Evaluation of the Malaria Programme funded by the Global Fund in Ghana (2003-2011)

Final Draft Evaluation Report

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The following people from EHG contributed to this report

Chandana Mendis, Team Leader
Roberto Garcia
Ulrika Enemark

The following people from the Global Fund contributed to this report

Simon-Pierre Tegang
Olga Avdeeva
Scott Filler
John Puvimansinghe
Mary Ann Lansang
Rifat Atun
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<tr>
<td>ACT</td>
<td>Artemisinin Combination Therapy</td>
</tr>
<tr>
<td>AGA</td>
<td>AngloGold Ashanti</td>
</tr>
<tr>
<td>AMFm</td>
<td>Affordable Medicines Facility - malaria</td>
</tr>
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<td>AMP</td>
<td>Alliance for Malaria Prevention</td>
</tr>
<tr>
<td>AR</td>
<td>Annual Report</td>
</tr>
<tr>
<td>CFR</td>
<td>Case Fatality Rate</td>
</tr>
<tr>
<td>CHAI</td>
<td>Clinton Health Access Initiative</td>
</tr>
<tr>
<td>CHIM</td>
<td>Centre for Health Information Management</td>
</tr>
<tr>
<td>CIF</td>
<td>Cost, Insurance and Freight</td>
</tr>
<tr>
<td>CMS</td>
<td>Central Medical Store</td>
</tr>
<tr>
<td>CP</td>
<td>Conditions Precedent (to grant approval)</td>
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<tr>
<td>DP</td>
<td>Development Partners</td>
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<tr>
<td>EQ</td>
<td>Evaluation Question</td>
</tr>
<tr>
<td>FDB</td>
<td>Food and Drugs Board</td>
</tr>
<tr>
<td>FOB</td>
<td>Free on Board</td>
</tr>
<tr>
<td>FY</td>
<td>Financial Year</td>
</tr>
<tr>
<td>GDHS</td>
<td>Ghana Demographic and Health Survey</td>
</tr>
<tr>
<td>GHS</td>
<td>Ghanaian New CEDI (appr. USD 0.60 Dec 2011)</td>
</tr>
<tr>
<td>GHS</td>
<td>Ghana Health Service</td>
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<tr>
<td>GMAP</td>
<td>Global Malaria Action Plan</td>
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<td>GoG</td>
<td>Government of Ghana</td>
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<tr>
<td>GPR</td>
<td>Grant Performance Report</td>
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<tr>
<td>HSMTDP</td>
<td>Health Sector Medium Term Development Plan 2010-2013</td>
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<tr>
<td>IGF</td>
<td>Internally-Generated Funds</td>
</tr>
<tr>
<td>IPT</td>
<td>Intermittent preventive treatment</td>
</tr>
<tr>
<td>IRS</td>
<td>Indoor Residual Spraying</td>
</tr>
<tr>
<td>ITNs</td>
<td>Insecticide-Treated Nets</td>
</tr>
<tr>
<td>LFA</td>
<td>Local Fund Agent</td>
</tr>
<tr>
<td>LLINs</td>
<td>Long-lasting insecticidal nets</td>
</tr>
<tr>
<td>MARA</td>
<td>Mapping Malaria Risk in Africa</td>
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<tr>
<td>M&amp;E</td>
<td>Monitoring and Evaluation</td>
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<tr>
<td>MICS</td>
<td>Multiple Indicator Cluster Survey</td>
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<tr>
<td>MOFEP</td>
<td>Ministry of Finance and Economic Planning</td>
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<tr>
<td>MoH</td>
<td>Ministry of Health</td>
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<tr>
<td>MTEF</td>
<td>Mid-Term Expenditure Framework</td>
</tr>
<tr>
<td>NA</td>
<td>Not Available/Not Applicable</td>
</tr>
<tr>
<td>NHIA</td>
<td>National Health Insurance Authority</td>
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<tr>
<td>NHIS</td>
<td>National Health Insurance Scheme</td>
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<td>NMCP</td>
<td>National Malaria Control Programme</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>NMSP</td>
<td>National Malaria Strategic Plan</td>
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<tr>
<td>OPD</td>
<td>Outpatient Department</td>
</tr>
<tr>
<td>PGA</td>
<td>(Global Fund) Programme Grant Agreement</td>
</tr>
<tr>
<td>PMI</td>
<td>(US) President's Malaria Initiative</td>
</tr>
<tr>
<td>PPME</td>
<td>Policy, Planning, Monitoring, and Evaluation Division</td>
</tr>
<tr>
<td>PR</td>
<td>Principal Recipient</td>
</tr>
<tr>
<td>ProMPT-Ghana</td>
<td>Promoting Malaria Prevention and Treatment, URC Project</td>
</tr>
<tr>
<td>PSM</td>
<td>Procurement and Supply Chain Management</td>
</tr>
<tr>
<td>PUDR</td>
<td>Progress Update and Disbursement Request</td>
</tr>
<tr>
<td>RBM</td>
<td>Roll Back Malaria</td>
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<tr>
<td>RCC</td>
<td>Rolling Continuation Channel</td>
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<td>RDT</td>
<td>Rapid Diagnostic Test</td>
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<tr>
<td>RMS</td>
<td>Regional Medical Stores</td>
</tr>
<tr>
<td>SBS</td>
<td>Sector Budget Support</td>
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<tr>
<td>SCM</td>
<td>Supply Chain Management</td>
</tr>
<tr>
<td>SDA</td>
<td>Service Delivery Area</td>
</tr>
<tr>
<td>SP</td>
<td>Sulphadoxine Pyrimethamine</td>
</tr>
<tr>
<td>SPE</td>
<td>The Strategy Performance and Evaluation Cluster of the Global Fund</td>
</tr>
<tr>
<td>STC</td>
<td>Special Terms and Conditions (for grant approval)</td>
</tr>
<tr>
<td>SWAp</td>
<td>Sector-Wide Approach</td>
</tr>
<tr>
<td>U5</td>
<td>Children under five years of age</td>
</tr>
<tr>
<td>USAID</td>
<td>The United States Agency for International Development</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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<tr>
<td>WMR</td>
<td>World Malaria Report</td>
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ACKNOWLEDGEMENTS

The Evaluation Team would like to thank everyone in Ghana who took time out of their very busy schedules to help facilitate the successful implementation of the evaluation and to contribute their experience and views to the evaluation findings.
EXECUTIVE SUMMARY

The Global Fund contracted Euro Health Group to carry out an evaluation of the Global Fund support to the National Malaria Control Programme (NMCP) in Ghana. The overall objectives of the evaluation were to:

1. Identify changes in coverage, outcomes, impact and effectiveness in key interventions against disease burden brought about by the Global Fund programme contributions
2. Assess drivers of programmatic scale-up and disease trends
3. Assess allocative efficiency and sustainability of Global Fund contribution towards malaria control in Ghana

The evaluation covered Round 2(R2), Round 4(R4), Rolling Continuation Channel (RCC), Round 8(R8) and Affordable Medicine Facility malaria (AMFm) through 2010. The evaluation was conducted during the period 24 October ± 30 November 2011 and the methodology consisted of preparatory desk work, data collection and field visits including in-depth interviews with key stakeholders, and an in-depth desk review.

Changes in coverage, outcome and impact

Coverage - Access to malaria related services increased to 170 districts under R4 from 20 districts in R2 including scale up of community based services. Despite significant strides in ensuring availability of key interventions identified by the NMCP the RCC grant has been unable to achieve several targets resulting in B and C ratings from Oct 2009 to September 2010). Nevertheless it is clear that without Global Fund support under R2 and R4 achievements would have been at a much lower level as the proportion of government funding for the national response only recently increased to around 50%.

Outcome/Impact - Mixed outcomes have been recorded during the implementation period where 4 of 9 outcome targets (treatment/management of uncomplicated and severe malaria and mothers/caretakers response to malaria within 24hours) set for the Global Fund supported programme with the NMCP were on track while use of Insecticide Treated Nets (ITNs), Intermittent Preventive Treatment (IPT) and Rapid Diagnostic Test (RDT) results hovered around 50% of the targets. The massive scale up of Global Fund support contributed to a reduction in both malaria morbidity and mortality (noted in RCC Q20 results).

Reducing the disease burden - Data available from the national health recording system indicated no significant changes of disease burden over the ten-year evaluation period possibly attributable to: the practice of presumptive treatment; introduction of national health insurance for all which triggered more unconfirmed malaria cases treated; inaccurate recording and processing of data; and/or that interventions are not reaching enough of the population. Although no nation-wide prevalence data are available, the high parasite prevalence (over 50% throughout the year among children under5 years) in the middle belt of Ghana implies that malaria continues to be a major disease burden in the country.

Intervention mix – Malaria interventions in Ghana supported through the Global Fund grants evolved over time in line with national strategic plans addressing the emerging health needs related to malaria (i.e. the scope of distribution of ITNs was expanded to include the entire risk population). The NMCP in collaboration with its development and implementing partners is making as realistic estimates of the country’s malaria needs as possible by using tools such as the LLIN)need/gap calculator.

Increase in access to ACTs– Based on quantitative data the AMFm appears to have improved availability at the central level and affordability of ACTs although overpricing was noted among some private providers. Despite and overall appreciation of on-going efforts qualitative information has highlighted areas in need of improvement including addressing: overpricing among some private providers; avoidance of AMFm ACTs related low (subsidized) prices associated with poor quality; delays in procurement, particularly in the
public sector; and the need to tackle issues of long distances and bad road networks. Another major area of concern is the insufficient efforts aimed at reducing mono-therapy in Ghana. In the absence of comprehensive and reliable consumption data is not possible to determine an increase in the access to AMFm ACTs.

**Drivers of programmatic scale-up and disease trends**

*Key Drivers* - The programme is establishing clear strategies and setting up targets at coverage, outcome and impact levels, promoting the use of correct and efficient intervention methods and planning appropriately for the next phases of implementation based on strategic and financial gap analysis.

*Implementation according to design* – Based on the documentation reviewed there seem to have been no major discrepancies between planned and implemented programme strategies although operational strategies were altered (i.e. abolishing an ITN voucher scheme in lieu of universal coverage and introduction of an innovative strategy for the promotion and use of LLINs).

*Relevance of past and future interventions* - Based on Ghana’s current epidemiological situation, experts’ recommendations and international best practices, it would be fair to suggest that Ghana has chosen the most appropriate and comprehensive package of interventions.

**Allocative efficiency and sustainability**

*Financing trends* - The funding for malaria control in Ghana has increased dramatically over the past ten years, stabilizing around $5 per capita in 2007-09. The Government of Ghana (GOG) has substantially increased its malaria spending but remains heavily dependent on international donors to fund interventions (around 50%). Although the original purpose of the Global Fund grants was to fill the strategic and financial gaps in the NMCP, they became the single vertical donor (2003-2005) and contributed around 45% of direct funding in 2009.

*Differential resource allocation* - Increased attention and budgetary allocations have been directed towards prevention and health systems strengthening aspects; with regard to actual expenditures there appears to be a bias towards treatment. ITNs continue to receive the most resources under prevention interventions, but indoor residual spraying is picking up and the need to target behaviour change communication (BCC) specifically is reflected in increasing funds being earmarked for such activities.

Neither the size of the budget nor the mix of interventions appears to be related to the variation in the malaria disease burden or risk of transmission. Rather, budgeting principles appear to be based on more or less equal allocations to all districts irrespective of risk transmission and population numbers. Funds have been earmarked for certain activities with little room for variation in service mix. Allocative efficiency of the Global Fund resources is difficult to judge as the Global Fund support complements the contributions made by GOG and other partners; that said there appears to be good complementarity between the interventions supported by different funders.

*Financial Sustainability* - A comprehensive funding gap analysis was undertaken in 2008 (related to the Global Fund application submission); many of the baseline assumptions are still valid (i.e. government funding). Despite increased government contribution (around 50%); the malaria control programme is not likely to be financially sustainable for years to come. Most development partners have a relatively short horizon, but the Global Fund funding is considered relatively stable funding for a longer programme period.
Recommendations

Objective 1: Changes in coverage, outcomes, impact and effectiveness in key interventions against disease burden brought about by the Global Fund programme contributions

1. NMCP and its partners should strengthen the existing Monitoring and Evaluation (M&E), surveillance and operational research activities and demonstrate evidence of the appropriateness of the mix of interventions supported by the Global Fund to reach the expected impact.

2. The Global Fund should work more closely with the ACT manufacturers and ensure a smooth supply of the AMFm ACTs in order to increase availability and accessibility.

Objective 2: Study of drivers of programmatic scale-up and disease trends

3. The NMCP should urgently work with its development partners to review the current delivery strategies for key malaria interventions and modify/follow these in order to reach universal coverage. This could include the NMCP devising a strategic action plan including piloting and scaling up methods to improve RDT testing rates, provider compliance, and patient acceptance in support of the national diagnostic policy of prompt parasitological confirmation including relevant training for health care staff.

4. The NMCP should convene frequent review meetings between the technical, M&E, Procurement and Finance units in order to identify early warning signals of delayed implementation and agree on appropriate measures to overcome bottlenecks.

Objective 3: Allocative efficiency and sustainability of Global Fund contribution towards malaria control in Ghana

5. The NMCP should consider introducing clear criteria for resource allocation to district interventions based on population at risk and to allow districts flexibility to adapt the activities to local needs instead of subscribing to “one size fits all” and “micro-planning”.

6. The NMCP should immediately look at how to address the dilemma between the desired future balance between use of ACTs and RDTs and the economic incentive structures in place.
1. BACKGROUND INFORMATION

1.1 Context of malaria in Ghana

Malaria is prevalent throughout the country and transmission is perennial, although transmission rates are lower in the urban areas. Transmission occurs all year round with slight seasonal variations during the rainy season from April to July. The only available malaria distribution maps have been developed by Mapping Malaria Risk in Africa (MARA), using climatological and ecological satellite maps with some ground data (see Map 1). Map 2 (licensed to malaria atlas project) refers to the malaria risk in Ghana; notably high risk of malaria infections countrywide. The Malaria Prevalence Model for Ghana shows the highest malaria prevalence rates for the Northern and Upper West regions with high prevalence rates in parts of Brong-Ahafo, Ashanti and Eastern regions while Southern regions are lower endemic areas. Ghana can be stratified into 3 malaria epidemiologic zones: northern savannah; tropical rainforest; and coastal savannah / mangrove swamps.

Figure 1: Malaria Prevalence

Source: MARA, using climatological and ecological satellite maps; March 2002.

Figure 2: Malaria Risk Pattern

Source: Malaria atlas project, showing the entire country at high risk of malaria infections, 2007.

The majority of malaria cases are *Plasmodium falciparum* accounting for more than 90% of all cases while *P. malariae* and *P. ovale* constitute the rest. Mixed infections of *P. falciparum* and *P. malariae* are common. Crude parasite rates range from 10 to 70%. The established vectors of transmission of malaria are *Anopheles gambiae* and *Anopheles funestus*; *Anopheles arabiensis* is common in the drier northern savannah regions while *Anopheles melas* is found in the southern marshy lands. The entire area of the Ghana is endemic and not prone to epidemics of malaria (2000-2010 Roll Back Malaria (RBM) strategic plan).

1.2 Epidemiology of malaria in Ghana

Malaria is hyper endemic in all regions of Ghana, with all the 24.2 million population at risk. More than 3 million cases of clinical malaria are reported in public health facilities each year, of which 900,000 cases are in children under five years. Malaria accounted for 38% of all outpatient illnesses, 34.9% of all admissions and 19.5% of all deaths in 2010 thereby negatively affecting productivity. There were 3.8 million reported cases of malaria in Ghana in 2010, 1.1 million of which were children under five years old; only 26% of these cases were confirmed. Pregnant women and children under five years of age (U5) who constitute

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20% and 4% of the population respectively are most at risk of acquiring the disease and succumbing to malaria. The burden of malaria remains high with about 323 per 1,000 cases reported among children < 5 years in 2008; and there is limited evidence of a decrease in recent years (2002 - 2008)\(^4\). The trend of malaria case in the Outpatient Department (OPD) shows an apparent rise in number of cases from 2007 onwards; attributable to factors that influenced facility utilisation such as the introduction of free Medicare for pregnant women, enrolment in the National Health Insurance Scheme, as well as improvement in access to health facilities in the country\(^5\). The highest incidence rate for OPD malaria was recorded in Upper East region (59,400 per 100,000 population) and the lowest was in Greater Accra (7,000 cases per 100,000). Malaria studies carried out in the middle belt of Ghana report of high transmission of approximately 269 infective bites per person per year and a parasite prevalence of not less than 50% at all times in the year among children< 5 years\(^6\).

1.3 Context of malaria control in Ghana

In the Ghana Poverty Reduction Strategy, 2002-2004, the Government of Ghana (GoG) incorporated the RBM recommended interventions for malaria, including ensuring the availability and use of insecticide-treated bed nets (ITNs). Within the health Sector-Wide Approach (SWAp) arrangements, malaria was accorded the highest priority in the Ministry of Health’s second 5-Year Programme of Work document (2002-2007) alongside HIV/AIDS and TB. Malaria control activities are budgeted for in the Mid-Term Expenditure Framework (MTEF). Free treatment to all children under five, pregnant women and the elderly through an exemption scheme forms part of the national policy. In addition the GoG waived taxes on imported bed nets.

1.4 The malaria response in Ghana

The NMCP is responsible for providing technical guidance to the Ministry of Health to ensure proper planning, coordination, implementation and monitoring of malaria programmes in the country.

The bulk of the health budget is provided by the Government of Ghana Health Fund, the Internally-Generated Fund (IGF), the National Health Insurance Fund (NHIF) and a few development partners including the Global Fund. The government is committed to removing financial barriers to treatment due to out of pocket payments at the point of service witnessed through introduction of prepayment mechanisms and an Act of Parliament stating that 1% of District Assemblies Common Fund be set aside for malaria control activities at the district level\(^7\).

The current National Malaria Control Strategic Plan (2008-2015) marks a continuation of the original Roll Back malaria Strategic Plan (2000-2010) with a significant scale up of activities to achieve and sustain universal access. The plan also addresses news methods of addressing malaria including treating uncomplicated malaria with artemisinin-based therapy, malaria prevention in pregnancy through use of sulfadoxine-pyrimethamine and increased emphasis on indoor residual spraying using more effective methods.

The NMCP strategic plan is summarized in Table 1 below while Table 2 presents the Global Fund strategies from various rounds. Clear linkages of the Global Fund grants with the NMCP are evident when examining the “how health needs were identified” in Table 2.

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\(^7\) Ghana: Ministry of Health. Round 2 Proposal submitted to GFATM
<table>
<thead>
<tr>
<th>General Objectives</th>
<th>Strategies</th>
<th>Specific Objectives</th>
<th>Expected Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deploy Multiple Prevention Methods</td>
<td>1.1: To scale-up access to Long Lasting ITNs to achieve universal coverage 1.2: At least 90% of all houses in targeted districts will be covered with Indoor Residual Spraying by 2011 and sustain until 2015 1.3: IPT</td>
<td>• 100% of HH own at least one ITN by 2015  • 80% of the general population sleep under ITNs by 2015  • Increase the # of U5 &amp; pregnant women sleeping under ITN from current levels to 85% by 2015.  • 100% (All) pregnant women shall be on appropriate IPT (at least 2 or more doses of (SP) under DOT) by 2015  • 90% of all structures in targeted districts covered through IRS by 2015.</td>
<td>Improved Malaria Prevention  • Increased use of ITNs by children and pregnant women  • Improved drainage, mosquito-proofing of houses and general sanitation  • Reduction of mosquito population through in-door residual spraying and larviciding</td>
</tr>
<tr>
<td>Improve Access to Prompt and Effective Treatment Improve Access to Prompt and Effective Treatment</td>
<td>2.1: To improve early diagnosis and effective management of malaria in all health facilities: 2.2: To scale-up community based treatment of malaria in all districts to ensure 100% of under five children have prompt access and effective treatment of malaria</td>
<td>By December 2015:  • 100% HF will provide prompt and effective treatment using ACTs  • 90% of all patients with uncomplicated malaria correctly managed at public/private health facilities using ACTs  • 100% communities have access to community-based treatment for uncomplicated malaria  • 90% of caretakers and parents will be able to recognise early symptoms and signs of malaria.  • 90% of U5 with fever receive an appropriate ACT w/in 24 hrs. of onset</td>
<td>Improved access to Prompt and Effective Treatment  • Early recognition of fever and early treatment with Artesunate-Amodiaquine especially  • at the home  • Appropriate referral of severe cases assured  • Quality of treatment for malaria improved  • Basic services accessible to the sick</td>
</tr>
<tr>
<td>Strengthen Monitoring &amp; Evaluation and Operational Research</td>
<td>3.1: To Strengthen Monitoring &amp; Evaluation, and Operational Research</td>
<td>Not set.</td>
<td>Strengthened Monitoring and Evaluation, and Operational Research  • Increased availability of funds for research and monitoring  • Capacity in malaria research and monitoring improved  • Routine monitoring of programme activities and outputs strengthened  • Operational research into malaria with results disseminated/utilised  • Periodic evaluation of programme outcomes and impact institutionalised  • Safety and efficacy of drugs and insecticides monitoring institutionalised and strengthened  • APR conducted</td>
</tr>
<tr>
<td>Strengthen the Health Systems at all Levels</td>
<td>• Improved HR (technical and managerial), Infrastructure, Equipment, Transport, IT, Drugs, Essential Logistics and Health Industry  • Improved planned preventive maintenance to increase equipment availability and resources to support replacement of obsolete equipment.</td>
<td>Not set.</td>
<td>Strengthened Health Systems at all Levels  • Human resource capacity built to deliver health (including malaria) interventions at all levels  • Infrastructure, logistics and communication systems improved  • Financial management improved at all levels  • Improved procurement and supply management  • Community systems strengthened</td>
</tr>
<tr>
<td>Create and Sustain Partnerships for Malaria Control</td>
<td>5.1: Create awareness among the community as well as health workforce on malaria control and prevention activities 5.2: Forge functional partnerships between department programmes within/outside the health sector.</td>
<td>Not set.</td>
<td>Create and Sustain Partnerships for Malaria Control  • Functional partnerships and mechanisms between departments and programmes within Health  • Functional partnerships and mechanisms with and between development agencies, government sectors, NGOs, private and informal sectors</td>
</tr>
</tbody>
</table>
## 1.5 The Global Fund investments and supported programmes

As per the table below, Ghana has benefited from four malaria grants. The Global Fund has recognised the Ministry of Health (MoH)/GHS among the best PRs worldwide.\(^8\)

### Table 2: Evolution of Global Fund Malaria Interventions

<table>
<thead>
<tr>
<th>Grant Period</th>
<th>Pre-R2 situation</th>
<th>R2 Grant – 20 districts</th>
<th>R4 Grant – 110 districts</th>
<th>R4 RCC Grant*</th>
<th>R8 Grant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>$8,849,450</td>
<td>$38,887,781</td>
<td>$49,012,885</td>
<td>$154,964,121</td>
<td></td>
</tr>
</tbody>
</table>
| Identified key malaria related health needs preceding proposal formulation | Malaria responsible for 44.5% of all outpatient illnesses, 36.9% of all admissions and 13.2% of all deaths thereby negatively affecting productivity. Pregnant women and U5 children most at risk of morbidity and mortality. | High malaria burden & level of Govt. will and yet:  
- Full package of interventions limited to a few districts  
- Minimal community-based activities  
- Minimal involvement of NGOs and civil society  
- Limited HR capacity | Ghana’s political commitment to the needs of women, children & the poor was reflected in the articulation of malaria needs (IPT, ITN & BCC for promoting early treatment seeking practices). Need for change in treatment policy resulted from emergence of resistance to chloroquine. | Persistence of high malaria morbidity resulting from:  
- i. poor coverage of ITNs targeting only some segments of population at risk and poor retreatment practices  
- ii. Over-reliance on presumptive clinical diagnosis resulting in a distorted picture of the disease burden. | Limited utilization of case management due to problems of physical and financial access. Potential benefit of Indoor Residual Spraying (IRS) for high malaria burden rural communities with poor or limited access to health care services |

|----------------------------------|--------------------|--------------------|--------------------|----------------|----------------|
| Key intervention implemented | Promotion of home-based care, use of ITN, improving case management in health facilities and use of appropriate chemoprophylaxis in pregnancy mostly at central level and some in 20 selected districts | 1. IPT (targeting 60% of Pregnant Women in 20 additional districts or 80,000 in number)  
2. ITNs in children < 5 yrs.  
(from a baseline of 9.1% to 55%, covering approximately 400,000) and pregnant women  
(from a baseline of 22.1% to 45%, covering approximately 80,000) in 20 additional districts  
3. Correct treatment seeking practices among mothers/care takers (50%) | 1. IPT (targeting 70% of pregnant women in the rest of 90 districts translating into a target of 317,314 by 2008  
2. ITNs in U5 (50%, approx. a target of 1,350,000 by 2008) through innovative voucher system and the Communication for Behavioural Impact (COMBI),  
3. Correct treatment seeking practices among mothers/care takers through BCC (60%, a target of 1,439,040 by 2008)  
4. Effective case management through implementation of new Anti-Malarial Drug Policy in all 110 districts | 1. IPT (targeting 56% of Pregnant Women in all 110 districts  
2. ITNs in U5 (67%) and pregnant women (67%) in all 110 districts  
3. Correct treatment seeking practices mothers/care takers (60%)  
4. Effective case management (use of Artemisinin-Amodiaquine in 34.5% of the general pop) through implementation of new Anti-Malarial Drug Policy in all 110 districts  
5. Scaling up of RDTs  
6. AMFm interventions | 1. Scaling up of home based care in 123 rural districts particularly through trained Community Drug Distributors (CDDs).  
2. Scaling up indoor residual spraying in 40 districts that are experiencing the highest malaria disease burden.  
3. Supporting interventions |

| Comments | Limited range of interventions reaching extremely low proportions of those in need. | Broader range of interventions, but extended to only a small proportion of those in need. | A broader range of interventions but only to a small proportion of those in need. | Broader range of interventions to a greater proportion of those in need; still short of universal coverage. | More complete intervention package with. Universal coverage aimed only for some interventions |

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\(^8\) Grant Performance Reports R2 and R4  
\(^9\) In June 2010 R8 and the AMFm grants were consolidated into the on-going R4 RCC grant.
2. INTRODUCTION TO THE PROGRAMME EVALUATION

2.1 Rationale of this study
Since its establishment in 2002, the Global Fund has committed US$ 22.6 billion to improve HIV, TB, malaria and health systems in more than 150 countries. While the portfolio administration and management aspects (proposal assessment, grant awarding, progress monitoring and performance-based disbursements) of the Global Fund as a financing body have evolved over the past 10 years, very few programme evaluations have been carried out. Recently, there has been greater emphasis towards institutionalisation of programme evaluations with the Strategy Performance and Evaluation (SPE) Cluster of the Global Fund Secretariat commissioning a number of programme evaluations each year. The aim is to evaluate specific country disease control programmes – selected according to specified criteria, for their effectiveness, efficiency and quality, and to determine the impact of Global Fund investments on the disease burden. Ghana was one of the countries selected for Malaria programme evaluation in 2011.

2.2 Goals, objectives and evaluation questions
The evaluation seeks to assess the effectiveness, efficiency, outcome/impact and sustainability of malaria grants supported by the Global. The overall questions discussed in the evaluation can be grouped into three specific objectives as follows:

Specific objective 1: Changes in coverage, outcomes, impact and effectiveness in key interventions against disease burden brought about by the Global Fund programme contributions
1. To what extent have Global Fund malaria grants resulted in improving coverage and access of populations to prevention and treatment interventions?
2. What have been the outcomes and impact following Global Fund investment in malaria programming?
3. The contribution of the malaria control programme in reducing the disease burden.
4. Compare the mix of interventions with the health needs of the populations.
5. Has there been an increase in access to ACTs, reducing the use of inappropriate medicines for malaria, due to the AMFm initiative in Ghana?

Specific Objective 2 - Study of drivers of programmatic scale-up and disease trends
1. What are the key drivers of the trends in (malaria) disease burden?
2. To what extent are malaria programme strategies implemented as they were designed in proposals submitted to the Global Fund?
3. To what extent are past and future interventions relevant to the disease epidemic in the country?

Specific Objective 3 - Allocative efficiency and sustainability of the Global Fund contribution towards malaria control in Ghana
1. Financing trends under the national malaria programme by key funding sources
2. Differential resource allocation: malaria treatment, prevention (ITN, IRS, BCC, IPT), diagnostics, programme management, other interventions. Analysis of unit costs (unit cost at the point of service provision).
3. How sustainable are gains made in malaria programming under Global Fund supported grants?
3. EVALUATION DESIGN AND METHODS

3.1 Evaluation design
Taking into account certain budget, time and data constraints, the evaluation targeted malaria program implementers at the national, regional, district and community levels. Respondents included officials from the MoH; NMCP; PR; SRs; SSRs; LFA; partners; community stakeholders; other stakeholders and partners.

Data sources included proposals of malaria grants approved; program implementation documents; progress reports and disbursement requests; country health management information systems (HMIS); WHO malaria reports; Financing data (programme) as committed budget, disbursement and expenditure data executed budgets; as well as any other documents and data sources as relevant.

3.2 Data collection methods
The evaluation used a mixed approach including the desk review of existing documentation; Semi-structured in-depth interviews; group interviews and observation during field visits. A Semi-structured interview questionnaire based on the evaluation questions was used (see Annex 3). Given the time limitations, the evaluation focused on compiling and analysing existing quantitative data (i.e., input, activity and output data from routine information systems and outcome and impact data from surveillance and surveys) supplemented with key informant interviews. The field work was conducted from 1-20 November 2011.

3.3 Data management and analysis
The evaluation matrix (see Annex 2) positions the evaluation questions within the Global Fund evaluation framework and associates data needs/standardized indicators with their data sources. Content analysis was made from the data compiled from different sources.

Financial analysis included that of committed budgets, disbursements and expenditures against disease burden, by key interventions and geographic areas, executed budgets of the government, financing for malaria programme, sources of revenue and additionality, pooling of funds. Partners’ financial reports were also considered as well as other available and reliable documentation. Special attention was targeted at unit cost analysis of essential goods (ACT, ITNs/LLINs, etc.).

3.4 Limitations of the methodology
- The time frame and level of effort for the evaluation determined that the evaluation team had to rely on the analysis of existing sources of quantitative data with their inherent strengths and weaknesses including data gaps (i.e. unavailability of prevalence data in addition to morbidity and mortality data). These data limitations were beyond the control of the evaluation team.

- It was not possible (a) to distinguish regions with and without Global Fund-supported programmes; or, (b) to identify Global Fund support linked to staggered service implementation (i.e., no naturally occurring comparison groups); or, (c) to identify specific programmes/ interventions solely supported by Global Fund.

- Different evaluations, high level visits and bed net distribution campaigns were conducted at the same time as the programme evaluation. This non-coordination also resulted in unavailability of a number of requested key informants and additional time pressures for those managing or providing services.
4. EVALUATION FINDINGS

4.1 To what extent have Global Fund malaria grants resulted in improving coverage and access of populations to prevention and treatment interventions?

4.1.1 Implementation Strategy
All of the Global Fund supported interventions are consistent with and integrated into the national strategic plans as key interventions and therefore are in line with the country programme objectives and goals (see Tables 1 and 2). However, the NMCP implements these interventions with a more holistic approach where different contributing partners are sharing the financial and technical responsibilities. NMCP produces one consolidated work plan for all of its activities. This allows all development partners to assess gaps and contribute more easily to the NMCP’s strategic priorities. The Global Fund principally contributes towards implementing specific malaria interventions through funding the national proposals based on the country’s needs and a gap analysis.

4.1.2 Reporting through Performance frameworks
Normally, the reporting of progress on the annual NMCP work plan is tied to the annual reports where clear targets on output, outcome and impact indicators are identified. Development of the Global Fund grant proposal work plans (since R2) have improved the progress measurements of the NMCP work plan through establishing more detailed M&E plans specifically tied to the performance framework (PF). The PF clearly identifies the frequency of reporting, indicators and their definitions, sources of data, individuals responsible for data collection, etc. therefore ensuring a more comprehensive and systematic data collection and reporting system. Further, the NMCP has designed and implemented data management tools for non-routine MOH activities such as ITN distribution and improved the routine data capturing systems for specific activities such as IPT and RDT.

According to the national work plans and implementing procedures, the reporting information on almost all the outcome/impact indicators does not differentiate amongst each contributing partner; to do so would require special data capturing and reporting mechanisms that function down to the district level. Although most of the process indicators included in the performance framework (PFs) are identified as ‘tied’ to Global Fund grants, in reality the resources obtained from different partners were often pooled together and used at the implementation level; the exception is number of ITNs procured and distributed. It was thus deemed not feasible to report on the Global Fund contributions in terms of several of the process indicators (outputs, access and coverage).

4.1.3 Monitoring and Evaluation Systems
Although a unified national multi-sectoral M&E system which ensures timely, high quality and easily accessible data for strategic planning, resources allocation and programme improvement is not in place the NMCP have made strides. Under the auspices of funding from the Global Fund the M&E capacities on various levels have been improved including establishing clear M&E plans for each grant with core indicators and data collection strategies defined in PFs and linked to the Global Fund budgets.

An important element of the M&E system is the availability of adequate HR in terms of numbers as well as skills. Over the Global Fund grant implementation period in support of the NMCP M&E positions have been created including regional level M&E officers in the north, centre and south regions of the country specifically for partner activity monitoring and also at central level for monitoring implementation and finance. In addition capacity-building efforts focusing on the development and implementation of standardized M&E materials and...
training have been implemented ensuring that they have the skills and infrastructure necessary to conduct their work.

The routine HMIS system captures data on output and some impact indicators of the NMCP while specific population surveys are carried out with partner assistance to capture most of the outcome indicator data. Data is captured primarily at the district health facility levels and collated monthly and transmitted to district levels for auditing and data quality checks and analysis carried out by the district HMIS officer and the district health director. This data is transmitted to provincial and central levels for additional data management processes such as computer storage and trend analysis for provincial and national levels by several personnel starting from provincial HMIS officers, provincial directors and data managers and program directors at the central level. This data management system is also linked to the epidemic surveillance activities conducted by HMIS officers.

One of the key M&E gaps noted was that no national agenda for malaria research and programme evaluation studies which would aid in avoiding duplication of efforts and building on synergies between different studies over time are in place.

4.1.4 Contributions from Global Fund
An analysis of major contributions made by all partners towards implementing the strategic plan shows that the Global Fund has taken the lead role (>50% on many or most occasions) in providing necessary financial resources for the NMCP to roll out the prevention and treatment measures from 2003 to date. Such an analysis was carried out by the NMCP and available for reference (Annex 1). These data indicate the contribution towards each objective by individual partner from 2007.

Moving away from being the sole vertical funder of malaria control efforts from 2003 to 2005, the Global Fund in 2009 provided 45% of the direct funding. Analysis done elsewhere (e.g. for the WMR, WHO 201110) indicates that the Global Fund has significantly contributed financially to the NMCP action plans since 2005 (See Figure 16). Taking a specific example, during 2010, out of a total of 9,042,184 LLINs distributed door-to-door as part of a “hang-up campaign” in the Northern and Eastern regions of the country, 4,388,184 were sourced from the Global Fund; DFID provided 2,350,000 and the PMI supplied 2,304,000.

4.1.5 Coverage and Access Indicators from the Global Fund Grant Reports
The following table summarises R2 and R4 grant indicators (no up to date information on results were available for R8 grants in the Grant Performance Report (GPR) - 3 March 2010).

Table 3 uses both similar as well as different indicators related to specific objectives for each grant. The baseline of 2002 recorded in the R2 GPR is used for comparisons over the current status of achievement against those indicators related to coverage and access to prevention and treatment.

Round 2 achievements:
It is clear from the table above that the NMCP was able to achieve or exceed almost all the targets set under the R2 grant which performed up to expectations, receiving “A” level grading from the Global Fund Secretariat. Results for the R2 grant clearly identify remarkable improvement of the key coverage and access indicators over time in the 20 selected districts

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## Table 3: Key Output (including Access and Coverage) Indicators R2, R4, RCC

<table>
<thead>
<tr>
<th>Indicator</th>
<th>First 20 selected districts only</th>
<th>All districts in Ghana (currently 170)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline 2002</td>
<td>R2 targets (‘end of grant Sep 08)</td>
</tr>
<tr>
<td><strong>Prevention Interventions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of households owning an insecticide-treated net</td>
<td>3.30% (2004)</td>
<td>75%</td>
</tr>
<tr>
<td>Total # and % of ITNs/LLINs distributed to people.</td>
<td>19326 (2004)</td>
<td>398600 (91%)</td>
</tr>
<tr>
<td># of CBAs trained in ITN promotion and re-treatment</td>
<td>0</td>
<td>2800 (100%)</td>
</tr>
<tr>
<td># of nets retreated at community retreatment sites</td>
<td>0</td>
<td>4200 (100%)</td>
</tr>
<tr>
<td># and % of CBAs trained to set up retreatment sites and carry out the retreatment</td>
<td>0</td>
<td>80 (67%)</td>
</tr>
<tr>
<td># of community retreatment sites established</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td># and % of pregnant women on IPT (at least 2 doses of SP) according to national policy</td>
<td>0</td>
<td>120000 (100%)</td>
</tr>
<tr>
<td># and % of ANC clinical staff trained in use of IPT</td>
<td>0</td>
<td>2800 (100%)</td>
</tr>
<tr>
<td># and % of health centres implementing IPT</td>
<td>0</td>
<td>60 (100%)</td>
</tr>
<tr>
<td><strong>Treatment Interventions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td># and % of malaria patients treated with ACT in health centres</td>
<td>0 (2004)</td>
<td>8201317 (61%)</td>
</tr>
<tr>
<td># of people treated with ACT by community based health workers.</td>
<td>239484 (2007)</td>
<td>2,540,718</td>
</tr>
<tr>
<td>Proportion of Health facilities (public and private) with NO reported stock-out lasting more than one week of nationally-recommended antimalarial drug at any time during the past three months</td>
<td>99% (2009) (n= 2504)</td>
<td>2479 (100%)</td>
</tr>
<tr>
<td>Proportion of health facilities with no reported stock for more than one week of IPT drugs</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Proportion of Community Drug Distributors with NO reported stock out lasting more than 1 week of Artesunate Amodiaquine at any time during the past 3 months (6493)</td>
<td>5,194</td>
<td></td>
</tr>
<tr>
<td># of Community Drug Distributors trained in HBC using Artesunate Amodiaquine</td>
<td>9,665</td>
<td></td>
</tr>
<tr>
<td># of service deliverers trained in home based care of malaria</td>
<td>0</td>
<td>2500 (100%)</td>
</tr>
<tr>
<td># and % of CBAs/ Community Health Officers trained in home based care of malaria</td>
<td>800</td>
<td>7820 (100%)</td>
</tr>
<tr>
<td># of health workers from public and private centres given refresher training on malaria case management</td>
<td>0 (2004)</td>
<td>5910</td>
</tr>
<tr>
<td># of service deliverers trained for drug resistance monitoring</td>
<td>60</td>
<td>120 (100%)</td>
</tr>
<tr>
<td># of patients monitored for drug resistance</td>
<td>900 (2003)</td>
<td>2000 (100%)</td>
</tr>
<tr>
<td># of sentinel sites established for drug resistance monitoring</td>
<td>6</td>
<td>10 (100%)</td>
</tr>
<tr>
<td><strong>BCC and Other Supporting Interventions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>%Percentage of people who know the cause of, symptoms of, treatment for or preventive measures for malaria</td>
<td>85%</td>
<td></td>
</tr>
<tr>
<td># of TV and radio broadcasts promoting key messages on malaria case management.</td>
<td>1,674</td>
<td></td>
</tr>
<tr>
<td># of both public and private supervisory visits</td>
<td>510</td>
<td></td>
</tr>
<tr>
<td># of staff trained in data management or general M&amp;E at national and sub-national level</td>
<td>20 (2004)</td>
<td>218</td>
</tr>
</tbody>
</table>

Red-below 50%; Yellow- 51% to 75%; Light green-75% to 95%; Dark green- 96% or more
Round 4 and RCC achievements:
R4 and RCC malaria grants have achieved mixed results. Positive results were obtained in terms of improving coverage and access to RDTs and treatment with ACT, particularly under the R4 grant. However the programme failed to achieve the agreed targets in the areas of bed net distribution and community based interventions. The performance on the RCC grant in particular has been disappointing as witnessed by a C rating (Oct ’09 to March ’10) and a B2 rating (April-September 2010). Many factors could have contributed to this situation including: scaling up to 170 districts which proved to be a daunting overall management challenge for the NMCP and GHS and put a strain on implementation capacity of the health workforce; and procurement of massive quantities of bed nets and RDTs proved to be challenging and fraught with delays. Consolidation of grants (R4, RCC, AMFm and R8) into one has also brought in its wake not only implementation delays but strains on the health workforce throughout the country.

Both the over achievement of R2 and under achievement of the RCC grant point to the need to set realistic and achievable targets with close coordination between all key players involved in the implementation process. Lack of consistency in terms of data sources across the different grant performance framework (PFs) has presented problems in terms of comparability of results against baselines and across grants. For e.g. results from DHS, MICS or health information system (HIS) were presented depending on availability in a number of Progress Update and Disbursement Requests (PUDRs) without following the preferred principle of using the same data source for baseline as well as monitoring progress (to the extent possible) and without triangulating data from different sources.

4.1.6 Progress made on the Coverage and Access Indicators in the Strategic Plan

Table 4 below summarises the achievements against the key coverage and access indicators in the current 2008-2015 strategic plan. While progress appears to have been excellent in relation to two indicators (IRS in targeted districts - not attributable to the Global Fund and prompt and effective treatment including ACTs at health facilities), moderate progress has been achieved against one indicator (Household coverage with at least one ITN). Progress against two indicators (IPT coverage for pregnant women and community-based antimalarial treatment) has lagged significantly behind.

<table>
<thead>
<tr>
<th>Specific Target and Indicator</th>
<th>Baseline as at 2002</th>
<th>Current status at 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% of households will own at least one ITN</td>
<td>2% (2000-2010 RBM strategic plan)</td>
<td>57% (‘07) (R4 GPR) 33%(DHS ‘08)</td>
</tr>
<tr>
<td>90% of all structures in targeted districts will be covered through indoor residual spraying</td>
<td>Not available</td>
<td>97% (RTI/PMI VSUD)</td>
</tr>
<tr>
<td>100% (All) pregnant women shall be on appropriate IPR (receive at least two or more doses of sulphadoxine-pyrimethamine under DOT)</td>
<td>0</td>
<td>40% (R4 GPR)</td>
</tr>
<tr>
<td>All (100%) health facilities will provide prompt and effective treatment using ACTs</td>
<td>0</td>
<td>96% (NMCP AR ‘10)</td>
</tr>
<tr>
<td>All (100%) communities will have access to community-based treatment for uncomplicated malaria</td>
<td>N/A</td>
<td>18% (R4 GPR)</td>
</tr>
</tbody>
</table>

Red-below 50%; Yellow- 51% to 75%; Light green-75% to 95%; Dark green- 96% or more

4.1.7 Progress on Coverage and Access Indicators

Coverage of ACTs
Ghana adopted the use of ACTs to treat uncomplicated malaria cases in 2004 in both public and private sectors. According to the NMCP Annual Report (AR) for 2010, the proportion of OPD malaria cases treated with an ACT has been increasing over the period11 noted in an increase to 99.2% (2010) up from 96% in 2007.

According to the NMCP Annual Report (2010) a total of 609,778 patients were treated with ACTs in Ashanti region, 577,474 in Western region and 518,956 in Eastern region. On average, about 96.5% of uncomplicated malaria cases were treated with ACTs in all the regions. However this information is in contrast to the PUDR for the 1 October 2010 to 31 March 2011 period wherein it was stated that 2,579,290 uncomplicated malaria cases were recorded out of which just over two thirds (1,756,115 or 68.1%) were treated with ACTs.

According to the DHS 2008, 20% of children under five years had a fever in the two weeks preceding the survey. Of these 43% were prescribed an antimalarial drug. Only around a quarter (24%) of the children took the antimalarial drug on the same or the next day after the onset of the illness. In the majority of cases, the fever was not managed appropriately, with ACT not being given as recommended in the national policy although ACT was the most common antimalarial drug given for fever in 2008 (22% of cases).

According to the NMCP 2008 Malaria Survey, about half (52.1%) of the children who had fever in the preceding two weeks were given an antimalarial within 24 hours after the onset of fever; 24% of the those treated were given ACT. This finding coincides with results from the DHS carried out in the same year. Upper West had the highest use of ACTs at 48.2% and Volta the lowest regional use at 14.7%. Urban areas witnessed a marginally higher ACT coverage (27.3%) than rural areas (24.1%). Slightly more children (26.0%) R2 were given an ACT compared with R4 (23.8%).

Based on the WMR 2011 it is apparent that a stationary trend has taken place since 2008 in Ghana with regard to the percentage of cases treated with any antimalarial drugs as well as the percentage of P. Falciparum cases potentially treated with ACTs and the gap between these two percentages has been considerably reduced implying improvements in parasitological diagnosis and administration of ACTs.

**Figure 3: Cases tested and ACT delivered: Programme data (public sector)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Suspected cases tested</th>
<th>Cases treated with any antimalarial</th>
<th>P. falciparum cases potentially treated with ACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>2001</td>
<td>2002</td>
<td>2003</td>
</tr>
<tr>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

*Source: World Malaria Report*

**Summary of ACT Findings:**
Since the introduction of ACT with the assistance of the Global Fund through R2 and R4 the NMCP has managed to significantly improve the case management at health centres with ACTs (NMCP 2010 annual report and WMR 2011). The achievements of ACT coverage are above 90% levels compared to that of 0% in 2002 baseline (R2 grant performance report) and around 20% - 50% reported in DHS and NMCP population surveys in 2008. This trend of improvement is similarly observed for diagnosis of suspected cases since 2006. The Global Fund has been critical in ensuring that ACTs were adopted as a treatment regime in Ghana and also critical in providing resources for their procurement. It has been observed that the NMCP has fully utilized the Global Fund mechanisms to gradually scale up treatment of malaria with ACTs since the inception of the grants in Ghana.
Coverage of IPT
According to the NMCP Annual Report for 2010, a total of 576,142 pregnant women received IPT1, which is about 67.1% of the expected pregnancy for 2010. For IPT2 and IPT3 the figures were 466,437 (49.5%) and 368,960 (38.9%) respectively. The expected pregnancies occurring in the country during the year were estimated to be 947,810 (a difference of 371,668 pregnant women). The difference was attributed to shortages of stocks of SP in a majority of the Regions/Districts partially due to delays in the procurement processes and partly as a result of failure of some of the SPs to pass quality tests conducted by the FDB.

The DHS 2008 results show that over half (58%) of women 15-49 with a live birth in the two years preceding the survey took SP/Fansidar—the recommended drug for prevention of malaria during pregnancy in Ghana—at least once during the pregnancy. Less than half (46%) of pregnant women said they took SP twice during the pregnancy. According to the DHS, women in urban areas are more likely to take anti-malarial drugs during pregnancy (74%) than rural women (60%). The Volta and Brong Ahafo regions (79% and 76% respectively) have the highest proportions of women taking any anti-malarial drug, while the Upper East and Northern regions (43% and 45% respectively) have the lowest proportions. The use of antimalarial drugs during pregnancy increases with increasing levels of education and increasing wealth quintile.

The NMCP 2008 malaria survey revealed a better IPT coverage than the DHS carried out in the same year. Approximately 3 out 4 pregnant women (2336/3071; 76.1%) took at least 2 doses of SP during their pregnancy with 43% taking 3 doses or more. The national average for pregnant women taking any IPT (80.9%) obtained during the survey was just above the targeted 80% of all pregnant women using IPT. The highest response rate for any IPT during pregnancy was in the Upper East Region (87.9%) and the lowest in Volta region (62.3%); see below figure. The majority of those who took IPT took SP (94.1%). The regional distribution of SP administration (by number of doses) is shown below.

Figure 4: Proportion of women receiving SP dose by region

Upper East region had the highest proportion of women receiving 3 doses of IPT (61.3%) followed by women in Brong Ahafo (52.6%) and Upper West (52.5%) while the lowest proportion receiving 3 or more doses was registered in the Eastern region.

According to PMI’s Annual Report, while the proportion of pregnant women who have received at least one IPT dose during their last pregnancy has increased rapidly across Africa since 2004–2005, the percentage of pregnant women who receive at least two doses of IPT has lagged behind. In spite of this, eight PMI countries including Ghana have reported increases in IPT2 from their baseline nationwide household surveys although lagging behind its neighbours. The WMR ranked Ghana among the 21 of the 36 high burden countries which

12As above
have adopted ITP as a national policy with approximately half of women attending antenatal clinics receiving a second dose of IPT.

**Figure 5: Proportion of pregnant women who received IPT from 2006 to 2010**

Summary of IPT Findings:
Since the initiation of SP for IPT in 2003 through the R2 funding and subsequent expansion under R4, IPT1/2/3 coverage has increased steadily until 2008 toward the national targeted levels. The noted downfall in 2009 is attributed to the shortage and/or stock out of SP in the country during 2010 due mainly to change in administration at the Ghana Health Services. Despite the shortage and/or stock-outs the NMCP IPT program has managed to maintain higher coverage levels for IPT2 and IPT3; commendable compared to neighbouring countries and attributable to effective implementation of BCC campaigns for which the Global Fund contributed significantly. The IPT coverage rates are influenced by the socio-economic levels of the community and there is significant variation of coverage rate amongst different regions; an indication that special emphasis on education related to IPT is needed.

**Coverage of ITNs**
NMCP reports for 2009 and 2010 lacked comprehensive information on the overall coverage of ITNs in the country. However the NMCP report for 2010 stated that a ProMPT-Ghana evaluation report indicated that almost 68% of households interviewed in the Northern Region had at least 1 ITN; a significant improvement over the 2008 demographic and health survey (DHS) figure of 27% for the Northern Region. The notable difference can be attributed to the campaign approach focusing on universal coverage.

According to the DHS 2008, one-third (33%) of households had at least one ITN compared with only 3% of households in 2003. During a five-year period (DHS 2003 & 2008) ownership of a mosquito nets (treated or untreated) increased from 18% to 45% and household ownership of more than one net increased from 6% to 19%. These increases demonstrate remarkable improvements in Ghana’s bed-net distribution programmes in just five years.
In 45% of households ownership of a mosquito net whether treated or untreated was noted; 19% own more than one net. Mosquito net ownership was found to be highest in the Upper West region (72%) and lowest in the Greater Accra (32%) region while ITN ownership ranged from 20% in the Greater Accra region to 47% in the Upper East region. Ownership was highest among the poorest households while rural households were found to have a relatively better coverage than urban households.

The NMCP 2008 malaria survey showed that 57.3% of the households with under-five population surveyed owned at least one bed net. Overall, slightly more than half (56.6%) of the households interviewed owned an ITN, a considerably higher proportion than found in the DHS 2008 (33%). Upper west Region had the highest percentage of ITNs (89.1%) while the lowest was Northern Region with 40.3%. ITN coverage in rural areas (59.4%) bettered coverage in urban areas (48.5%) whilst households in R2 (60.0%) had a marginally better coverage than the households in R4 (53.9%).

According to the Annual Report of PMI published in April 2011 Ghana’s coverage of ITNs still lags behind several other countries in Africa where more than half of all households now own an ITN. The WMR reviewed 15 household surveys (including in Ghana in 2008) with data on ITN coverage for the period 2008-2010 and concluded that modest proportions of households own at least one ITN and that in almost all these countries, less than half of households that had received ITNs had enough for all occupants.

**Figure 7: Trends in Household Ownership of Mosquito Nets**

Summary of ITN Findings:
Compared to less than 5% ITN coverage in 2002/3 which marked the beginning of the Global Fund presence in Ghana the NMCP ITN program has progressed significantly over time both geographically (20 districts to universal coverage) and in improving ITN coverage to around 50% of all households. The inability to meet targets during 2009/10 (R4 & RCC PUDRs 2010) has been effectively addressed through a change in strategy focusing on door to door hanging campaigns nationwide. Coverage rates of above 80% were reported in 2011 for several regions (unpublished NMCP records – personal communication) marking another
improvement but still falling short of the 100% target. This shortfall was attributed to procurement delays at the MOH due to internal administrative changes. It is evident that the NMCP and MOH are now fully committed to achieving the universal coverage target in all regions in Ghana within next two year period.

4.2 What Have Been Outcomes and Impact Following Global Fund Investment in Malaria Programming?

4.2.1 Progress on Outcome and Impact Indicators

The PMI Annual Report (April 2011) illustrated steady declines in under-five mortality observed in the PMI countries including Ghana. Although several other factors could account for these impressive reductions (e.g., the deployment of other lifesaving interventions - especially for pneumonia or diarrhoea - rapid improvements in nutrition and correction of micronutrient deficiencies, and improvement in vaccination coverage), the timing of these reductions, in close association with the massive scale-up of malaria prevention and treatment measures, strongly suggests that malaria is playing a major role in this improvement.

Analysis of outcome indicators for R2 grant shows that the desired outcomes for sleeping under an ITN were not achieved and the caretakers’ practices had shown only a moderate improvement. However, severe malaria morbidity and malaria mortality rates declined considerably and hence the related impact was well above expectations. In the case of R4 and RCC grants, there was poor outcome in relation to the proportion of U5 children with fever in the last 2 weeks who received antimalarial treatment. Limited success in relation to ITN use by pregnant mothers and U5 as well as parasitological diagnosis of malaria was noted. Moderate success was reported for U5 with uncomplicated malaria correctly being managed at health facilities as well as the practices of mothers/caretakers in responding to malaria. Targets against correct management of malaria cases appeared to be on track by the end of the implementation period. Significant Progress was noted against two of the agreed impact indicators of the RCC grant. Since most of the malaria interventions have been supported through R2, R4, RCC and R8 support it is fair to assume that the Global Fund has contributed to the current achievements in terms of meeting expected outcomes and impact on the disease in Ghana. The following table summarises R2 and R4 grant outcome and impact indicators.

However areas of concern remain including: ITN use (for U5, pregnant women and population as a whole) and the use of RDTs/microscopy in the confirmation of suspected malaria cases. In the case of IRS, there has been a delay in implementing R8 activities due to delays in GoG tax exemption on insecticides and material. In the case of bed nets and SP tablets, procurement delays resulted from changes that had occurred in the GHS procurement units.

The slow achievement rate for improving the use and access to RDT during malaria treatment is also a cause for concern. Interviews conducted during the evaluation highlighted the lack of advanced planning efforts for procuring sufficient number of RDTs while priority for procuring ACTs was overemphasised. The on-going lack of diagnosis and use of presumptive treatment practices (contrary to the NMCP strategy) appears to be affecting the proper cost effective use of ACTs and hindering the process of correct assessment of the burden of the disease in the population.

Rapid scaling up of the programmes with multiple intervention approaches (from 20 to 170 districts) appears to have only raised premature expectations in terms of outcomes and impact. The evidence obtained from the NMCP grant performance report on impact and outcome indicators should have contributed logically to the overall reduction of the malaria burden in the country over the past 8 years, which in fact has not been realised (refer to Figure 10). The contributions from the Global Fund have certainly facilitated the process of
expansion of services but the programme delivery capacity of the GHS and NMCP have not been correspondingly raised as required leading to overall mixed results.

Table 5: Key Outcome and Impact Indicators R2, R4, RCC

<table>
<thead>
<tr>
<th>Indicator</th>
<th>First 20 selected districts only</th>
<th>All districts in Ghana (currently 170)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Baseline 2002</strong></td>
<td><strong>R2 targets (end of grant)</strong></td>
</tr>
<tr>
<td><strong>Outcome indicators</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ITN Intervention</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td># and % of U5 children sleeping under an ITN the previous night</td>
<td>51171 (9.1%)</td>
<td>3.4% (04)</td>
</tr>
<tr>
<td>% of pregnant women (and other target groups) sleeping under an ITN the previous night</td>
<td>8772 (7.2%)</td>
<td>30.2% (08)</td>
</tr>
<tr>
<td><strong>IPT Intervention</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of pregnant women on IPT (at least 2 doses of SP) according to national policy (n= Y1=922,892, Y2=947,810, Y3=973,401, Y4=999,682, Y5=1,026,674, Y6=1,054,394)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of patients reporting at health facilities with uncomplicated malaria who receive correct treatment (ACT) promptly (n=3,000,000)</td>
<td>0 (2004)</td>
<td></td>
</tr>
<tr>
<td>% of U5 children (and other target group) with uncomplicated malaria correctly managed at health facilities</td>
<td>30% (2008)</td>
<td></td>
</tr>
<tr>
<td>% of U5 children (and other target groups) admitted with severe malaria and correctly managed at health facilities</td>
<td>31.30% (2008)</td>
<td></td>
</tr>
<tr>
<td>Proportion of children U5 with fever in the last 2 weeks who received antimalarial treatment according to national treatment policy within 24 hours of onset of fever</td>
<td></td>
<td>40%</td>
</tr>
<tr>
<td><strong>Case Management Intervention</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of suspected malaria cases confirmed by RDT or microscopy</td>
<td>N/A</td>
<td>40%</td>
</tr>
<tr>
<td>% of patients reporting at health facilities with uncomplicated malaria who receive correct treatment (ACT) promptly (n=3,000,000)</td>
<td>0 (2004)</td>
<td></td>
</tr>
<tr>
<td>% of U5 children (and other target group) with uncomplicated malaria correctly managed at health facilities</td>
<td>30% (2008)</td>
<td></td>
</tr>
<tr>
<td>% of U5 children (and other target groups) admitted with severe malaria and correctly managed at health facilities</td>
<td>31.30% (2008)</td>
<td></td>
</tr>
<tr>
<td>Proportion of children U5 with fever in the last 2 weeks who received antimalarial treatment according to national treatment policy within 24 hours of onset of fever</td>
<td></td>
<td>40%</td>
</tr>
<tr>
<td><strong>BCC Intervention</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td># and % of mothers/caretakers who respond appropriately to malaria within 24 hours of onset of disease (n=1,439,040)</td>
<td>22.1%</td>
<td>21% (2004)</td>
</tr>
<tr>
<td><strong>Impact indicators</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduced all-cause under 5 mortality (endemic areas)</td>
<td>111 (2004)</td>
<td></td>
</tr>
<tr>
<td>All-cause under-five mortality rate in Ghana</td>
<td>80 (2008)</td>
<td></td>
</tr>
<tr>
<td>Reduction of U5 mortality. Total # of deaths due to malaria in children U5.</td>
<td>2.2%(2002) 3.8%(2004)</td>
<td>11400 (2%)</td>
</tr>
<tr>
<td>Parasites prevalence in sentinel sites</td>
<td>60% (2008)</td>
<td></td>
</tr>
<tr>
<td>Reduced malaria specific morbidity</td>
<td>3,000,000</td>
<td></td>
</tr>
<tr>
<td>Morbidity attributed to severe malaria in pregnancy that is, total # of pregnant women out of expected pregnancies who had severe malaria (n= 417,518)</td>
<td>10.6% (2004)</td>
<td>10,000 (8%)</td>
</tr>
</tbody>
</table>

Red - below 50%; Yellow - 51% to 75%; Light green - 75% to 95%; Dark green - 96% or more
Table 6 below summarises the achievements against the key outcome indicators in the current 2008-2015 strategic plan. While progress appears to have been in line with expectations in relation to only one indicator (U5 receiving appropriate ACTs) moderate progress has been achieved against two indicators (use of ITNs by pregnant mothers and U5 and ability of caretakers to recognise malaria early) while progress against one indicator (use of ITNs by general population) has not been included in the Global Fund grant PFs.

<table>
<thead>
<tr>
<th>Specific Target and Indicator</th>
<th>Baseline as at 2002</th>
<th>Current status at 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>80% of the general population will sleep under ITNs</td>
<td>4.4 % (2000-2010 RBM strategic plan)</td>
<td>Not reported in GPR</td>
</tr>
<tr>
<td>Increase the number of children under-five and pregnant women sleeping under treated net from current levels to 85%</td>
<td>4% (2000-2010 RBM strategic plan)</td>
<td>55%-53% (R4 GPR)</td>
</tr>
<tr>
<td>90% of all patients with uncomplicated malaria will be correctly managed at public and private health facilities using ACTs</td>
<td>0</td>
<td>73% (R4 GPR)</td>
</tr>
<tr>
<td>90% of U5 children with fever will receive an appropriate ACT</td>
<td>0</td>
<td>99% ((NMCP AR 2010)</td>
</tr>
<tr>
<td>90% of caretakers and parents will be able to recognise early symptoms and signs of malaria</td>
<td>22% (R2 GPR 15/4/10)</td>
<td>77% (R4 GPR)</td>
</tr>
</tbody>
</table>

**Red**-below 50%; **Yellow**- 51% to 75%; **Light green**- 75% to 95%; **Dark green**- 96% or more

NMCP reports for 2009 and 2010 contained incomplete information on the overall results associated with the impact indicators in the country. However the NMCP report for 2010 states that a ProMPT-Ghana evaluation shows that the usage among children under five was 52% and among pregnant women the usage was 39.5%; marking improvement over the 2008 DHS figures of 28% and 20% (statistics for Northern region only). The fourth MICS was just underway during this evaluation; hence only information gathered from the most recent DHS (2008) and the NMCP 2008 Malaria Survey is presented below.

**Use of mosquito nets by children**

The DHS 2008 results (see figure below) show that 41% of children under five years in all households surveyed slept under a mosquito net (treated or untreated) the night before the survey; 29% slept under an ever-treated net; and 28% slept under an ITN. In households that own at least one ITN, a substantially larger proportion of children under age five slept under an ITN the night before the survey (54%). Children in rural households are more likely to have slept under an ITN than children in urban households (31% vs. 24%). The proportion of children who slept under an ITN was highest in the Brong Ahafo region (50%) and lowest in the Northern region (11%). The proportion of children under age five, in all households, who slept under an ITN the night before the survey, has increased 24% from 4% in 2003 to 28% in 2008.

In the NMCP 2008 Malaria Survey, use of ITNs did not match the proportion of households that possessed an ITN as only 40.5% of the 3,850 children surveyed indicated sleeping under an ITN the previous night. The lowest proportion of children who slept under an ITN was in the Northern Region with 23.2% and the region with the highest proportion was Upper West with 69.7%. Forty-two percent of children in rural households and 33.4% of urban children slept under an ITN the night preceding the survey. In R2 43.0% of children used an ITN while in R4 it was 38.4%.

The use (defined as having slept under a net the previous night) of any type of bed net by U5 in Ghana has increased about two folds during the period of 2003 to 2008; a period in which the Global Fund contributed significantly not only to the procurement of nets but to related distribution and awareness/education information interventions. This is in line with the trend noted by PMI nationwide household surveys completed from 2007-2010 for the region.
Use of Mosquito Nets by Women and Pregnant Women

According to the DHS 2008, 26% of all women and 32% of pregnant women slept under any net the night before the interview; 18% and 21%, respectively, slept under an ever-treated net, and 17% and 20%, respectively, slept under an ITN. Use of ITNs by pregnant women is higher in rural areas than urban areas (25% versus 13%). Use of an ITN is highest in Brong Ahafo (30%) and lowest in the Greater Accra region (7%). Education is inversely related to sleeping under a mosquito net. Similarly women in the highest wealth quintile are the least likely to have slept under an ever-treated net, or an ITN. This pattern is probably related to the fact that many women in wealthier households, those who are better educated, and women in urban areas live in houses with mosquito screening on the windows and doors, hence the redundancy of using a mosquito net.

According to the NMCP Malaria Survey (Table 7) 30.0% of pregnant women slept under an ITN the night before the study. Brong-Ahafo had the highest proportion (44.2%) whilst the lowest was in the Northern Region with 11.5%. More pregnant women in rural areas tended to sleep under an ITN (30.8%) than pregnant women in urban areas (27.9%). The higher the educational level of the pregnant woman the higher the proportion that slept under an ITN in contrast to the DHS 2008 findings. The corresponding proportions of women sleeping under and ITN the night before the survey were 31.7% (R2) and 28.5% (R4).

Over the time period of 2003 to 2008, corresponding to implementation of R2 and R4, the Global Fund has contributed significantly to the NMCP prevention programs contributing to the doubling of use of bednets by women/pregnant women and U5. Similar observations are reported by PMI and WMR annual reports during the period noting variations dependent upon the region. A lack of nets was the main reason for less than optimal rates of use by women/pregnant women and U5. The increased use of nets is evident when examining 2011 coverage yet there is long way to go before the goal of universal access to ITNs will be reached.

Table 7: Proportion of Pregnant Women who slept under ITN by Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Brong Ahafo</th>
<th>Upper West</th>
<th>Eastern</th>
<th>Upper East</th>
<th>Volta</th>
<th>Ashanti</th>
<th>Greater Accra</th>
<th>Central</th>
<th>Western</th>
<th>Northern</th>
<th>National</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slept under an ITN</td>
<td>19</td>
<td>17</td>
<td>61</td>
<td>46</td>
<td>28</td>
<td>16</td>
<td>61</td>
<td>29</td>
<td>27</td>
<td>27</td>
<td>331</td>
</tr>
<tr>
<td># of HH</td>
<td>43</td>
<td>39</td>
<td>158</td>
<td>133</td>
<td>82</td>
<td>48</td>
<td>188</td>
<td>92</td>
<td>87</td>
<td>235</td>
<td>1105</td>
</tr>
<tr>
<td>%</td>
<td>44%</td>
<td>44%</td>
<td>39%</td>
<td>35%</td>
<td>34%</td>
<td>33%</td>
<td>32%</td>
<td>32%</td>
<td>31%</td>
<td>11%</td>
<td>30%</td>
</tr>
</tbody>
</table>

Source: NMCP 2008 Survey

4.3 The Contribution of the NMCP in Reducing the Disease Burden

4.3.1 Number of Total Malaria Cases (Presumptive)

A majority of the malaria cases at OPD are classified as presumptive since only about 15% on average (increased to 23% in 2010) of those cases are confirmed either by microscopy or
rapid diagnostic tests. There is a clear indication that annual incidence has been maintained between 3.2 and 3.8 million cases over the past 10 years (see figure below).

**Figure 9: OPD Presumptive Malaria Cases from 2001 to 2010**

<table>
<thead>
<tr>
<th>Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
</table>

Source: NMCP AR 2010

**4.3.2 Key Malaria Burden Indicator Data**

The following graphs clearly demonstrate that over the past ten years there has been no trend in reduction of the malaria burden (graphs for children under five are similar in nature). Further, a slight increase over the past three years is indicated despite on-going prevention and treatment interventions implemented over a seven year period.

**Figure 10: Malaria Burden - Admissions & deaths (all causes and malaria)**
The slight increase in admissions and decrease in deaths related to malaria noted by the evaluation team is in keeping with malaria control programme annual reports (as can be seen in the above figure). According to the NMCP¹³, this is attributable to factors that influenced greater facility utilization such as the introduction of free Medicare for pregnant women, enrolment on the National Health Insurance Scheme, as well as improvement in access to health facilities in the country. The NMCP also stressed that these cases were predominantly, presumptively diagnosed and a number of febrile illnesses were being wrongly captured as malaria and hence unreliable. This observation reinforces the need to confirm all cases by laboratory tests through microscopy or RDTs.

Due to delays in training, the community based treatment programme has yet to start; this programme is expected to identify and treat 2.3 million cases per year which will close the treatment gap significantly.

Most interviewees expressed their concerns that since the general mortality rate was going down, malaria death rates as well as morbidity should also have declined. All of them recognised the weaknesses of the system where inferences on the malaria burden are still dependent on the unconfirmed malaria case detections and also the fact that there is a need for more stringent and quality control of data reporting and management of the health information system. Other weaknesses raised were the lack of data quality supervisions, problems in accessing RDTs due to prolonged stock outs, expiring test kits and undesirable clinician practice of treatment without seeking or relying on parasitological diagnosis often caused by lack of diagnostic means at most of the peripheral health centres.

The Case Fatality Rate (CFR) in fact shows more sensitivity toward the improved case management and treatment and general service quality of the hospitals. The lowering trend of CFR may indicate that the quality of the services offered may have improved over time (see Figure below).

---

Based on the analysis of trends in admissions and deaths in West African countries described in the WMR it is clear that while Ghana has achieved considerable success in reducing malaria mortality, malaria morbidity has in fact increased over the years (see figure below).

Figure 12: Trends in Changes in Malaria Admissions and Deaths in W. Africa (WMR)

The WMR also shows a relatively stationary trend in terms of admissions from 2000-2010, confirmed cases and deaths due to malaria morbidity with a slight increase over the last 3 years, as part of its profile on Ghana.

Figure 13: Confirmed Cases, Admissions and Deaths (per 100,000)
4.3.6 Analysis of Specific District Data

Only data for the past 3 years were available for analysis. The data on admissions and death rates for the U5 from the initial 20 intervention districts (R2) were analysed against 20 other districts (with comparable socio-economic conditions) for disease trends in an attempt to study the impact of the Global Fund interventions compared to a control scenario. The data is graphed in Figure 14 below. However, from 2005, the latter control districts were also included in the Global Fund R4.

The first two sets of graphs in Figure 14 depict admission and death curves of initial R2 supported 20 districts and 20 comparable districts from R4. The general observation is that there is a greater tendency for the increase in U5 admissions due to malaria during this period (14 in R2 and 15 in R4). Deaths due to malaria in U5 showed similar but more random changes over the same period since the numbers are not robust.

![Figure 14: Under 5 admissions and deaths due to malaria recorded in selected districts](image)

Note: figures above are from R2; Figures below are from R4

4.4 Compare the Mix of Interventions with the Health Needs of the Population

4.4.1 Evolution of Malaria Interventions in Ghana through Global Fund Grants

Tables 1 and 2 summarise the evolution of the malaria interventions in Ghana over successive Global Fund grants in line with the emerging health needs related to malaria. Key interventions promoted in the RBM Plan (starting in 2001) included the promotion of home-
based care, use of ITNs, improving case management in health facilities and use of appropriate chemoprophylaxis in pregnancy.

Prior to 2002, implementation of most of these interventions were limited mainly to the national level due to lack of funds and capacity to move to scale and some limited funds were mobilised to implement some of these interventions initially in 20 selected districts. The commencement of the Global Fund grants proved timely and under R2 Ghana was able to institutionalise the Anti-Malarial Drug Policy Review Process and extend selected key interventions such as: provision of IPT to 60% of Pregnant Women; increased usage of ITN in U5 (up to 55%) and pregnant women (up to 45%); and increased proportion of mothers/caretakers who respond appropriately to malaria within 24 hours of onset of disease (to 50%) to 20 additional districts using a community based approaches involving civil society, NGOs and relevant stakeholders.

The development of systems during R2 implementation helped set the stage for further scale up through the R4 grant\textsuperscript{14}. Thus the NMCP attempted to implement the new Anti-Malarial Drug Policy in all 110 districts, provide IPT to 70% of pregnant women in the remaining 90 districts, increase the usage of ITNs in U5 to 50% and increase the proportion of mothers/caretakers who are able to identify early symptoms and signs of uncomplicated and severe malaria and seek prompt treatment to 60%.

Successful implementation of both the R2 and R4 grants enabled the country to become one out of the two countries in Africa invited to submit a RCC proposal to the Global Fund in 2009\textsuperscript{15}. The fact that despite the successful implementation of the selected interventions through the R2 grant as well as other donor supported projects, malaria morbidity continued to remain unacceptably high has implied that these highly effective interventions are not getting to more than a small proportion of those who need them in the country. For example, according to the NMCP\textsuperscript{16}, the population covered with ACTs increased from 0% to only 20.5% in 2007 whilst the household ownership of ITNs rose from 3.2% to a mere 18.7% during the same year. Treatment of unconfirmed cases definitely increases the number of malaria cases reported by the public health sector but it is worth noting that malaria cases recorded by health service institutions account for only a small fraction of actual cases in the country. Although precise information on the overall malaria prevalence is lacking in Ghana, malaria studies carried out in the middle belt of Ghana report a high transmission of approximately 269 infective bites per person per year and a parasite prevalence of not less than 50% at all times in the year among children< 5 years\textsuperscript{17}

The aforementioned lack of reduction in morbidity and mortality and possible causes was addressed in the new National Malaria Control Strategic Plan (2008-2015)\textsuperscript{18} developed with an overall goal “to reduce malaria disease burden (morbidity and mortality) by 75% by the year 2015. To achieve this goal, the country has developed a number of comprehensive and integrated strategies. The primary interventions under the strategies include provision of early diagnosis, prompt and effective treatment of malaria using ACTs; scaling-up vector control measures with considerable emphasis on universal LLIN coverage, targeted IRS application in selected areas; and IPT for pregnant women.

While some of the strategic interventions advocated under the new NMSP were incorporated into the RCC grant, others were included in the R8 proposal. The main gaps with ITNs have been identified as:

- low coverage targeting only pregnant women and U5 as primary beneficiaries;

\textsuperscript{14}Ghana: Round 4 Proposal submitted to GFATM
\textsuperscript{16}The Global Fund: Round 4 RCC Funding Application submitted to GFATM, Ghana; 2008
\textsuperscript{17}Owusu-Agyei S et al: Epidemiology of malaria in the forest-savannah transitional zone of Ghana. Malar J 2009, 8:220.
• excluding vulnerable groups to malaria interventions which can be improved by moving towards universal coverage of the entire population; and
• poor re-treatment rates- which can be resolved by providing LLINs.

Universal coverage of the entire country’s population with LLINs has therefore been included as a key RCC intervention. Until recently, most malaria diagnoses in health facilities have been presumptive. This has created a distorted picture of the actual burden of malaria. The programme under the RCC proposal aims at scaling up the use of RDTs nationwide in health facilities to improve differential diagnosis and hence provide more dependable information on actual disease burden.

To address the problem of physical and financial access, and to ensure prompt and effective treatment, the National Malaria Control Strategy has been revised to incorporate community based malaria case management targeting children under five living in rural areas. The R8 proposal envisaged the scaling up of home based care in 123 rural districts to ensure that parents and caretakers recognise symptoms and signs of malaria and respond appropriately and promptly by seeking treatment from trained Community Drug Distributors.

Ghana’s National Malaria Control Strategic Plan calls for a scale up of IRS to one third of its 170 districts nationwide by 2015. Although IRS has been one of the malaria control strategies, the NMCP had not implemented IRS in the country. To date, the major programmes are those supported by AngloGold Ashanti (AGA) in one southern district and PMI in nine northern districts. Results from Obuasi mining community covering a single district since 2005 have shown the unmatched impact of IRS in Ghana (>74% reduction in malaria cases following two years of operation) Globally, IRS is currently recommended for areas of holo-endemic malaria and a majority of the districts in Ghana and particularly rural communities where the malaria burden is high with poor or limited access to health care services would benefit from IRS. Lack of IRS in the NMCP is considered a major weakness that ought to be addressed if major outcomes are to be realised. The second major intervention proposed under the R8 grant is the scaling up of IRS in 40 districts with the highest malaria burden. Starting in January 2012, AGA will begin implementing the five-year R8 grant to scale up IRS to as many as 40 new districts. The IRS districts were selected based on the greatest malaria case fatality and pronounced seasonal peaks of malaria transmission. These areas are also marked by high poverty and high child mortality coupled with poor health services. Due to the endophillic and endophagic characteristics of the predominant vector in these areas, it is substantially vulnerable to the proposed intervention is therefore adequate.

Identification and Estimation of Needs
The LLIN needs in Ghana are aimed at universal coverage and this goal is expected to be achieved by mid-2012. The majority of the LLINs will be used to complete the universal coverage targets and the remainder will be distributed to the new cohort of pregnant women and infants estimated at 4% of the population and to begin the process of replacing worn out nets. In calculating the net gap for Ghana, the information above and information on population growth and number of nets per person were entered into the PMI LLIN need/gap calculator. A surplus of approximately 660,000 LLINs is anticipated for 2013 to provide a buffer for variations in population growth and to maintain stock requirements at the regional, district, and facility levels to fill routine distribution requirements. Over the course of 2012, Ghana will be rebuilding its LLIN routine distribution mechanisms. However, maintaining a surplus is important because of the practicalities of implementing LLIN replacements. For example, differentiating among the population that owns a viable net and the population that needs a replacement net is a challenge and will likely lead to trade-offs resulting in a high percentage of people owning unviable nets. Ghana expects to contribute to the international

20ibid
body of knowledge for determining net replacement needs and processes in high net ownership communities as the country works through these issues.

Table 8: Bed net need/gap calculator based on # of persons protected

<table>
<thead>
<tr>
<th>Criteria of using nets per person</th>
<th>Country data</th>
</tr>
</thead>
<tbody>
<tr>
<td>At-Risk Population 2010</td>
<td>24,223,431</td>
</tr>
<tr>
<td>Expected annual population growth</td>
<td>2.86%</td>
</tr>
<tr>
<td>Average number of persons per net</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Distributed LLINs

| Distributed LLINs in 2010         | 1,087,525    |
| Distributed LLINs in 2011 as of October 2011 | 1,863,500 |
| Additional pledged to be distributed in 2011 and 2012 | 11,004,135 |

Pledged LLINs

| Pledged LLINs in 2012 for distribution in 2013 | 1,350,000 |
| Pledged LLINs in 2013                           | 0        |
| Pledged LLINs in 2014                           | 0        |

Calculations for 2013

| Population at risk in 2013 | 26,361,809 |
| Total number of LLINs needed| 14,645,450 |
| Nets distributed plus pledged| 15,305,160 |
| LLIN gap or (surplus)       | (659,710)  |

4.4.3 Persisting Gaps and Emerging Needs

Although the Global Fund grants have together with other donor funding helped Ghana to make significant progress, there are still some gaps (listed below) which will need to be addressed through future funding proposals including to the Global Fund:

- Inadequate resources to support ITN procurement and distribution towards achieving the universal coverage. The NMCP needs to fill a gap of over 6 million LLINs in order to reach the target for universal coverage. Current problems include ITN stock-outs, a lack of secure storage at the sub-district level, logistical problems in traversing Ghana’s terrain, prohibitive costs, and cultural and social barriers to increased net use.

- Bridging the wide gap (approximately 20%) between ITN ownership and usage. Further, the longevity of ITNs is undermined by poor net maintenance practices, such as washing too often with harsh detergents and hanging to dry in direct sunlight.

- Scaling up and sustaining other preventive interventions including IRS, larviciding, space spraying and environmental management.

- Inadequate human, technical, and financial resources are contributing to less than full coverage of IPT.

- Exclusion of IPT in children (IPTc) and infants (IPTi): all infants at risk of P. falciparum infection in countries in sub-Saharan Africa with moderate to high malaria transmission should receive three doses of SP along with the DTP2, DTP3 and measles immunisation through the routine immunisation programme.

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High rate of presumptively diagnosed malaria in health facilities. Currently fewer than 14% of all malaria diagnoses in Ghanaian health facilities are based on laboratory examination, and the quality of those diagnoses is unknown\(^\text{28}\).

Inadequate functional microscopes and skilled laboratory personnel to manage the anticipated increase in laboratory test requests and ensuring an uninterrupted supply of RDTs to all health facilities without microscopy\(^\text{28}\).

Access to WHO pre-qualified quality ACTs, especially in the private sector. A survey carried out as a part of a large-scale INDEPTH Effectiveness and Safety Studies (INESS) project carried out between 2009 and June 2010 in Ghana revealed that mono-therapies such as chloroquine and sulfadoxine-pyrimethamine (SP), which have lost their efficacy against malaria, are still being used to treat the disease in health facilities including public hospitals despite a shift in treatment policy\(^\text{30}\).

It is expected that when the AMFm pilot ends in 2012, gaps in support for malaria management in the private sector will reappear. The need for private-sector capacity building will continue to be high in Ghana, whose economy continues to expand at one of Africa’s fastest rates, and where over 50% of medical care is delivered in the burgeoning private sector\(^\text{31}\).

Un-sustained Behavioural Change Communication to positively affect people’s perception, attitude and practices regarding malaria\(^\text{32}\).

Improving the quality of data management at all levels\(^\text{33}\).

Inherent bottlenecks in the health care delivery system that militate against effective malaria control which include poor access to quality basic health services, lack of health infrastructure and equipment for emergency management of the sick, limited human resource capacity worsened by exodus of key technical staff in the formal sector, inadequate harnessing of potential of other human resources, large funding gaps for massive investment required to achieve the MDGs and weak management capacity including poorly developed HMIS and M&E systems\(^\text{34}\).

Need to establish at least an additional three to four sites for routine insecticide resistance monitoring across ecologic zones, in order to approach international standards\(^\text{35}\).

The biggest gap is for RDTs because the use of ACTs for presumptive treatment has gone up without simultaneous efforts to achieve universal parasitological diagnosis.

### 4.5 Has There Been an Increase in Access to ACTs, Reducing the use of Inappropriate Medicines for Malaria, Due to the AMFm Initiative in Ghana?

#### 4.5.1 Availability and Stock Position of AMFm ACTs

**Current Status**

The first co-paid ACTs were delivered in August 2010. To date, approximately 16,481,262 treatment courses have been received in country as against 25,778,782 ordered. Due to long public sector procurement processes particularly because of the lack of a baseline quantification of ACTs, until the end of September 2011, the CMS had no stocks of the AMFm ACTs although the first private sector stocks had arrived more than a year earlier. As a result, the 10 Regional Medical Stores (RMS) and public health facilities had to procure co-paid ACTs from private sector FLBs. It was only in August 2011 that the public sector could place their first order of AMFm ACTs which was delivered just 2 months later to the CMS.

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\(28\) DFID. *Malaria: Country Profiles*. Version 1.1 with updated maps: 31 August 2011

\(29\) ibid

\(30\) [http://www.ammren.org/content/stakeholders-ghana-worried-over-presumptive-malaria-diagnosis](http://www.ammren.org/content/stakeholders-ghana-worried-over-presumptive-malaria-diagnosis)


\(32\) DFID. *Malaria: Country Profiles*. Version 1.1 with updated maps: 31 August 2011

\(33\) ibid

\(34\) ibid

Unavailability (ordered but not received) of supplies from AMFm manufacturers has been noted with just over half of the treatments ordered being received. According to the March-April 2011 Pharmacy Council monitoring report, 56% of the 808 chemists that were surveyed had AMFm co-paid ACTs in stock. AMFm medicines were found in the private sector, but not in every formal and informal outlet visited by the Health Action International (HAI) price-tracking survey team in June 2011. More AMFm medicines were found in formal outlets than in informal outlets.\(^{36}\) Overall availability of ACTs increased due to increased number of treatment doses in the country. This was also reaffirmed by a wide range of stakeholders during interviews/through filled-in questionnaires. However, some of the district and regional health officials expressed the concern that sometimes the appropriate ACT combinations are not available in the market. The LFA was also concerned that availability was a problem at some facilities and communities.

Considering the uneven distribution of the availability of co-paid ACTs, in particular the low availability in several rural and poorest areas, the AMFm Coordinating Committee in Ghana should identify and institute appropriate interventions such as focusing on training the practitioners in such areas, stepping up publicity and community awareness for AMFm in such areas, prioritizing marketing efforts focused on consumers/patients and insisting that consumers demand ‘ACTs with the green leaf logo’.

4.5.2 Price of AMFm ACTs

The Ghana Health Service AMFm Update summarised the current pricing of AMFm ACTs in the country as follows.\(^{37}\)

- Ghana’s suggested maximum price of Ghanaian New CEDI (GHS) 1.50 seems to be influencing retail prices of AMFm ACTs. The Pharmacy Council (PC) March-April 2011 report indicated a price range of GHS 0.80 – 5.00 for the adult dose and an average adult dose price of GHS 1.76. The modal price was GHS 1.50 in line with the suggested maximum price. However, there were a few outliers who were selling the co-paid ACTs at GHS 5.00. Price hikes may have resulted from most of the distributors from whom the retailers bought the ACTs not sourcing their drugs from the right channels, which consequently caused an increase in the prices.

- Since Ghana still has a high suggested price compared to other implementing countries, a letter has subsequently been sent to the Chief Director of the Ministry of Finance and Economic Planning (MOFEP) outlining how the charging of duties on Free on Board (FOB) rather than Cost, Insurance, Freight (CIF) could help to bring down the prices of AMFm ACTs. The MOFEP response is still to come at the time of this evaluation.

- A meeting was held on the 24\(^{th}\) August 2011 between the NMCP/AMFm, FLBs and some AMFm CC members in order to explore the ways of bringing prices down. A consensus was reached that it will be best to allow the market forces to bring down the prices of the AMFm ACTs.

Median prices of AMFm ACTs were higher in informal outlets in Ghana when compared to the formal ones.\(^{38}\) However, Chloroquine tablets and generic SP were found to be sold at lower prices during the price-tracking survey carried out in June 2011. Since the FLBs have stated that the profits from the non-AMFm ACTs are twenty times more than from the AMFm ACTS, there should be no haste in bringing down the current prices of ACTs as supply/availability continues to be major challenge. Market forces may be allowed to determine the prices. If 50% of the required ACTs are to be manufactured locally, this would only increase availability but also reduce price, enhance local industry capacity and foster sustainability. Most stakeholders have appreciated the AMFm initiative for bringing down the current price of ACTs from GHS 5.00 to GHS 1.50. However, USAID have cautioned that

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\(^{36}\) Health Action International: Retail prices of ACTs co-paid by the AMFm and other antimalarial medicines in Ghana, Kenya, Nigeria and Tanzania. Report of price-tracking surveys, June 2011

\(^{37}\) Ghana Health Service (2011): CC Members’ AMFm Update July-Sep 2011

\(^{38}\) Health Action International: ibid
there appears to be a perception among some consumers that “if it's cheap, then it's not quality” and hence suggested that the programme increase the budget to publicise the benefits including the quality of AMFm ACTs.

4.5.3 Accessibility of AMFm ACTs

According to BAL\textsuperscript{39}, the AMFm objective to increase ACT use in the country has been met since the demand has increased by 24\% upon the arrival of affordable AMFm Quality Assurance ACTs. Seventy four percent of the national population (18.02m) are registered under the National Health Insurance Scheme, however as of December 2010, only 45\% (8.15m) of the registered population were active members. Through the National Health Insurance Scheme 34\% of the population have access to AMFm ACTs under the NHIS approved drug list. Currently 66\% of the Ghanaian population access AMFm ACTs through a "cash-and-carry" payment system (i.e. patients pay for treatments out of pocket or through private insurance and are not covered by NHIS). Prior to May 2011, this “cash-and-carry” population had to pay a minimum of GHS 5.00 for ACTs. Subsequent decrease in the price of ACTs to GHS 1.50 for AMFm ACTs has resulted in increased access to the “cash-and-carry” population, hence a higher demand and supply for ACTs. This is evident by the order of the FLBs of 26.27m treatment courses as of September 2011. FLBs in Ghana had received 16.48m between August 2010 and September 2011. Of the 16.48m received through September 2011, 50\% has been sold to the public sector through RMS and public health facilities. This public sector procurement is double its historic annual anti-malarial treatments procurement.

4.5.4 Use of AMFm ACTs

\textbf{Table 9: Proportion of Confirmed Malaria Cases and ACTs Reported by the Public Sector}

<table>
<thead>
<tr>
<th>Period</th>
<th># of presumptively diagnosed malaria cases</th>
<th># and % treated with ACTs</th>
<th># and % of confirmed cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct 2009-Mar 2010</td>
<td>1,976,808</td>
<td>1,605,318 (81%)</td>
<td>576,807 (29%)</td>
</tr>
<tr>
<td>Oct 2010-Mar 2011</td>
<td>2,579,290</td>
<td>1,756,115 (68%)</td>
<td>1,277,737 (50%)</td>
</tr>
</tbody>
</table>

When data obtained from the PUDRs for the two comparable periods of October-March 2010/11 is analysed (see table above), it is observed that while there has been a slight increase in the absolute number of ACTs used, the proportion of the presumptively diagnosed malaria cases treated with ACTs has in fact been reduced from 81\% to 68\%. At the same time, it is noted that the proportion of confirmed cases has gone up from 29\% to 50\%. If this data is extrapolated for the entire year (October 2010 to September 2011 - since the report for April-Sept 2011 is not yet available), it may be presumed that around 3.6 million ACT treatments may have been provided through the public health facilities as against more than 8 million AMFm ACTs procured by RMS and public health facilities in addition to the huge stocks of non-AMFm ACTs held by CMS.

It is clear that only part of the ACT stock ordered, obtained and stocked by the public sector was actually used during AMFm implementation to date. This indicates that no comprehensive quantification or absorption analysis was carried out prior to the commencement of the AMFm initiative in the country. What is also of concern is that there continues to be a lower acceptance and use of RDT results by the prescribers (even in the public sector), thus suspected cases which have been proven (through the use of RDT) not to be malaria are still treated as malaria, although there’s a considerable improvement over the previous year. In the survey carried out by Africa Fighting Malaria in Accra, all drugs in all pharmacies were available without a prescription and were purchased without a RDT result\textsuperscript{40}.

\textsuperscript{39}Boulders Advisors Limited (2011): Market Analyses of Public and Private Sector Capacities to expand access to subsidised ACTs. Executive Summary. October 2011

\textsuperscript{40}Africa Fighting Malaria. The Global Fund’s Malaria Medicine Subsidy: A nice idea with nasty implications”. AFM Policy Paper- September 2011.
It may be pointed out that several health experts have urged the Global Fund to finance RDT to complement AMFm activities and prevent drug resistance to ACTs.\(^{41}\)

It should be noted that the WHO directive to diagnose before treatment may lead to delays in providing care to those who need it, especially in remote and deprived areas where there are no laboratories and/or unavailability or limited supplies of RDTs. Hence there is a need for the expansion in the use of RDTs by licensed chemical sellers and pharmacies and to provide training for their proper use.

The consultants feel it is premature to do a proper analysis on whether or not AMFm has increased access as this would require well designed consumption studies. In the absence of comprehensive and reliable consumption data, the consultants hope that the Global Fund commissioned independent evaluation that is currently underway will provide more concrete information on changes in availability, affordability, market share and use of ACTs through the AMFm. Reports from the private sector obtained in the near future will also facilitate in understanding the impact of AMFm on ACT demand.

**4.5.5 Use of Inappropriate Medicines for Malaria**

The following points illustrate the continued availability, sale and use of inappropriate, substandard and even counterfeit antimalarial drugs in Ghana.

- 65% of the facilities monitored by the Pharmacy Council between March to May 2011 were still selling mono-therapies such as chloroquine, artesunate, artemether, dihydroartemisinin and sulfadoxine-pyrimethamine (SP)\(^ {42}\)

- By May 2011, a Pharmacy Council study found the average sale price was around the recommended level of GHS1.50, but availability was low in rural regions and mono-therapies continued to be widely sold. Curiously, the low cost ACTs have been met with suspicion by sectors of the population. Whether this pilot programme can achieve its objective of driving out mono-therapies through market forces remains to be seen.\(^ {43}\)

- During the small-scale Africa Fighting Malaria Survey in Ghana,\(^ {44}\) two courses of oral Artemisinin mono-therapy were procured in Accra, one at GHS5.26 and the other at GHS1.97.

- Even more challenging is how to get people to stop patronising mono-therapies. Though there is a policy on anti-malaria drugs the ban on the importation of mono-therapies are not being enforced and patronage is equally high.\(^ {45}\)

- Some Chinese companies are being blamed for importing fake anti-malaria drugs into Ghana. On June 19, Ghana’s FDB issued a statement to warn the public against the sale of counterfeit Artesunate tablets on the market which laboratory analysis had confirmed contained no active anti-malaria ingredient. ”The counterfeit Artesunate tablet with batch number 080504 had the manufacturers address as Guilin Pharmaceutical Co limited, China," said the FDB statement.\(^ {46}\)

Several of the stakeholders contacted by the consultants including USAID expressed concern that AMFm has not pushed out mono-therapy. Dispensing of non-AMFm ACTs in parallel with AMFm ACTs at both public and private service delivery points has been highlighted by some of the stakeholders. There is a need to rapidly and aggressively scale up the training of licensed chemical sellers to follow appropriate treatment. Considering the wide availability of mono-therapies, the Ghana Health Services should in collaboration with

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\(^{42}\) Ghana Health Service (2011); CC Members’ AMFm Update July-Sept 2011


[http://trial.eyesonmalaria.org/content/keeping-vision-alive-ghanas-malaria-control-programme](http://trial.eyesonmalaria.org/content/keeping-vision-alive-ghanas-malaria-control-programme)

the Pharmacy Council, the Food & Drugs Board and Customs institute regulatory measures to stop the distribution and sale of these mono-therapies.

Background for the following sections (4.5.5 – 4.5.8) can be found in Annex 5

4.5.6 Supporting Interventions
The Coordinating Committee for AMFm Update (July-Sep 2011) summarised the wide range of supporting interventions conducted since the inception of the initiative in Ghana (see Annex 5 for a full range of activities). These supporting interventions cover training for the private and public sector on general principles of the AMFm, pharmacovigilance, etc. Marketing and publicity campaigns including a docudrama, print advertisement, regional launches, and others have been undertaken in addition to efforts to improve M&E. In addition first-line buyers have been distributing information posters with drug supplies in order to reduce the risk of drugs being distributed without public relations material. The consultants would recommend replication of this best practice in other AMFm countries.

4.5.7 Challenges and Constraints
A market analysis conducted by BAL summarised challenges and constraints faced by the Public Sector as well as the Private Sector. The challenges, which are numerous and wide ranging, focused on procurement/supply issues, distribution and storage/stock management.

Some of the challenges for the public sector range from: a lack of technology to lack of trained personnel (procurement/supply); long distances and poor conditions of vehicles (distribution); to storage capacity constraints and lack of storage systems control (storage and stock management).

Within the private sector constraints include but are not limited to: improper phasing out of existing AMFm ACTs with FLB, poor quantification, delayed tendering (procurement and downstream supply); poor roads (distribution); and lack of wholesale outlets in certain regions, cost of constructing storage facilities, and lack of sustainable AMFm ACTs resulting in redundant warehousing.

A main risk observed with the AMFm is overtreatment and potential drug resistance brought about by presumptive treatment of malaria in the absence of RDTs and microscopy. Also of major concern is the slow roll out of RDTs for which decisions regarding the long term parallel improvements needed in diagnosis for the roll out of ACTs was not given adequate attention during the AMFm proposal development process. The proposal lacked the diagnostic aspects and long term considerations/implications of increasing ACTs. An opportunity cost of funds has arisen since the Global Fund has refused orders placed with qualified manufacturers. Sustainability of the AMFm is definitely a major concern particularly because the local manufacturers have been made redundant.

4.6 What are the Key Drivers of the Trends in (Malaria) Disease Burden?

4.6.1 Trends in Disease Burden (Malaria)
An apparent stationary trend in the disease burden has been observed in Ghana over the period 2002 to 2010 based on the information available from the country’s health system. This necessitates a thorough analysis of the elements of the control programme as well as the contextual elements including the risk factors.
4.6.2 **Drivers of Disease Burden**

In Ghana, two types of major forces influencing the disease transmission pattern and the trend in disease burden include:

- Natural drivers or environmental elements such as rainfall, temperature and type of terrain. Biological forces such as vector prevalence and densities are closely related to the environmental factors. These natural elements usually determine the disease prevalence and burden in a given area and tend to harmonise with normal annual and other biological cycles; and
- Preventive and mitigating actions taken by the control programme aiming toward reduction of the burden and that of population actions such as migration, irrigation and agricultural practices, socio-behavioural factors etc.

The Ghana NMCP carries out a comprehensive programme encompassing all the appropriate malaria control elements (prevention and treatment, public awareness interpolations) with support from the Global Fund and partners. Any lack or reduction of these interventions would results in increased contribution of natural drivers to the disease burden.

*Health System Structures, Management, Delivery, Planning*

Despite the strain of rapid large scale ramping up of malaria interventions, Ghana shows an overall systems capacity of the health delivery system. The Ghana NMCP reports from 2004 to 2010 testify to the gradual but definite improvements undergone by the system where one can observe an increased coverage and efficiency. Conceptually, all such improvements are actually working against any increase of disease but there is also a tendency to see a preliminary increasing trend with such expansion of services. This increase in the absolute disease burden estimates arises as new cases are detected and entered in the records of the programmes. Certainly this fact occurs in the case of Ghana as exemplified by the increases observed in treated malaria cases at public health facilities in recent years.

4.7 **To What Extent are Malaria Programme Strategies Implemented as They Were Designed in Proposals Submitted to the Global Fund?**

4.7.1 **Original Proposals vs. Programme Grant Agreements (PGA)**

A comparison of the original proposals submitted by Ghana to the Global Fund for R2, R4, RCC, R8 and AMFm with the subsequent Programme Implementation Abstracts attached to the respective PGAs revealed no major discrepancies between the approved proposals and the respective grant agreements. Similarly a detailed review of the annual work plans and budgets revealed that almost all the activities included were in line with the programme strategies proposed to be implemented in the successive Global Fund grant proposals. The plans were found to be comprehensive and detailed with well aligned objectives, Service Delivery Areas (SDA) and activities. As the Global Fund Secretariat pointed out, “the PR implements the national strategy of malaria control developed in collaboration with WHO and RBM. All partners adhere to this strategy.”

While the R2 Grant PUDRs indicated that most of the activities were carried out as planned, the R4 RCC PUDRs have shown how delays have become a common denominator of grant implementation for a number of reasons. Although broad programme strategies were not changed, operational strategies were modified from time to time in order to ensure that the interventions were more accessible and effective. For example, the R4 RCC PUDR recorded that the redeeming of the ITN voucher scheme for pregnant women was terminated because of the move towards universal coverage of ITNs and subsequent free distribution.

Annual Reports also documented changes made in regard to the operational strategies. Thus the Annual Report for 2010 described the analysis conducted before the introduction of an innovative strategy for the promotion of the use of LLINs.
The Global Fund on its part made sure that the proposed strategies and interventions would be implemented by incorporating these in the form of conditions precedent (CP) and special terms and conditions (STC). The Global Fund’s Grant Performance Reports not only documented the extent to which the malaria programme strategies were implemented as designed in the original proposals but also raised the potential need for reprogramming the grant based on a number of arguments including the results from a few key indicators. The Grant Score Cards have clearly and comprehensively captured the country and programme context while evaluating the periodical progress and played a key role in facilitating the progression of the different grants into their respective latter phases.

4.8 To What Extent are Past and Future Interventions Relevant to the Disease Epidemic in the Country?

4.8.1 Package of Interventions Required for Reducing the Disease Burden.

The WHO Global Malaria Programme has summarised the key malaria interventions\(^{49}\) as shown in the following figure.

**Figure 15: Key antimalarial interventions & strategies in 2010**

4.8.2 Relevance of Ghana’s Antimalarial Interventions

Ghana has recognised that malaria cannot be controlled by the health sector alone, nor can a single intervention help achieve results. In view of this, a multi-interventional strategy has been developed to address malaria. Ghana has been attempting to ensure that a comprehensive package of interventions is progressively implemented nationwide for impact. Interventions for prevention include LLINs, IRS using an integrated vector management approach and IPT of malaria in pregnancy. Interventions for case management are parasitological diagnosis and effective treatment. Quality control and assurance systems for microscopy and RDTs are also being ensured. Based on Ghana’s current epidemiological situation, experts’ recommendations and international best practices, it would be fair to suggest that Ghana has chosen the most appropriate and comprehensive package of interventions (see table below) which if implemented fully (universal coverage) will pave the way for significant morbidity and mortality reductions in line with the strategic goals set for the country.

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### Table 10: Main Interventions & Delivery Strategies

<table>
<thead>
<tr>
<th>MAIN INTERVENTIONS</th>
<th>KEY DELIVERY STRATEGIES IN GHANA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prevention</strong></td>
<td></td>
</tr>
<tr>
<td>LLIN</td>
<td>Door to Door Distribution and Hang Up Mass Campaigns followed by covering the new cohort of pregnant women, replacing worn out LLINs, and maintaining keep-up through routine systems (e.g. ANC and child welfare clinics, school and NGO based distribution, social marketing, etc.)</td>
</tr>
<tr>
<td>IRS (per round)</td>
<td>One round per year through a private sector organisation. The key operations comprise of Entomological monitoring, spray operations, data collection, environmental assessment and compliance monitoring, BCC activities including community mobilization, and logistics support.</td>
</tr>
<tr>
<td>IPT</td>
<td>Pregnant mothers during antenatal visits. Increase healthcare worker administration of all three IPT doses through supportive supervision, onsite training, and quality improvement.</td>
</tr>
<tr>
<td><strong>Diagnosis</strong></td>
<td></td>
</tr>
<tr>
<td>Microscopy</td>
<td>Scale up through MOH facilities, private hospitals and clinics</td>
</tr>
<tr>
<td>RDT</td>
<td>Scale up RDT use in peripheral settings, notably private pharmacies, licensed chemical seller (LCS) shops, and potentially among volunteer community-based agents (CBAs) in settings of supervised home-based care programs</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td></td>
</tr>
<tr>
<td>ACT</td>
<td>Health Facility based; Home-based care</td>
</tr>
<tr>
<td>Case management of severe malaria</td>
<td>Hospital-based</td>
</tr>
<tr>
<td><strong>Supportive interventions</strong></td>
<td>Electronic media; Print media; Advocacy</td>
</tr>
<tr>
<td>BCC</td>
<td></td>
</tr>
<tr>
<td>Training</td>
<td>Health Staff; Community Drug Distributors</td>
</tr>
<tr>
<td>PSM</td>
<td>Forecasting; Procurement; Supply Chain Management</td>
</tr>
<tr>
<td>M&amp;E</td>
<td>Routine HMIS; Surveys</td>
</tr>
<tr>
<td>Surveillance</td>
<td>Routine Disease Surveillance; Drug Resistance Surveillance; Pharmacovigilance; Insecticide Resistance Surveillance</td>
</tr>
</tbody>
</table>

| Operational Research | Therapeutic efficacy studies; Entomological research; Anthropological an social research; Epidemiological research; Piloting of public-private partnership initiatives |

### 4.8.3 Delivery Strategies for ITNs

Among the proven interventions being implemented is the promotion of ownership and use of ITNs. Until recently the strategy for net distribution was mainly through static point delivery at health facilities and occasional mass distribution through health campaigns. Based on ITN usage presented earlier in this report there is a clear gap between ITN ownership and usage. The various surveys revealed that ownership did not translate to use for various reasons, including difficulty in hanging them over the sleeping places. The programme therefore decided to take a bold decision during the year to stop the routine distribution of ITNs and as a mitigating measure, modify the distribution strategy and adopted a campaign style innovative approach dubbed “Door-to-Door Distribution and Hang Up.” With the support of other partners and stakeholders, this innovative approach was initially implemented in the Northern Region targeting households with U5 and pregnant women. An evaluation conducted six months afterwards showed a dramatic increase in net ownership and usage among the target population.

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4.8.4 Potential for Inclusion of Future Interventions

Ghana is still in the Control phase of the Global Strategy advocated under GMAP and is likely to remain in this phase for several years more despite the political will in favour of malaria elimination currently prevailing in the country. Enthused by the initial results obtained from bio-larviciding efforts made in Ghana, the Economic Community of West African States (ECOWAS) drafted its Strategic Plan for Malaria elimination in the region by 2015\(^51\).

However, it may be cautioned that malaria elimination would require universal coverage with potent tools and stronger health systems but also unprecedented leadership, efforts and resources from government, partners as well as elimination communities themselves. As WHO officials have stated there is also the need for accelerated implementation of high impact interventions towards sustained control before re-orienting programmes based on robust surveillance\(^52\).

Two potential interventions that Ghana is planning to launch in the future include bio-larvicide and a malaria vaccine.

4.8.5 Selection of Future Intervention Strategies

Selecting malaria intervention strategies is a complex problem, but one that is highly motivated by the burden of the disease on economic development and human morbidity and mortality. Conventionally a bottom-up approach has been popular in addressing the problem. Such an approach concentrates on a single sub-problem in great detail, such as modelling the economic burden of malaria, or studying the cost-effectiveness of a single intervention such as ITNs or IRS. It is recommended that a top-down approach, by combining the sub-problems into a single large-scale geographic optimisation for selecting malaria interventions as advocated by Dimitrov NB et al (2011)\(^53\) be adopted by Ghana. At a high level, the optimisation uses: 1) data on available intervention strategies; 2) ecological and demographic data; and 3) an intervention budget constraint. As output, the optimisation delivers the location of the supply distribution and a geographic plan of intervention delivery that minimises the disease’s impact, subject to the budget constraint. The optimisation can be used to construct an efficient frontier, depicting the achievable morbidity or mortality at each budget value.

4.9 Financing Trends under the NMCP by Key Funding Sources

Malaria control activities in Ghana are primarily financed within the framework of priority diseases addressed through the integrated service delivery at district level. The main sources of funding for prevention and treatment of malaria are GoG, Development Partners (DPs) and IGFs (in the form of out-of-pocket payment or reimbursement from NHIS). Other sources may include the private sector and local NGOs. The GoG funding for service delivery to end-user flows in the form of earmarked funding for malaria interventions through the NMCP/GHS and through the regional and district health services. In addition, the district assemblies are (since 2004) supposed to allocate (according to an Act of Parliament) 1\% of their District Assembly Common Fund allocation for malaria interventions. GoG has also waived all taxes on imported bed nets.

However, the majority of GoG funding related to malaria is imposed by the heavy burden of malaria cases on health facilities especially with regard to the provision of preventive and treatment services at primary health care level. Consequently, considerable amounts of un-earmarked funding goes into malaria treatment in the form of staff time and other recurrent expenditures that are part of normal operations at service delivery level and to a large extent are directly related to the number of malaria cases that need treatment. Health education


\(^{52}\)ibid

with a focus on malaria, and environmental health activities also take place at the district and facility level and are likely to be related to the perceived size of the malaria burden.

The implementation of the NMCP activities has been heavily supported by a multitude of DPs including WHO, the Global Fund, UNICEF, DFID, USAID, JICA and international NGOs such as American Red Cross and Rotary International, either through Sector Budget Support (SBS)/basket funding or through earmarked/project funding for malaria interventions. The latter also include in-kind donations that are not valued and accounted, i.e. Exxon Mobile donated 60,000 bed nets in 2004.

The budget earmarked for malaria control has increased from almost nothing before 2005 to around $110 million annually in 2007-2009, see figure below. This reflects a general international trend with a dramatic increase in funding for malaria control over the past ten years as development assistance in health for malaria took off slowly following the Abuja Declaration in 2001 but was accelerated around 2007.54 The increase in funding for malaria was basically driven by the Roll Back Malaria Initiative. The Global Fund followed with funding under R2 in 2002 and the World Bank introduced its Malaria Control Booster Programme in 2005 while the Nutrition and Malaria Programme started in 2007 and PMI was established in 2005 on a relatively small scale during the first year55.

**Figure 16: Budget earmarked for malaria by source, 2002-2009**

![Budget earmarked for malaria by source, 2002-2009](image)

*Source: Reported by NMCP for the WMR 2006-2010*

The increase in the total budget earmarked for malaria is reflected in the per capita budget, which was negligible until it started increasing in 2005, reaching almost $5 per capita in 2007 and stabilising thereafter, see Table 11.

From being the sole vertical funder of malaria during the period from 2003-2005, the Global Fund in 2009 provided 45% of the budget earmarked for malaria, see table below, thus reflecting that more partners have joined in a collective effort towards malaria control in Ghana. The GoG has increased its funding earmarked for malaria control despite the rapid increase in total malaria specific allocations; the GoG also increased its relative contribution to 8% in 200956. GoG’s ability to do so is partly a result of increased DP allocations to the GoG budget through SBS and Multi-Donor Budget Support (MDBS; general budget support). The PMI funding in terms of value of support for direct malaria interventions is probably an overestimate as it includes the total expenditures and not just commodity support. Using only the commodity support would on the other hand result in under-estimation.

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56It is not clear whether the GoG funding recorded includes the procurement of ITNs and ACT using sector budget support. It should in principle be included as the SBS is supposed to be merged with GoG funds. However, for example the Annual Programme of Work 2009 specifies that the sources of funding for procurement of ITNs and ACTs are SBS and project funding and that these two are almost of equal size.
Table 11: Trend indicators for the budget earmarked for malaria, 2002-2010

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per capita budget (USD)</td>
<td>0.00</td>
<td>0.04</td>
<td>0.10</td>
<td>0.71</td>
<td>1.50</td>
<td>4.96</td>
<td>4.48</td>
<td>4.57</td>
</tr>
<tr>
<td>Total budget earmarked for malaria</td>
<td>0.00</td>
<td>0.89</td>
<td>2.03</td>
<td>15.37</td>
<td>33.17</td>
<td>112.57</td>
<td>104.18</td>
<td>108.82</td>
</tr>
<tr>
<td>Of which MOH</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.73</td>
<td>2.98</td>
<td>3.24</td>
<td>8.70</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DPs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.00</td>
<td>0.89</td>
<td>2.03</td>
<td>15.37</td>
<td>31.44</td>
<td>109.59</td>
<td>100.94</td>
<td>100.12</td>
</tr>
<tr>
<td>% GoG contribution of total direct funding for malaria</td>
<td>.</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>5.2</td>
<td>2.6</td>
<td>3.1</td>
<td>8.0</td>
</tr>
<tr>
<td>% direct funding for malaria out of total MoH budget</td>
<td>.</td>
<td>0.7</td>
<td>1.1</td>
<td>4.0</td>
<td>6.9</td>
<td>18.9</td>
<td>9.7</td>
<td>19.8</td>
</tr>
<tr>
<td>% GLOBAL FUND contribution of total DP funding</td>
<td>.</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>86%</td>
<td>21%</td>
<td>27%</td>
<td>45%</td>
</tr>
</tbody>
</table>

Figure 16 and Table 11 do not include indirect funding for malaria treatment and prevention through the integrated service delivery system, which constitutes the bulk of the GoG contribution. No malaria specific cost data for service delivery is available. A crude estimate of the cost of health service delivery to malaria patients was estimated based on the total annual recurrent expenditures of public health facilities in the districts, which was apportioned based on the malaria share of total OPD visits and admissions. OPD visits and admissions were weighted using a factor three which was applied in a benchmarking study from 200557. Whether a factor three is reasonable is of course debatable and more guidance could perhaps be found in detailed analysis of the Ghana diagnosis related groups (DRG) rates. Similarly it is possible to refine the analysis by using different percentages for apportioning expenditures in hospitals (weighted OPD visits and admissions) and other service delivery (OPD visits) but the main picture may not change much.

Figure 17 is similar to Figure 16 but illustrates the crude estimate of the resources used by GoG for malaria-related activities. It is clear when taking this resources allocation into account the GoG provides a considerable share of the total resource use related for malaria prevention and treatment, in fact more than half of the resources. The estimate is, however, very crude. The considerable cost of malaria in the integrated service delivery was also pointed out in the burden of disease study undertaken in 200358, which in addition assessed the considerable societal loss due to household expenditures on malaria treatment and lost productivity due to illness and premature deaths.

In conclusion, the funding for malaria control in Ghana has increased dramatically over the past ten years, stabilising around $5 per capita in 2007-2009. GoG has since 2005 increased its targeted malaria spending as well as the indirect contribution through the integrated service delivery system.

4.9.1 Linking financing trends to epidemiological trends

The financing trend can be compared with the epidemiological trend, see Figure 18 and also section 4.3.2, although interpretations should bear in mind the quality of the epidemiological data not least the practice of presumptive diagnosis of malaria.

The budget earmarked for malaria treatment and prevention was low in 2002-2004, increased over the period 2005-2007, in the latter year dramatically and has been stable at a high level 2008-2009. The increase in funds available if used effectively could be expected to result in a decreasing incidence of malaria; if coupled with an increasing use of (better) treatment for the cases that occur the effects would result in decreased mortality. A confounding factor is the establishment of the NHIS that took off in 2005 and which would lead to an increase in the use of health services, including for malaria cases. In addition, registration practices may have changed.

The number of registered deaths from malaria among children dropped dramatically from 2002 - 2004, but has since fluctuated around the 2004 level, reaching its lowest in 2006. The number of malaria deaths in pregnant women has been relatively stable, although at its lowest in 2008-2009. The number of registered malaria deaths in adults increased dramatically in 2005, and although steadily decreasing since, is yet to reach the 2004 level. It seems that for children the main effect occurred before the increase in the budget earmarked for malaria, but for adults the reduction in malaria deaths appear to occur simultaneous with the increase in overall budgets.

In terms of services, the cases admitted for severe malaria are likely to be more accurately diagnosed than malaria OPD cases. The admissions for severe malaria increased dramatically from 2002 - 2004, and decreased dramatically in 2006. For children admissions has continued to be low, but for pregnant women and other adults the admissions have increased from 2006-2009, although not reaching the 2006 level. The number of registered malaria OPD cases has remained fairly stable, with the exception that number of cases for children which tripled from 2006 – 2008 subsequently decreasing dramatically in 2009. Cases of pregnant women with malaria followed a similar pattern. At the same time the number of overall malaria OPD cases has been stable around 3.5 million from 2003-2006, with a decrease to 3.1 million in 2007 followed by an increase to 3.7 million in 2009. As above it seems that the main reduction in service use for children happened before the increase in the earmarked budget for malaria. This could reflect that the focus of the early interventions was indeed on the prevention of malaria in children as the MOH was giving high priority to MDG 4 (reducing child mortality). The increase in the use of services may be subscribed to a combination of the shift from cash-and-carry (out-of-pocket payment) to
health insurance and increased availability of resources and knowledge at facility and community level.

The increase in the budget earmarked for malaria is reflected in increasing coverage of ITNs and introduction and subsequent increase in use of ACTs and IPT, see section 4.1.5 – 4.1.7.

**Figure 18: Financing and Epidemiological Trend**

![Graph showing deaths, admissions, and OPD cases due to malaria from 2002 to 2009.](image)

Source: Data from the NMCP 2011.

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### 4.10 Differential Resource Allocation: Malaria Treatment, Prevention (ITN, IRS, BCC, IPT), Diagnostics, Programme Management, other Interventions. Analysis of Unit Costs (Unit Cost at the Point of Service Provision)

**4.10.1 Resource Allocation by Intervention Area**

The composition of the budget earmarked for malaria control activities has changed over the years with an increasing share of the budget for prevention and diagnostic testing and a decreasing share for treatment. This is reflected in the composition of the overall budgets for the Global Fund grants, but also when including budgets from the other main funder, PMI. Budget and expenditure items have been categorised into five main functional areas (see Table 12 below). The classification has varied over time, as diagnostics was initially included under the treatment category and could not be easily disentangled. Likewise aspects of health systems strengthening were part of the early programme, but currently integrated in treatment (i.e. home-based management) and supportive environment (i.e. development of monitoring, evaluation and operational research). Comparisons should be made with this in mind.
Table 12: Classification of program functional areas

<table>
<thead>
<tr>
<th>Functional area</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention</td>
<td>Malaria prevention in pregnancy, ITNs, vector control, BCC</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>RDTs, microscopes</td>
</tr>
<tr>
<td>Treatment</td>
<td>Home-based management of malaria, prompt effective anti-malarial treatment</td>
</tr>
<tr>
<td>Supportive environment</td>
<td>Monitoring of drug or insecticide resistance, coordination and partnership development, programme management and administration</td>
</tr>
<tr>
<td>Health systems</td>
<td>Service delivery, HR, community systems strengthening, information systems and operational research, infrastructure, PSM</td>
</tr>
</tbody>
</table>

**Coherence of budget, disbursement and expenditures**

Information allowing comparison of committed budgets, disbursements and expenditures was only available for the Global Fund support. This sub-section is therefore restricted to this support, but may illustrate the situation more generally.

The balance of budgets between functional areas, in particular between prevention and treatment, has varied over the Global Fund grants. The majority of the budget was aimed at prevention of malaria in R2 and R8, whereas in R4 almost equal allocations were made for treatment and prevention. It is notable that whereas distribution of expenditures under R2 matches the budget, there is considerable difference between the distribution of budget and expenditures in R4. According to the budget, 41% was intended to be spent on prevention, but the share of actual expenditures incurred on prevention was only 33%, diagnostics was planned to take 5%, but received only 2%, whereas treatment increased from a planned 40% to an actual 47%.

When the expenditure pattern differs considerably from the budget it can give rise to concerns about the credibility of the budget formulation process. In R2, spending was slow to take off, but picked up half a year into the programme, however, only in October 2005 had the cumulated expenditures caught up with the cumulated budget. At the closure of the program, 96% of the budget had been spent and to a large degree in accordance with the initial budget – at least in these broad terms. Under R4 expenditures, disbursements and the budget were in line until 2008, when expenditures started deviating considerably from the budget, leaving an annual gap of unspent funds of $8-10 million, and in 2010 close to $25 million. As a result by the end of 2010 only 55% of the disbursed funds had been spent and the Global Fund performance ratings dropped to unacceptably low levels. Since the first half of 2010 implementation has improved and the performance rating has changed to “Inadequate but demonstrated potential”. Problems with procurement and quality of medicines in 2009-2010 have affected expenditures on both treatment and prevention, but as the budget set aside for procurement of ITNs was somewhat larger, this has affected the composition of expenditures under R4.

The implementation periods of R2 and R4 overlap as do the planned implementation periods of R4 and R8. This means that the full picture will emerge only if the totality of funding is regarded. The development in the budget allocations from the Global Fund per functional area is illustrated in Figure 19. It appears that while the allocation to prevention decreased from 2005 to 2008, the budget in 2009 returned to 2005 levels and in 2010 increased considerably. The treatment budget is the only functional area that has been constantly increasing. Unfortunately, as mentioned above spending capacity has not been able to follow suit in recent years. The full picture can, however, only be obtained when looking at the distribution of budgets or expenditures from all sources as there may be a division of labour between partners, i.e. increased budget for treatment may be relevant if another partner focuses on prevention. Unfortunately there is no consolidated overview over expenditures by all partners against the functional categories.
Although no consolidated overview of budget and expenditures by all partners is available, comparable budget information does exist for two major partners, the Global Fund and PMI. While the treatment budget for these two partners accounted for 63% of the budget in 2007, it was only 47% in 2008; 37% in 2009 and 20% in 2010. There has been a consistent shift in increased budget allocations towards prevention, while supportive environment/programme management has increased steadily from 7% to 11% which may appear to be high. Specific preventive activities that have been prioritized is not clear.

The following Table shows that the initial focus mainly on ITNs and IPT in pregnant women has been broadened to include IRS and BCC. BCC has been an integral part of ITN activities from the onset but it is possible to identify earmarked funding specifically for BCC activities only from 2008 and beyond. Increasing distribution and use of bed nets, however, remains the major strategy in terms of resource allocation for reducing the malaria disease burden.

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITNs</td>
<td>56</td>
<td>85</td>
<td>93</td>
<td>9</td>
<td>92</td>
<td>64</td>
<td>71</td>
<td>75</td>
</tr>
<tr>
<td>IRS</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>19</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>BCC</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>IPT</td>
<td>44</td>
<td>15</td>
<td>7</td>
<td>91</td>
<td>8</td>
<td>10</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Total in Mill. USD</td>
<td>1.5</td>
<td>0.7</td>
<td>1.4</td>
<td>5.4</td>
<td>3.0</td>
<td>12.3</td>
<td>17.3</td>
<td>46.9</td>
</tr>
</tbody>
</table>
In summary, it appears that over the period 2003-2010 increasing attention and budgetary allocations were applied to prevention and health systems strengthening aspects of malaria control. In terms of actual expenditures, there appears to be a bias towards treatment. ITNs continue to receive most of the resources for prevention, but IRS is picking up and the need to target BCC specifically is reflected in increasing funds being earmarked for such activities.

4.10.2 Resource Allocation and Geographic Disease Profile

From an efficiency point of view it is of interest whether the resources earmarked for malaria are allocated to areas where they are likely to produce the largest benefit. This section attempts to assess the relevance of the resource allocation to the geographic disease profile. Clearly such an assessment should take into account all resources available. Scarcity of information however restricts the analysis.

Regional distribution of resources and malaria cases

Regional distribution of malaria cases is readily available for several years. The financial information regarding resources earmarked for malaria in the 10 regions could only be provided for the Global Fund support. In 2005, the budget earmarked for malaria from other sources was negligible compared to the support from the Global Fund. The allocation of the Global Fund resources for 2005 compared to the disease profile may therefore provide some insights on overall efficiency.

There is no clear relationship between the number of OPD malaria cases observed in a region and the allocation of Global Fund resources for malaria control (see figure below).

**Figure 21: Number of OPD malaria cases & Global Fund budget allocation by region (2005)**

The above figure does not however tell the extent of the malaria burden in each region as the population varies considerably between regions. Since many of the OPD cases are diagnosed based on symptoms and may not really represent malaria, it could also be considered to compare admissions which are diagnosed more accurately, although even in hospitals there is a considerable margin of error (i.e. Upper East Region Annual Report 2010). Because regions also vary in accessibility to hospitals and therefore in admissions, which in turn could lead to underestimation in underserved areas, Figure 22 therefore uses the number of OPD malaria cases normalised by population size.59

**Figure 22: Regional Global Fund allocation by number of malaria cases (2005)**

59A similar pattern however emerges when using admissions, although the trend is slightly less pronounced.
As seen in Figure 22 above there is a slight upward trend indicating that on average regions with higher burden of malaria (measured by number of OPD cases per 100,000 population) received a relatively higher per capita allocation from the Global Fund budget.

It would be interesting to compare with the geographical allocation in later years, but the lack of comprehensive budgets does not allow this. The planning for a National Health Accounts exercise in 2012 is on-going and it is hoped that this may come up with sufficient detailed information.

4.10.3 District Level Expenditures - 3 Selected Districts by Risk of Transmission

Regions are, however, large entities and there exists considerable variations between districts within regions. Three districts were selected based on the risk of transmission as indicated by the climatic map see Table 14 below.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Keta</td>
<td>Low</td>
<td>1536</td>
<td>3581</td>
</tr>
<tr>
<td>Amansie West</td>
<td>Medium</td>
<td>1641</td>
<td>4529</td>
</tr>
<tr>
<td>Gushegu</td>
<td>High</td>
<td>1104</td>
<td>3401</td>
</tr>
</tbody>
</table>

Note: selected districts with varying risk of transmission

Malaria is endemic in all the three districts; Keta (Volta) relatively low risk of transmission, Amansie West (Ashanti) medium risk of transmission and Gushegu (Northern) high risk of transmission. All three districts have received funding under R2. The per capita allocation does not appear to be related to risk of transmission see table above; in fact the lowest allocation per capita was given to Gushegu located in a high risk transmission area according to the climatic map. The highest allocation per capita was provided to Amansie West (medium risk), both in the first year and in total over the implementation period.

When looking at the figures to the left it appears that the distribution by activity areas of the budget transferred directly to districts for implementation of malaria prevention activities shows very little variation between the three districts. In 2004-2005 the distribution of the budget per activity area is strikingly similar across the three districts, although the promotion of use of ITNs appears to receive a slightly smaller share (4%-points) of the budget in Keta District (low risk). In 2006 all three districts appear to have followed a national push for promotion of home-based care. Keta district, however, received only small funds for supervision, monitoring and evaluation in 2007, so in reality received funding for only 3 years against 4 years in the other two districts. Nevertheless the total per capita allocation in Keta district exceeds that of Gushegu district (high risk).

There is no indication that variations in incidence of malaria are reflected in a different resource allocation by service mix or intervention pattern. Given the relatively high endemicity of malaria in all the three districts reviewed, it is also a question as to whether this would be expected. It is, however, perhaps less plausible that all districts would have the same history of previous interventions and therefore exactly the same need for mix of new interventions. However, the budget discussed above does not capture MoH budget on
integrated service delivery that is related to malaria nor in kind contributions from development partners at central and regional levels.

The MoH actual expenditures on integrated service delivery can be obtained from the annual financial statements. Historical district level information can be obtained albeit with some difficulty. Based on the share of patients presenting with malaria in the OPDs and admissions due to malaria a rough estimate of the MOH contribution can be made. An estimation based on district expenditure data for Amansie West suggests that 84% of district level malaria expenditures in 2004 could be attributed to the integrated service delivery.

In summary, neither the size of the budget nor the mix of interventions appears to be related to the variations in the malaria disease burden or risk of transmission. Rather, the principle appears to be more or less equal allocations to all districts irrespective of risk of transmission, but also of population size. Funds have been earmarked for certain activities and provide little room for variation in service mix.

4.10.4 Comparing the Cost per Result of Interventions
The comparison of cost per result of intervention turned out to be difficult due to lack of overview of total resource inputs per intervention and lack of uniform results measurements. Nevertheless, the following presents estimates of costs of distribution, storage and clearing in addition to the estimated average cost per result for IPT, IRS and ITNs.

Cost of Distribution, Storage and Clearing
The purchase price of nets and tablets is for shipment to harbour. The costs for reaching the end-user therefore relates to clearing, storage and distribution of goods.

Clearing of Goods
Clearing costs vary unpredictably. However, for this assessment clearing costs are set at the average cost paid per 40 foot container for a recent shipment of 66 containers of nets.

Figure 24: Unit cost of a bale of LLINs (100 units)

Storage
The estimated cost of storage is based on the volume that should be available for storage, i.e. m³ needed per 100 bed nets or per 10,000 SP tablets. The rent per square meter is set at the annual rent per m² for a neighbouring warehouse used by a private company contracted under PEPFAR. The annual rent was set by the Land Valuation Board for government property. The commercial rates are likely to be 2-3 times higher.

Distribution
Based on a sample of bills from CMS for delivery to district level in all regions, the average distribution costs per cubic meter of goods were estimated. There are, however, further distribution costs from the district to service delivery point, but these are likely to be less (personal communication, Director CMS).

It appears that the purchase price accounts for by far most of the costs, i.e. 97.5%. Distribution costs account for almost 60% of the remaining 2.5% of total costs (at least - bearing in mind that the final distribution is not included here), while clearing costs account for 35% of the remaining 2.5% of the total costs. Given the relative low cost of distribution, storage and clearing, no further attempt was undertaken to obtain more details.

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60Estimation of malaria-related costs of integrated service delivery: District hospital costs attributed to malaria proportionate to percentage of a weighted average of OPD visits and admissions (1:3) with malaria diagnosis; sub-district costs attributed to malaria proportionate to percentage of OPD cases due to malaria.
Estimated Average Cost per Result

It is relevant to compare the cost effectiveness of the implementation of the various prevention strategies. However, to truly make a reliable assessment requires more accurate and complete data than available for this evaluation. Furthermore, the comparison should also take into account the differences in effects between the various strategies in terms of number of malaria cases averted and consequent Disability Adjusted Life Years (DALYs) gained. Based on a very crude attempt relating the funds invested to the persons reached it appears that IPT is relatively cost effective in reaching its target group and IRS appears to be most costly, however, any long term or cumulative effects have not been taken into account (see table below). Where annual cost per result has been calculated it should be kept in mind that procurement costs are lumpy by nature, and it is therefore not surprising to find some volatility in the estimates.

Table 15: Estimates of cost per result for IPT, ITN and IRS

<table>
<thead>
<tr>
<th>Item</th>
<th>Period</th>
<th>Costs covered</th>
<th>Results measure</th>
<th>Cost per result USD/unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPT</td>
<td>Annual</td>
<td>Procurement of SPs, training, health education and promotion</td>
<td>Number of pregnant women receiving IPT1</td>
<td>0.54, 2.51, 1.84, 2.22</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Number of pregnant women receiving IPT3</td>
<td>1.16, 4.69, 3.26, 3.47</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITN</td>
<td></td>
<td>Procurement of nets, training, BCC activities</td>
<td>Number of persons using bednet in end year</td>
<td>#DIV/0!, #DIV/0!</td>
</tr>
<tr>
<td></td>
<td>2007-2009</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2005-2008</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Annual</td>
<td>Procurement of nets, training, BCC activities</td>
<td>Number of nets distributed</td>
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<tr>
<td>IRS</td>
<td>Annual</td>
<td>Assessment, procurement, training</td>
<td>Number of persons protected</td>
<td>3.88, 4.98, 7.81</td>
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In summary, distribution, storage and clearing is estimated to contribute only a limited share of total costs of interventions (2.5%). In order to give meaning to the Global Fund and dully compare the cost-effectiveness of the implementation of the various prevention strategies, more accurate and complete data would be required and would also need to be combined with estimates of DALYs gained.

4.11 How Sustainable are Gains Made in Malaria Programming under Global Fund Supported Grants? (Financial Sustainability)

4.11.1 Projected Funding Gaps and Nature of Funding Commitments

Availability of sufficient funding is important for Ghana to sustain the achievements already made in the control of malaria and to progress further. It is important to give due consideration to such issues also when planning ahead and starting new initiatives.

Over the period 2007-2010, the total annual per capita allocation to the health sector increased from $22 to $29 (Independent Technical Review 2011). Funds raised by the MOFEP, NHIS and DPs contributed 51%, 32% and 17% respectively to the health sector in
2009. Although the donor dependency appears high when looking at funding earmarked for malaria, refer to section 4.9, the overall donor dependency in the sector is decreasing. In the longer term, changes in Ghana’s macroeconomic development related mainly to the oil industry may potentially have a positive effect on the government funding of health services in the future. In the meantime, however, Ghana will have to rely on DPs.

The MOH/GHS undertook a gap analysis in relation to the application for R8 and the RCC using a projection model based on past experience and a set of assumptions about future development. The estimates took into consideration the cost of current coverage of malaria interventions, the capacity constraints on implementation by governmental and non-governmental organisations and the needs taking as a point of departure targets set in the Ghana Malaria Strategic Plan 2008-2015 and updated policy decisions (universal access).

The gap analysis, while in general both thorough and sound, was rather optimistic on some of its assumptions which pull the results in different directions. For example it was assumed that over four years the percentage of adults with fever who choose to go to a health facility has increased from 45% (2008) to 90% (2012). This appears to be rather high and would drive the calculated financing needs up compared to a more modest (and more realistic) assumption. On the other hand, it was also assumed that over a similar period the percentage of people presenting with fever who would be diagnosed through microscopy or RDTs would increase from 60 to 100%. This again is rather optimistic and has not materialised, but this time the optimism would tend to reduce the calculated funding needs as it overestimates the funding needed for testing but underestimates the funding needed for (symptomatic) treatment. This analysis indicated a financing gap for implementation of the National Strategic Plan of around $50 million annually after the request to the Global Fund. The gap analysis has not been updated since 2008. The analysis nevertheless gives an impression of the funding needed and the considerable gap between available government funding and resource requirements.

More recently, the costing of the Health Sector Medium Term Development Plan 2010-2013\(^6\) (HSMTDP) was completed in December 2010. The costing used both the Marginal Budgeting for Bottlenecks (MBB) tool for the MDG-related services and activity-based costing for other services. Various scenarios for resource needs and resource envelope projections were developed and validated with stakeholders; targets and strategies were consequently adjusted. The preferred scenario was selected mainly due to its expected impact on the health-related MDGs, including a 46% reduction in malaria incidence in under-fives and a 44% reduction in malaria mortality. The projected resource needs were GHS6.9 billion over four years compared to a projected resource envelope of GHS6.6 billion with a funding gap occurring primarily in the outer years, which also have the most uncertain information on DP funding. According to the resource envelope projections DPs will contribute just above 10% of the total funding of the HSMTDP.

**Figure 25: Projected funding gap for the health sector, GHS (million)**

\(^6\) Start of implementation was postponed to 2011.
Funding commitments from development partners to address the malaria disease burden took off in 2005. Ghana has typically relied on three major development partners and presently mainly two major partners for funding resources. Most of the development partners providing earmarked funding for malaria interventions are committed on a 1-3 year basis only. Some may in principle be committed for 3 years, but are subject to annual approval. The Global Fund funding can, however, be considered as a relatively stable funding committed for a longer program period, provided that Ghana performs against set targets. This obviously puts Ghana in a vulnerable position for sustaining the momentum and the achievements made in the implementation of the NMCP strategy. Ghana’s position would be much better if government funding was available to meet the gap. Despite increasing government contribution to the national malaria control program, the programme as currently implemented is not likely to be financially sustainable without support from development partners for a considerable time to come. However, if Ghana manages to obtain a substantial reduction in malaria cases, then savings could be obtained on health care services and productivity gains could be made.

4.11.2 Improving on Cost Efficiency

To ensure sustainability is not just a question of mobilising more funding, but also to use existing funding efficiently. Coordination of contributions by development partners has improved over the years and is rooted in the strong commitment to the SWAp in Ghana. Examples include the World Bank revision of its programme to drop the planned insecticide resistance monitoring as it is covered under PMI. Currently, most of the RBM sub-committees are functional. They include the ITN, Case Management, Vector Control, Communications and Home-Based-Care committees. These committees have enabled different partners such as WHO, UNICEF, DfID, PMI and civil society organizations to coordinate their activities and undertake joint technical work under the auspices of the NMCP. Also, strategic partnership and harmonisation meetings between development partners and government in specific areas (bed nets, vector control, and behaviour change communication) have been introduced to better plan, i.e. the distribution of LLINs to achieve universal coverage and the environmental safeguards management. In this context, an ITN database was recently established. There are still risks of duplication in some areas, i.e. studies and surveys such as the MIS and drug resistance monitoring. The introduction of consolidated joint annual work plans and budgets as well as financial reports could help to further provide an overview and strengthen coordination and joint follow up. Development of a joint work plan matrix including the Global Fund and PMI in 2010 resulted in division of labour with Global Fund funding focused on ACT and training, whereas PMI shifted ACT funds to bed nets.

There is no institutionalised mechanism in place for ensuring that cost effectiveness is taken into account in decision-making. There is, however, increasing awareness of the importance of cost-effectiveness, not least fuelled by the concerns about over-spending on malaria treatment raised by the National Health Insurance Scheme. In relation to the decision to scale up IRS it would, for example, be useful to undertake a rapid assessment of the best choice of climatic zones, e.g. the savannah area rather than other geographical areas.

There is considerable evidence of symptomatic treatment of malaria and of the errors made in exclusively depending upon clinical diagnosis of malaria. There are thus potential savings from large scale introduction of RDTs and insistence of parasitological diagnosis prior to treatment. However, at the moment RDTs are in short supply while at the same time ACTs will be available at reduced costs, hence reducing the incentive to wait for diagnostic investigations and confirmation of results from laboratories. Considerations need to be given as to how to address this dilemma including developing a strategy plan for the roll out of RDTs in all treatment centres in parallel to the ACT programmes and in line with the national

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guidelines for treatment based on positive confirmation of malaria. This will reduce the use of ACTs which are more costly than RDTs in addition to reducing the possibility of drug resistance to ACTs if used inappropriately. In addition considering the local manufacturing of RDTs would greatly reduce prices and should in turn ensure availability.

The procurement of medicines and supplies appear to have been dysfunctional for a couple of years, see also section 4.9, with stock-outs of ACTs and RDTs as a result. This is a severe problem. Cost effectiveness of training and behaviour change communication and, as mentioned above, restriction of treatment to confirmed cases, depend on a well-functioning supply chain at all times.
5. CONCLUSIONS

Changes in coverage, outcome and impact

Coverage - Access to malaria related services increased to 170 districts under R4 from 20 districts in R2 including scale up of community based services. Despite significant strides in ensuring availability of key interventions identified by the NMCP the RCC grant has been unable to achieve several targets resulting in B and C ratings from Oct 2009 to September 2010). Nevertheless it is clear that without Global Fund support under R2 and R4 achievements would have been at a much lower level as the proportion of government funding for the national response only recently increased to around 50%.

Outcome/Impact - Mixed outcomes have been recorded during the implementation period where 4 of 9 outcome targets (treatment/management of uncomplicated and severe malaria and mothers/caretakers response to malaria within 24 hours) set for the Global Fund supported programme with the NMCP were on track while use of Insecticide Treated Nets (ITNs), Intermittent Preventive Treatment (IPT) and Rapid Diagnostic Test (RDT) results hovered around 50% of the targets. The massive scale up of Global Fund support contributed to a reduction in both malaria morbidity and mortality (noted in RCC Q20 results).

Reducing the disease burden- Data available from the national health recording system indicated no significant changes of disease burden over the ten-year evaluation period possibly attributable to: the practice of presumptive treatment; introduction of national health insurance for all which triggered more unconfirmed malaria cases treated; inaccurate recording and processing of data; and/or that interventions are not reaching enough of the population. Although no nation-wide prevalence data are available, the high parasite prevalence (over 50% throughout the year among children under 5 years) in the middle belt of Ghana implies that malaria continues to be a major disease burden in the country.

Intervention mix – Malaria interventions in Ghana supported through the Global Fund grants evolved over time in line with national strategic plans addressing the emerging health needs related to malaria (i.e. the scope of distribution of ITNs was expanded to include the entire risk population). The NMCP in collaboration with its development and implementing partners such as the LLIN need/gap calculator.

Increase in access to ACTs– Based on quantitative data the AMFm appears to have improved availability at the central level and affordability of ACTs although overpricing was noted among some private providers. Despite and overall appreciation of on-going efforts qualitative information has highlighted areas in need of improvement including addressing: overpricing among some private providers; avoidance of AMFm ACTs related low (subsidized) prices associated with poor quality; delays in procurement, particularly in the public sector; and the need to tackle issues of long distances and bad road networks. Another major area of concern is the insufficient efforts aimed at reducing mono-therapy in Ghana. In the absence of comprehensive and reliable consumption data is not possible to determine an increase in the access to AMFm ACTs.

Drivers of programmatic scale-up and disease trends

Key Drivers - The programme is establishing clear strategies and setting up targets at coverage, outcome and impact levels, promoting the use of correct and efficient intervention methods and planning appropriately for the next phases of implementation based on strategic and financial gap analysis.

Implementation according to design – Based on the documentation reviewed there seem to have been no major discrepancies between planned and implemented programme strategies although operational strategies were altered (i.e. abolishing an ITN voucher scheme in lieu of universal coverage and introduction of an innovative strategy for the promotion and use of LLINs).
Relevance of past and future interventions - Based on Ghana’s current epidemiological situation, experts’ recommendations and international best practices, it would be fair to suggest that Ghana has chosen the most appropriate and comprehensive package of interventions.

Allocative efficiency and sustainability

Financing trends - The funding for malaria control in Ghana has increased dramatically over the past ten years, stabilizing around $5 per capita in 2007-09. The Government of Ghana (GOG) has substantially increased its malaria spending but remains heavily dependent on international donors to fund interventions (around 50%). Although the original purpose of the Global Fund grants was to fill the strategic and financial gaps in the NMCP, they became the single vertical donor (2003-2005) and contributed around 45% of direct funding in 2009.

Differential resource allocation - Increased attention and budgetary allocations have been directed towards prevention and health systems strengthening aspects; with regard to actual expenditures there appears to be a bias towards treatment. ITNs continue to receive the most resources under prevention interventions, but indoor residual spraying is picking up and the need to target behaviour change communication (BCC) specifically is reflected in increasing funds being earmarked for such activities.

Neither the size of the budget nor the mix of interventions appears to be related to the variation in the malaria disease burden or risk of transmission. Rather, budgeting principles appear to be based on more or less equal allocations to all districts irrespective of risk transmission and population numbers. Funds have been earmarked for certain activities with little room for variation in service mix. Allocative efficiency of the Global Fund resources is difficult to judge as the Global Fund support complements the contributions made by GOG and other partners; that said there appears to be good complementarity between the interventions supported by different funders.

Financial Sustainability - A comprehensive funding gap analysis was undertaken in 2008 (related to the Global Fund application submission); many of the baseline assumptions are still valid (i.e. government funding). Despite increased government contribution (around 50%); the malaria control programme is not likely to be financially sustainable for years to come. Most development partners have a relatively short horizon, but the Global Fund funding is considered relatively stable funding for a longer programme period.
6. RECOMMENDATIONS

Objective 1: Changes in coverage, outcomes, impact and effectiveness in key interventions against disease burden brought about by the Global Fund programme contributions
1. NMCP and its partners should strengthen the existing Monitoring and Evaluation (M&E), surveillance and operational research activities and demonstrate evidence of the appropriateness of the mix of interventions supported by the Global Fund to reach the expected impact.

2. The Global Fund should work more closely with the ACT manufacturers and ensure a smooth supply of the AMFm ACTs in order to increase availability and accessibility.

Objective 2: Study of drivers of programmatic scale-up and disease trends
3. The NMCP should urgently work with its development partners to review the current delivery strategies for key malaria interventions and modify/follow these in order to reach universal coverage. This could include the NMCP devising a strategic action plan including piloting and scaling up methods to improve RDT testing rates, provider compliance, and patient acceptance in support of the national diagnostic policy of prompt parasitological confirmation including relevant training for health care staff.

4. The NMCP should convene frequent review meetings between the technical, M&E, Procurement and Finance units in order to identify early warning signals of delayed implementation and agree on appropriate measures to overcome bottlenecks.

Objective 3: Allocative efficiency and sustainability of Global Fund contribution towards malaria control in Ghana
5. The NMCP should consider introducing clear criteria for resource allocation to district interventions based on population at risk and to allow districts flexibility to adapt the activities to local needs instead of subscribing to “one size fits all” and “micro-planning”.

6. The NMCP should immediately look at how to address the dilemma between the desired future balance between use of ACTs and RDTs and the economic incentive structures in place.
ANNEXES
### Annex 1: CONTRIBUTIONS BY PARTNER (AVAILABLE/PLEDGED) - 2008-2015 STRATEGIC PLAN

#### Annex 1: Contributions by partner (available/pledged) - 2008-2015 strategic plan

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<td>Total DOMESTIC</td>
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**TOTAL AVAILABLE FUNDS BY STRATEGIES AND SERVICE AREAS**

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<td>Treatment: Prompt, effective antimalarial treatment</td>
<td>2,737,800</td>
<td>3,896,880</td>
<td>9,647,742</td>
<td>2,628,000</td>
<td>2,700,000</td>
<td>2,750,000</td>
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<td>Malaria diagnostics</td>
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<td>2,635,000</td>
<td>1,585,000</td>
<td>1,685,000</td>
<td>1,735,000</td>
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<td>Strengthen drug supply management</td>
<td>850,000</td>
<td>887,790</td>
<td>1,735,790</td>
<td>1,675,000</td>
<td>1,775,000</td>
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<td>TOTAL FOR DIAGNOSIS AND TREATMENT IN HEALTH FACILITIES</td>
<td>4,887,800</td>
<td>6,089,670</td>
<td>14,018,532</td>
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## Annex 2: Evaluation Matrix

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<th>Area</th>
<th>Variables</th>
<th>Indicators</th>
<th>Data Source</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 To what extent have Global Fund malaria grants resulted into improving coverage and access of populations to prevention and treatment interventions?</td>
<td>Output</td>
<td># and kind of services provided People reached by the programme, by geographic areas (regions, districts) Size of population targeted (vs. reached) / Population at risk vs. population covered with the key interventions Services utilization (by age, sex, risk group, economic status) Adequacy/relevance of care (compared to standards, and measured by quality of care)</td>
<td># suspected patients treated with ACT w/in 24 hours # of people trained for improved service delivery # of people with knowledge on malaria prevention # of people benefiting from community-based programmes # of RDT tests done # of pregnant women treated with IPT # of bed nets distributed # of houses sprayed</td>
<td>PUDR or NMCP reports same</td>
<td>CM</td>
</tr>
<tr>
<td>1.2 What have been the outcomes and impact following Global Fund investment in malaria programming?</td>
<td>Outcome</td>
<td>LLIN use IRS IPT BCC Malaria diagnosis and treatment Treatment of complicated malaria Correct treatment of OPD suspected of (uncomplicated malaria)</td>
<td>% or Prop. of people sleeping under LLINs % or prop Population sleeping in sprayed houses % house coverage rate % pregnant women treated with IPT % of caretakers with correct knowledge of malaria symptoms, treatment and prevention % of Suspected malaria cases tested and treated with ACT % complicated cases recovering (case fatality rates) Malaria test positivity rates</td>
<td>Population surveys such as KAP, MIS, DHS or any other specific surveys IRS program reports same MIS, DHS or KAP surveys and NMCP report same Routine district level malaria data reports – compiled at regional or central level Regional and central level malaria data report or hospital based malaria data bases Routine malaria data reports</td>
<td>CM</td>
</tr>
<tr>
<td>1.3 (What has been) The contribution of the malaria control program in reducing the disease burden?</td>
<td>Impact</td>
<td>Morbidity (number of reported malaria cases) Mortality (deaths attributable to malaria)</td>
<td># of malaria cases # of malaria deaths # U5 mortality Annual cumulative disease burden trends over the time - anaemia prevalence rates</td>
<td>Comparison programme GF interventions vs. non-intervention groups District wide malaria morbidity and mortality data analysis 2002 to 2009. District monthly malaria data reports compiled at region or at NMCP central level</td>
<td>CM</td>
</tr>
<tr>
<td>1.4 Compare the mix of interventions with the health needs of the populations</td>
<td>Design (Input)</td>
<td>GF programme design Cost-effectiveness of interventions vs. Population health needs (basic, women's, children's etc.) Health needs that are not addressed adequately</td>
<td>Completeness of intervention package Effectiveness of strategies Understanding of BOD Health needs from literature (urban, rural, population groups)</td>
<td>National health strategic plan/reports Most recent DHS (2008) Annual WHO reports NGO reports (national and by region) NMCP reports</td>
<td>RG</td>
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<tr>
<td>1.5 Has there been an</td>
<td>Output</td>
<td>Changes in the use of ACTs following the</td>
<td>AMFm coordinating body or Task Force</td>
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### Evaluation question

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<td><strong>increase in access to ACTs reducing the use of inappropriate medicines for malaria due to the AMFm initiative in Ghana (added value of AMFm in malaria overall response)</strong></td>
<td>introduction of AMFm ACT delivery dates (planned versus real)</td>
<td>reports Outlets reports Independent evaluator reports as per the in-country monitoring management arrangements Reports on fake drugs/drug seeking behaviour</td>
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### 2. Drivers of programmatic scale-up and disease trends

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<th>Variables</th>
<th>Indicators</th>
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<td><strong>2.1 (What are) The key drivers of the trend in disease burden?</strong></td>
<td><strong>[Context]</strong></td>
<td>Malaria epidemiology Demographic factors Environmental factors Effectiveness of disease control programmes HS delivery and programmes</td>
<td>Malaria Disease burden maps (district morbidity and mortality data) Prevalence data from blood surveys Entomological indicators (VC or density etc.) by surveys</td>
<td>NMCP or MOH sources NMCP records NMCP records CM</td>
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<tr>
<td><strong>2.2 To what extent are Malaria program strategies implemented as they were designed in proposals submitted to the Global Fund?</strong></td>
<td><strong>Process</strong></td>
<td>Design of GF malaria programmes Objectives of NMP Strategies in GF proposals Implementation</td>
<td>Design of GF malaria programmes Objectives of NMP Strategies in GF proposals Implementation Changes in country epidemiological profile Planned activities versus implemented activities</td>
<td>PUDRs and NMCP reports Performance frameworks of grants Original and revised Workplans and budgets RG</td>
</tr>
<tr>
<td><strong>2.3 To what extent are past and future interventions relevant to the disease epidemic in the country?</strong></td>
<td><strong>Design (Input)</strong></td>
<td>Characteristics of malaria epidemic in Ghana International best practices Compare with countries with similar malaria epidemiology WHO RBM strategy</td>
<td>Characteristics of malaria epidemic in Ghana International best practices Compare with countries with similar malaria epidemiology WHO RBM strategy</td>
<td>PUDRs and NMCP reports Performance frameworks of grants Original and revised Workplans and budgets RG</td>
</tr>
</tbody>
</table>

### 3. Allocative efficiency and sustainability (Are the Global Fund investments in malaria response in Ghana allocatively efficient?)

<table>
<thead>
<tr>
<th>Evaluation question</th>
<th>Area</th>
<th>Variables</th>
<th>Indicators</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3.1 Financing trends of malaria national program by the key funding sources in Ghana.</strong></td>
<td><strong>Financing (Input)</strong></td>
<td>Financing for malaria programme Sources of revenue and additionality Pooling of funds Committed budget Executed budgets of the government</td>
<td>Per capita HS budget &amp; expenditures for malaria % distribution of malaria programme budget and expenditures by source (including aggregation by pooled vs. non-pooled funding; DP vs. GOG) Budget execution rate</td>
<td>Reports from the NMCP Annual budget statements Annual financial reports UE</td>
</tr>
<tr>
<td><strong>3.2 Differential resource allocation for malaria treatment, prevention (including ITNs, IRS, BCC, IPTp), diagnostics, program management, etc.</strong></td>
<td><strong>Financing (Input)</strong></td>
<td>Resource allocation for treatment, prevention - including ITNs, IRS, BCC, IPTp -, diagnostics, program management, other</td>
<td>Commodities Human Resource Logistics and transport Disbursement and expenditure against disease burden, by key interventions and geographic areas</td>
<td>NMCP annual reports GF financial reports Commodity study UE</td>
</tr>
<tr>
<td><strong>3.3 How sustainable are gains made in malaria programming under Global Fund supported grants?</strong></td>
<td><strong>Financing (Input)</strong></td>
<td>Measures of sustainability?</td>
<td>Annual variation in financing (overall, by source and if possible by intervention area) No. of future years with secured funding Predicted funding gap compared to GOG funding</td>
<td>Round 8 application ICC application Possibly information from Development Partners on future plans UE</td>
</tr>
</tbody>
</table>
Annex 3: Semi-Structured Questionnaire

GUIDANCE NOTE FOR THE GENERAL QUESTIONNAIRE WITH STAKEHOLDERS

AN EVALUATION OF GHANA’S GLOBAL FUND MALARIA PROGRAMMES

Objective
An evaluation of Global Fund contribution from round R2, R4 and R8 toward achieving national malaria control goals from 2002 to date.

Specific objectives
1. A study of outcomes (changes in programme coverage) and impact (changes in malaria related mortality and morbidity)
2. A study of drivers of programmatic scale-up and disease trends (factors driving changes in burden of disease and epidemiological profile)
3. A study of funding, allocative efficiency and (financial) sustainability

Principle
The mission will meet with main stakeholders essentially at central level to gather quantitative information to cover 2 programmatic and financial aspects which are considered as the two interlinked areas. The Evaluation framework has captured the main variables to be considered, the indicators/questions that will be asked during interviews with relevant interlocutors, and the data sources that will be used for the analysis. Most of the interviews will take place in Accra through a consultative mode, focus group when possible. (The Team Leader and health economist will conduct the above exercises).

Regarding the qualitative information, the interviews are conducted at central level essentially. Open questions are developed/organized in a semi-structured guide to engage the discussion with the list of interlocutors identified. After discussion on Friday 4th with the Global Fund team, the semi-structured questionnaire guide is refined accordingly and sent to the interlocutors so they can already provide response in writing. The set includes a mix of open and specific questions which answers will help feed the report analysis. The main interlocutors include CCM members, DP, NMCP, LFA, private sector, MoH relevant departments, implementers.

Instruction to recipient
The Questionnaire is primarily designed to capture most of the qualitative aspects of the Global Fund contributions towards achieving national malaria control goals. It is expected that clear and evident observations, results, trends, changes and impacts would be presented perhaps in point form for clarity and simplicity. Again, please note that this exercise is carried out to qualitatively evaluate the contributions from GLOBAL FUND programmes.

Your kind corporation in finding replies to any of the following questions is highly appreciated.

Source of information and names of interviewees will be kept strictly confidential

- According to your views, to which extent has the Global Fund contributed to the fight against malaria in your country, since its inception? (Broad - open question).

- What are the main elements in the Global Fund model that you think have led to (or not led to) improvement in the fight against the disease? Be specific and provide concrete examples and dates if relevant (Governance and partnership development including community and private sector involvement in decision making/ key policy and protocol changes that have occurred in the malaria
strategy / the result based disbursement model / weight of the increase of the financial contribution / speed in disbursement, involvement of a new set of implementers in the fight against malaria such as civil society, private sector, communities, others?…)

- To which extent are malaria program strategies implemented as they were designed in the original proposal? Please indicate major changes along the course of implementation if so (for example reprogramming, RCC single-stream funding, and in such case was it done in a timely manner?).

- To which extent has the Global Fund enhanced/strengthened the leadership as well as the management capacity of the NMCP (for example mobilize decision makers such as Govt and/or other partners to consider, better planning (or not) for activities, procurement and supply, monitoring, etc.?)

- What are the main bottlenecks you have faced with the Global Fund that have been a handicap for a timely delivery of expected results? (You can look at GLOBAL FUND policies and processes which have changed/evolved along the years but also at operation/implementation issues, procurement, etc.)

- To what extend are past and future interventions relevant to the disease epidemic in-country? For example regarding treatments protocols, targets groups needs beyond the reach of services not sufficiently addressed. Is the IRS approach under round 8 focusing on the right zones/population? Are the malaria health needs of the population covered by the interventions supported by the Global Fund?

- Despite delays (the reason for delays?), do you think that over the time the PSM approach/requirements of the Global Fund have strengthened the implementation of the malaria program since inception of the grants? Is the strong GLOBAL FUND emphasis on the SM (supply management part of the PSM) helping delivering better? Overall and to the best of your knowledge, are drugs being finally delivered more rapidly than in the past? Less stock-out, less expired drugs, out of dates? etc… (Consider this within the frame of the drastic increase of quantities). Also look at the specific items (Nets, ACT, RDT, microscopes, …).
- How has AMFM improved access to ACTs? (Urban/rural coverage, evidence that outlets are privileging the cheapest bi-therapy …)? Is there a risk in your views of not joining the AMFM initiative with the RDTs? Is it a sustainable mechanism and what are the risks associated that you anticipate?

- Has the Global Fund acted as leverage in the fight against malaria in Ghana? Give examples (more resources (Financial/HR) from other donors as well as Govt, involvement of new partners, building partnership with non-govt …).

- What is in your views the major contribution of the Global Fund has made in the fight against malaria in Ghana since its inception?

- What is in your views of the major obstacle for the Global Fund has been in improving the fight against malaria in Ghana since inception?

Additional PSM related issues
Need to visit national bodies responsible for forecasting, procurement and storage/distribution, plus Health Facilities to check on stock management, storage and verify that the ordering (push/pull) and LMIS systems are operating.

National/ Central level:
- Who is responsible for forecasting of ACTs, RDT, ITN/LLIN and other malaria related commodities? Is the body responsible for forecasting provided with reliable and timely data on consumption of ACTs and malaria commodities, plus stock levels in health facilities and Central Medical Stores (CMS) in order to be able to quantify needs and forecast future needs this information is needed? Basically how well is the logistic management information system (LMIS) working?

- How well is coordination/communication between Global Fund, Malaria program, procurement, CMS and HF on PSM going; any problems?

- Are there any issues as regards the technical specification of the items?

- Who is responsible for procurement and clearing? The AMFm is a new mechanism for ACTs (ensuring quality and price). How is the process for ordering and paying of AMFm items going? Do specific guidelines (SOPs) exist for procurement through AMFm? Are they adequate, clear and are they used? Other malaria items are presumably being procured through the normal routine procedures used for other essential drugs and medical supplies. How well are both these systems operating? Are there any problems related to procurement (HR issues, adequacy, delay, quality?).

Central level/ District levels:
- Assuming all items are stored in the CMS, and in the HF. How well are they stored?
- How are the stock management systems operating in the CMS/ HF?
- Is there a separate system used for ordering malaria items from the CMS as compared with other essential drugs items? Assuming CMS is responsible for distribution, is the ordering system based on pull or push? How well is the system operating, as this will impact on stock levels in the HF.

### Stakeholder views obtained by Euro Health Group based on semi structured interview process

**Regional and District health officials:**

- ACTs are acquired from the central medical stores and in case they are unavailable, they are purchased from the open market. The problem is that sometimes the appropriate ACT combinations are not available on the open market
- AMFm has helped reduce prices of ACTs from about GHC 5.00 to GHC 1.50
- Problems with availability of subsidised drugs (Volta Regional malaria focal person)
- “AMFm has been operational and very effective so far in the district”. (Amansie West District Health Directorate)
- AMFm helped reduced the price of ACTs from about GHC5.00 to GHC1.50 and it is widely available (Keta District Health directorate)

**FDB:**

FDB is responsible for quality control activities in relation to the AMFm initiative (ACTs). Registration of RDTs is also done by FDB. There are three departments that work with the NMCP in this regard:

- Imports and exports department
- Safety/pharmacovigilance
- Drug quality

As for the impact of ACTs on malaria control, the FDB representative opined:

- ACTs have positive impact on malaria control but problem with availability at chemical stores. This encourages the presence other anti-malaria drugs on the market
- Only ACTs receive approval from FDB

**Global Fund contributions**

- improvement in monitoring and evaluation of malaria activities
- improved capacity and training of staff
- acquisition of equipment, e.g. mini labs to be used at entry ports

**Ghana Social Marketing Foundation (GSMF):**

GSMF trains licensed chemical sellers under the AMFm initiative, and according to GSMF AMFm idea is brilliant but implementation not the best because:

- it stopped local manufacturers from production due to competition
- it could have improved on quality of local manufacturers
- other drugs still exist on the market and are in use

However, they agreed that without GF:

- there would be no money to produce drugs at the same price
- even with money, local manufacturers may not be able to produce as they have stopped their operations,

In terms of the impact:

- malaria will not reduce but mortality due to malaria has reduced due to Global Fund activities

**Bilateral agencies:**

DFID and USAID fully support AMFm but have pointed out certain challenges:

**DFID:**

- Delays in supply
- Reimbursement schedule for NHIS changed
• Focus on treatment but no diagnosis; perhaps refresher courses and training should be organised

USAID:
• Cost may be passed on to the consumer
• Sellers may increase cost
• Perception of consumers; ‘if it’s cheap then it is not quality’. There will be need for extra budget to publicise.
• AMFµ has not pushed out mono-therapy (see study report on AMFµ provided by USAID). PMI tried to organise training for licensed chemical sellers to follow appropriate treatment
• AMFµ has come as a directive from the Global Fund (top-down approach)

LFA:
• the AMFµ initiative is good but there is a need to create much more awareness
• availability is a problem at some facilities and communities
• not very sure of sustainability but anticipates some donor fatigue

Noguchi Institute:
AMFµ is a good thing but a very dangerous programme at present. The very basic question is for how long this subsidy will continue and what happens when the subsidy is withdrawn? What is the long term game plan? For now there may be a lot of drugs in place but we should be careful not to kill local initiatives and then when there is no subsidy find out that the local producers have targeted other diseases and can no longer respond to the needs of the country. One interesting thing is that there are reports of people, especially in the urban areas, assuming that the drugs are of inferior quality due to the very low price. A lot more education is needed in this area. Use of RDTs with the drugs will be ideal, and efforts should be made to link them and also stress that at least for a start, treatment should be offered to only RDT positives.

Views of Key Stakeholders based on completed questionnaires

Western Regional Health Director offered the following feedback:
Actual outcomes
- various training programmes were organised for the health workforce in the region
- improved case management in pregnancy
- improved drug availability and access
- improvement in laboratory malaria confirmation rate
- improvement in human resource that focus on malaria
- bed nets used to be marketed in 2002 but now universal coverage

Without Global Fund?
- major problems with malaria diagnosis as RDT was very helpful
- lack of training at community level
- there would be no HBC
- lack of logistics (e.g. vehicles etc.)

Partners’ involvement?
- presence of Global Fund encouraged more partners participating in malaria control in the region e.g. NGOs in malaria. This has helped greatly in ITN distribution and campaigns.

Sustainability?
- sustainability of malaria control activities without Global Fund will be a problem

PPME, GHS:
Challenges have been summarised as follows:
- Global Fund approval process too rigorous
- focus mainly on convincing review team even if proposal is not feasible
- need for GF review team to visit countries for familiarisation
- Global Fund not engaged at the sector level
- programmes not able to contribute to Global Fund decision. Top-downs system of administration. Even suggestions from the sector not accepted at the programme level.
- there will be need for innovative funding for government to take over in order to ensure sustainability

PMI has offered the following reasons for why they feel Ghana is finding it difficult to meet with Global Fund expectations:
- increase in scale due to introduction of round 8
- change in administration at the MoH and GHS; procurement problems different under various administrations
- LFA needs to play more active role in fund administration and monitoring

WHO feels that the implementation of GF grants has been beset with:
- procurement difficulties
  - Global Fund may be contributing to procurement delays due to delays in grant/budget negotiations
  - there has been some stock outs which the PMI, sometimes, help in filling
  - procurement challenges have however improved even though they still exist
- Problems in implementation due to huge responsibilities on NMCP
### Annex 4: List of People Met

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Organization</th>
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<tbody>
<tr>
<td><strong>National Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. Constance Bart-Plange</td>
<td>Programme Manager</td>
<td>NMCP</td>
</tr>
<tr>
<td>Dr. Kezia Malm</td>
<td>Deputy Programme manager</td>
<td>NMCP</td>
</tr>
<tr>
<td>Ama Aubin</td>
<td>AMFm chair</td>
<td>NMCP</td>
</tr>
<tr>
<td>David Mensah</td>
<td>M&amp;E Officer</td>
<td>NMCP</td>
</tr>
<tr>
<td>Dr. Derek Aryee</td>
<td>CCM chair</td>
<td>CCM</td>
</tr>
<tr>
<td>Daniel Norgbedzie</td>
<td>Executive Secretary</td>
<td>CCM</td>
</tr>
<tr>
<td>Frank Boateng</td>
<td>Former chair</td>
<td>CCM</td>
</tr>
<tr>
<td><strong>Regional Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. Linda Van-Otoo</td>
<td>Western Regional Director</td>
<td>Ghana Health Service</td>
</tr>
<tr>
<td>Dr. Oduro</td>
<td>Ashanti Regional Director</td>
<td>Ghana Health Service</td>
</tr>
<tr>
<td>Mr Dobbin Dominic</td>
<td>Amansie West District Director</td>
<td>Ghana Health Service</td>
</tr>
<tr>
<td>Roland Glover</td>
<td>Volta Regional Malaria focal person</td>
<td>Ghana Health Service</td>
</tr>
<tr>
<td>Mrs Success Dovlo</td>
<td>Keta District health director</td>
<td>Ghana Health Service</td>
</tr>
<tr>
<td><strong>Donor Partners</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. Carolyn Sunners</td>
<td>Malaria Focal Person</td>
<td>DFID</td>
</tr>
<tr>
<td>Dr. Felicia</td>
<td>Malaria Focal Person</td>
<td>WHO</td>
</tr>
<tr>
<td>Lisa Krammer</td>
<td>Malaria Focal Person</td>
<td>USAID</td>
</tr>
<tr>
<td>Paul Psycas</td>
<td></td>
<td>USAID</td>
</tr>
<tr>
<td><strong>Private Partners</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mr. Alex Banful</td>
<td>Director</td>
<td>Ghana Social Marketing foundation</td>
</tr>
<tr>
<td>Dennis Sena Awitty</td>
<td>Executive Secretary</td>
<td>Pharmaceutical Association</td>
</tr>
<tr>
<td>Steve Knowles</td>
<td>Programme Manager</td>
<td>Ashanti Gold Malaria Control Programme</td>
</tr>
<tr>
<td><strong>Ghana Health Service</strong></td>
<td></td>
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</tr>
<tr>
<td>Mr. Dan Osei</td>
<td>Director PPME</td>
<td>Ghana Health Service</td>
</tr>
<tr>
<td>Mr. Daniel Darko</td>
<td>Center for health information management</td>
<td>Ghana Health Service</td>
</tr>
<tr>
<td><strong>LFA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mr Augustine Aboagy</td>
<td>Focal Person</td>
<td>LFA</td>
</tr>
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Annex 5 Summary of AMFm Background Documents

CC Members’ update (July-Sep’11)

Training:
Private Sector: A total of 6,400 Licensed Chemical Sellers have been trained nationwide by Pharmacy Council and Ghana Social Marketing Foundation (GSMF). The Pharmaceutical Society of Ghana (PSGh) has trained 1,400 pharmacists and is to do a mop up training for 200 pharmacists. Society of Private Medical and Dental Practitioners (SPMDP) has trained (362) private medical practitioners (Prescribers) in the Greater Accra Region, Volta, and Ashanti Regions and plans to complete the training in the Brong Ahafo region by end of October 2011. The PC has submitted proposal for the training of 1600 Medical Counter Assistants (MCAs) which has been approved. Implementation will begin when the funds for the programme has been released to them.

Public Sector: Four thousand (4,000) health care providers in the public sector have been trained on the AMFm objectives and their roles in achieving them as well as on malaria case management. Public sector training is ongoing.

Pharmacovigilance Training: The FDB has trained Institutional Contact Persons (ICPs) as part of the process of Cohort Event Monitoring being carried out by the FDB in the framework of the AMFm implementation.

Marketing and Publicity Campaigns:
Television and Radio: There is continued nationwide public sensitisiation and BCC through the airing of Television (TV) advertisements on 5 TV stations (Metro TV, TV Africa, GTV, TV3 and Multi TV) and 31 radio stations across the country. The messages have been to inform about the availability of the AMFm ACTs, price and the need to use them once diagnosed with malaria. These messages have been in English and seven Ghanaian languages (Akan, Ewe, Ga, Dagbani, Dagaaare, Frafra and Hausa) spanning the various regions and the dominant ethnic dialects. There are also various on-going TV appearances by NMCP staff and designated individuals to discuss, educate and inform on the AMFm. This is further supported by radio presenter mentions on Adom and Peace FM.

Dramatised Documentary (docudrama): Twenty-five minutes docudrama in seven local languages have been produced and submitted to the NMCP by Primetime Limited for review. The docudramas are still under review. There are plans to use various local drama slots to air them (e.g. Akan drama) and also to use the community outreach mechanism of the NCCE to bring the docudrama to the local communities in the 170 districts of Ghana.

Print Advertisements: Full and Strip colour page adverts have also been placed in four newspapers (Daily Graphic, Daily Guide, Ghanaian Times and Crusading Guide). The target for print media placement was achieved in August 2011.

Posters and Danglers: These have been produced and distributed to various partners in the AMFm

Publicity: Various groups and associations are being sensitised through public activities such as exhibitions, durbars, church programmes, etc.

International Collaboration: NMCP, GF and Coca-Cola have taken steps to setup collaboration in anticipation of phase 2 of the marketing campaign. The BBC has recorded a documentary on the AMFm implementation in Ghana. It is yet to be aired.

Regional Launches: The Central Region launched the AMFm in September 2011. The function was chaired by the Omanhene of the Oguaa traditional area Osabarima Kwasi Atta II. At the launch the Omanhene pledged his support to ensure that the AMFm succeeds in making quality assured ACTs available at affordable prices by using every opportunity and forum available to him to sensitise the people of the Oguaa traditional area.

Monitoring and Evaluation:
The PC submitted its first monitoring report of the AMFm in private health facilities (Pharmacies and Licensed Chemical Seller Shops) in July 2011. The findings were subsequently disseminated on 9th August 2011. This generated a lot of media discussion following a Daily Graphic report of the findings. The monitoring results were also posted on the Ghana News Agency website. The findings showed a modal price of GHC 1.50 with a few outliers selling the AMFm ACTs at GHC 5.00. The July 2011 monitoring has been completed but the results are yet to be submitted to the NMCP. Due to delay in processing of funds the PC monitoring was stalled in August and September. The FDB has submitted proposals for Drug Quality Surveillance, Port of Entry Monitoring and Cohort Event Monitoring. Some of the Funds has been released to them and these activities are at various stages of implementation. They have not yet reached the stage where they will submit reports to the NMCP/AMFm. There is currently an on-going Mystery Client Survey of Pharmacies and LCSs on price, availability and case management.
Embedded in this is a small exploratory survey of public sector hospitals, clinics and health centres’ through exit interviews.

Operational Research:
Dodowa health research centre under the Ghana Health Service is conducting a study on the Feasibility and Acceptability of Expanding the Use of RDTs within the Private Sector in Ghana. The main objective is to assess the feasibility and acceptability of RDT use in the Pharmacies and LCS in Ghana for improved targeting of ACTs. The study is being carried out in two of the three Ga districts of the Greater Accra region which used to be one district but has recently been administratively divided into three districts (Ga East, Ga West and Ga South). The three areas have a mix of rural, peri-urban and urban characteristics.

The Kintampo Rural Health School is leading operational research in: Assessing the Feasibility of expanding Health Insurance to Private Licensed Chemical Shops to increase Access to ACTs and other essential medicines especially in rural poor communities. Kintampo is yet to receive its first instalment of funds to begin the study.


Observations from Key Informant Interviews and FGDs:
Key lessons learnt in the implementation of AMFm in Ghana;
• Almost all the stakeholders (except one consumer) were aware of the AMFm and felt that there was improved availability and a greater access to ACTs.
• NHIA prices for ACTs now fixed at AMFm price which may lead to increase in access to anti-malarias (ACTs)
• All participants found the AMFm to be “excellent” “good”, “laudable” “a great initiative”, etc.
• There was very enthusiastic support for the concept of making good quality medicines affordable to all especially the poor. Affordability has improved sharply – prices have fallen
• Improved collaboration internally (within MoH) and externally with the public and the private sectors
• Increased visibility of the green leaf
• Training of key personnel

The AMFm Business Model:
• Ghana found the public-private partnership and collaboration commendable and useful but too rigid with regard to how first line buyers access the medicines from the manufacturers. Hence a mixed model that includes local manufacturers will be preferable
• There is generally a lack of clear publicly available guidelines in the process of ordering products from the Global Fund, poor consultation with stakeholders prior to commencement of implementation, stock availability from manufacturers and lead times for getting in products has been very poor affecting the availability of the medicines in the country
• First Line Buyers indicated that they had not been included in the marketing campaign that is on-going and would like to see them given more visibility by for example mentioning a few at a time during radio and TV discussions and advertisement, this is especially important because the profit margins are very small but they see their participation as contributing to the ‘public good’ (corporate social responsibility)
• Absence of visible high level political support for the AMFm in Ghana.

The future of AMFm:
• Abrupt termination of AMFm at the end of 2012 may lead to shortage or no products in the shops. Taking into consideration the time required to re-register with FDB (about one year) so as to commence manufacturing, and the time to retool manufacturers who as a result of the AMFm had stopped manufacturing, plus the difficulty in communicating a new price/prices which are much higher compared to AMFm prices to the public it would be best if a transitional period of one year is allowed even in the worst case scenario of termination
• All stakeholders were against termination of the AMFm after phase 1 and the favoured option is to continue but with modifications.

Opinions expressed during the Stakeholders meeting held in August 2011:
a. By key officials
• The Minister of Health, Honourable Joseph YilehChireh, in his address stated that he would urge the global partners not to terminate the programme but rather to CONTINUE. He informed that the provision of affordable
medicines has helped to strengthen the health system and has led to improvements in quality care and so such gains made should not go to waste. He assured the meeting that government on his part will continue to support the programme to improve health care in Ghana.

- The CHAI representative has seen signs that AMFm is working as envisaged, that it is fostering Public-Private partnerships. She also said that she had observed that there are challenges.
- The Pharmacy Council representative felt that the AMFm is a wonderful idea in the quest to manage malaria. Awareness levels in some of the areas the Council had monitored were very low, that there are some misconceptions about what the programme seeks to do and also that though price levels were initially high, preliminary results of July show that the prices were going down. He called on the NMCP to strengthen its marketing efforts in the AMFm and on all partners to think about the sustainability of the programme.

b. By participants

- Availability of the products was a big challenge to its sustainability especially in the current phase of the pilot. The Global Fund representative explained that manufacturer assessment was on-going and so may help to identify the challenges of manufacturers also there is research into other sources of the raw materials for the production of the ACTs, findings from these will inform the decision on the manufacturing and supply
- The first line buyers stated that when the profit/gains from non AMFm ACTs are compared with AMFm ACTs the ratio is about 20:1, therefore the only way to make any form of reasonable profit would be to sell large volumes of the product, in the absence of such volumes there is no motivation to take the goods up north and so Global Fund should ensure that the Orders are honoured as quickly as possible
- It would be good to take a look at the institutional arrangement of the AMFm, should the Global Fund continue to host it
- There should be no haste to bring down the current prices of the ACTs in Ghana as supply/availability is a major challenge. Market forces may be allowed to determine the prices
- If the Global Fund decision is to terminate the initiative, it will be necessary to allow time to prepare local industries to go back to manufacturing and so an amount should be earmarked to support local industries to begin production locally
- If the savings made from AMFm by the NHIS could be determined, it could be used to start an in-country subsidy (local co-payment) to support the manufacture and supply of ACTs. The NHIS would therefore need to put in mechanisms to track savings
- If 50 percent of the required ACTs were to be manufactured locally, it would help increase availability, reduce prices, enhance capacities of local industries and foster sustainability
- The FDB should be strengthened to check the quality of the AMFm medicines and improve pharmacovigilance
- The WHO directive to diagnose before treatment may lead to delays in providing care to those who need it, especially in remote and deprived areas where there are no laboratories and the non-availability or limited supply of RDT kits. Hence there is a need for the expansion in the use of RDTs to licensed chemical sellers and pharmacies and to provide training for their proper usage.

At the end of the stakeholders’ meeting the following outcomes were noted:
- All stakeholders were against termination of the AMFm after Phase 1 and the favoured option was to continue but with modifications. Some of the reasons given for this were that it would be difficult to go back to pre-pilot phase prices of artemisinin based combination therapies (ACTs)
- A key supporting intervention that Ghanaians would like to see included in the programme is support to local manufacturers to reach WHO prequalified status so that the programme ACTs can be produced in country
- Supply of the AMFm ACTs should be assured to increase availability rather than the current erratic nature of supply
- Creation of distribution depots and points to reduce the complexity of the supply chain
- The government should waive taxes on co-paid ACTs including the current phase and the phase 2
- Weakness and successes of the implementing countries should serve as lessons learnt to inform future directions rather than see weaknesses as failures.
- Number of manufacturers in the programme should be increased
- Prequalification of suppliers of raw materials
- Ghana should own the programme and device strategies for sustainability
- Increase political involvement to give AMFm a higher profile
- Involve local government and governance structures e.g. District Assemblies more actively in AMFm
- Improve marketing communications to reach all sectors of the Ghanaian society
- Enhance Public-Private Partnership
- Global Fund to make the ordering processes more transparent