are some of the activities planned by the programme under diagnostics for 2015. The rest are to implement the laboratory quality assurance protocol, complete the WHO National Archive of Malaria Slides (NAMS) validation process and work with laboratory training institutions to update malaria diagnostics pre-service training based on revised national guidelines for malaria diagnosis and treatment.

1.2.8 Vector Control
Under vector control for 2015, the Programme planned to work with laboratory training institutions to update malaria diagnostics pre-service training based on revised national guidelines for malaria diagnosis and treatment, distribute LLINs through point distribution in Western Region; regional informative meeting, volunteer & health worker trainings, distribution exercise, distribute LLINs through point distribution in Central Region; regional informative meeting, volunteer & health worker trainings, distribution exercise, distribute LLINs through point distribution in Ashanti Region; regional informative meeting, volunteer & health worker trainings and distribute LLINs through point distribution in Non-IRS districts in Northern Region; regional informative meeting, volunteer& health worker trainings, distribution exercise.

Also planned for 2015 under vector control are to distribute LLINs through point distribution in Upper East Region; regional informative meeting, volunteer& health worker trainings, distribution exercise, distribute (to be determined) LLINs through point distribution in rural Greater Accra Region; regional informative meeting, volunteer& health worker trainings, distribution exercise, monitoring and supervision of LLIN point distribution in all implementing regions and conduct post point distribution validation in Brong Ahafo Region, Western Region, Central Region, Ashanti Region, some districts in Northern Region, Upper East Region and Greater Accra Region. The rest are to distribute LLINs through ANCs & CWCs in all regions and to monitor and supervise distribution of LLINs through ANC and CWCs.

1.2.9 Vector Control Coordinating Meetings
Under vector control coordinating meetings, the NMCP planned to hold quarterly MAVCOC meetings, coordinate and monitor insecticide resistance management sentinel sites activities, review the IVM Policy and conduct insecticide resistance monitoring through sentinel sites.
1.2.10 Indoor Residual Spraying
In 2015, NMCP planned to monitor IRS activities in Northern Region (Abt-IRS) and Upper West Regions (AGAMAL), review susceptibility reports to inform the selection of appropriate insecticide for IRS spraying in consultation with partners (MOH/NMCP, AGAMAL and PMI), facilitate entomology training for GHS/NMCP technicians including participation from partners, conduct Entomological surveillance at all established sites (Both AGAMAL, and PMI/ABT sentinel sites including Bunpkurugu Yunyo) and conduct post-IRS evaluation workshop/meeting.

1.2.11 Advocacy, Communication and Social Mobilization (ACSM)
Has planned to conduct malaria day advocacy; including commemoration of world malaria day, conduct quarterly communication sub-committee meetings, produce and air both television and radio adverts on LLINs and ACTs, liaise with health promotion to undertake intensive BCC to promote test, treat and track: compliance, use and improve provider confidence in the use of RDTs and SP (TV adverts), develop and print material for education on SMC and finalize, design, print and disseminate the national communication strategy.

Others are to Support NGOs advocacy and sensitize community on IPT for the coalition of NGOs in malaria, Train and orientate journalists including newsroom editors on malaria control interventions, Review malaria educational materials on malaria interventions in line with current communication strategies (ITNs, SMC, SP, ACTs, RDTs, ICCM), print MIP guidelines, print mass LLIN point distribution campaign Coupons for Brong Ahafo, Western, Central, Ashanti, Northern Region, Upper East and Greater Accra Regions, design & print disseminate IMCI documents and educational materials and revise, print and disseminate material for education on SMC. The rest are to develop and print malaria microscopy job aids, develop and print daily malaria log book for all facilities, print IPT guidelines, National Strategic plan & M&E Plan, develop materials for community mobilization on iCCM and print iCCM tools.

1.2.12 Research, Surveillance, Monitoring and Evaluation
The NMCP, planned to conduct surveillance, monitoring and evaluation technical working group meetings (quarterly), produce periodic reports, report on the PUDR for the Global Fund (GP), the dashboard for the CCM, RBM Roadmap updates, and WMR for the WHO. Others are produce reports to other partner and stakeholders, develop and produce of malaria Bulletins and conduct On-site Training and Supportive Supervision (OTSS). Also planned for 2015 are public and private supervisory visits, support the GSS with the DHS report writing, documentation of best practices, conduct routine data quality audits, conduct periodic data review (in 10 Regions), semi-annual seminars to disseminate research findings and investigate factors that influence non-adherence to test results and treatment policy.

Other activities planned under RSM&E for 2015 are to conduct research into, investigate the threat of surface mining and artisan mining on malaria control, and identify reasons for low uptake of HBC, stratify of malaria endemicity to cover districts and develop national and district specific thresholds for malaria surveillance.

1.2.13 Administration and Finance
Plans for 2015 under administration and finance were, NMCP end of year review and planning meetings, conducting financial monitoring on public facilities, conducting coordination meetings (MICC, various committees), conducting end of term review meeting at the national level,
participating in regional annual review meetings, producing half year report and annual reports and conducting internal and external audits.

1.3 Targets for January to December 2015

Though the above activities by the various units the program had a target to achieve by the end of December 2015. This is shown in the table below:

Table 2a: Intended targets for indicators in Ghana from January to December 2015

<table>
<thead>
<tr>
<th>Indicator Description</th>
<th>Intended Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under five Case fatality rate</td>
<td>0.53</td>
</tr>
<tr>
<td>Confirmed malaria cases (microscopy and RDT) per 1000 population per year</td>
<td>73</td>
</tr>
<tr>
<td>Inpatient Malaria deaths per 100,000 persons per year</td>
<td>7</td>
</tr>
<tr>
<td>Percentage of pregnant women on Intermittent preventive treatment (at least three doses of SP) according to national policy</td>
<td>55%</td>
</tr>
<tr>
<td>Number of long-lasting insecticidal nets distributed to at-risk populations through mass campaigns</td>
<td>1,346,132</td>
</tr>
<tr>
<td>Proportion of population at risk potentially covered by long lasting insecticidal nets distributed</td>
<td>93%</td>
</tr>
<tr>
<td>Number of LLINs distributed to targeted risk groups (pupils, pregnant women and children under five years) through routine distribution</td>
<td>341,367</td>
</tr>
<tr>
<td>Proportion of targeted risk groups (pupils, pregnant women and children under five years) receiving long-lasting insecticidal-nets through routine distribution</td>
<td>87%</td>
</tr>
<tr>
<td>Proportion of households in targeted areas that received Indoor Residual Spraying during the reporting period</td>
<td>90% (141960/15773)</td>
</tr>
<tr>
<td>Proportion of population protected by Indoor Residual Spraying within the last 12 months</td>
<td>90% (871071/96785)</td>
</tr>
</tbody>
</table>
Table 2b: Intended targets for indicators in Ghana from January to December 2015

<table>
<thead>
<tr>
<th>Indicator Description</th>
<th>Intended target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of districts implementing IRS</td>
<td>40</td>
</tr>
<tr>
<td>Proportion of children aged 3-59 months treated under SMC</td>
<td>80% (591884/739855)</td>
</tr>
<tr>
<td>Percentage of reported suspected malaria cases that received a parasitological test( RDTs or microscopy)</td>
<td>70.0%</td>
</tr>
<tr>
<td>Percentage of reported uncomplicated malaria cases (both suspected and confirmed) treated with ACT at health facilities</td>
<td>80.0%</td>
</tr>
<tr>
<td>Number and percentage of uncomplicated malaria cases (tested positive) treated with ACT at health facilities</td>
<td>100% (1,178,153)</td>
</tr>
<tr>
<td>Number of uncomplicated malaria cases among under 5 year children treated with ACT by community based health workers (CBA).</td>
<td>52,963</td>
</tr>
<tr>
<td>Number of service providers from targeted public and private health facilities given refresher training on malaria control (case management etc.)</td>
<td>12,000</td>
</tr>
<tr>
<td>Number of meetings held by MICC and its subcommittee/working groups</td>
<td>11</td>
</tr>
<tr>
<td>Number of corporate bodies who have adopted malaria control programmes</td>
<td>5</td>
</tr>
<tr>
<td>Number of strategic partners (financial and technical) identified and collaborated with</td>
<td>50</td>
</tr>
<tr>
<td>Number of identified partners contributing to malaria control programme</td>
<td>25</td>
</tr>
<tr>
<td>Number of sentinel sites established and functioning for epidemiological monitoring</td>
<td>30</td>
</tr>
<tr>
<td>Number of Districts with functional M&amp;E unit with data quality improvement teams.</td>
<td>216</td>
</tr>
<tr>
<td>Percentage (% of health facilities submitting timely and complete reports( on malaria ) to regional level</td>
<td>80.0%</td>
</tr>
<tr>
<td>Promotion of research that informs the programme in terms of policy and operational issues</td>
<td>3</td>
</tr>
<tr>
<td>Quantities of ACSM materials(Manuals, posters, radio/TV spots, etc.) produced</td>
<td>7,000</td>
</tr>
<tr>
<td>Number of mass media spots promoting key messages on malaria case management</td>
<td>1,750</td>
</tr>
</tbody>
</table>
CHAPTER TWO

2.0 Activities Undertaken in 2015

2.1 Procurement and Supply Management (PSM)

2.1.1 Commodity Supply for Malaria Control
Health commodities play a major role in the delivery of public health service. Malaria control interventions involve the use of diagnostic tools including Rapid Diagnostic Test kits, Anti-malaria medicines and treated bed nets and insecticides for vector control. These are all bulky and/or temperature sensitive commodities requiring huge storage space and optimum storage conditions. The unfortunate fire incident in the Central medical Stores in the beginning of the year 2015 posed serious threat to malaria control in the country. It was therefore very relieving when the Ministry of Health and partners secured a temporary storage spaces to warehouse commodities and also constituted a Crisis Management Committee to ensure that the fire incident did not lead to a cessation of service delivery which could potentially lead to a reversal of the gains made in the health sector including malaria control.

With the support of the government and partners, commodity supply throughout the year was satisfactorily managed ensuring the regular availability of the core malaria control commodities for both treatment and prevention. An exceptional case is that of Sulphadoxine Pyrimethamine, SP, for IPTp implementation. The stocks that were carried over from 2014 to 2015 got burned in the CMS fire. The MOH undertook to procure some for use but it was not until the last quarter that the contract was awarded. The supplier managed to deliver 14% of the total contract in November. However the delivered product was not available for use pending the quality test by the FDA. Out of almost 6.6 million LLINs ordered, all but 300,000 nets were delivered as scheduled. The programme distributed all the LLINs delivered to the programme.

In respect of Rapid Diagnostic Test kits, the Programme and partners placed an order for about 14.3 million. However in course of the year, it emerged that the single pack type, point of care kit, POCT, which the country uses, suffers buffer evaporation after 18 months of storage and for that reason the WHO had withdrawn its recommendation for use. Consequently, that type was not available for procurement and the country had to change to the multi-dispenser buffer type. This switch in specification ultimately resulted in stock out of RDTs.
Table below summarizes the commodities procured, received and distributed during the year under review.

Table 3 : Summary of commodities received and distributed in 2015

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity Ordered</th>
<th>Quantity Received</th>
<th>Quantity distributed/used</th>
<th>Closing Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artemether/ Lumefantrine 120/20 mg 6's (0-3 yrs)</td>
<td>1,054,800</td>
<td>1,054,800</td>
<td>585,390</td>
<td>469,410</td>
</tr>
<tr>
<td>Artemether/ Lumefantrine 120/20 mg 12's (4-8 yrs)</td>
<td>862,650</td>
<td>862,650</td>
<td>499,410</td>
<td>363,240</td>
</tr>
<tr>
<td>Artemether/ Lumefantrine 120/20 mg 18's (9-13 yrs)</td>
<td>314,400</td>
<td>314,400</td>
<td>293,070</td>
<td>21,330</td>
</tr>
<tr>
<td>Artemether/Lumefantrine 120/20 mg 24's (14 yrs)</td>
<td>3,283,560</td>
<td>3,283,560</td>
<td>1,748,050</td>
<td>1,533,510</td>
</tr>
<tr>
<td>Artesunate plus Amodiaquine 25/67.5 mg 3's (2-11 mth)</td>
<td>554,500</td>
<td>554,500</td>
<td>272,600</td>
<td>281,900</td>
</tr>
<tr>
<td>Artesunate plus Amodiaquine 50/135 mg 3's (1-5 yrs)</td>
<td>1,503,000</td>
<td>1,503,000</td>
<td>876,675</td>
<td>626,325</td>
</tr>
<tr>
<td>Artesunate plus Amodiaquine 100/270 mg 3's (6-13 yrs)</td>
<td>265,500</td>
<td>265,500</td>
<td>265,500</td>
<td>Nil</td>
</tr>
<tr>
<td>Artesunate plus Amodiaquine 11/270 mg 6's (14+ yrs)</td>
<td>2,182,775</td>
<td>2,182,775</td>
<td>1,115,375</td>
<td>1,067,400</td>
</tr>
<tr>
<td>Injection Artesunate 60 mg vials</td>
<td>1,622,875</td>
<td>1,622,875</td>
<td>671,400</td>
<td>951,475</td>
</tr>
<tr>
<td>Malaria RDTs</td>
<td>14,381,325</td>
<td>7,160,000</td>
<td>7,160,000</td>
<td>Nil</td>
</tr>
<tr>
<td>Sulphadoxine - Pyrimethamine 500/25 mg</td>
<td>3,150,000</td>
<td>501,950</td>
<td>Nil</td>
<td>501,950</td>
</tr>
<tr>
<td>Sulphadoxine-Pyrimethamine 500/25 mg plus Amodiaquine 153 mg</td>
<td>620,000</td>
<td>620,000</td>
<td>620,000</td>
<td>Nil</td>
</tr>
<tr>
<td>LLINs</td>
<td>6,595,767</td>
<td>6,295,767</td>
<td>6,295,767</td>
<td>300,000</td>
</tr>
</tbody>
</table>
The Global Fund and the USAID’s engagement of Imperial Health Services, a private company specialized in the warehousing and distribution of health commodities, did not only increase the hope for health commodity security but also offered an opportunity to initiate a scheduled delivery from central level to the Regional Medical Stores and the four main Teaching Hospitals.

This arrangement ensured that anti-malaria commodities were delivered from the central level to the regional level in a timely and more orderly manner. Though beneficial, this arrangement also had its initial challenges since there was the immediate need to depart from long established practices and norms in the supply chain system that most actors in the sector are used to. The challenges were however partially addressed and the situation is likely to improve in course of time as the major players learn and apply lessons. It is important to mention that the issue of the MOH’s Supply Chain Master Plan which hitherto has not been implemented was resurrected in the midst of the CMS fire crisis. The document is being reviewed and if and when finalized and implemented, it will contribute to solving a lot of problems that have bedeviled the supply chain of health commodities in the country and will potentially and eventually benefit malaria control in the country.

Other challenges that remain to be addressed include the full scale implementation of scheduled delivery from the regional level to the Service Delivery Points, SDPs. Currently some of the regions are implementing some degree of scheduled delivery others are yet to commence, in the coming year and beyond, efforts will be made to support the regions to also deliver the commodities to the SDPs so as to improve on the supply chain of health commodities.

Short falls in the Inventory control systems remain another major challenge that confront the health commodity supply chain. Efforts to address this lapse has not yielded the desired results. Whereas there are different, and almost always stand alone, softwares at different levels being used to manage inventory, there is a large proportion of service providers who use manual and often ineffective and incomplete tools to capture information regarding their inventory management activities. Notable among the shortfalls is the problem of inadequate or non-capture of consumption data on medicine actually used or dispensed to patients with its wider implication on forecasting and quantification. In the year under review the MOH/GHS piloted a logistic management information system in some Regional Medical Stores and some Health Facilities, it is hoped that if proved successful, it can be scaled up and contribute to solving the problem of documentation in respect of logistics management.

2.2 Partnership, Planning and Resource Mobilization
The NMCP with support from the Resource Mobilization Sub-Committee/Working group developed a Financial Sustainability and Resource Mobilization Plan to guide the generation of domestic funds for malaria control in Ghana. This will help to ensure availability of adequate resources to execute planned activities in order to achieve targets set in National Strategic Plan for malaria control 2014-2020
The Plan is purposed to
- Provide an expanded and integrated way of mobilizing resources in support of the national strategic plan for malaria 2014-2020
- Reduce duplication of efforts and aligns resources to achieve the targets of the various stakeholders in malaria control at the country level
- Reduce transaction costs to stakeholders in the fight against malaria
- Enhance alignment with national priorities and agenda.
• Stakeholders discussed and agreed that it will be useful to segment the potential contributions in order to be able to develop specific strategies for the various segments. For this reason the Plan has set the following targets for government, corporate/private sector, donors and civil society.
• Increase government financial allocation to malaria control by 20% year on year up to 2020 on identified funding gap in the national strategic plan for malaria
• Increase private sector contribution to malaria control up to 20% of the national gap for malaria financing
• Wean off donor support for malaria control by 5% annually starting from 2016
• Raise 5% of national funding need for malaria control through civil society

In August 2015 Stakeholders met to validate the Plan and at this meeting it was recommended a private sector-led Malaria Foundation should be encouraged. The Working group took this up and in November outdoor a Malaria Ambassador in the person of Mr. Prince Kofi Amoabeng who in collaboration with the Resource Mobilization Working Group is leading the process for the establishment of the Malaria Foundation.

2.2.1 Private Sector Copayment Mechanism (PSCM)
Ghana included the Private Sector Copayment Mechanism (PSCM) in the Grant application under the New Funding Model and received US$20million for its implementation for the years 2015 and 2016. The NMCP in collaboration with partners decided to use US$10million for each year (2015 and 2016). This was reduced funding compared to 2014 where US$20 million was assigned for just one year. The US$ 10million was able to purchase approximately 13,625,939 treatment doses of the subsidized “Greenleaf” ACTs under the PSCM.

2.3 Case Management

2.3.1 Diagnostics
As part of efforts to achieve the programme goal of reducing malaria morbidity and mortality diagnostic unit carried out following activities in 2015.

Malaria Diagnostic Refresher Training (MDRT) of laboratory Scientists
This activity was carried out from February to May 2015 across the ten Regions of Ghana. A total of 245 laboratory Scientists from 217 health facilities of the various levels were trained. This training led to competency improvement of laboratory scientist over their pre-test scores by a median score of 14% for parasite detection, 41% for parasite species identification and 32% for parasite quantification in parasite per microlitre of blood (parasite/ul). Fifty-eight (58) percent of participants met the target score for competency in malaria microscopy.

Pre-service Training of laboratory scientists in UDS and UCC
A total of 44 lecturers and laboratory technicians were trained in two pre-service institutions (University of Development Studies and University of Cape Coast) on malaria case management with emphasis on microscopy. The training which was aimed at providing knowledge and competency of malaria diagnosis in both technical and management aspects, also covered topics such as quality control of stains, record keeping, microscope maintenance, and quality of reagents and supplies.
RDT Monitoring among Private partners
A total of 102 facilities were followed up on RDT usage among private partners (OTCMS, CPPA, PSG and SPMDP) who received RDTs from the programme in three regions, Greater Accra, Central and Eastern Regions of Ghana. Below shows the summary of the follow-up.

Table 4: Rapid Diagnostic Test follow up among private partners 2015

<table>
<thead>
<tr>
<th>Parameters</th>
<th>OTCMS</th>
<th>CPPA</th>
<th>PSGH</th>
<th>SPMDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>57</td>
<td>5</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td>2. RDT Brand</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Response</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>SD-Bioline</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Carestart</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>3. Unit Price (GHC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost Price</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Selling Price</td>
<td>0 - 5</td>
<td>2 - 5</td>
<td>2 - 8</td>
<td>0 – 10</td>
</tr>
</tbody>
</table>

Documentation among the CPPA, PSGH and SPMDP needed improvement. The OTCMS had a duplicate record book which contained the records documented though not all the RDT test conducted were documented.

**Complete the WHO National Archive of Malaria Slides (NAMS) validation process**
National Malaria Control Programme supported Kintampo Health and Research Centre (KHRC) to characterize and validate all NAMS donors by Polymerase Chain Reaction. The molecular validation of all 38 NAMS donors was completed in March 2015. The Ghana NAMS currently consists of 6,084 well-characterized and high-quality blood films. The archive contains malaria species endemic to Ghana, high and low parasite densities of *P. falciparum*, mixed infections, and negative samples. In project year 4, MalariaCare will support WHO-level validation of the slide bank – the last step in developing a national archive.

Four biomedical scientists who are laboratory staffs participated in the WHO External Competency Assessment in malaria microscopy training in Nairobi, Kenya. Three participants received WHO L2 accreditation, and one received WHO L4 accreditation. All participants obtained a WHO L1-equivalent score on parasite detection; and two obtained a WHO L1-equivalent score on species identification (the other two obtained a L2-equivalent score). The weak competency among Ghana participants was quantification, which mirrors the results of the MDRT held earlier in the year: the average score of all four participants on this indicator was 48.5 percent.

Development of Quality Assurance Manual for malaria Diagnostics (RDT and Microscopy)
The development of the malaria RDT Quality Assurance Manual began in October 2015. This
was modified to include microscopy quality assurance. The modified version known as Malaria Microscopy and RDT Quality Assurance Manual is currently available in a draft manual with about 98% content development is available.

**Laboratory Guidelines and RDT multi-buffer use training for Regional laboratory facilitators**

The National Guidelines for Laboratory Diagnosis of Malaria was finally reviewed and approved and awaiting proof reading and printing. Also the RDT training materials (Slides for presentation and Job aids) was revised to accommodate the temporary shift from single-use buffer RDT kits to multi-use buffer kits. Following this revision, 41 biomedical scientists from the regional level were given update training on RDT use with the new kits. These scientists subsequently facilitated the update training to RDT providers in their regions through case management training

2.3.2 Malaria Case Management

**In-Service Training**

During the year under review, refresher trainings were carried out across the country. Due to updates from WHO and 2014 DHS, slides for the trainings were revised to reflect current trends. As such, the following activities were carried out in a bid to update health workers:

- Two-day facilitators’ workshop in Afienya Alexis Hotel in which national experts were invited to update the slides.
- Two sessions of a Two-day training of trainers of regional representatives; which was carried out concurrently in Koforidua and Kumasi for the whole country. Participants were made up of doctors (or in their absence Physician Assistants), pharmacist, Malaria focal person and iCCM Focal person/CHPS coordinator

Case Management and iCCM Training

Regions carried out orientation at the regional level to update the facilitators on the slides. This was followed by district level trainings which is currently on-going for some regions. During the year under review, Malariacare supported the training of 1,478 health providers and 188 providers from the four teaching hospitals trained on RDT use and triaging in severe malaria.

Below is a table on the number of persons trained:

**Table 5: Number of persons trained on Case Management and iCCM in 2015**

<table>
<thead>
<tr>
<th>REGION</th>
<th>CASE MGT.</th>
<th>ICCM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Health workers</td>
<td>Other Health Workers including CHOs/CHNs</td>
</tr>
<tr>
<td>Quasi Government Institutions</td>
<td>44</td>
<td>0</td>
</tr>
<tr>
<td>Regional Training of Trainers (Northern Sector)</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Regional Training of Trainers (Southern Sector)</td>
<td>49</td>
<td>49</td>
</tr>
</tbody>
</table>

**Table 5**

<table>
<thead>
<tr>
<th>REGION</th>
<th>CASE MGT.</th>
<th>ICCM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Health workers</td>
<td>Other Health Workers including CHOs/CHNs</td>
</tr>
<tr>
<td>Quasi Government Institutions</td>
<td>44</td>
<td>0</td>
</tr>
<tr>
<td>Regional Training of Trainers (Northern Sector)</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Regional Training of Trainers (Southern Sector)</td>
<td>49</td>
<td>49</td>
</tr>
</tbody>
</table>
### Table 5: Number of persons trained on Case Management and iCCM in 2015

<table>
<thead>
<tr>
<th>REGION</th>
<th>CASE MGT.</th>
<th>ICCM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Health workers</td>
<td>Other Health Workers including CHOs/CHNs CBA</td>
</tr>
<tr>
<td></td>
<td>Quasi Government Institutions</td>
<td>Regional Training of Trainers (Northern Sector)</td>
</tr>
<tr>
<td></td>
<td>44</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>49</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>856</td>
<td>0</td>
</tr>
<tr>
<td>VOLTA</td>
<td>1057</td>
<td>440</td>
</tr>
<tr>
<td>WESTERN</td>
<td>488</td>
<td>115</td>
</tr>
<tr>
<td>GREATER ACCRA</td>
<td>0</td>
<td>237</td>
</tr>
<tr>
<td>NORTHERN</td>
<td>240</td>
<td>685</td>
</tr>
<tr>
<td>BRONG AHAFO</td>
<td>-</td>
<td>537</td>
</tr>
<tr>
<td>UPPER WEST</td>
<td>365</td>
<td>365</td>
</tr>
<tr>
<td>UPPER EAST</td>
<td>630</td>
<td>630</td>
</tr>
<tr>
<td>CENTRAL</td>
<td>0</td>
<td>155</td>
</tr>
<tr>
<td>EASTERN</td>
<td>146</td>
<td>238</td>
</tr>
<tr>
<td>ASHANTI</td>
<td>900</td>
<td>270</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>4823</strong></td>
<td><strong>3769</strong></td>
</tr>
</tbody>
</table>

Onsite Training and Supportive Supervision

During the year under review, MalariaCare supported onsite training and supportive supervisory (OTSS) activities in 3,578 health facilities across their allocated five regions and 13,981 staff were supervised. This covered 84 percent of the facilities targeted (MalariaCare aimed to support visits to 80 percent of all facilities in each region).

As at the time of visit, it was revealed that despite fire incidence at the Central Medical Stores in January, RDT availability remained above 90 percent in all regions except for Ashanti, which reported 80 percent availability during the rounds. Availability of rectal artesunate, as a pre-referral antimalarial medicine, however was less than 40 percent in all five regions. Below are some graphs showing the findings from the Clinical OTSS:

**Figure 1: Case Management; Clinical Competence in Malaria Case Management in some regions in Ghana, 2015**

![Figure 1: Case Management; Clinical Competence in Malaria Case Management in some regions in Ghana, 2015](source=MalariaCare 2015)
The graph above indicates that competence with malaria case management was high, ranging 75% from the least score in Ashanti region for the third round to 96% in Upper West.

Figure 2: Case Management: Adhering To Negative Test Results in some region in Ghana 2015

Adherence to test results was also high as shown in the graph above. The rate of adherence to negative test results ranged from as low as 52% in Ashanti region for the fourth round to as high a rate as 93.2% in the third round in Upper East Region.

Continuous Professional Development of Doctors and Physician Assistants

During the year under review, there was a Continuous Professional Development for Doctors and Physician Assistants hosted by MalariaCare and Systems for Health. The topics treated were Malaria Case Management, Malaria in Pregnancy and Diagnostics; the use of Rapid Diagnostic Tests and quantification of parasites. The following were the numbers trained:

Table 6: Number of prescribers trained during the CPD programme in 2015

<table>
<thead>
<tr>
<th>Supporting Organization</th>
<th>Region</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>MalariaCare</td>
<td>Brong Ahafo</td>
<td>113</td>
</tr>
<tr>
<td>MalariaCare</td>
<td>Ashanti</td>
<td>243</td>
</tr>
<tr>
<td>Systems for Health</td>
<td>Northern (including Upper West and Upper East)</td>
<td>161</td>
</tr>
<tr>
<td>Systems for Health</td>
<td>GAR</td>
<td>179</td>
</tr>
<tr>
<td>Systems for Health</td>
<td>Central</td>
<td>81</td>
</tr>
</tbody>
</table>
Table 6: Number of prescribers trained during the CPD programme in 2015

<table>
<thead>
<tr>
<th>Supporting Organization</th>
<th>Region</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>Systems for Health</td>
<td>Western</td>
<td>39</td>
</tr>
<tr>
<td>Systems for Health</td>
<td>Volta</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>856</td>
</tr>
</tbody>
</table>

Training of Quasi Government Institutions
As part of training on Malaria Case Management, Quasi-Government Institutions were trained on Epidemiology of Malaria, Malaria Case Management, Diagnostics, Malaria in Pregnancy, data management and some training on DHIMS. The number of institutions represented was 17 and 44 participants were trained. Since most of the institutions absent were in the Greater Accra Region (GAR), the malaria focal person for GAR was tasked to forge a strong collaboration with them.

Case Management trainings for Tutors in Pre-service Health Institutions:
JHPIEGO and MalariaCare carried out training of tutors for nursing health institutions and Laboratory Personnel at Nursing School and Medical laboratory schools respectively. In 2015, 16 midwifery schools and 2 community health-nursing schools were trained as a follow up to the 28 midwifery schools planned and trained in 2014 by Jhpiego. MalariaCare is in initial consultations with Medical Schools for training of lecturers.

E-Learning
- Computer Based
In 2015, the MOH and Jhpiego identified ten midwifery schools for eLearning module (Intel SkooolHE); an expansion of that which was started in 2014. Below are the schools:
  I. MTC Agogo, Ashanti Region
  II. KNUST Midwifery School, Ashanti Region
  III. MTC DunkwaOffin, Central Region
  IV. MTC Koforidua, Eastern Region
  V. MTC Pantang, Greater Accra
  VI. MTC Korle-bu, Greater Accra
  VII. MTC Nandom, Upper West Region
  VIII. MTC Tumu, Upper West Region
  IX. MTC Kete-Krachi, Volta Region
  X. MTC Asankragwa, Western Region

- Phone Based
In 2015, Jhpeigo in collaboration with NMCP and award-winning Ghanaian game developer, Leti Arts designed a game (termed “gamification”) in malaria case management to be implemented in 16 midwifery and 2 community health nurses schools in all regions of the country. This is expected to be rolled out in phases in 2016 and 2017 until a total of 38 midwifery schools and 12
community health nursing schools are covered
The malaria game is a mobile app and is to supplement classroom learning with both midwifery
and community health nursing students. The game has been called ‘Hello Nurse’

Updating of Curriculum
During the year under review, the Nurses and Midwives Council (NMC) led the process of
updating the curriculum of the Nurses and Midwives training institutions. The curriculum has
since been updated and training is expected to be carried out in 2016. Other training institutions’
curricular are yet to be updated.

Conduct a Meeting with Providers in Quasi Government Health Facilities
During the year under review, a meeting was held to plan for more collaborative activities between
National Malaria Control Programme and Ghana Association of Quasi Health Institutions
(GAQHI).

Pharmacy Register
There is an on-going collaboration between the Chief Pharmacist’s office and the NMCP to
come up with a Pharmacy Register. A couple of proposed designs were presented at the Hospital
 Pharmacists Senior Managers’ Meeting in Tamale. This was followed by a pretest of the selected
draft register in 5 facilities in the Northern Region. In all 34 facilities will pilot the proposed
Pharmacy Register. The pretest will be done in 2016; followed by the possible roll out of the
register.

2.3.3 Malaria in Pregnancy
Roll Back Malaria Annual General Meeting
The 17th Roll Back Malaria Annual General meeting of the Malaria in Pregnancy Working Group
took place in Geneva 8th -10th July, 2015. Issues raised included:
• Restructuring of Roll Back Malaria Working groups to make them more autonomous.
• Ghana is still ranking 2nd after Zambia in IPTp uptake
• IPTp in countries is generally low. There was a call to study barriers to IPTp uptake.

Printing of Malaria in Pregnancy Documents
During the year under review, Guidelines for Malaria in Pregnancy (MiP) were printed by Systems
for Health. A total of 8,500 copies were printed and 500 copies were sent to all 5 regions supported
by the organization. The rest were sent to NMCP and to be allocated to the remaining regions.

Supervisory Visits
During the year under review supervisory visits were carried out in six out of ten regions of the
between the period of April-June 2015. Findings of the supervisory visits included:
• SP was available at all the regional medical stores visited but that could not said about all
the districts and facilities visited. Region had not informed districts of the availability of
stocks and districts also failed to request.
• Poor documentation of SP doses received and dispensed by facilities
• Counting of IPT from the register is difficult and there are a lot of discrepancies between
data entered into the DHIMS and the register count (higher).
• Collating of all data for different services in the same registers has caused difficulties or inconvenience to the frontline health workers who are responsible for documenting records relating to all the services they have delivered at the health facility.
• ANC registers lacked space for IPT 4 and 5 records, forcing health workers to manipulate their record keeping or by securing supplementary books, which leads to data overestimation or underestimation.
• Possible reasons for the low IPTp 3-5 according to the health workers could be attributed to the following:
  1. Long distances to access ANC services, cost of transportation, lack of transportation except on market days, travelling to other places to seek care or to their farm villages
  2. Late reporting due to clients forgetting dates of next clinic visit.
  3. Lack of NHIS cards to access general antenatal care also affect access to free IPTp care

• Most ANCs visited were giving IPTp up to the fifth (5th) dose

Text Messaging
During the year under review a mobile phone was obtained with a telephone number with the idea that health personnel could call or whatsapp their complaints. About 5,000 community health officers, district and regional malaria focal persons had their contacts entered on an SMS-GH bulk text-messaging platform, with the account name NMCP. In the year under review, two text messages were sent for malaria in pregnancy on the need to access the SP. The NMCP therefore responded to complaints mostly relating to supply chain blockage.

Malaria in Pregnancy Working Group
One Malaria in Pregnancy Working Group working group meeting was held out of four expected.

2.3.4 Integrated Community Case Management (iCCM)

Community-Based Agents (CBA) Onsite Training Supportive Supervisory (OTSS)
During the year under review the first Community-based agents (CBA) Onsite training supportive supervisory (OTSS) was carried out in collaboration from MalariaCare, Systems for Health and Jhpiego. A delegation of regional representatives made up of malaria focal persons, CHPS coordinator and a third person (regional preference) were invited as national supervisors. They were tasked to supervise the CBA OTSS in other regions as national representatives. They were tasked to train CBA supervisors (who are community health nurses or officers) at the district level, to visit CBAs at the community level and carry out (OTSS) activities on them. A total of 10,039 CBAs were visited by the supervisors within a period of one to two weeks. Conclusions drawn were as follows:
OTSS Skills of CBAs
 Generally CBAs had good skills in diagnosing fever/malaria as shown in the figure above

Figure 3: Percentage of CBAs who are able to ask for Body fever during their iCCM activities in their communities by Regions in Ghana, 2015

![Percentage of CBAs who are able to ask for Body fever during their iCCM activities in their communities by Regions in Ghana, 2015](image)

<table>
<thead>
<tr>
<th>Region</th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>N/A (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashanti</td>
<td>96.59%</td>
<td>2.49%</td>
<td>0.91%</td>
</tr>
<tr>
<td>Brong Ahafo</td>
<td>95.16%</td>
<td>3.35%</td>
<td>1.49%</td>
</tr>
<tr>
<td>Central</td>
<td>92.86%</td>
<td>6.67%</td>
<td>0.48%</td>
</tr>
<tr>
<td>Eastern</td>
<td>95.72%</td>
<td>2.97%</td>
<td>1.30%</td>
</tr>
<tr>
<td>Northern</td>
<td>88.68%</td>
<td>9.98%</td>
<td>1.33%</td>
</tr>
<tr>
<td>Upper East</td>
<td>91.07%</td>
<td>6.02%</td>
<td>2.91%</td>
</tr>
<tr>
<td>Upper West</td>
<td>93.21%</td>
<td>6.50%</td>
<td>0.28%</td>
</tr>
<tr>
<td>Volta</td>
<td>94.80%</td>
<td>1.73%</td>
<td>3.47%</td>
</tr>
<tr>
<td>Western</td>
<td>96.00%</td>
<td>3.43%</td>
<td>0.57%</td>
</tr>
</tbody>
</table>

However the skills of CBAs trained in RDT use was low as shown in figure above

Figure 4: Percentage of CBAs using RDTs correctly in each region in Ghana, 2015

![Percentage of CBAs using RDTs correctly in each region in Ghana, 2015](image)

<table>
<thead>
<tr>
<th>Region</th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>N/A (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashanti</td>
<td>0%</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Brong Ahafo</td>
<td>0%</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Central</td>
<td>0%</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Eastern</td>
<td>99%</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>Northern</td>
<td>28%</td>
<td>72%</td>
<td>0%</td>
</tr>
<tr>
<td>Upper East</td>
<td>0%</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Upper West</td>
<td>0%</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Volta</td>
<td>100%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Western</td>
<td>0%</td>
<td>100%</td>
<td>0%</td>
</tr>
</tbody>
</table>

However the skills of CBAs trained in RDT use was low as shown in figure above
Figure 5: Percentage of AA Availability for under 1 at CBAs for iCCM in Ghana, 2015

Figure 6: Percentage of AA for 1-5yrs Availability to CBAs for iCCM in Ghana, February 2015
There is a general poor availability of ACTs at CBA level in spite of large stocks sent in 2014. However Ashanti and Volta Regions had a relatively high availability at the CBA level, which may indicate the vibrancy of the intervention in these regions. Paradoxically there were stocks of expired ACTs at the CBA level indicating lack of supervision by supervisors.

Recommendations:
- More supervisors should be made more active in their supervisory role of CBAs
- iCCM should be considered more as part of the CHPS concept and not a stand-alone.

Quantification of iCCM Logistics and Dissemination and Advocacy Meeting
A quantification workshop was carried out in March 2015 to quantify malaria, ARI and diarrhea logistics needed for iCCM. The purpose of the quantification was to use the document as a tool to advocate for resources. A meeting to disseminate the findings and advocate for the logistics was carried out on 30th November 2015.

Printing of revised documents and tools for iCCM is ongoing. So far the “Handbook for Supervisors” has been printed.

iCCM Monitoring and Supportive Supervision
Trainings on iCCM was undertaken in all regions of the country and this was monitored by national facilitators who were pulled from NMCP and other areas of the MOH. The following were observed during the supervision of trainings

Other Issues Identified During Supervision
Adu Suanzo a CBA at TAKINTA displaying both old and new bicycles received for his hard work.

Visit to a CBA who has never been visited by CHO or reported before.
Challenges
- ACTs for iCCM distribution line not considered
- ACTs to be used for iCCM diverted to health facilities
- Non availability of IE & C materials
- Poor data capturing and reporting by CBAs and supervisors
- Attrition of CBAs and supervisors due to lack of motivation
- Lack of funds for quality monitoring and supervision by supervisors of CBAs

Collaboration with Other Agencies Implementing iCCM
During the year under review there were opportunities to meet with other agencies implementing iCCM to help strengthened the activities of the interventions. These were Anglican Diocesan Relief Organization (ADDRO) and Concern Worldwide.

CHO Internship
An internship programme expected to improve the competency of CHOs manning CHPS compounds was organized in the year under review. Using the CHO assessment checklist, the competency of each CHO was monitored over the five-day period as they assessed and diagnosed clients presenting with febrile conditions. A total of 126 interns participated in the programme, which was supported by Systems for Health and MalariaCare.

The interns were given short lectures on acute respiratory tract infections, ear nose and teeth conditions, genitourinary tract infections and malaria; explaining for each condition, its causes, signs and symptoms. The interns were taken through the role of the CHO in CHPS implementation. Post - test clinical assessment shown that the participants did very well compared to the pre-test assessment.

Recommendation/Lessons Learnt
- Collaboration with private/CHAG health facilities
- Experience of Facilitators: It was observed that the Physician Assistants who had more than seven years’ experience were better mentors for the internship than the few younger ones who were brought on board. Nonetheless the CHO competency assessment checklist provided enough guidance for standardization
- Undertake monitoring visits to interns at their facility to observe application of competency skills gained in assessing client with febrile conditions

2.4 Integrated Vector Control
Activities carried out during the year 2015 under Vector Control are:
- Point Mass Distribution of LLINs/Review of point distribution guidelines
- Continuous Distribution of LLINs
- Peers Run Project
- Indoor Residual Spraying (IRS)
- Insecticide Resistance Monitoring
- Malaria Vector Control Oversight Committee Meetings
- Review of Integrated Malaria Vector Management Policy
- Larviciding
2.4.1 Point Mass Distribution of LLINs
The National Malaria Control Programme/Ghana Health Service and partnering organizations (PMI-DELIVER and USAID-Vector Works) organized LLIN Point Mass Distribution campaigns in Brong-Ahafo, Western, Central and Ashanti regions. The point distribution was a replacement campaign to sustain and maintain the coverage's achieved during the previous distribution and hang-up campaigns (2010 – 2012).

In each region, the following activities were undertaken prior to the distribution: informative meeting, movement of nets based on estimated district population figures, regional planning meetings, district orientations, household registration/coupon distribution, and allocation of nets / data compilation, pre-distribution validation, movement of nets based on actual figures from registration exercise, point distribution and post distribution validation.

Table 7: Distribution dates and quantities of nets distributed for Point Mass Distribution Campaign, 2015.

<table>
<thead>
<tr>
<th>REGION</th>
<th>DISTRIBUTION DATE</th>
<th>NO. of LLINs DISTRIBUTED</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brong-Ahafo</td>
<td>3rd – 9th May, 2015</td>
<td>1,438,345</td>
<td>All activities completed</td>
</tr>
<tr>
<td>Western</td>
<td>25th – 31st May, 2015</td>
<td>1,380,497</td>
<td>All activities completed</td>
</tr>
<tr>
<td>Central</td>
<td>23rd – 29th Nov., 2015</td>
<td>1,462,042</td>
<td>Post distribution validation yet to be conducted in 2016</td>
</tr>
<tr>
<td>Ashanti</td>
<td>7th – 13th Dec., 2015</td>
<td>3,002,220</td>
<td>Post distribution validation yet to be conducted in 2016</td>
</tr>
</tbody>
</table>

Point Distribution of LLIN Ghana 2015
A lessons’ learnt meeting was organized to discuss the point distribution campaigns that have happened in the country so far. Thus the point distribution guidelines used during the 2014 distribution was reviewed and printed for the 2015 campaign based on the meeting with stakeholders.

2.4.2 Continuous Distribution of LLINs

As a follow up to mass campaigns, to sustain universal coverage achieved, continuous distribution was instituted. Three main channels were adopted by the country through Netcalc, a computer generated model to distribute LLINs free to various population groups to make sure Universal Coverage reached was maintained and sustained. The channels adopted were the Ante Natal Clinic (ANC) to pregnant women attending ANC for the first time (Registrants), the Child Welfare Clinics (CWC) to children 18 months to 36 months due for measles booster and Primary Schools to pupils in primaries 2 and 6.

A series of trainings were conducted by USAID/Vector works in collaboration with NMCP. A two day workshop organized at Dodowa, Forest Hotel from the 25th -26th of March 2015 to orient and form National Monitoring Teams (NMTs) and to regularly monitor the Health Facility Distribution of LLINs, another training was held for selected district staff from all 13 districts in the Upper East Region from 1st – 5th June 2015. The national teams formed were deployed into the regions to carry out re-orientation of Regional/District Management Teams for monitoring of health facility-based LLIN distribution. Four regions, Upper East, Ashanti, Northern and BrongAhafo regions were covered. In all, a total of 26 staff from the Regional Health Management Team and 589 from the District Health Management Teams were re-orientated to carry out on-the-job training of staff and monitoring of the health facility based continuous distribution in their various district.

Pregnant Woman receiving LLIN at ANC in 2015
2.4.3 Peers Run

Peers RUN is aimed at promoting consistent use of ITNs among community members including primary school children whilst Parent Teacher Association (PTA) Malaria update meetings are also being used as platforms for mobilizing families to promote consistent use and care of ITNs. Guidelines for community and schools levels for the program were developed in April, 2015. The Peers Run program was launched in 32 out of the 35 pilot districts throughout the country and a total of 3,960 PTA meetings were completed. Implementation guidelines were developed and the program was piloted in 35 communities in 7 districts. In all 184 contacts (volunteers and supervisors) were trained. About 18,000 community members including primary schools children from 35 communities received messages on ITN use through the program.

2.4.4 Indoor Residual Spraying (IRS)

IRS was undertaken in fifteen districts in the country. Global Fund and AngloGold Ashanti Malaria Control Limited is carrying out IRS in all the nine districts in Upper West Region and one in the Ashanti Region (Obuasi Municipal, Wa West, Wa Municipal, Wa East, Sissala West, Nadowli, Jirapa, LabussieKarni, Lawra and SissalaEast ) whilst PMI funded ABT Associates carried out IRS in 5 districts of the Northern Region (Bunkpurugu-Yunyoo, East Mamprusi, Mamprugu Moaduri, West Mamprusi and Kumbungu).

Activities carried out include Training and Capacity Building, Facility-based epidemiological monitoring sites and entomological monitoring sites to assess the impact of IRS. Organophosphate insecticide, Pirimiphos Methyl 300 CS (Actellic CS) is used. The impact of the insecticide on IRS workers that is biomonitoring is assessed in all 5 districts. Actellic CS will still be used in 2016 for USAID/ABT Associates sprayed districts since vectors remain susceptible to the insecticide. However, in Obuasi Municipal, vectors have become highly resistance to the currently used insecticide and also other known insecticides for IRS such as pyrethroids. In lieu of this, IRS in Obuasi will be suspended and replaced with larviciding using bio insecticides.

Table 8: IRS Coverage by AGA and Abt in 2015

<table>
<thead>
<tr>
<th>Implementing Partner</th>
<th>No of structures found</th>
<th>No of structures sprayed</th>
<th>Percentage Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGA</td>
<td>842,596</td>
<td>788,516</td>
<td>93.6%</td>
</tr>
<tr>
<td>Abt</td>
<td>224,592</td>
<td>205,935</td>
<td>91.7%</td>
</tr>
</tbody>
</table>
2.4.5  Insecticide Resistance Monitoring (IRM)
IRM was conducted in 20 sentinel sites from the 22nd June to 30th July 2015 for the southern sites and 1st September to 4th October, 2015. Funding for the field work was jointly provided by PMI and Global Fund with each funding 5 sites. SOPs were developed for the field activities and 28 people (staff from NMIMR, GHS and NHR) were trained on SOPs. GHS staff on the field and others were also recruited for larval collections, 4 other people in each sites.

In all, six insecticides, namely, Deltamethrin, PBO+ Deltamethrin, Permethrin, PBO+ Permethrin, Alphacypermethrin, DDT, Bendiocarb, and Malarithhion were tested. Almost all teams were able to complete the minimum of 9 insecticides recommended for testing (80-100% completion rate). We detected pyrethroid resistance in all sites surveyed. 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. Enhancement of susceptibility was observed with the use of PBO synergist for Deltamethrin and Permethrin in most cases. Bendiocarb and Malathion were effective at most sites. Pirimiphos methyl was effective at all sites in Northern Sector, however tests for Pirimiphos methyl were not done in the Southern sector.
Figure 7: Insecticide resistance sentinel sites across the country in Ghana

Northern Site

Southern Site
2.4.6 Malaria Vector Control Oversight Committee (MaVCOC)

MaVCOC a multi-sectoral committee, membership of which comprises, Insecticide Regulatory Bodies (FDB, EPA), Research Institutions (NMIMR, GAEC), other agencies (MOFA, MOH), Partners (PMI, WHO), Vector Control Implementing Bodies (AGA, Abt, VCC, Labiofam) and Commercial Partners (VestergaardFrandsen and recently admitted, Bayer, Zoomlion and Calli Ghana) held its four meetings in February, June, August and December during the year. In the year under review, MaVCOC was achieved the following:
- development of SOPs for larviciding
- development of SOPs for IRM
- coordination of IRM activities
- training/development of database for vector control activities (DDIMs)
- advisory role for all vector control activities

2.4.7 Review of Integrated Malaria Vector Management (IMVM) Policy

As a result of the new developments in vector control, the national IMVM Policy developed and produced in 2008 was reviewed. The reviewed policy seeks to outline the key integrated malaria vector management interventions adopted for use in Ghana to guide and regulate the selection and implementation of appropriate strategies for malaria vector control. The workshop was held at the MJ Grand Hotel at East Legon,
Accra, from the 27th to 31st July 2015. Representatives from the NMCP/GHS, Noguchi Memorial Institute for Medical Research (NMIMR), PMI – AIRS (Abt Associates), AngloGold Malaria Control Ltd, School Health Education Programme of the Ghana Education Service and PMI-Vector Works, WHO, Ghana Atomic Energy Commission, Environmental Protection Agency, Ministry of Local Government and Rural Development, Ministry of Food and Agriculture (MOFA), School of Hygiene, Africa Regional Postgraduate Programme in Insect Science (ARPPIS)-University of Ghana and Aquatic Biology-CSIR and representatives of Vestergaard Frandsen, Bayer, Alliance for Health and the Malaria Focal Persons of the Ghana Health Service, from all the ten regions attended the workshop. The workshop was in the form of presentations, group works and plenary sessions all towards the review of the policy.

2.4.8 Larviciding
The Implementing agency for larviciding in the country, Labiofam under the auspices of the Ministry of Health (MOH) undertook larviciding in three cities; Accra, Kumasi and Sunyani had to curtail their activities.

2.5 Seasonal Malaria Chemoprevention
In the Sahel region, most childhood mortality and morbidity from malaria occur during the rainy season. Giving effective antimalarial medicines at full treatment doses at appropriate intervals during this period has been shown to prevent illness and death from malaria in children (Cairns et al., 2012; Tine et al., 2013).

In Ghana, the northern part of the country is contiguous with the Sahel region and exhibit similar patterns of malaria transmission. The period of highest risk coincides with the rainy season which lasts from June to September and then reduces in intensity.

Seasonal Malaria Chemoprevention is the administration of full treatment courses of Sulphadoxine Pyrimethamine and Amodiaquine (SP+AQ) during the malaria high transmission season to prevent malaria episodes with the objective of maintaining therapeutic concentrations in the blood during this period.

The main objective of the SMC is to implement its intervention targeting an estimated 150,000 children aged 3-59 months in the year 2015 during the rainy season in the Upper West Region of Ghana. Four rounds of SMC were scheduled to take place in the Upper West Region in 2015.

2.5.1 Pre-SMC Campaign Activities
A regional micro plan was developed to guide implementation of the SMC and this was updated at the end of each round. The update of the micro plan took into account logistical needs estimation, sketch maps and movement plans to hard-to-reach areas. A regional training was conducted for the District teams at the beginning of the first round. The trained district teams subsequently held training sessions for sub-district supervisors and coordinators with the support of the trained Regional Team. The sub-district teams with support from district teams trained the volunteers in each sub municipal/districts. Refresher trainings were held for all relevant levels at the beginning of each subsequent round. This was to equip and update coordinators, supervisors and volunteers of new decisions arising from lessons learnt from review of previous round activities and achievements. Multi-staged social mobilization approaches were used to disseminate messages about the campaign.
There were series of community meetings involving elders, opinion leaders and other persons that matters to the success of the campaign. Radio announcements and discussions in the local languages were done at the regional level and the districts levels. Different platforms were used to disseminate information; this included health facility, social, traditional, and religious platforms.

**Logistics management**

A logistics management committee was established headed by the Regional Medical Store’s Manager to take charge of allocation of SMC medicines to various districts. They also trained officers responsible for distribution of the medicines in the respective districts and sub districts on how to document and track issues and receipts at all pre-positioning points as well as the Regional medical stores. The committee reviewed stock balances at the end of each SMC round and re-allocated to the various districts and facilities. T-shirts were printed and distributed to volunteers and supervisors as a form of identification and motivation for the campaign.

### 2.5.2 SMC Implementation Campaign

**Launching of SMC Implementation**

There was a mini launch to mark the administration of SMC medicines in the region. This launch was carried out in Nadowli and chaired by The District Coordinating Director for Nadowli. In attendance were the Deputy Regional minister, Regional Director Health Services, District Chief Executive for Nadowli district, heads of decentralized departments, national and regional supervisors, chiefs and people of Nadowli district, care givers with their children and the general public.

A total of 2,500 volunteers were allocated and distributed base on the number of communities in each district proportionally. Districts however recruited more, trained and deployed the volunteers to their respective community to administer SP+AQ to eligible children from house to house three times within the seven (7 days of the campaign). Supervisors at district and sub district levels visited volunteers on the field to ensure quality of work. The supervision was augmented by teams from the national and regional levels. There were daily review meetings with supervisors to discuss findings on the field and immediately address challenges for the subsequent days.

**Coverage**

A total estimated number of 148,107 children were earmarked for dosing with SMC medicines (2010 National Housing Census). The target was to dose at least 80% eligible children in each round. At the end of the round 1, a total of 111,593 (75.3%). The number of children covered in the second, third and fourth rounds were 76.6%, 79.7% and 79.8% coverage levels respectively. Using the registered population as a denominator, the proportion of eligible children dosed in the 4 rounds were 91.6%, 96.6%, 93.3% and 94.5% respectively exceeding the target of 80%. Coverage for the districts varied greatly throughout the SMC rounds. The lowest coverage was recorded in Lawra district (51.4%) at the end of the first round. This district also recorded the lowest coverage in the subsequent rounds although it improved steadily (figure 8)
Coverage levels using the registered population exceeded 80% in all districts except Jirapa which recorded 56.7% at the end of the 1st round (figure 11).

Figure 9: Coverage of SMC R1 – R4 in Upper West Region based on registered population, 2015
Adverse Drug Reaction
The total number of adverse drug reactions reported for rounds one, two, three and four were 59, 103, 47 and 56 respectively. The highest number was observed during the 2nd round and this was possible due to inadequate training of new volunteers who had replaced a number of old volunteers used in the 1st round. Representatives from Food and Drugs Authority, and Pharmacists monitored the adverse drug events recorded during the campaign.

2.5.3 Post SMC Round Reviews
Review meetings were conducted at the end of each SMC round to enable districts present their achievements and challenges and also for other districts to adopt best practices from other districts.

Lessons Learnt
A number of lessons were learnt during the implementation. These were:

- Participation of community members especially teachers in community sensitization and mobilization helped build confidence between health workers and community
- Creating awareness of the programme and its benefits ahead of the SMC delivery was vital and help avoid negative perceptions
- The role and commitment of the volunteers to the SMC implementation forms a vital component of the campaign success

Challenges
- Some districts have high target population compared to what has been captured on the community register and this affected coverage
- Poor documentations was also observed among volunteers and even health workers
- Some caregivers left for their farms with the children because of the season making it a little difficult for the volunteers to reach them
- Dissolution of the SP tablet was very difficult
- Most official motorbikes were broken down, supervisors had to use personal bikes
- High number of hard to reach due to flooding
- Intermittent rainfall disrupting the work of volunteers

Recommendations
- Volunteers could be supported with raincoats and wellington boots since the exercise will always come during the rainy season to improve effectiveness.
- Need to improve remuneration for volunteers since they play a key role in the exercise
- Registers should be labeled or numbered such that you can easily noticed missing registers
- Current register should be amended to include age of child at first registration.
- Appropriate formulation for children 3-11 months should be procured to avoid breaking of medicines into halves for children which may not give the required dosage.

The effectiveness of the intervention is being studied by Navrongo Health Research institute and findings will be released in 2016
2.6 Advocacy, Communication and Social Mobilization (ACSM)

Strategic use of Behavior Change Communication (BCC) through targeted messages and tailored approaches helped in promoting good malaria behaviors. Strategic Behavior Change Communication (SBCC) which evolved from Information, Education and Communication (IEC) and also known as Social and Behavior Change Communication encompasses health communication, social and community mobilization. However SBCC puts more emphasis on the social context within which health behavior takes place. Therefore SBCC has components ranging from interpersonal communication between a health worker and her client to multi-level mass media campaigns, evidence-based and theory-driven SBCC interventions are an integral part of all types of health promotion and disease prevention.

BCC is used to encourage families to hang and use their nets regularly, care for them and repair them when they are torn, to create demand for replacing nets on a continuous basis or as part of distribution campaigns. Another key role is informing and mobilizing communities to work with IRS spray teams, to follow instructions during and after spraying, and then promote continued use of LLINs following spraying. Adoption of diagnostic testing of fevers by both consumers and providers is a necessary step for improved treatment and surveillance of malaria, and is critical for the success of the Test, Treat and Track (T3) initiative. BCC was also vital for creating demand for testing and to build trust in results, particularly when patients receive malaria-negative results and are unsure of what to do next. As malaria transmission dynamics change, malaria will cease to be the primary cause of fever and there is an urgent need to improve provider skills in communicating with and counselling patients. Communication campaigns that use interpersonal communication are recommended to improve treatment adherence and demand for and recognition of quality drugs in the country. BCC was used to promote ANC attendance and IPTp uptake. Investment in high-quality malaria BCC is good practice, and it is an integral component of malaria control strategies from the start. At the same time, rigorous evaluations are needed to increase the evidence base across country. By supporting the use of BCC and research on its effectiveness, partners can be assured of a much stronger return on their investments in malaria control. BCC also complements the procurement and distribution of malaria commodities, such as long-lasting insecticidal nets (LLINs), rapid diagnostic tests (RDTs), Artemisinin combination therapy (ACT), insecticide for indoor residual spraying (IRS), and drugs for intermittent preventive treatment for pregnant women (IPTp), by ensuring that these commodities are accessed and then used appropriately at the right time, thus protecting investments.

Planned activities carried out included commemoration of world malaria day, quarterly communication sub-committee meetings, produced and aired both television and radio adverts on LLINs, ACTs, Test, Treat and Track: compliance, use and improve provider confidence in the use of RDTs and SP (TV adverts), developed and printed educational materials on SMC. The BCC team supported development and designing of various malaria guidelines, manuals and data capturing tools. The team so developed and aired various jingles on LLIN point distribution campaigns in Brong Ahafo, Western, Central and Ashanti Regions. Sixty one (61) NGOs were trained and supported to conduct BCC activities across various communities. A total of 10,538 radio spots and 538 TV spots were aired across the country in 2015. Below is the list materials printed
Table 9: Materials Printed by the BCC team in 2015

<table>
<thead>
<tr>
<th>NO</th>
<th>NAME OF ITEM</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Guideline for Case Management of Malaria in Ghana</td>
<td>4,000</td>
</tr>
<tr>
<td>2</td>
<td>ICCM Guidelines</td>
<td>1,000</td>
</tr>
<tr>
<td>3</td>
<td>ICCM Supervisors Hand Book</td>
<td>2,000</td>
</tr>
<tr>
<td>4</td>
<td>Monthly OPD Morbidity Returns Form</td>
<td>6,000</td>
</tr>
<tr>
<td>5</td>
<td>Malaria Monitoring and Evaluation Plan 2014-2020</td>
<td>2,000</td>
</tr>
<tr>
<td>6</td>
<td>Monthly Midwives Returns Form A</td>
<td>6,000</td>
</tr>
<tr>
<td>7</td>
<td>CHO Summary Booklet</td>
<td>6,000</td>
</tr>
<tr>
<td>8</td>
<td>Re-Designing and Printing of Community Registers</td>
<td>15,000</td>
</tr>
<tr>
<td>9</td>
<td>ACT Data Tool for Monthly Returns</td>
<td>6,000</td>
</tr>
<tr>
<td>10</td>
<td>Monthly OPD Morbidity Tally Form</td>
<td>6,000</td>
</tr>
<tr>
<td>11</td>
<td>Assorted posters</td>
<td>100,000</td>
</tr>
<tr>
<td>12</td>
<td>Assorted LLINs Monitoring Forms</td>
<td>64,000</td>
</tr>
<tr>
<td>13</td>
<td>SMC Assorted Forms</td>
<td>64,000</td>
</tr>
<tr>
<td>14</td>
<td>SMC Posters/flyers</td>
<td>3,000</td>
</tr>
<tr>
<td>15</td>
<td>Consulting Room Register</td>
<td>10,000</td>
</tr>
<tr>
<td>16</td>
<td>In Patient Morbidity and Mortality Register</td>
<td>10,000</td>
</tr>
<tr>
<td>17</td>
<td>ICCM Monthly Reporting Form</td>
<td>6,000</td>
</tr>
<tr>
<td>18</td>
<td>Tally Cards</td>
<td>6,000</td>
</tr>
<tr>
<td>19</td>
<td>2016 Wall Calenders</td>
<td>5,000</td>
</tr>
<tr>
<td>20</td>
<td>Redesigning and Printing of Referral Form for CBAs</td>
<td>20,000</td>
</tr>
<tr>
<td></td>
<td>Printing LLINs coupons</td>
<td>68,000</td>
</tr>
</tbody>
</table>
World Malaria Day
On 25th April, 2015 World Malaria Day commemoration was held at the Western Plus Atlantic Hotel in Takoradi, Western Region. It was an indoor programme bringing together Health workers, traditional & religious leaders, students, security services and the general public. Activities included Press Briefing, Health Walk, Radio and TV discussion programmes, Exhibition by partners and Free malaria Screening. It offered an opportunity to create awareness, provide updates on the interventions and also seek needed support from the partners for continuous support. The theme for the vent was “Invest in the Future, Defeat Malaria”. This placed emphasis on the need for continued investment of time, ability and financial resources in the fight against malaria.

2.7 Research, Surveillance, Monitoring and Evaluation (RSM&E)
Activities undertaken under RSM&E include DHIMS Data verification, Rapid Impact Assessment, Data Quality Audit, Sentinel Site visits. Other activities were the facilitation of the printing of some reporting forms, report writing and dissemination of the Ghana Demographic and Health Survey (DHS 2014), conducting some other researches and finalization of the M&E plan 2014-2020. The M&E team also supported training of newly recruited Health information officers (HIOs) in the Ghana Health Service (GHS) and the finalization of the GHS M&E plan.

2.7.1 DHIMS Data Verification
To strengthen the Health information system in order to ensure timely availability of quality, consistent and relevant malaria data at all levels, the M&E unit conducted DHIMS data verification in June 2015 in all the 10 regions. The following are summary findings from the data verification.
- Some facilities records management staff lacked understanding of major indicators on the reporting forms. eg. Principal and Provisional diagnosis on the Consulting Room Register.
- Unavailability of standard data collection tools (registers) causing officers to improvise.
- Poor internet connection
- Lack of commitment on the part of some DDHS to actively monitor the data in the DHIMS2.
- Poor data quality since there is little or no functional data validation teams at the facility, sub-district and district.

2.7.2 Rapid Impact Assessment
In collaboration with WHO, the NMCP conducted a Rapid Impact Assessment (RIA) of facility-based inpatient and outpatient malaria data to document reduction in malaria burden at health facilities and compare this to scale-up of malaria interventions. Results from RIA will also be used to demonstrate the use of routine malaria surveillance and logistic data for programme management and evaluation of malarial interventions. Thirty facilities from 30 districts from each ecological zone (Southern coastal zone, Middle tropical zone and Northern savanna zone) was selected. To be eligible for selection, the facility must have an outpatient diagnostic and in-patient capacity as well as laboratory capacity.

The specific objectives of RIA are as follows;
1. Collect and analyze outpatient data for pregnant women, <5 years, 5-9, 10-14years, 15 and above age groups from year 2008 to June 2015 from sample number of health facilities
2. Collect and analyze inpatient data for pregnant women, <5 years, 5-9, 10-14years, 15 and above age groups from 2008 to June 2015 from sample number of health facilities
3. Collect and analyze district level stock outs of antimalarial medicines from 2008 to June 2015
4. Collect and analyze malaria intervention activities from 2008 to June 2015 in the areas where health facilities are sampled and relate to trends on malaria morbidity and mortality.

Also find below number of districts and health facilities selected by region.

| Table 10: Number of health facilities selected for Rapid Impact Assessment 2015 |
|---------------------------------------------|-----------------|-----------------|
| Region                                | Total number of districts in the region | Number of districts to be selected | Number of health facilities to be selected |
|---------------------------------------------|-----------------|-----------------|
| Southern coastal zone                      |                 |                 |
| Greater Accra                             | 10              | 5               | 5               |
| Central Region                            | 17              | 8               | 8               |
| Volta Region                              | 18              | 9               | 9               |
| Western Region                            | 17              | 8               | 8               |
|                                             | 62              | 30              | 30              |
| Middle tropical zone                      |                 |                 |
| Eastern region:                           |                 |                 |
|                                             | 21              | 9               | 9               |
| Ashanti region:                           | 27              | 12              | 12              |
| Brong Ahafo                                | 22              | 9               | 9               |
|                                             | 70              | 30              | 30              |
| Northern savanna zone                     |                 |                 |
| Upper East region                         | 9               | 7               | 7               |
| Upper West region                         | 9               | 7               | 7               |
| Northern region                           | 20              | 16              | 16              |
|                                             | 38              | 30              | 30              |

Data was collected between September and October 2015. Data analysis and reporting was will completed by end of first quarter 2016.

2.7.3 Data Quality Audit
In the last quarter of the year, NMCP in collaboration with Policy planning Monitoring and Evaluation Department (PPMED) conducted data quality audit in selected health facilities nationwide. The purpose of this Data Quality Audit (DQA) was to verify the accuracy of reported data and to assess the quality of the data recorded in source document and reporting system, in relation to the current Global Fund grant. The following are summary of preliminary findings from the audit.

- Absence of some officers made retrieval of reports and registers difficult.
- Improper filling of source documents. E.g. Consulting Room Register.
- Some reports on selected indicators were not available.
- Provisional diagnoses and test results not indicated in the consulting room register.
- Variations between numbers in registers, reported forms and DHIMS
- Some questions in the questionnaire were not applicable to the various levels.
- Inadequate monitoring and supervision at the lower levels.
Exercise books used as folders in some facilities.
Data entry errors
Tally of data not done daily
Unavailability of Consulting Room Registers in some facilities.
Inadequate understanding of key malaria indicators by most of the districts officers
Electronic System which does not conform to GHS forms and registers.
Budget for M&E activities not specified
No training plan for staff on data management
Inadequate structure and staffing

2.7.4 Sentinel Site Monitoring and Supportive Supervision
Malaria diagnosis has largely been presumptive over the years leading to poor data on prevalence of the disease in the country. This with associated limitations with malaria prevalence estimates from District Health Information Management System (DHIMS) which includes incomplete data, inaccurate data and low private sector reporting makes it difficult to use DHIMS alone for programme decisions.
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.

Planned Activities
To ensure that the sites are adhering 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. Pre and post monitoring meetings were held with NMIMR to plan and assess the exercise carried out by the team.

Approach
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. It 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, whiles supplying sites with requested/needed logistics.

Activities Carried Out
From 8th to 21st February 2015 monitoring and supportive supervisions were carried out and the conclusions were that treating only confirmed cases is not being adhered to by some sites. Poor record keeping was a challenge to the system and finally regular stock out of RDT by some facilities impeded the progress of some sites. Recommendations were made appropriately to the needed levels. These recommendations were shared to the teams at the zonal level stakeholder’s workshops which were carried out in May.
Table 11: Details of sentinel site zonal level review meeting 2015.

<table>
<thead>
<tr>
<th>Date</th>
<th>Zone</th>
<th>Region</th>
<th>Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>May, 2015</td>
<td>Northern</td>
<td>Northern</td>
<td>Radach Hotel, Tamale</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Upper East</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Upper West</td>
<td></td>
</tr>
<tr>
<td>May, 2015</td>
<td>Middle</td>
<td>Ashanti</td>
<td>Silicon Hotel, Kumasi</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Western</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Brong-Ahafo</td>
<td></td>
</tr>
<tr>
<td>May, 2015</td>
<td>Southern</td>
<td>Greater Accra</td>
<td>Dodowa Forest Hotel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eastern</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Volta</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Central</td>
<td></td>
</tr>
</tbody>
</table>

Staff trained included Prescribers, Laboratory staff and malaria focal persons from the sentinel site. Summary of finding from subsequent monitoring exercise revealed that some sites were not performing as expected partly due to staff rotation, transfers et cetera whereas others were doing well. The non-performing sites were identified for onsite training.

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

2.7.5 Integrated Community Case Management Data Review

Integrated Community Case Management (iCCM) is a strategy implemented by the National Malaria Control Program (NMCP) to extend malaria case management of childhood illness beyond health facilities so that more children have access to lifesaving treatments. The iCCM package can differ based on particular contexts, but most commonly include Malaria, diarrhea, and ARI. In the iCCM model, community health workers are identified and trained in diagnosis and treatment of key childhood illnesses, and also in identifying children in need of immediate referral.

The main objective of the iCCM data verification and monitoring activity was to ascertain the
status of iCCM reporting and implementation challenges in the various districts that affecting coverage low reporting nationwide. The specific objectives were to:

1. Visit the health facilities earmarked to verify and monitor the iCCM reporting on to the DHIMS2 platform
2. Document the challenges affecting implementation of iCCM leading to non achievement of target
3. Discuss recommendation and way forward to improve iCCM performance

Key findings with respect to the iCCM data verification and monitoring activities leading to inadequate iCCM data reporting on the DHIMS 2 platform are summarized as follows:

- Late submission of iCCM reports by the volunteers and the various health facilities in most of the districts. DHIMS was closed as at the time most of the districts received the reports for entries.
- Poor Supervision of the iCCM data entry on to the DHIMS by DHMTs particularl in districts where data entry into DHIMS is done at sub district level. Poor supervision of the iCCM activities in the various communities and sub districts
- Inconsistency of the iCCM data entered into DHIMS and the hard copy data on file.
- Some facilities in selected districts implementing iCCM activities are not assigned with the iCCM reporting forms on the DHIMS 2 platform.
- Supply chain challenges between region and districts leading to shortage of drugs for iCCM activities in some of the districts
- There are no means of transportation in some of the districts affecting proper monitoring and supervision of the iCCM activities.
- Most of the volunteers in the various districts were not committed to the CBA activities due to lack of or inadequate incentives

Other Activities carried out by the M&E unit were printing and distributing data capturing tools to all health facilities. The reporting tools and registers distributed include; Monthly OPD Morbidity Return, Monthly Returns for Anti-Malaria, Admission and Discharge register and Ward Register.

2.7.6 Research activities conducted and participated in 2015
Research activities conducted and participated in the year under review included:

- Maiden research working group meeting
- Conducted research into the economic burden of malaria in Ghana
- Participation in the Demographic and Health Survey (DHS 2014)
- Conducted research into factors contributing to high malaria mortality in the northern region

Conducting relevant and timely research for appropriate intervention is one of the strategies adopted by the programme to achieving its general objective of reducing malaria morbidity and mortality by 75% (using 2012 as baseline) by the year 2020. A committee to identify, harmonize, monitor and coordinate researches relating to malaria is therefore needed to achieve this purpose.
The first research working group meeting was held on 26th Nov. 2015 at the National malaria control conference. The following institutions forms the group:

- Research division, Ghana Health Service
- Navrongo Research Institute
- Kintampo Research Institute
- Dodowa Research Institute
- Noguchi Memorial Institute of Medical Research, University of Ghana Legon
- World Health Organization
- Kumasi Centre for Collaborative Research, Kumasi
- Research unit, Korle-Bu Teaching Hospital
- School of Public Health, University of Ghana Legon
- National Malaria Control Programme, Ghana

This meeting was co-chaired by Dr. Abraham Hodgson & Prof. Kwadwo Koram

Assess the economic burden of malaria in Ghana

Malaria is known to affect businesses in many ways—reduced productivity due to increased worker absenteeism, increased health care spending (Dillon, Friedman, & Serneels, 2010). In sub-Saharan Africa, 72% of businesses reported a negative malaria impact, with 39% perceiving these impacts to be serious. In Ghana, in 2004, AngloGold Ashanti incurred up to $55,000 per month on treatment of malaria in its employees and their dependents. Further, 30% of business leaders who responded to a survey in Ghana reported that malaria had a strong impact on productivity (MOH, 2008). With the above statistics notwithstanding, the estimates of the economic burden of malaria on businesses is limited in sub-Saharan Africa and Ghana in particular.

The purpose of this study, therefore, is to estimate the economic burden of malaria on businesses in Ghana. Such clear estimates are essential as advocacy tools to stimulate private sector involvement in malaria control in the country, particularly as donor funds are reducing given the country’s current status as a lower-middle income country.

The study was conducted in three regions; Ashanti, Greater Accra and Western. Available business statistics indicated that these regions have the largest number of businesses with variation in types and sizes of businesses in the country. There were 909 businesses registered with AGI and GEA as at the time of data collection.

The results showed that the total cost of malaria to businesses in Ghana in 2014 was GHS3.2 million, 92% of which were direct costs. Further, a total of 3,913 workdays were lost due to malaria in firms in the study sample during the period 2012-2014, with an annual average of 1,304. The study further estimated that businesses in the study sample spent an average of 0.5% of the annual corporate returns on treatment of malaria in employees and their dependents, 0.3% on malaria prevention, and 0.5% on other health-related corporate social responsibilities. In addition, business leaders concurred that malaria affected their businesses efficiency (43%), employee attendance and productivity (38%) and expenses (46%). Finally, 98% of business leaders expressed the need for increased government investments in malaria control and 93% of them agreed that it is worthwhile for their businesses to invest in malaria control.

Ghana Demographic and Health Survey (DHS 2014)

Research continues to be an integral part of malaria control activities in Ghana. NMCP
participated actively in activities of Demographic and Health Survey (DHS 2014) undertaken by Ghana Statistical Service including dissemination of findings. In addition to data collected in previous DHS research, data on malaria parasite prevalence, based on rapid diagnostic testing (RDTs) and microscopy, are incorporated as part of the new components in the DHS 2014. These data provide a unique nationwide snapshot of peak-season malaria point-prevalence in children aged 6-59 months. The NMCP sponsored the Malaria component of the survey, partook in the review of questionnaire, training of field workers (interviewers and biomarkers) and undertook monitoring of field data collection activities nation-wide.

**Key Findings:**
In Ghana, 68 percent of households own an insecticide-treated net. A higher percentage of households in rural than in urban areas own an insecticide-treated net (78 percent versus 60 percent). Eighty-three percent of women with a live birth in the two years preceding the survey took at least one dose of SP/Fansidar during an antenatal care visit; 68 percent took two or more doses and 39 percent took three or more doses, at least one of which was received during a visit. Eight percent of children age 6-59 months had a low haemoglobin level (less than 8.0 g/dl), indicating possible malarial infection. The prevalence of malaria in children age 6-59 months is 36 percent as measured by RDT and 27 percent for microscopy.

**Factors contributing to high malaria mortality in the northern region**
This was done after a validation of the northern region malaria in-patient data which still revealed that quite a number of facilities recorded high case fatality with respect to malaria. Thirteen facilities were selected for having more than 1.0 case fatality rate after the validation. Ten cases (malaria mortality) were selected from each facility with twenty controls (2:1). When a case is selected, all patients who were eligible to be controls (patient admitted within 24 hours before or after the case was selected) were listed and numbered and two patient folders were selected at random from a covered box at a ratio of two controls to one case.

The results revealed that unconfirmed patient were being treated for malaria. Risk factors such as children under-five years, duration of stay less than 24 hours, severe pallor, and sepsis as additional diagnosis were significantly associated with malaria mortality. However, it was found that the risk factors; sex, and type of prescriber who mostly saw the patient were not significantly associated with malaria mortality and the use of oral Artesunate Amodiaquine and Artemether/ Lumefantherine was protective against malaria mortality. Findings have been disseminated to the regional health directorate and action plans to mitigate the high malaria mortality will be implemented in collaboration with the regional health directorate in 2016.

2.8 **Administration and finance**
The administrative department coordinated and supported the various subcommittee meetings as well as the MICC meeting and conducted the general administrative duties in the office. The finance department generated reports on the Great Plains (financial statements, PUDR, new GF reporting etc), worked on the dashboard for the CCM, undertook the budget tracking and monitoring as well as signed off and approved all payment vouchers for the period. The team under the period of review also worked on the budgets for the various departments for activities to be undertaken. Various financial reports such as the semester PUDR and financial reports for relevant institutions were also prepared.
CHAPTER THREE

3.0 Progress, Achievements and Challenges

The number of health facilities reporting in the DHIMs increased in 2015, from 6,869 in 2014 to 7,060. Similar to what pertained in 2013 and 2014, the increase in the number of facilities such as CHPS compounds, as well as private service providers submitting reports on their services led to an increase in the volume of information. With about 73.6% proportion of OPD cases tested in 2015 and 73.5% in 2014, the number confirmed as malaria were 4,315,156 and 3,223,540 respectively.

In the four years preceding the reporting period, the number of OPD malaria cases increased consistently from 2010 to 2013. However, 2014 saw a sharp drop from about 11 million cases in 2013 to 8.4 million cases (Fig.10) and in 2015, it increases to 10.1 million cases with the proportion of OPD cases attributable to malaria dropping from 43.7% in 2013 to 30.9% in 2014 and increasing to 38.1% in 2015 (Fig. 14). It is important to note that, clinical or presumptive diagnosis and treatment still persist even though the current policy is to test all suspected malaria cases before treatment. This practice by service providers and increase in the number of facilities reporting may account for the increase in the number of malaria cases reported in this year. There is a general decline however in institutional deaths due to malaria. This could be attributable to improved management in malaria cases.

3.1 Malaria Case Burden

3.1.1 Outpatient Malaria Cases

As reported above, in 2015, the country recorded about 10.1 million cases of OPD malaria representing about 20.2% increase. This translates into approximately 27,671 cases seen per day in 2015 in all health facilities, compared to an average of approximately 23,299 of such cases seen each day in the country’s health facilities in 2014. Figure 11 below shows the trend of OPD malaria cases per 1000 population over the years. As seen from the graph, there is general increase since 2010. The reason for this trend may be attributed to the increase in number of reporting facilities as more cases are being reported compared to the previous years.

Figure 10 : Out Patient Malaria Suspected Malaria Cases in Ghana, 2010-2015

![Graph showing trend of OPD malaria cases per 1000 population over the years.](source: DHIMs)
In 2015, Upper West region recorded the least number of OPD malaria cases, 420,454 followed by Greater Accra and Upper East region. 798,601 (Fig. 12). Brong Ahafo maintained its position as a region reporting the highest malaria cases in 2014 and 2015. However, in terms of burden of malaria cases per 1000 population is shown in the ranked order in figure 12. Though upper west recorded the least number of cases, it ranks first in malaria burden as cases per 1000 population is 719. Greater Accra recorded lowest 157 cases per 1000 population. Five regions Upper West, Brong Ahafo, Upper West, Western Region and Eastern Region recorded malaria burden above the national average 363 per 1000 population.
One way of showing whether cases are increasing or decreasing is comparing malaria OPD cases with the total OPD cases. The trend of the proportion of total OPD cases attributable to malaria is shown in figure 14.

The proportion over the years ranged from 31% to 44%. In 2014, the proportion was 30.9% whiles in 2015, it is 38.1%. Greater Accra recorded the least proportion of 31.8%, implying that close to 32% of all OPD cases recorded in health facilities in the Greater Accra Region in 2015 were as a result of malaria. However, again as in 2014, in 2015 Upper West region recorded 48.9%.

Figure 14: Proportion of OPD Cases Attributable To Malaria from 2006 to 2015
Since 2012, the proportion of OPD malaria cases which were tested by microscopy or RDT has been increasing. From a low figure 38.9% in 2012. This has risen to 73.6% in 2015. This performance represents 98.2% of the target set by the program in 2015 (Figure 16).

Figure 16: Proportion of OPD Malaria Cases Tested, 2010-2015

However, not all the suspected cases in all facilities were tested in the year under review, even though the focus of the country programme has been the pursuance of the Test, Treat and Track policy. However the proportion of malaria cases parasitically tested in 2015 by the
regions varied. Six out of the ten regions achieved above the target set in 2015 with the highest testing rate recorded in Upper East which is approximately 89%. On the whole, all the regions are making effort to increase their testing rate. Northern region continue to record the lowest testing rate for the past five years. In 2015, they recorded 47.9%, from 37.7% in 2013.

Figure 17: Proportion of OPD Malaria Cases Tested by Regions, 2011-2015.

Service providers continue to accept the need to test before treatment. In 2014, the malaria test positivity rate for both RDTs and microscopy nationally were 61.8% and 48.8% respectively and collectively, it was 55.5% in 2014 which was lower than 66% in 2013. The Greater Accra region continues to have the lowest test positivity rate of 24.3% (Fig. 17).

Meanwhile, results from 2014 Ghana Demographic and Health Survey (GDHS) indicates a national parasite prevalence rate of 36.4% and 26.7% for RDT and microscopy respectively. Figure 18 shows malaria prevalence among children age 6-59 months by regions from the DHS 2014. Malaria parasite prevalence also declined marginally from 27.5% in 2011 to 26.7% in 2014.

Figure 18: Test Positivity Rates for RDT and Microscopy in Demographic and Health Survey, 2014
Test Positivity Rates for Malaria parasite using RDT and Microscopy in 2014 DHS conducted by GSS.

**Figure 19: Test Positivity Rates for RDT and Microscopy in 2014**

The use of ACTs to treat uncomplicated malaria cases was adopted in 2004. Since then it has been of interest to track its use in both public and private health sectors. The proportion of OPD malaria cases treated with an ACTs has been increasing.

**Figure 20: Proportion of OPD Malaria Cases Put on ACTs, 2011-2015**

There had been consistent increase in the proportion of OPD malaria cases put on ACTs from 39.6% in 2011 to 86.3% in 2013; in 2014, there was a drop from 82.3% to 57.4% in 2015. This reduction in the use of ACTs is due to increase in the parasitical diagnosis of suspected malaria cases thus reduction in the over use of ACTs.
Figure 21: Proportion of OPD Malaria Cases Put on ACTs by Regions in 2013 to 2015

The Volta region treated the largest proportion (78.7%) of all suspected malaria cases with ACTs, followed by the Brong Ahafo region (70.1%) while the greater Accra region was the least (37.5%) in 2015.

3.1.3 Malaria Admissions
Admissions for malaria decreased from 451,000 in 2013 to 429,940 in 2014 and further decreased to 409,446 in 2015. Among children under five years, 204,164 were admitted due to malaria in Ghana in 2015. Of that number, 53,638 (representing 26.3% of the total number of cases nationwide) occurred in the Northern region, followed by 43,281 (21.2%) in the Ashanti region. The lowest number of 4,927 (2.4%) occurred in the Upper west Region region.

On regional distribution of admissions due to malaria in 2015, Northern region had the highest number of admissions (94,969) followed by Ashanti region with 90,797 admissions. The Upper West regions recorded the lowest numbers of malaria admissions (11,446), as shown in (Fig. 23).

Figure 22: In-patients Malaria Cases in 2014 by Regions
3.1.4 Malaria-Related Deaths

The total number of deaths attributable to malaria in 2015 was 2,133 representing a reduction of about 3.0% to the 2014 figures. Out of these malaria deaths, 1,033 occurred among children-under-5-years in 2015 compared to 1,060 in 2014 (Table 13).

The trend of in-patient malaria deaths from year 2000 to 2015 is presented in Table 13. A section of it in Figure 25 showing a decreasing number of malaria deaths over the period, despite the fact that total deaths on admission has been on the increase from 2011. It is also observed that in the nine years preceding the year under review, malaria related deaths in children-under-five years were less than that in persons five-years-and-above.

Table 12: In-patients Malaria Deaths, 2000-2015

<table>
<thead>
<tr>
<th>Years</th>
<th>In-patient malaria Death</th>
<th>&lt; 5 years malaria Deaths</th>
<th>5 years and Above malaria Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>6,054</td>
<td>3,952</td>
<td>2,102</td>
</tr>
<tr>
<td>2001</td>
<td>4,158</td>
<td>2,717</td>
<td>1,441</td>
</tr>
<tr>
<td>2002</td>
<td>4,274</td>
<td>2,914</td>
<td>1,360</td>
</tr>
<tr>
<td>2003</td>
<td>3,571</td>
<td>2,195</td>
<td>1,376</td>
</tr>
<tr>
<td>2004</td>
<td>2,734</td>
<td>1,380</td>
<td>1,354</td>
</tr>
<tr>
<td>2005</td>
<td>5,948</td>
<td>2,026</td>
<td>3,922</td>
</tr>
<tr>
<td>2006</td>
<td>4,434</td>
<td>973</td>
<td>3,461</td>
</tr>
<tr>
<td>2007</td>
<td>4,579</td>
<td>1,241</td>
<td>3,338</td>
</tr>
<tr>
<td>2008</td>
<td>3,760</td>
<td>1,697</td>
<td>2,063</td>
</tr>
<tr>
<td>2009</td>
<td>3,352</td>
<td>1,505</td>
<td>1,847</td>
</tr>
<tr>
<td>2010</td>
<td>3,882</td>
<td>1,812</td>
<td>2,070</td>
</tr>
<tr>
<td>2011</td>
<td>3,197</td>
<td>1,539</td>
<td>1,658</td>
</tr>
<tr>
<td>2012</td>
<td>2,799</td>
<td>1,129</td>
<td>1,670</td>
</tr>
<tr>
<td>2013</td>
<td>2,985</td>
<td>1,348</td>
<td>1,637</td>
</tr>
<tr>
<td>2014</td>
<td>2,200</td>
<td>1,060</td>
<td>1,140</td>
</tr>
<tr>
<td>2015</td>
<td>2,133</td>
<td>1,033</td>
<td>1,100</td>
</tr>
</tbody>
</table>
It is also worth noting that the country has been recording a systematic reduction in the proportion of death due to malaria, as recorded at the In-Patient Departments of facilities in the country.

Figure 24: Proportionate In-patient Malaria Deaths, 2010-2015

At the regional level, the Northern region recorded the highest number of deaths due to malaria (710) followed by the Ashanti region (248) while the Eastern region recorded the lowest number of deaths due to malaria (73) in 2014 (Fig. 26).

Figure 25: Inpatient Malaria Deaths by Region, 2014-2015

There was a reduction in the Case Fatality Rate recorded from approximately 0.6 in 2013 to 0.51 in 2015 (Figure 26). In 2015, Northern region recorded the highest case fatality (0.82) followed by the Upper West region (0.44) and the Upper East region (0.72).
3.1.5 Malaria Prevalence using surveys

Comparing the regional map on Multiple indicator Cluster Survey (MICS 2011) and the Ghana Demographic and Health Survey on malaria prevalence which has similar methodology some regions have improved whiles others are have not. Figure 27 shows the variations per region.

Figure 27: Malaria prevalence among children 6 – 59 months by region comparing MICS 2011 and GDHS 2014, Ghana
3.2 Malaria in Pregnancy
Among pregnant women, malaria cases recorded at OPD in 2015 was 327,145 as compared to 197,017 in 2014. The 2015 figure represents an increase of 39.8% over the 2015 recorded number of malaria cases among pregnant women. The top three regions with the highest number of malaria in pregnancy cases in 2015 were the Western region (58,644 cases), followed closely by the Central Region (42,902 cases) and Ashanti region (41,252 cases) the region with the least number of malaria in pregnancy cases is the Upper West Region (12,895 cases).

Figure 28: Malaria in Pregnancy by Region, 2015

3.2.1 Intermittent Preventive Treatment in Pregnancy (IPTp)
The use of Sulphadoxine Pyrimethamine for preventing malaria during pregnancy is one of the interventions being pursued by the country under Intermittent Preventive Treatment of malaria in pregnancy (IPTp). In 2015 a total of 944,649 pregnant women were registered, out of which 651,949 (69%) received IPTp1 compared to 54.1% who received IPTp1 in 2014. For IPTp2 the figure was 548,109 (58%) in 2015 compared to 372,331 (38.7%) in 2014 and for IPTp3, 390339 (41.3%) was recorded in 2015 compared to 236,392 (24.6%) in 2014. The general uptake of IPTp plummeted further in the year under review. In 2015, 148,668 pregnant women (15.7%) took up IPTp4 and 54,534 (5.8%) took up IPTp5. The trend over the years is as shown in Figure 28.

Figure 29: Proportion of Pregnant Women who took up IPTp from 2011-2015
Contrary to the reduction in IPTp from health facility reports over the past few years, result from population surveys conducted between 2011 and 2014 indicates increase from 64.4% (MICS 2011) and 67.5% (2014 GDHS) as shown in figure 29.

Figure 30: IPTp Uptake in 2015 by Pregnant Women

Regarding the regional distribution of IPTp uptake in 2015, the Upper East region was the region with the highest proportion of pregnant women taking up IPTp1, IPTp2, IPTp3, IPTp4 and IPTp5 and that happens to have been above the national figures, as can be seen in Figure 29. The Upper West region recorded the lowest figures in IPTp uptake in 2015 (Fig. 29). Generally the country was able to halt the rate of increase of malaria cases and its complications as service to patients and other control interventions increases.
4.0 Conclusion and Way Forward

Most of the targets for the year under review were achieved and this is summarized in the table below. This table summarizes objectives, key indicators and achievement in 2015.

Table 13: Summary of objectives and key results for 2015

<table>
<thead>
<tr>
<th>Goal/Objectives</th>
<th>Indicator Description</th>
<th>Baseline Value (%)</th>
<th>Intended Target Year</th>
<th>Attained Result Year</th>
<th>% Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective 1: To protect at least 80% of the population with effective malaria prevention interventions by 2020</strong></td>
<td>Parasitemia prevalence: children aged 6–59 months with malaria infection (by microscopy) (percentage)</td>
<td>27.5% 2011</td>
<td>24.5%</td>
<td>26.7%</td>
<td>91.0</td>
</tr>
<tr>
<td></td>
<td>Under five Case fatality rate</td>
<td>0.6% 2012</td>
<td>0.53</td>
<td>0.51</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td>Confirmed malaria cases (microscopy and RDT) per 1000 population per year</td>
<td>186 2013</td>
<td>146</td>
<td>153</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>Inpatient malaria deaths per 100,000 persons per year</td>
<td>9 2013</td>
<td>7</td>
<td>7.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percentage of pregnant women on Intermittent preventive treatment at least three doses of SP</td>
<td>41.4% 2012</td>
<td>55%</td>
<td>41.3%</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Percentage of Households with at least one insecticide treated nets (LLINs).</td>
<td>33.7% 2011</td>
<td>66.0%</td>
<td>68.3%</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td>Percentage of children under 5 years old who slept under an insecticide-treated net the previous night</td>
<td>39.0% 2011</td>
<td>53.0%</td>
<td>58.8%</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>Percentage of pregnant women who slept under an insecticide-treated net the previous night</td>
<td>32.6% 2011</td>
<td>48.0%</td>
<td>54.6%</td>
<td>114</td>
</tr>
<tr>
<td></td>
<td>Proportion of households in targeted areas that received Indoor Residual Spraying during the reporting period</td>
<td>90% (443,637/492,630) 2013</td>
<td>90% (141960/157734)</td>
<td>86% (122,622/141960)</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>Proportion of population protected by Indoor Residual Spraying within the last 12 months</td>
<td>90.23% 2013</td>
<td>90% (871071/967857)</td>
<td>80% (765633/967857)</td>
<td>88.9</td>
</tr>
<tr>
<td><strong>Objective 2: To provide parasitological diagnosis to all suspected malaria cases and provide prompt and effective treatment to 100% of confirmed malaria cases by 2020</strong></td>
<td>Percentage of reported suspected malaria cases that received a parasitological test (RDTs or microscopy)</td>
<td>37.9% 2012</td>
<td>75.0%</td>
<td>73.6%</td>
<td>98.2</td>
</tr>
<tr>
<td></td>
<td>Percentage of reported uncomplicated malaria cases (both suspected and confirmed) treated with ACT at health facilities.</td>
<td>83% 2012</td>
<td>80.0%</td>
<td>57.4%</td>
<td>139.4</td>
</tr>
<tr>
<td></td>
<td>Number and percentage of uncomplicated malaria cases (tested positive) treated with ACT at health facilities.</td>
<td>100% 2012</td>
<td>100% (4,315,156)</td>
<td>100% (4,315,156)</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>Number of uncomplicated malaria cases among under 5 year children treated with ACT by community based health workers (CBA).</td>
<td>747,615 2012</td>
<td>264,817</td>
<td>153,663</td>
<td>58</td>
</tr>
</tbody>
</table>
## Table 13: Summary of objectives and key results for 2015

<table>
<thead>
<tr>
<th>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</th>
<th>Number of service providers from targeted public and private health facilities given refresher training on malaria control (case management etc.)</th>
<th>23,250</th>
<th>2011</th>
<th>24,000</th>
<th>17,733</th>
<th>73.9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of meetings held by MICC and its subcommittee/working</td>
<td>21</td>
<td>2012</td>
<td>21</td>
<td>19</td>
<td>90.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Objective 4: To strengthen the systems for surveillance and M&amp;E in order to ensure timely availability of quality, consistent and relevant malaria data at all levels by 2020</th>
<th>Number of Districts with functional M&amp;E unit with data quality improvement teams.</th>
<th>10</th>
<th>2012</th>
<th>100</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percentage (%) of health facilities submitting timely and complete reports (on malaria) to regional level</td>
<td>13.2%</td>
<td>2012</td>
<td>83.6%</td>
<td>83.9%</td>
</tr>
<tr>
<td></td>
<td>Promotion of research that informs the programmer in terms of policy and operational issues</td>
<td>2</td>
<td>2012</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Number of sentinel sites established and functioning for epidemiological and insecticide monitoring</td>
<td>21</td>
<td>2011</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>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</th>
<th>Quantities of ACSM materials (Manuals, posters, radio/TV spots, etc.) produced</th>
<th>12,000</th>
<th>2012</th>
<th>14,000</th>
<th>11,076</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percentage of people who know the cause of, symptoms of, treatment for or preventive measures Number of mass media spots promoting key messages on malaria case management</td>
<td>96%</td>
<td>2011</td>
<td>96.70%</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6,533</td>
<td>2011</td>
<td>35,000</td>
<td>29,076</td>
</tr>
</tbody>
</table>

### 4.1 The Way Forward

The following activities will be carried out in 2016 to help the programme achieve its objective: National Policy and Regulatory Preparedness

- Conduct cohort event monitoring studies to assess safety of Antimalarial (ACTs, Quinine, etc.)

**Partnership, Planning and Resource Mobilization**

- Finalization of Resource Mobilization (RM) Plan with RM Sub Committee and other stakeholders
- Lobby the Presidency to get the President to make a firm commitment to assign domestic funds to malaria control activities
- Meet with Parliamentary Select Committee on Health and Finance on the need to get Cabinet and the Presidency to act on getting domestic financing for malaria activities and also for Parliamentarians to advocate at various fora/avenues to get funding to support malaria control activities in their constituencies
- Set up a Malaria Fund with the support of professional Fundraisers and Event Organizers to support NMCP and its partners
• Conduct fund raising event
• Accessing data from private sector for advocacy

**Case Management**
• Conduct Case management trainings health institutions
• Collaborate with training institutions to update curriculum and arrange for pre-service training opportunities in all medical and allied schools for update in MCM
• OTSS on Case Management

**Malaria in Pregnancy**
• Conduct in-service training for health workers
• Quarterly MIP Working Group Meeting
• OTSS on MIP (as part of Case Management) and stakeholders meeting on folic acid

**Integrated Community Case Management (iCCM)**
• Strengthen Community Health Planning Service to improve community level management of malaria as a better alternative to iCCM

**Diagnostics**
• Sentinel sites studies for Parasite prevalence tracking
• Conduct Malaria Diagnostic Training for health facilities
• Development of GHS quality assurance plan and standard protocol for RDTs
• Implement the laboratory quality assurance protocol

**Seasonal Malaria Chemoprevention**
• Implement SMC in Upper West and Upper East regions

**Vector Control**

**Long Lasting Insecticide Nets**
• Distribute LLINs through Schools for Continuous Distribution in BA, WR, CR, ER, VR and AS; orientation, data validation, distribution and monitoring
• Distribute LLINs through ANC, CWC, for Continuous Distribution in all regions
• Distribute LLINs through Point Distribution in NR, UW and GA Regions
• Insecticide Resistance Monitoring through sentinel sites

**Indoor Residual Spraying**
• Implement IRS in targeted areas

**Procurement and Supply Management (PSM)**
• Procure LLINs for continuous distribution and mass campaign
• Procure RDTs
• Private sector co-payment mechanism for ACTs
• Support Integration and Harmonization of LMIS
• Conduct Stock checks at central and regional medical stores
• Support the distribution of malaria commodities among the regional medical stores to
ensure commodity security
- Carry out quarterly monitoring and supportive supervision of service delivery
- points’ on logistics management

Research, Surveillance, Monitoring and Evaluation
- Public and Private sector supportive supervisory visits
- Conduct routine data quality assessments
- Conduct Operational Research on malaria control interventions
- Monitoring and supportive supervision of sentinel site
- Impact assessment of IPTp; Anaemia, Low birth weight etc,
- Development of National and District specific thresholds for malaria surveillance
- Impact of BCC Interventions in malaria control
- Health Facility Survey and Case Management Quality Assessment
- Malaria indicator Survey
- AIDS/TB/MALARIA(ATM) Mortality analysis

Advocacy, Communication and Social Mobilization (ACSM)
- Review malaria IE&C materials on malaria interventions in line with current communication strategies(ITNs, SMC, SP, ACTs, RDTs, ICCM)
- Produce and air both TV and Radio adverts on malaria control interventions
- Conduct Quarterly Advocacy and BCC activities (including world malaria day commemoration)
- Train and orient journalists including newsroom editors on malaria control interventions

Administration and Finance
- Coordination meetings (MIACC, various committees)
- NMCP quarterly review meetings
- NMCP End of year review and planning meetings
- End of term review meeting at the national level
- Conduct Financial Monitoring to public facilities
- Conduct audits internal and external audits
5.0 REFERENCES